

KNJIGA SAŽETAKA

53. KONGRES STUDENATA
BIOMEDICINSKIH NAUKA SRBIJE
SA MEĐUNARODNIM UČEŠĆEM



Organizator:
Medicinski fakultet Novi Sad, Univerzitet u Novom Sadu
Savez studenata Medicinskog fakulteta Novi Sad
Naučna sekcija Saveza studenata

26-30. april 2012. godine Kopaonik



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prof. dr Marija Mihalj

Urednički odbor:

prof. dr Nikola Grujić
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prof. dr Snežana Brkić
prof. dr Marko Erak
prof. dr Jovan Popović
prof. dr Goran Marušić
Višnja Krizmanić
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Milan Levnajić

Ljiljana Nedić, student prodekan

Medicinski fakultet Univerziteta u Novom Sadu



GOVOR DOBRODOŠLICE

Drage kolege, naučnici, uvaženi članovi komisija,

U ime studenata Medicinskog fakulteta Novi Sad, želim da vam uputim srdačnu dobrodošlicu na 53. Kongres studenata biomedicinskih nauka Srbije sa međunarodnim učešćem.

Želim Vam uspešno prezentovanje radova, zanimljive sesije, odličan provod, da izdržite pešačenje po brdima, upoznate kopaonički kraj, sklopite nova poznanstva, prijateljstva, ljubavi, da se uvek rado sećate ovog kongresa.

Posebno bih pozdravila studente koji prvi put izlažu svoje radove. Naučno - istraživački rad treba da predstavlja sastavni deo vašeg profesionalnog života i usavršavanja. Nadam se da će Vas iskustvo koje steknete na Kongresu ohrabriti da i narednih godina vredno radite i učestvujete, sa željom da naučite nešto novo ali da i drugima prenesete svoja saznanja.

Pohvalila bih Organizacioni odbor. Dugogodišnja tradicija nacionalnog kongresa je stavila pred mladi tim Naučne sekcije Saveza studenata Medicinskog fakulteta Novi Sad jedan veliki zadatak. Uloženo je mnogo truda i energije u samu organizaciju. Sigurna sam da će ispuniti sva vaša očekivanja i omogućiti da radovi, koji su prošli recenziju, na pravi način predstave Vaš fakultet.

Dobro došli na Kopaonik!

Srdačno, Ljiljana Nedić

Student prodekan Medicinskog fakulteta u Novom Sadu

PREDGOVOR

Kongres studenata biomedicinskih nauka Srbije sa međunarodnim učešćem je najstarija i najveća studentska naučna manifestacija. Već pola veka na kongresu se okupljaju studenti svih državnih medicinskih fakulteta Srbije- Medicinskog fakulteta u Beogradu, Kragujevcu, Nišu, Prištini (sa privremenim sedištem u Kosovskoj Mitrovici) i Novom Sadu. Osnovan kao Kongres studenata medicine i stomatologije, danas ovaj skup objedinjuje studente i drugih biomedicinskih nauka- farmacije, molekularne biologije, zdravstvene nege, specijalne rehabilitacije i edukacije, veterinarske medicine.

Ulogu organizatora kongresa svake godine dobija Centar za naučno-istraživački rad studenata sa drugog fakulteta biomedicinskih nauka iz naše zemlje. Ove godine, velika čast i odgovornost da organizuje 53. Kongres studenata biomedicinskih nauka Srbije sa međunarodnim učešćem poverena je Naučnoj sekciji Saveza studenata Medicinskog fakulteta Novi Sad.

Kongres je opstao zahvaljujući istrajnosti i radoznalosti studenata, kao i podršci njihovih profesora. Stoga je zadatak organizatora da omogući studentima, koji su započeli svoj rad u nauci, uslove za izlaganje rezultata svojih novih istraživanja i za razmenu naučnih iskustava. U dogovoru sa predstavnicima preostalih fakulteta, doneta je zajednička odluka da se na kongresu ukinu nagrade za najbolje radove u sesiji. Ovo je učinjeno sa namerom da se umesto nadmetanja podstakne saradnja i interesovanje za rad kolega čime se ujedno podstiče i razvija timski duh, značajan za budući rad.

Kongres pruža priliku studentima da se upoznaju i uspostave saradnju sa kolegama drugih fakulteta. Na kongresu učestvuju i studenti iz susednih zemalja- Republike Makedonije, Crne Gore i Republike Srpske. Ukupno je prijavljeno 784 studenta da prezentuje svoje radove na kongresu. Njihove prezentacije će slušati i ocenjivati 107 članova stručne komisije.

Potrudili smo se da osmislimo program kongresa tako da ga čine tematski povezana predavanja i radionice. Tema ovogodišnjeg kongresa je posvećena transplantaciji i donorstvu organa. Zahvaljujemo gostujućim predavačima: dr Gordani Nikčević, višem naučnom saradniku Instituta za molekularnu genetiku i genetički inženjering, prof. dr Igoru Mitiću, upravniku Klinike za nefrologiju i kliničku imunologiju Kliničkog Centra Novi Sad, i akademiku prof. dr Nebojši Laliću, dopisnom članu SANU, što su prihvatili poziv da sa nama podele svoje naučno i stručno iskustvo i znanje. Zahvaljujemo Komitetu za međunarodnu saradnju studenata medicine, Kosani Mitrović i njenim saradnicima, na pomoći u organizovanju radionica. Tokom ovih radionica učesnici će moći da se upoznaju sa veštinama pojedinih metoda hirurškog šivenja i vezivanja čvorova, da diskutuju i rešavaju dileme na teme donorstva organa i javnog zdravlja, da potpisuju donorske kartice.

Zvaničan deo programa kongresa učesnici će biti u mogućnosti da upotpune organizovanim izletima, razvojem sportskog duha u igri ekipnih sportova i večernjim druženjem uz muziku.

Zahvaljujući pomoći koju nam je pružila prof. dr Mirjana Životić-Vanović, načelnik Sektora za školovanje i naučno-istraživački rad VMA, kolege sa Medicinskog fakulteta Vojnomedicinske akademije Univerziteta odbrane u Beogradu će prvi put učestvovati na Kongresu studenata biomedicinskih nauka Srbije sa međunarodnim učešćem. Šestoro kadetkinja i kadeta, prve, druge i treće klase VMA, će kao gosti kongresa prikupljati iskustva za svoj budući naučno-istraživački rad, a sa nama deliti pojedinosti i iskustva svog školovanja na VMA. Zahvaljujemo prof. dr Gordani Panovoj, profesoru Fakulteta medicinskih nauka u Štipu, što je okupila grupu studenata Univerziteta Goce Delčev i prijavila ih za učešće na kongresu.

Zahvaljujemo svim predsednicima Centara za naučno-istraživački rad studenata i njihovim zamenicama: kolegama Ivani Mitić, Andrijani Puzović, Aleksandri Vranić, Jelici Rogić, Veselinu Nasufoviću, Dejanu Radakoviću, Vladanu Đorđeviću i Igoru Mamliću, Urošu Glaviniću, Marku Pajiću, Saši Jovanoviću i Predragu Vučetiću, Ivanu Živkoviću i Mirku Mikiću. Oni su izuzetnom saradnjom i posvećenošću pomogli u organizaciji ovog kongresa.

Svim članovima stručne komisije takođe zahvaljujemo što svojim savetima i pitanjima obezbeđuju kvalitetnu diskusiju i stimulišu studente da dalje tragaju za novim saznanjem.

Pozdravljamo stručnost i efikasnost svih zaposlenih agencije PanaComp, g-đe Jadranke Petrović i njenog tima saradnika.

Za strpljenje i umešnost u dizajniranju i pripremi za štampu kongresnog programa i knjige sažetaka, zahvaljujemo Milanu Levnajiću, masteru grafičkog dizajna.

Zahvaljujemo gospodinu Rajku Kosijeru, direktoru izdavačkog preduzeća KAIROS, kao i direktoru, gospodinu Bojanu Višiću, i svim zaposlenima štamparije „Budućnost” a.d. na profesionalnoj pomoći u brzom i kvalitetnom štampanju kongresnog materijala.

Poštovani članovi komisije, gosti kongresa, drage kolegice i kolege,

Želimo vam uspešan rad tokom kongresa i da vas na 53. Kongres studenata biomedicinskih nauka Srbije sa međunarodnim učešćem podsećaju prijatna iskustva i prijateljstva koja ste tokom kongresa stekli!

U ime Organizacionog i Nadzornog odbora kongresa,

Predsednik Organizacionog odbora
Aleksandra Vejnović

Igor Mitić, redovan profesor Medicinskog fakulteta Novi Sad

Klinika za nefrologiju i kliničku imunologiju Kliničkog Centra Novi Sad



Petak, 27.04.2012. 19:00-20:00, Velika sala kongresnog centra

BIOGRAFIJA

Igor Mitić rođen je 27.05.1961 u Novom Sadu. Osnovnu školu i Srednju medicinsku školu završio je u Novom Sadu. Medicinski fakultet je upisao 1979. godine, a diplomirao 1985. godine sa prosečnom ocenom 9.60. Po završetku lekarskog staža, radio je 1986-1988. godine u Instiutu za onkologiju, Sremska Kamenica, kao asistent u naučno-istraživačkom radu za oblast patologija. Od 1988. godine zaposlen je na Klinici za nefrologiju i kliničku imunologiju, Instituta za interne bolesti, Kliničkog Centra Novi Sad, kao odeljenjski lekar, od 1995. do 1998. godine kao načelnik Imunološke laboratorije Instituta za interne bolesti, od 1998. do 2002. godine kao načelnik Odeljenja za transplantaciju bubrega Klinike, a od 2002. godine je Upravnik Klinike za nefrologiju i kliničku imunologiju Kliničkog Centra Novi Sad.

Od 1988. do 1992. godine biran je u zvanje asistenta u naučno-istraživačkom radu na predmetu Interna medicina, 1992. godine izabran je u zvanje asistenta, 2001. godine u zvanje docenta, a od 2012. u zvanje redovnog profesora na predmetu Interna medicina (nefrologija i klinička imunologija). Tokom 1992. godine završio je specijalizaciju iz interne medicine, a 1998. užu specijalizaciju iz nefrologije, a tokom 1995/1996. pohađao je poslediplomsku nastavu iz reumatologije, na Medicinskom fakultetu u Beogradu.

Magistrirao je 1991. godine sa temom: "Bubrežne promene u sistemskom eritemskom lupusu" i doktorirao 2001. godine sa temom: "Poremećaji funkcije T limfocita u sistemskom eritemskom lupusu" na Medicinskom fakultetu u Novom Sadu.

Autor je više radova iz oblasti glomerulopatija, dijagnostike i terapije sistemskih autoimunih bolesti i transplantacije bubrega. Usavršavao se u Columbia Presbyterian College of Surgeons and Physicians u Njujorku (SAD), Medicinskom fakultetu u Frajburgu (Nemačka) i IKEM u Pragu (Češka). Učestvuje kao konsultant u oblasti imunologije u 2 internacionalna projekta, bio je učesnik više naučno-istraživačkih projekata pokrajinskog i republičkog ranga, a trenutno je angažovan u kao saradnik u jednom nacionalnom projektu iz oblasti bazičnih disciplina.

Govori engleski jezik. Oženjen je i ima dve ćerke.

TRANSPLANTACIJA ORGANA - STVARNOST MEDICINE XXI VEKA

Transplantacija je najbolji trenutno dostupni metod lečenja bolesnika sa ireverzibilnim oštećenjima strukture i funkcije različitih parenhimskih organa. Iako je kao ideja poznata vekovima, tek je razvoj medicinskih i tehnoloških saznanja XX veka, omogućio da se do tada samo teoretska mogućnost lečenja zamenom obolelih organa pretvori u praktično primenjivu medicinsku disciplinu.

Klinička uspešnost transplantacije potvrđena je poslednjih 50 godina, a primena savremenih imunosupresivnih protokola doprinela je da lečenje transplantacijom značajno smanjuje opterećenje zdravstvene službe i zdravstvenih fondova koji je za lečenje terminalnih bolesti neprihvatljivo visok. Sve ovo rezultiralo je činjenicom da preko 2 miliona ljudi danas živi sa transplantiranim organima. Među njima je najviše bolesnika sa transplantiranim bubregom, ali je veliki i broj bolesnika sa transplantacijom jetre, srca, pluća, creva, pa i komplikovanih tkivnih sistema, kao što su ruka ili lice. Kako transplantacija zahteva primenu različitih imunosupresivnih lekova u lečenju, ogroman broj istraživanja posvećenih izučavanju teoretske i praktične imunologije posvećen je ovoj temi.

Iskustva u primeni lekova i postupaka, preneti su poslednjih godina iz transplantacione medicine u druge medicinske discipline sa velikim uspehom. Istovremeno, razvoj veštački izazvanog imunokompromitovanog stanja primaoca organa predstavlja izazov za dijagnostiku i lečenje i čini transplantacionu praksu u potpunosti novom i „veštačkom granom“ medicine.

Osim medicinskih i tehnoloških problema, tokom razvoja transplantacije pojavili su se i brojni etički izazovi. Način izbora davaoca organa, živog ili kadaveričnog, a naročito izbor i selekcija primaoca postavljaju pred medicinsko osoblje ogromne moralne dileme, koje ne postoje u drugim granama medicine.

U celini, transplantaciona medicina je u potpunosti arteficialna procedura, čija je uspešnost u našoj zemlji zasnovana na entuzijazmu malog broja pojedinaca. Samo adekvatna edukacija svih zdravstvenih radnika, uz medijsku promociju i opštu edukaciju stanovništva može dovesti do povećanja broja transplantacija u našoj sredini.



**Gordana Nikčević, viši naučni saradnik u Laboratoriji za molekularnu hematologiju
Institut za molekularnu genetiku i genetičko inženjerstvo, Univerzitet u Beogradu**

Subota, 28.04.2012. 19:00-20:00, Velika sala kongresnog centra

BIOGRAFIJA

Datum rođenja: 03.04.1960.
Adresa: Laboratorija za molekularnu hematologiju
Institut za molekularnu genetiku i genetičko inženjerstvo (IMGGI)
Vojvode Stepe 444a, P.O. Box 23, 11010 Beograd
Telefon: 011 3976 445
Fax: 011 3975 808
Email: gordnik@eunet.rs

Obrazovanje:
1998 – Doktor bioloških nauka – Biološki fakultet, Univerzitet u Beogradu
1988 – Magistar bioloških nauka – Biološki fakultet, Univerzitet u Beogradu
1984 – Diplomirani biolog, smer molekularna biologija i fiziologija, Biološki fakultet, Univerzitet u Beogradu

Profesionalno iskustvo:
2011 - danas Viši naučni saradnik, Laboratorija za molekularnu hematologiju, IMGGI
2006 - 2010 Viši naučni saradnik, Laboratorija za humanu molekularnu genetiku, IMGGI
2001 - 2006 Zamenik direktora, IMGGI
2000 - 2006 Naučni saradnik, Laboratorija za humanu molekularnu genetiku, IMGGI
1996 - 2000 Istraživač, Odsek za fiziologiju i biofiziku, Illinois univerzitet u Čikagu, SAD
1993 - 1996 Gostujući istraživač, Odsek za fiziologiju i biofiziku, Illinois univerzitet u Čikagu, SAD
1988 - 1993 Istraživač saradnik, Laboratorija za deobu ćelija, IMGGI
1986 - 1988 Istraživač pripravnik, Laboratorija za deobu ćelija, Centar za genetičko inženjerstvo, Beograd

Naučni interes:

- Izučavanje molekularnih mehanizama uključenih u regulaciju ekspresije eukariotskih gena. Istraživanja su uključivala rad na nekoliko različitih model sistema: humani beta interferon, beta globin pacova, humani laki i teški lanac miozina, humani SOX geni.
- Molekularna genetika retkih bolesti i farmakogenomika. Istraživanja su vezana za analizu molekularne osnove i dijagnostike različitih retkih bolesti, kao i analizu genetičkih polimorfizama važnih za optimizaciju korišćenja lekova u tretmanu inflamatornih bolesti

Izabrane publikacije:

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4. Mojsin M, Grujicic NK, Nikcevic G, Krstic A, Savic T, Stevanovic M. Mapping of the RXRalpha binding elements involved in retinoic acid induced transcriptional activation of the human SOX3 gene. *Neurosci Res*. 2006 56:409-418.
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7. Nikcevic G, Heidkamp M, Perhonen M, Russell B. Mechanical activity in heart regulates translation of a-myosin heavy chain mRNA but not its localization. *Am J Physiol*. 1999 276:H2013-H2019.
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10. Knezic Z, Nikcevic G, Marjanovic J, Glisin V, Popović Z. Constitutive interferon expression from retroviral vector. *Antivir Res*. 1993 22:215-221.



MATIČNE ĆELIJE - BUDUĆNOST MEDICINE

Matične ćelije imaju izuzetnu osobinu da od njih nastaju svi tipovi ćelija u telu. U mnogim tkivima one predstavljaju bazu za obnavljanje ćelija tokom života. Razlikuju se od drugih tipova ćelija po tome što mogu da se deobom samoobnavljaju i/ili diferenciraju u specijalizovane ćelije određenih tkiva.

Postoje različiti tipovi matičnih ćelija: embrionalne i somatske (adultne). One se razlikuju po diferencijacionom potencijalu koji poseduju. Prema potencijalu, matične ćelije mogu biti totipotentne, pluripotentne, multipotentne, oligopotentne i unipotentne. Postoje i matične ćelije kancera. Kancerogeneza predstavlja klonalnu propagaciju matične ćelije kancera koja dovodi do stalnog rasta tumora. Nedavno su naučnici uspeali da diferencirane adultne ćelije genetički „reprogramiraju“ i dobiju ćelije sa osobinama matične ćelije (indukovane pluripotentne matične ćelije). Ove ćelije bi mogle biti polazna osnova za dobijanje svih tipova ćelija, i tako predstavljati „rezervnu banku“ tkiva za svaku osobu. Danas su matične ćelije predmet ekstenzivnih istraživanja. Na njima se testiraju novi lekovi. U regenerativnoj medicini su terapeutik koji najviše obećava. Očekuje se da će one biti korišćene u bliskoj budućnosti za lečenje hematoloških bolesti, srčanih oboljenja, povreda kičmenog stuba, dijabetesa, reumatoidnog artritisa i Alzheimer-ove bolesti.

Ključne reči: embrionalne matične ćelije, adultne matične ćelije, matične ćelije kancera, indukovane pluripotentne matične ćelije

Nebojša Lalić, dopisni član SANU

redovni profesor Medicinskog fakulteta Univerziteta u Beogradu

BIOGRAFIJA

Rođen je 14. januara 1958. godine u Beogradu. Osnovnu školu i gimnaziju završio je u Beogradu. Diplomirao je na Medicinskom fakultetu Univerziteta u Beogradu 1982. godine sa prosečnom ocenom 10,0.

Od 1983. godine je zaposlen u Institutu za endokrinologiju, dijabetes i bolesti metabolizma Kliničkog centra Srbije u Beogradu, specijalista interne medicine je od 1990. godine, a uže specijalizacije iz endokrinologije od 1998. godine. Magistarsku tezu je odbranio 1986. godine, a doktorsku disertaciju 1993. godine.

U Institutu za endokrinologiju, dijabetes i bolesti metabolizma Kliničkog centra Srbije od 1995. godine je bio šef jedinice, od 1997. godine načelnik odeljenja, a od 2003. godine je načelnik Centra za metaboličke poremećaje, intenzivni tretman i ćelijsku terapiju u dijabetesu, dok je od 2001 godine zamenik direktora Instituta.

Izabran je na predmetu Interna medicina na Medicinskom fakultetu Univerziteta u Beogradu u zvanje asistenta pripravnika 1989. godine, asistenta 1991, docenta 1995, vanrednog profesora 1999. godine, i redovnog profesora 2007. godine. Od 2002. godine obavlja dužnost prodekana Medicinskog fakulteta u Beogradu.

Od 2003. godine je predsednik Republičke stručne komisije za šećernu bolest Ministarstva zdravlja Republike Srbije.

Izabran je za dopisnog člana SANU 2.11.2006. godine.

U toku svog naučnoistraživačkog rada autor je ili član autorskog tima u 563 publikacije, od čega je u 180 prvi ili jedini autor. U okviru navedenog broja publikacija, objavio je 90 radova in extenso u časopisima i zbornicima, od čega je 43 publikovano u časopisima indeksiranim u internacionalnim bazama podataka (Current Content/Science Citation Index i Medline)

Analiza ukazuje da je većina navedenih publikacija iz oblasti dijabetologije što je kontinuirano dominantna oblast naučnog interesa. U ovim radovima najviše se bavio proučavanjem odnosa insulinske senzitivnosti i insulinske sekrecije u dijabetesu, zatim ispitivanjem autoimunih mehanizama u osnovi nastanka tipa 1 dijabetesa, proučavanjem mehanizama destrukcije transplantata ostrvaca endokrinog pankreasa i metaboličkim aspektima prevencije hroničnih komplikacija dijabetesa. U okviru svojih istraživanja formirao je istraživački centar u kome se, u delu kliničkih ispitivanja, primenjuju složene metode insulinskog klampa kombinovane sa indirektnom kalorimetrijom i određivanjem produkcije glukoze u jetri, dok se, u delu laboratorijskih istraživanja, razvijaju najsavremenije metode ispitivanja izolovanih pankreasnih ostrvaca i limfocita pacijenata sa tipom 1 dijabetesa.



Održao je 64 predavanja po pozivu na međunarodnim (16) i nacionalnim naučnim skupovima (48), bio je recenzent i član uređivačkog odbora u internacionalnim (International Diabetes Monitor) i nacionalnim časopisima (Srpski arhiv) i član naučnog odbora na međunarodnim (10) i nacionalnim (22) skupovima.

Od 1983. godine uključen je kao istraživač saradnik u radu na projektima koje je finansirala Republička zajednica nauke Srbije, Osnovna zajednica nauke Beograda i Ministarstvo za nauku Srbije a od 2001. je rukovodilac projekta.

Od 1994 učestvuje kao rukovodilac centra u 5 međunarodnih projekata Boravio je na usavršavanju u Biomedicinskom centru Univerziteta u Upsali, Švedska 1981. godine, u Joslin Diabetes Center-u, Medicinskog fakulteta Univerziteta Harvard u Bostonu 1991. godine i u Centru za transplantaciju ostrvaca Univerziteta Vašington, Sent Luis, SAD 1991. godine.

Bio je nosilac organizacije 31 internacionalnog i nacionalnog naučnog skupa u našoj zemlji, od kojih je 7 organizovano u saradnji sa SANU. U poslednje tri godine organizovao je 6 seminara kontinuirane medicinske edukacije, internacionalnih ili sa međunarodnim učešćem, među kojima je najveći značaj imala posle diplom- ska škola Evropske asocijacije za studiju dijabetesa 2005. godine.

U okviru Odeljenja medicinskih nauka SANU rukovodi Odborom za multidisciplinarna istraživanja šećerne bolesti a takođe je član Odbora za kardiovaskularnu patologiju i Odbora za imunologiju.

U Endokrinološkoj sekciji Srpskog lekarskog društva član je od 1983.godine, u Udruženju endokrinologa Jugoslavije od 1984. godine a u Udruženju za proučavanje šećerne bolesti od 1998.godine. Bio je sekretar Endokrinološke sekcije SLD od 1993-2001. godine a od 2003.godine je predsednik Odbora za dijabetes ove Sekcije. Bio je sekretar Udruženja endokrinologa Jugoslavije od 1995-2003. godine.

Član je Udruženja za aterosklerozu Srbije i Crne Gore od 1999. godine i sada je na dužnosti generalnog sekretara Udruženja.

Takođe, član je Evropske akademije za alergologiju i kliničku imunologiju od 1983 godine, Mediteranske grupe za studiju dijabetesa od 1986 godine, Evropske asocijacije za studiju dijabetesa od 1989. godine, Američke asocijacije za dijabetes od 1991. godine, Društva za ćelijsku transplantaciju od 1992. godine, Društva za transplantaciju ostrvaca od 1992. godine, Internacionalne asocijacije za transplantaciju pankreasa i ostrvaca od 1993. godine, Evropske grupe za proučavanje insulinske rezistencije (EGIR) od 1994. godine, Društva za imunologiju dijabetesa od 1995. godine, Evropskog udruženja za aterosklerozu od 2000. godine, Internacionalne dijabetesne federacije od 2002. godine.

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KOMITET ZA MEĐUNARODNU SARADNJU STUDENATA MEDICINE - SRBIJA IFMSA-SERBIA

RADIONICA 1

“ISTINE I ZABLUDE O POLNO PRENOSIVIM BOLESTIMA”
Četvrtak, 26.04.2012. 16:00-18:00

Plan radionice:

1. Uvod- uopšteno o polno prenosivim bolestima
2. Načini prenošenja i zaštite
3. Igrica
4. Istine i zablude o Hepatitisima (A, B, C)
5. Igrica
6. Istine i zablude o HIV/AIDS-u
7. Evaluacija

Vreme trajanja: 60 minuta

Koordinatori radionice: LORA LC NS Svetlana Petkov
LPO LC NS Maja Radanović

RADIONICA 2

“TEHNIKE HIRURŠKOG ŠIVENJA I VEZIVANJA HIRURŠKOG ČVORA”
Petak, 27.04.2012. 13:00-15:00

Plan radionice:

1. Uvod – istorijat hirurške tehnike, pravila sepse i antiseptice, uopšteno o osnovnim tehnikama vezivanja hirurškog čvora.
2. Praktični deo – praktična demonstracija vezivanja hirurškog čvora i rad sa svim učesnicima radionice.

Vreme trajanja: 60 minuta

RADIONICA 3

“DONACIJA I TRANSPLANTACIJA ORGANA”
Subota, 28.04.2012. 14:00-16:00

Vreme trajanja: 60 minuta



ORGANIZACIONI ODBOR

- Predsednik organizacionog odbora: Aleksandra Vejnović
- Zamenici predsednika organizacionog odbora: Milica Odavić, Sandra Pjevac
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- Sektor za nauku: Nataša Hinić, Marija Ždrnja, Ana-Marija Vejnović, Mila Kovačević, Đurđina Radenković, Sanja Popin, Bojan Radovanović, Nikola Martić.
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- prof. dr Snežana Brkić, prodekan za nastavu Medicinskog fakulteta Novi Sad
- Bojana Miljanić, šef računovodstva

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- Medicinski fakultet Univerziteta u Nišu
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- Departman za veterinarsku medicinu Poljoprivrednog fakulteta Univerziteta u Novom Sadu
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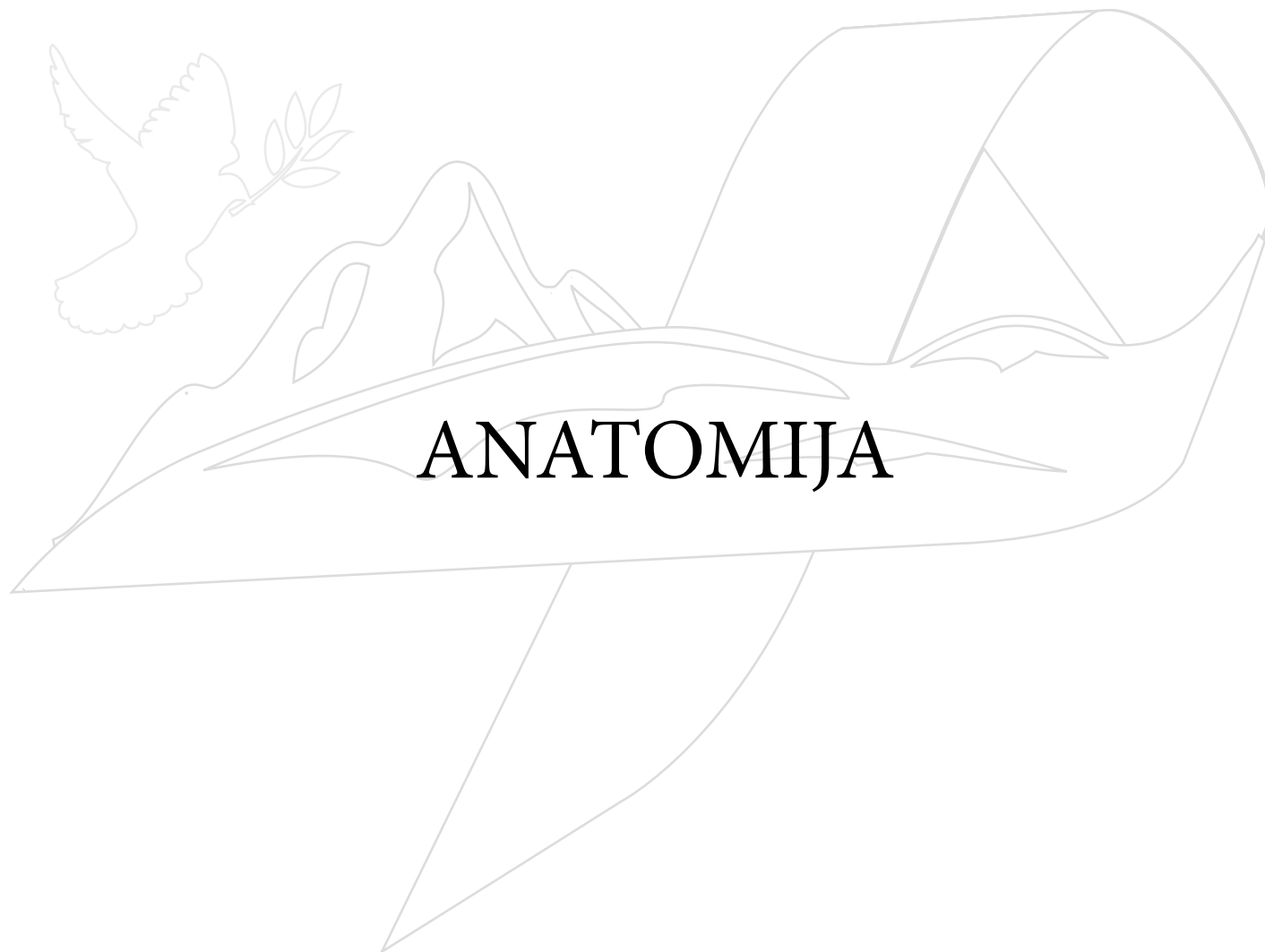
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- prof. dr Danijela Kirovski





VOLUMETRIJSKA ANALIZA NUCLEUS CAUDATUS-A KOD PACIJENATA SA TRANSEKSSUALIZMOM

Autor: Milan Radovanović, Marija Atanasković, Dušan Brkić

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Uvod: Transseksualizam se odlikuje čvrstim uverenjem i osećajem pripadnosti suprotnom polu nezavisno od biološkog pola. Postoji nesavladiva želja živeti kao osoba suprotnog pola, pa dolazi do potrebe za hiruškom promenom pola. Prateći simptom mogu biti anksioznost i depresija usled neprihvatanja od strane okruženja. Postoje dve vrste transseksualizma u zavisnosti od biološkog pola, odnosno kako se transseksualac predstavlja: female-to-male (F->M) i male-to-female (M->F). Nc.caudatus je tvorevina sive mase koja, osim što anatomski učestvuje u izgradnji zidova bočnih komora, učestvuje u učenju i memoriji, a smatra se jednim od glavnih morfoloških supstrata odgovornim za anksioznost i depresiju.

Cilj: Ispitivanje specifičnih volumetrijskih razlika bazalnih ganglija poređenjem zapremina nc.caudatus-a kod transseksualaca sa zapreminama kontrola da bi se ustanovilo da li postoji sličnost/razlika u odnosu na biološki pol.

Materijal i metode: Korišćeni su MRI snimci dobijeni kod 10-transseksualaca i 10-kontrola. Snimci su rekonstruisani i obrađeni pomoću kompjuterskih programa (MIPAV, DICOM). Merena je zapremina levog/desnog nc.caudatus-a kod transseksualaca i upoređivana sa kontrolama.

Rezultati: Volumetrijski parametri nc.caudatus-a obe vrste transseksualaca u odnosu na parametre kontrola statistički se značajno razlikuju, čak u nekim slučajevima visoko statistički značajno. Jedino kod F->M transseksualizma desni nc.caudatus u poređenju sa muškom kontrolom ne pokazuje statističku značajnost razlike.

Zaključak: Naše istraživanje pokazuje da nedvosmisleno postoji značajna statistička razlika u volumetriji nc.caudatus-a kod osoba sa transseksualizmom i kontrolne grupe. S obzirom da je broj ispitanika mali da bismo sa sigurnošću rekli da je ova bazalna ganglija različite zapremine nego kod normalnih, potrebno je povećati broj ispitanika da bi se potvrdili ovi rezultati.

Ključne reči: transseksualizam, nc.caudatus, volumetrija

VOLUMETRIC ANALYSIS OF NUCLEUS CAUDATUS IN TRANSEXUAL PATIENTS

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Introduction: Transsexuals experience themselves as being of the opposite sex, despite having the biological characteristics of one sex. It's unshakable conviction of belonging to the opposite sex, resulting in a request for sex-reassignment surgery and following symptoms could be anxiety and depression because society condemnation. There are two types of transsexualism: female-to-male (F->M) and male-to-female (M->F). Caudate nucleus is a grey matter structure, beside creating sides of lateral ventricles, also participate in learning and memory and lately reputes as major response for anxiety and depression.

The Aim: The aim of the study was to investigate sex-specific differences in basal ganglia morphology (caudate nucleus) using MRI and to detect if there is any difference/analogy between transsexuals and reference male/female controls in nc.caudatus volumetry examination.

Materials and methods: We performed MRI (Magnetic-Resonance-Imaging) scans on 10-transsexuals and 10-healthy controls. We used some computer software (MIPAV, DICOM) for image analyses and to measure the volume of left and right caudate nucleus.

Results: Significant sex difference were found for caudate nucleus in transsexuals and controls, even in some cases a high significant difference. But female-to-male transsexuals showed no significant difference for right nc.caudatus between male reference controls.

Conclusion: Our study reveals that there is clearly a significant difference for caudate nucleus in transsexuals and controls, but considering low number of adult subjects in the study to conclude that basal ganglia in transsexuals has different volume against healthy controls, we need to increase number of subjects to confirm this conclusion.

Key words: transsexuality, caudate nucleus, volumetry

UTICAJ MATERNALNE DEPRIVACIJE NA PARVALBUMIN POZITIVNE INTERNEURONE U MOTORNOM KORTEKSU PACOVA

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Mentor: prof. dr Vidosava Radonjić

Institut za anatomiju "Niko Miljanić", Medicinski fakultet Univerziteta u Beogradu

Uvod: Maternalna deprivacija podrazumeva rano odvajanje mladunaca od majke i predstavlja opšteprihvaćen model za ispitivanje uticaja repetitivnog stresa u najranijem periodu života na ponašanje jedinke u odraslom životnom dobu. Odrasli pacovi koji su rano po rođenju bili odvojeni od majke, pokazuju značajne promene u strukturi mozga, neuroendokrinom sistemu i obrascima ponašanja, koje su karakteristične za obolele od shizofrenije ili od afektivnih poremećaja ponašanja.

Cilj rada: Cilj ove studije je bio da se utvrdi da li postoji promena u ekspresiji parvalbumina na interneuronima u motornoj kori mozga pacova, koji su 24h bili odvojeni od majke.

Materijal i metode: Pacovi su devetog postnatalnog dana bili odvojeni od majke na 24h prema standardnoj proceduri maternalne deprivacije. Ekspresija parvalbumina na interneuronima u motornoj kori određivana je analizom koronarnih preseka mozga, udaljenih 250 µm i bojenih posebnim imunohisto hemijskim metodama.

Rezultati: Rezultati nisu pokazali statistički značajno smanjenje ekspresije parvalbumina na interneuronima motorne kore.

Zaključak: Tokom našeg istraživanja uočeno je da maternalna deprivacija ne dovodi do smanjenja parvalbumin pozitivnih interneurona u motornom korteksu pacova.

Ključne reči: maternalna deprivacija, motorna kora, parvalbumin, shizofrenija.

IMPACT OF MATERNAL DEPRIVATION ON PARVALBUMIN POSITIVE INTERNEURONS IN THE MOTOR CORTEX OF RATS

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Introduction: Neonatal separation in rats has widely been used as an animal model to study the effect of early life events on behavioral developments in adulthood. Adult rats which had been separated from their mothers, showed a significant alterations in brain structure, neuroendocrine system and behavioral patterns.

The Aim: The aim of the conducted study was to determine whether there is a change in expression of parvalbumin positive interneurons in motor cortex, in rats which were subjected to maternal deprivation for 24h on postnatal day 9.

Materials and methods: Rat pups were separated from their mothers on ninth post natal day, following the standard maternal deprivation regulations. The expression of parvalbumin in interneurons was determined after analyzing coronary sections of the brain, distanced 250 µm each, and stained with specific immunohistochemical methods.

Results: The results did not show a statistically significant reduction in expression of parvalbumin positive interneurons in motor cortex.

Conclusion: During our research it was noticed that maternal deprivation does not lead to a reduction in parvalbumin positive interneurons in rat motor cortex.

Key words: maternal deprivation, motor cortex, parvalbumin, schizophrenia

MORFOMETRIJSKA ANALIZA STRATUM – A PYRAMIDALE HIPOKAMPUSA KOD MATERNALNO DEPRIVIRANIH PACOVA

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Mentor: Prof. dr Valentina Nikolić

Institut za anatomiju „Niko Miljanić“, Medicinski Fakultet, Univerzitet u Beogradu,

Uvod : Maternalna deprivacija predstavlja rano odvajanje mladunca od majke i perinatalni model stresa. Kao takva maternalna deprivacija dovodi do niza poremećaja uključujući promene u mozgu, ali i promene u funkciji mnogih drugih organa. Ti poremećaji pretežno utiču na razvoj hipokampusa, čija je uloga u nastanku psihijatrijskih bolesti dominantna.

Cilj : Cilj istraživanja bila je morfometrijska analiza volumena stratum pyramidale kod pacova koji su bili izloženi maternalnoj deprivaciji devetog postnatalnog dana u trajanju od 24h.

Materijal i metode : U eksperimentima su korišćeni pacovi oba pola soja Wistar. Dve trudne ženke Wistar pacova su pojedinačno čuvane u kavezima sa 12-časovnim ciklusom svetlo-mrak. Hrana i voda su bili dostupni ad libitum. U roku od 24 sata od porođaja novorođeni pacovi iz dva legla su nasumično pomešani i formirane su dve grupe životinja: eksperimentalna i kontrolna. Devetog postnatalnog dana jedna majka je od mladunca (iz eksperimentalne grupe) izmeštena i premeštena u poseban kavez, te posle 24h ta majka je vraćena u matično leglo.

Rezultati : Naši rezultati pokazuju značajnu razliku volumena stratum pyramidale u dve ispitivane grupe životinja. U grupi životinja koje su bile izložene maternalnoj deprivaciji devetog postnatalnog dana volumen stratum pyramidale se smanjio što je statistički i dokazano ($p = 0,028$)

Zaključak : Uočeno je da maternalna deprivacija predstavlja značajan faktor koji dovodi do promena na hipokampusu pacova.

Ključne reči : volumen hipokampusa, maternalna deprivacija, shizofrenija

MORPHOMETRIC ANALYSIS OF STRATUM PYRAMIDALE IN THE HIPOCCAMPUS OF MATERNAL DEPRIVATED RATS

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Introduction : Maternal deprivation is the early separation of mother and pups, and it is a model of perinatal stress. As such maternal deprivation produces a range of disorders including changes in brain, and changes in the function of many other organs.

The Aim : The aim of this study was the morphometric analysis of the volume of stratum pyramidale in rats exposed to maternal deprivation ninth postnatal day during 24 hours.

Materials and Methods: In this experiment we used rats of both sexes, kind Wistar. Two pregnant female of Wistar kind, were kept individually in cages with 12 hour light – dark cycle. Food and water were available ad libitum. Within of 24 hours after birth, newborn rats from two litters were randomly mixed and we formed two groups of animals : experimental and control. On the ninth postnatal day, a mother of the pups (from experimental group) was relocated and moved to a separate cage, and after 24 hours that mother was returned to the parent nest.

Results : Our results show a significant difference between the volume of stratum pyramidale in the two studied groups of animals. In the group of animals that were exposed to maternal deprivation on ninth postnatal day, volume of the stratum pyramidale was reduced and it is statistically proven ($p = 0,028$).

Conclusion : It was observed that maternal deprivation is a significant factor which leading to changes in the hippocampus of rats.

Key words : hippocampal volume, maternal deprivation, schizophrenia

SINUS CORONARIUS, MIKROANATOMSKA STUDIJA

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Uvod: Razumevanje sabirnog venskog sistema srca traži poznavanje njegovog embrionalnog razvoja, uobičajenog anatomskog izgleda i mogućih varijacija.

Cilj rada je prikaz merne i topografske karakteristike koronarnog sinusa (SC).

Materijal i metode: Mikromorfološka istraživanja su izvršena na 25 srca kadavera oba pola (11 muških i 14 ženskih) starosti od 40 do 75 godina (prosečno 59,5). Na 10 srca je primenjena tehnika mikrodisekcije pod stereomikroskopom po njihovom injiciranju 10% rastvorom formalina, dok je na 15 srca korišćena korozivna tehnika dobijanja vaskularnih odlivaka vena i arterija srca

Rezultati: Dužina sinusa je bila u rasponu od 22,4 do 41,4 mm, prosečno $33,0 \pm 6,1$ mm. Kalibar sinusa je najveći na mestu njegovog završetka, prosečno $8,4 \pm 1,6$ mm (od 6,6 do 12,0 mm), a najmanji u nivou njegovog početka, prosečno $6,6 \pm 1,3$ mm (od 5,0 do 9,6 mm). Grana bilo desne ili leve koronarne arterije namenjena vaskularizaciji zadnjeg zida leve komore u 16 (64%) slučajeva je ležala niže i dublje od SC, dok na 9 (36%) srca ova grana bila je neposredno dublje od samog sinusa. U jednom slučaju postojale su dve gornje šuplje vene, desna i leva; v. cava superior dextra (VCSD) i v. cava superior sinistra (VCSS), kao i zasebna v. hepatica sinistra (VHS), koje su zajedno sa donjom šupljom venom bile pritoke desne pretkomore srca.

Zaključci: sinus coronarius, koji nastaje u ranoj fazi embrionalnog razvoja, je kratko i široko sabirno vensko stablo u koje se uliva većina vena srca.

Ključne reči: sinus coronarius, venae cordiacae, vena cava superior sinistra

CORONARY SINUS, MICROANTOMICAL STUDY

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Introduction: Appreciation of the cardiac venous system requires an understanding of its embryological basis, its usual patterns of distribution, and its common variations.

Aim is to present characteristics of measurement and topographical characteristics of the coronary sinus (CS)

Material and methods: The micromorphologic investigations were carried out on 25 human cadaver hearts (11 male and 14 female persons), mean age 59,5; range: (40 to 75 years). Technique of microdissection under the stereoscopic microscope was used in 10 cases and techniques to obtain vascular corrosion casts of veins and arteries of the heart in 15 cases.

Results: The length of CS varied from 22,4 to 41,4 mm ($33,0 \pm 6,1$ mm). The diameter of CS was the largest at its ending (from 6,6 to 12,0 mm, $8,4 \pm 1,6$ mm), and the lowest at its inception (from 5,0 to 9,6 mm, $6,6 \pm 1,3$ mm). The branch from the either right or left coronary artery intended to vascularize ventricular posterior wall in 16 (64%) cases, lay down and deeper than the SC, while in 9 (36%) heart, this branch was deeper than just the sinuses. In one case there were two superior v. cava, right and left, v. cava superior dextra (VCSD), and v. cava superior sinistra (VCSS), and separate c. hepatica sinistra (VHS), which together with the inferior vena cava were tributaries of the right atrium of the heart.

Conclusion: coronary sinus, which occurs early in embryological development, is short and broad collection of venous tree that joins the majority of veins of the heart

Key words: coronary sinus, cardiac veins, left superior vena cava.

UTICAJ MATERNALNE DEPRIVACIJE NA PARVALBUMIN POZITIVNE INTERNEURONE U RETROSPLENIJALNOM KORTEKSU PACOVA

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Uvod: Maternalna deprivacija predstavlja rano odvajanje mladunca od majke i perinatalni model stresa. Takav stres dovodi do širokog spektra promena u funkciji mozga.

Cilj: Cilj istraživanja bilo je dokazivanje promena u retrosplenijalnom korteksu pacova koji su bili izloženi maternalnoj deprivaciji devetog postnatalnog dana u trajanju od 24h, i veze tih promene sa kasnijim poremećajima ponašanja.

Materijal i metode: U eksperimentima su korišćeni pacovi oba pola soja Wistar. Dve trudne ženke Wistar pacova su pojedinačno čuvane u kavezima sa 12-časovnim ciklusom svetlo-mrak. Hrana i voda su bili dostupni ad libitum. U roku od 24 sata od porođaja novorođeni pacovi iz dva legla su nasumično pomešani i formirane su dve grupe životinja: eksperimentalna i kontrolna. Devetog postnatalnog dana jedna majka je od mladunaca (iz eksperimentalne grupe) izmeštena i premeštena u poseban kavez, te posle 24h ta majka je vraćena u matično leglo.

Rezultati: U grupi životinja koje su bile izložene maternalnoj deprivaciji devetog postnatalnog dana nije nađeno statistički značajno smanjenje broja parvalbumin pozitivnih interneurona.

Zaključak: Zbog izrazite heterogenosti grupe nismo došli do zaključka da maternalna deprivacija utiče na broj parvalbumin pozitivnih interneurona u retrosplenijalnom korteksu.

Ključne reči: parvalbumin, retrosplenijalni korteks, maternalna deprivacija, shizofrenija

THE INFLUENCE OF MATERNAL DEPRIVATION ON PARVALBUMIN POSITIVE INTERNEURONS IN THE CORTEX RETROSPLENIJALNOM

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Introduction: Maternal deprivation is the early separation of mother and pups, and it is a model of perinatal stress. Such stress leads to broad specter of changes in the function of the brain.

Aim: The aim of this study was to prove changes in retrosplenial cortex in rats exposed to maternal deprivation ninth postnatal day during 24 hours, and relation of the changes to the subsequent behavioral changes.

Material and methods: In this experiment we used rats of both sexes, kind Wistar. Two pregnant female of Wistar kind, were kept individually in cages with 12 hour light – dark cycle. Food and water were available ad libitum. Within of 24 hours after birth, newborn rats from two litters were randomly mixed and we formed two groups of animals : experimental and control. On the ninth postnatal day, a mother of the pups (from experimental group) was relocated and moved to a separate cage, and after 24 hours that mother was returned to the parent nest.

Results: In the group of animals that were exposed to maternal deprivation on ninth postnatal day, statistically significant reduction in the number of parvalbumin positive interneurons was not found.

Conclusion: Because of the significant heterogeneity of the group we didn't come to the conclusion that maternal deprivation affects the number of parvalbumin positive interneurons in the retrosplenial cortex.

Key words : parvalbumin, retrosplenial cortex, maternal deprivation, schizophrenia

VARIJACIJE KOSTIJU KARLICE KOD ŽENA U REPRODUKTIVNOM PERIODU

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Uvod: Karlica (pelvis) predstavlja koštanu strukturu koja čini oslonac i vezu sa donjim ekstremitetima preko butnih kostiju. Sa ginekološkog aspekta važno je poznavanje topografije karlice i njenih važnih tačaka, što je posebno značajno za savremeno porodiljstvo. Takođe, za savremeno akušerstvo važne su i odgovarajuće mere male karlice koje su, radi lakšeg i preciznijeg merenja podeljene u četiri ravni-Hodgeove ravni. Sužene karlice oduvek su bile jedna od glavnih komplikacija u akušerstvu. Teoretska podela suženih karlica kod žena danas obuhvata sedam podgrupa.

Cilj: Ispitati antropološke karakteristike ženske karlice i tendenciju njene eventualne promene u novoj generaciji.

Materijal i metode: Retrospektivna analiza istorija bolesti pacijentkinja hospitalizovanih na Institutu za ginekologiju i akušerstvo Kliničkog centra Srbije u periodu od januara do septembra 2011. Studijom je obuhvaćeno 45 žena određenog životnog doba, a analizirana su četiri parametra: c.bispinalis, c.bicristalis, c.bitrochanterica i c.extrema.

Rezultati: Istraživanje je pokazalo da nema statistički značajne korelacije između životnog doba i veličine karličnog prečnika, izuzev u slučaju c.bitrochantericae.

Zaključak: Iako sprovedena na malom uzorku i u kratkom vremenskom periodu, ova studija je pokazala da postoji trend promene oblika karlice od ginekoidnog ka androidnom.

Ključne reči: karlica, dijometri, suženje.

PELVIC BONES VARIATION IN WOMEN OF REPRODUCTIVE AGE

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Introduction: Pelvis is bone structure that gives support and connection with lower extremities over thigh bones, so statically looking, pelvis is very important part of body. From the gynecological point of view, knowing of dimensions, shape and topography of pelvis is the essential part of modern obstetrics. For modern obstetrics it is also important to know pelvic diameters which are divided into four planes-Hodge's planes. Narrowed pelvis has always been one of the most important complications during labor. Theoretical distribution of narrowed pelvises is into seven subtypes.

Aim: To investigate anthropological characteristic of female pelvis and tendency of its potential change in new generation.

Material and methods: Retrospective analysis of case records of patients that are admitted at the Institute for Gynecology and Obstetrics of the Clinical Center of Serbia from January to September 2011. The study included 45 women in certain age, and four parameters: bispinal, bichristal, bitrochanterical and extern diameter.

Results: No statistical correlation was found between age and pelvic diameters, except in case of bitrochanterical diameter.

Conclusion: Although the sample was small, and analysis was done in short period, it has shown that there is a tendency of shape change from gynoid to android pelvis.

Key words: pelvis, diameters, stenosis.

MORFOLOŠKE KARAKTERISTIKE MIŠIČNIH MOSTIĆA U NIVOU PREDNJE MEĐUKOMORNE GRANE HUMANOG SRCA

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Uvod: Mišićni mostići srca ili miokradni mostići su uži ili širi snopovi mišićnih vlakana komora ili pretkomora, koja se prebacuju preko srčanih arterija i/ili njihovih subepikardijalnih grana ili ih obuhvataju sa svih strana formirajući oko njih petlje.

Cilj rada: Svrha rada je bila da se opišu najznačajnije morfološke karakteristike miokradnih mostića u nivou prednje međukomorne grane kod humanih fetusa.

Materijal i metode: Analizirano je 63 srca humanih fetusa različitog pola i starosti, čije su arterije prethodno bile ispunjene kontrastom. Primenjena je disekciona metoda otvaranja grudnog koša i vađenja fetusnog srca. Kvantitativni parametri (kalibar arterije i širina mostića) određivani su uz pomoć Image J i statistički analizirani. Karakteristike mostića su analizirane makroskopski, pod lupom i histološki.

Rezultati rada: Miokardni mostići su evidentirani kod 53,97% srca; kod 88,24% uzoraka konstatovano je prisustvo jednog mostića, a kod 11,76% prisustvo dva mostića. Najzastupljeniji su miokardni mostići koji zahvataju istovremeno proksimalni i srednji segment arterije. Nema statistički značajne korelacije između širine mostića i nedeljnog porasta gestacijske starosti. Vrednosti kalibra proksimalnog i distalnog segmenta arterije kod uzoraka sa mostićem veće su od vrednosti istih segmenata bez mostića, ali dobijene razlike nisu statistički značajne. Kalibar arterije je bio veći, a njen tok češće vijugav u prisustvu miokardnog mostića.

Zaključak: Miokardni mostići u nivou prednje međukomorne grane evidentirani su u preko 50% srca. Najčešće se radi o jednom mostiću, lokalizovanom na proksimalnom i srednjem segmentu arterije, a razlike u odnosu na pol i starost fetusa nisu bile statistički značajne

KLjučne reči: Fetus, srce, prednja međukomorna grana, miokardni mostić

MORFOLOGICAL CHARACTERISTICS OF THE MUSCLE BRIDGES IN THE LEVEL OF THE ANTERIOR INTERVENTRICULAR BRANCH OF A HUMAN HEART

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Introduction: Miocardial bridges, are narrower or wider fascicula of the muscle fibres of ventricles or atria, which are transferred over the cardiac arteries and/or their subepicardial branches.

Aim: The aim of work was to describe the most significant morphological characteristics of the miocardial bridges in the level of the anterior interventricular branch in human fetuses.

Material and methods: Sixty-three fetuses' hearts of different gender and age, whose arteries were previously filled with contrast, were analyzed. A dissection method of opening a chest and pulling out the fetus's heart was applied. The quantity parameters were determined by Image J and statistically analyzed. The characteristics of the bridges were analyzed macroscopically, under the magnifier, and histologically.

Results of the work: Miocardial bridges were found in 53,97% of the hearts; 88,24% of the samples the presence of one bridge was found out, and in 11,76% the presence of two. The most common are the bridges which affect simultaneously the proximal and the middle segment of the artery. The caliber values of the proximal and distal segment of the artery in samples with bridges are bigger, than the values of the same segments without.

Conclusion: Miocardial bridges in the level of the anterior interventricular branch were found in over 50% of the hearts. In most cases it is one bridge, localized on the proximal and the middle segment of the artery, and the differences related to the gender and the age were not statistically important.

Key words: Fetus, heart, anterior interventricular branch, miocardial bridge

MORFOMETRIJSKE KARAKTERISTIKE MALOG KRILA KLINASTE KOSTI U FETUSNOM DOBU

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Uvod: Proučavanjem razvića baze ljudske lobanje utvrđeno je da prednja lobanjska jama koncentrično raste u svim pravcima, sa većom ili manjom konstantnošću u rastu. Poznavanje dinamike uzajamne povezanosti ovih parametara doba je važno zbog izučavanja brojnih kongenitalnih malformacija.

Cilj rada: Cilj ovog rada je bilo praćenje geometrije i merenje pojedinih linearnih i ugaoih dimenzija malog krila klinaste kosti u pojedinim razdobljima prenatalnog života, kao i utvrđivanje uzajamne povezanosti ovih parametara.

Materijal i metode: Ispitivanje je sprovedeno na 42 lobanje humanih fetusa starosti od 13 do 25 nedelja intrauterinog razvoja. Tokom ispitivanja fotografisana je baza fetalnih lobanja. Na svakom slučaju određivani su dužina, širina i spoljašnji ugao malih krila sfenoidalne kosti obradom fotografija u programu ImageJ.

Rezultati: Prosečna dužina malog krila klinaste kosti po ispitivanim mesecima razvića varirala je između 6,04 mm i 13,08 mm, dok je prosečna širina malih krila varirala između 4,64 mm i 9,04 mm. Prosečna vrednost spoljašnjeg ugla malog krila varirala je između 68,16° i 39,92°.

Zaključak: Dužina i širina malog krila klinaste kosti lobanje fetusa statistički značajno rastu u V i u VI lunarnom mesecu, dok veličina spoljašnjeg ugla malog krila opada sa starošću fetusa i to statistički značajno u VI lunarnom mesecu. Mereni parametri pokazuju levo-desnu asimetriju bez značajne statističke razlike.

KLjučne reči: lobanja fetusa, prednja lobanjska jama, mala krila klinaste kosti.

MORPHOMETRIC CHARACTERISTICS OF LESSER WING OF SPHENOIDAL BONE IN FETAL PERIOD

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Introduction: Developmental studies of the human skulls found that anterior cranial fossa concentrically grow in all directions, with more or less constancy in the growth. Knowledge of the growth dynamics of the skull structure during gestation is important because of many congenital malformations.

The aim: The aim of the study was to observe geometry and measure the certain linear and angular parameters of lesser wings of sphenoidal bone in the certain periods of gestation, and to determine the relationship between these parameters.

Material and methods: The material represents 42 cases of human fetal skulls, aged between 13 and 25 weeks of gestation. During examination, basis of the fetal skulls were photographed. On each case, length, width and lateral angle of lesser wings of sphenoidal bone were measured by using ImageJ programme.

Results: The average values of length of the lesser wing of sphenoidal bone by the respective months of gestation varied between 6.04 mm and 13.08 mm, while the average value of its width varied between 4.64 mm and 9.04 mm. The average value of the lateral angle of the lesser wing varied between 68.16° and 39.92°.

Conclusion: Length and width of the lesser wing of sphenoidal bone in human fetuse, statistically significant increased in V and VI lunar month, while the lateral angle decreased with fetal age, but with statistical significance only in VI lunar month. Measured parameters show a left-right asymmetry without a significant statistical difference.

Key words: fetal skulls, anterior cranial fossa, lesser wings of sphenoidal bone.

NEKI MORFOMETRIJSKI ASPEKTI UNUTRAŠNJEG UŠNOG OTVORA FETUSA ČOVEKA

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Uvod: Proučavanje razvojne anatomije slepoočne kosti može dovesti do boljeg razumevanja kongenitalnih poremećaja unutrašnjeg uva, a sa druge strane nam pokazati zakonitosti u njegovom razvoju što će omogućiti pravilniji izbor hirurškog pristupa ovoj delikatanj regiji glave.

Cilj rada: Cilj ovog rada je bilo merenje linearnih dimenzija unutrašnjeg ušnog otvora, kao i njegovog rastojanja od pojedinih struktura piramide slepoočne kosti, radi razumevanja njihovog odnosa u pojedinim razdobljima prenatalnog života i dinamike njihovog rasta.

Materijal i metode: Ispitivanje je sprovedeno na 41 lobanji humanih fetusa starosti od 13 do 25 nedelja intrauterinog razvoja. Tokom ispitivanja fotografisana je baza fetalnih lobanja. Određivane su dimenzije unutrašnjeg ušnog otvora, kao i njegova udaljenost od pojedinih struktura, obradom fotografija u programu ImageJ.

Rezultati: Prosečna širina unutrašnjeg ušnog otvora po ispitivanim mesecima razvića varirala je između 2,71 mm i 3,44 mm, dok se prosečna visina kretala između 2,06 mm i 2,41 mm. Prosečno rastojanje od unutrašnjeg ušnog otvora do vrha piramide variralo je između 4,63 i 6,61 mm.

Zaključak: Širina unutrašnjeg ušnog otvora je za oko 50% veća od njegove visine. Rastojanje od unutrašnjeg ušnog otvora do gornje ivice piramide statistički značajno raste u V lunarnom mesecu na desnoj strani, a takođe u istom mesecu i rastojanje od unutrašnjeg ušnog otvora do vrha piramide na obema stranama.

Ključne reči: lobanja fetusa, zadnja lobanjska jama, unutrašnji ušni otvor.

MORFOMETRIJSKA ANALIZA PARAMETARA SREDINE LICA NA SAGITALNOJ PROJEKCIJI DVODIMENZIONALNOG KOMPJUTER-TOMOGRFSKOG SNIMKA

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Uvod: Cefalometrija označava merenja na glavi, uzimajući u obzir i pokrivač koji grade sva meka tkiva glave. Nakon uvođenja kompjuterizovane tomografije (CT), omogućena je 3D rekonstrukcije struktura glave i vrata i 3D analiza angularnih i linearnih cefalometrijskih parametara.

Cilj rada: Cilj istraživanja bio je određivanje karakterističnih cefalometrijskih parametara u predelu sredine lica (CPPSL), uz pomoć 2D rekonstrukcije 'multi-slajsing' CT (MSCT) snimaka koji su značajni za kompjutersko konstruisanje parametarskog-geometrijskog-matematičkog modela lobanje čoveka ovog predela.

Materijal i metode: Istraživanje je sprovedeno na 20 CT snimaka adultnih pacijenata (12 muških i 8 ženskih) prosečne starosti 61±12,76 god, dobijenih iz arhive Centra za radiologiju, Kliničkog centra u Nišu. Merenje je vršeno na 2D rekonstrukcijama odabranih 3D snimaka glave čoveka koji su urađeni na 64-slajsnom MSCT. Koristeći prethodno definisane cefalometrijske tačke, određivane su vrednosti 10 linearnih cefalometrijskih parametara (LCP) i 4 angularna cefalometrijska parametara (ACP).

Rezultati: Najveće srednje vrednosti (\bar{X}) u mm zabeležene za linearne i angularne CPPSL bili su S-Gn (118,75±23,17) i S-SOrb-Pr (92,42±6,87) kod muškaraca, a najmanji za parametar S-Snp (43,65±9,53) kod muškaraca i A-N-B (4,39±3,12) kod žena.

Zaključak: Srednje vrednosti CPPSL dobijeni merenjem na 2D CT snimcima mogu poslužiti za kreiranje normativnih parametara koji predstavljaju vrednosti za kreiranje 3D parametarskog-geometrijskog-matematičkog modela lobanje (PGMM) čoveka. Tako generisani PGMM lobanje omogućavaju precizniju dijagnostiku, bolji izbor metode lečenja i precizniju prognozu izlečenja u ortodonciji, implantologiji, oralnoj i maksilofacijalnoj hirurgiji.

Ključne reči: cefalometrijski parametri, sredina lica, kompjuterizovana tomografija, 3D modelovanje

SOME MORPHOMETRIC CHARACTERISTICS OF INTERNAL ACOUSTIC OPENING IN HUMAN FETUS

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Introduction: The study of developmental anatomy of the temporal bone can lead to a better understanding of congenital disorders of the inner ear, and show the principles of its development which will enable more correct choice of surgical approach to this sensitive region of head.

The aim: The aim of study was to measure the dimensions of the internal acoustic opening, and its distance from the certain structures of the petrous bone, in order to understand their relations and dynamics of their growth in prenatal period.

Material and methods: The material represents 41 cases of human fetal skulls, aged between 13 and 25 weeks of gestation. Basis of fetal skulls were photographed. The dimensions of internal acoustic opening and its distance from the certain structures were measured by using ImageJ programme.

Results: The average values of width of the internal acoustic opening by the respective months of gestation varied between 2.71 and 3.44 mm, while the average value of its height varied between 2.06 and 2.41 mm. The average distance from the internal acoustic opening to the top of the petrous bone varied between 4.63 and 6.61 mm.

Conclusion: Internal acoustic opening width is approximately 50% greater than its height. The distance from the right internal acoustic opening to the superior margin of petrous bone grows significantly in V lunar month, as well as the distance from the internal acoustic opening to the top of petrous bone on both sides.

Key words: fetal skull, posterior cranial fossa, internal acoustic opening.

MORPHOMETRIC ANALYSIS OF THE MIDFACE PARAMETERS ON TWODIMENSIONAL MIDSAGITTAL COMPUTER TOMOGRAPHY IMAGE

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Introduction: Cephalometry is the measurement of the head by imaging, also taking into account the soft-tissue layers of the head. Following the introduction of computed tomography (CT), 3D reconstruction of the head and neck structures and 3D analysis of angular and linear cephalometric parameters was enabled.

The Aim: Was to determine the characteristic cephalometric parameters of midface region (CPMR), using 2D reconstruction of the multi-slicing CT images, which are important for computer designing of parameter-geometric-mathematical human skull model of this region.

Materials and methods: The study was conducted on 20 CT scans of adult patients (12 males and 8 females) mean age 61±12.76 years, taken from the radiology archive of the Clinical Center in Niš. Measurements were done on 2D reconstruction images of pre-selected 3D images of the human head created using 64-slice MSCT. Using predefined cephalometric points, the values of 10 linear cephalometric parameters (LCP) and 4 angular cephalometric parameters (ACP) were determined.

Results: The highest mean values (\bar{X}) in mm recorded for LCP and ACP were S-Gn (118.75±23.17) and S-SOrb-Pr (92.42±6.87) in males, and with the lowest \bar{X} is for parameter S-PNS (43.65±9.53) in males and A-N-B (4.39±3.12) in females.

Conclusion: Mean values of CPMR obtained by measurements on 2D CT images can be used to generate normative parameters which represent values used to generate 3D parameter-geometric-mathematical model (PGMM) of the human skull. This PGMM model of the skull allows more accurate diagnosis, better selection of treatment methods and more accurate prognosis for healing, in orthodontics, implantology, oral and maxillofacial surgery.

Key words: cephalometric parameters, midface, computed tomography, 3D modeling

ANATOMSKE VARIJACIJE GRANA LEVE KORONARNE ARTERIJE KOD ČOVEKA

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Uvod: Broj završnih grana leve koronarne arterije varira od 2 do 4. Postoje nesuglasice pojedinih autora oko naziva treće i četvrte grane. Arterijsko-venski trougao srca nastaje ukrštanjem velike vene srca, prednje međukomorne grane i polukružne grane, a smešten je u gornjem delu leve komore na plućnoj strani srca. Treća i četvrta završna grana leve koronarne arterije predstavljaju sadržaj arterijsko-venskog trougla.

Cilj rada: Cilj istraživanja je određivanje broja završnih grana stabla leve koronarne arterije, učestalost i sadržaj arterijsko-venskog trougla.

Materijal i metode: Istraživanje je obuhvatilo 32 srca odraslih osoba uzetih sa Zavoda za anatomiju, Medicinskog fakulteta u Novom Sadu. Na scrima je makroskopski utvrđen broj završnih grana leve koronarne arterije i morfološki analiziran arterijsko-venski trougao srca.

Rezultati: Leva koronarna arterija se odvaja od sinusa aorte i daje dve završne grane (bifurkacija) u 56,26%, tri grane (trifurkacija) u 40,62% i četiri grane (tetrafurkacija) kod 3,12% srca. Arterijsko-venski trougao je uočen kod 20 (62,5 %) srca. Najzastupljeniji je potpuno zatvoreni (70%), zatim dole otvoreni (20%) a najređi gore otvoreni i potpuno otvoreni (5%) arterijsko-venski trougao srca.

Zaključak: Poznavanje anatomije i varijacija završnih grana leve koronarne arterije je važno za pravilno tumačenje nalaza koronarne angiografije.

Ključne reči: Srce; Leva koronarna arterija; Anatomija; Čovek

ANATOMICAL VARIATIONS OF THE BRANCHING PATTERN OF THE HUMAN LEFT CORONARY ARTERY

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Introduction: The branches of the left coronary artery may be from 2-4 in number. There is controversy between authors in naming the third and the fourth branches. The arterio-venous trigone is formed by the intersection of the great cardiac vein, the anterior interventricular artery and the circumflex artery, located in the superior portion of the left ventricle on the pulmonary face of the heart. The third and the fourth branches of the left coronary artery crossed inside the arterio-venous trigone.

Goal: The aim of this study was to determine the number of terminal branches of the main trunk of the left coronary artery, the incidence of arterio-venous trigone, and content.

Materials and Method: The study included 32 adult human hearts collected from Department of Anatomy, Medical faculty, Novi Sad. The hearts were macroscopically inspected for the branching pattern of the left coronary artery and the arterio-venous trigones were morphologically analyzed.

Results: The left coronary artery branched out of the aortic sinus and give rise to two branches (bifurcation) in 56.26%, three branches (trifurcation) in 40.62%, and four branches (quadrifurcation) 3.12 % of the hearts. The arterio-venous trigone was found in 20 hearts (62.5 %). The predominant pattern found was “closed pattern” (70%), “open inferiorly” (20%), and the pattern “fully open” (5%) and “open superiorly” (5%).

Conclusion: Sufficient knowledge about the anatomy and variations of left coronary artery is important for proper interpretation of the coronary angiographies.

Key Words: Heart; Coronary artery; Anatomy; Human

ANALIZA POVRŠINE VISCERALNOG MASNOG TKIVA ABDOMENA U ODNOSU NA POL, STEPEN UHRANJENOSTI I OBIM STRUKA

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Uvod: Masa visceralnog masnog tkiva je prediktor komplikacija gojaznosti. U njenoj proceni koriste se brojne metode, među kojima su *imaging* metode najsuperiornije.

Cilj: Analiza površine visceralnog masnog tkiva abdomena u odnosu na pol, stepen uhranjenosti i obim struka.

Materijal i metode: Ispitivanu grupu činilo je 98 ispitanika oba pola starosti 57,81±16,55 godina kod kojih je, pored stepena uhranjenosti i obima struka, određena i površina visceralnog masnog tkiva (VMT) na CT-snimcima abdomena.

Rezultati: Muškarci su imali veću VMT u odnosu na žene (268,49±102,35 vs. 207,14±76,92 cm²). Vrednosti VMT su se razlikovale između muškaraca i žena iako nije bilo razlika u obimu struka i u stepenu uhranjenosti. Osobe oba pola sa povećanim obimom struka imale su značajno veće vrednosti VMT u odnosu na one sa normalnim vrednostima obima struka. Gojazni muškarci imali su značajno veće vrednosti VMT u odnosu na normalno uhranjene muškarce i na muškarce sa prekomernom telesnom masom. Normalno uhranjene žene imale su značajno manje vrednosti VMT u odnosu na gojazne žene i na žene sa prekomernom telesnom masom. VMT je značajno korelirala sa stepenom uhranjenosti i sa obimom struka kod pripadnika oba pola. Korelacija je bila jača sa obimom struka, a u odnosu na pol, kod muškaraca.

Zaključak: Obim struka je bolji pokazatelj VMT od stepena uhranjenosti, dok povezanost indeksa telesne mase sa VMT pokazuje polno specifične razlike.

Ključne reči: Gojaznost; Visceralno masno tkivo; BMI; Obim struka

ANALYSIS OF ABDOMINAL VISCERAL FAT AREA REGARDING TO GENDER, NUTRITION LEVEL AND WAIST CIRCUMFERENCE

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Introduction: The visceral fat mass is a predictor of complications of obesity. A lot of methods is used in its assessment, among which the most superior are imaging methods.

The aim: To analyze the surface of abdominal visceral adipose tissue in relation to gender, level of body weight and waist circumference.

Material and methods: The study group consisted of 98 subjects of both genders, aged 57.81 ± 16.55 years, who underwent measurements of BMI, waist circumference, and the area of visceral adipose tissue (VAT) on CT-scan images.

Results: Men had higher VAT than women (268,49±102,35 vs. 207,14±76,92 cm²). VAT values were different between men and women, although there was no difference in their waist circumference and nutrition level. Subjects of both genders with increased waist circumference had significantly higher values of VAT compared to those with normal waist circumference. Obese men had significantly higher values of VAT compared to normal weight and overweight men. Obese women had significantly lower values of VAT compared to obese and overweight women. VAT significantly correlated with the nutritional level and the waist circumference in both sexes. The correlation was stronger with waist circumference, and regarding to gender, it was stronger in men.

Conclusion: Waist circumference is a better indicator of the VAT than level of nutrition, while the association of body mass index with VAT shows gender specific differences.

Key words: Obesity; Visceral adipose tissue; BMI; Waist circumference

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Uvod: Prema izgledu ćelija periakveduktalna siva masa se klasično deli na četiri glavna jadra: dorzalno, medijalno, lateralno i ventralno. Dok poneki autori smatraju da se jadra sastoje iz sličnih neurona, pojedina istraživanja ukazuju da su jadra podeljena u manje grupe na osnovu ćelijske morfologije i ulaznih i izlaznih informacija.

Materijali i metode: Neuroni su uzeti sa pet humanih srednjih mozgova i impregnisani Goldži metodom. Isečci tkiva dobijeni su u toku redovnih obdukcionijskih postupaka odraslih osoba i uzimani su isključivo isečci srednjeg mozga bez vidljivog oštećenja moždanog tkiva. Dvodimenzionalne digitalne slike svakog neurona periakveduktalne sive mase dobijene su pomoću digitalne kamere povezane sa svetlosnim mikroskopom.

Rezultati: Neuroni periakveduktalne sive mase su kvalitativno analizirani i klasifikovani u dve osnovne grupe. Na osnovu oblika tela, broja primarnih dendrita, oblika dendritskog polja i položaja neurona u periakveduktalnoj sivoj masi, uočili smo tri potklase velikih i dve podklase malih neurona.

Zaključak: Naši rezultati potvrđuju pretpostavku da se periakveduktalna siva masa može podeliti na manja područja na osnovu morfoloških osobina.

Ključne reči: Periakveduktalna siva masa; Neuron; Čovek; Anatomija; Histologija

QUALITATIVE ANALYSIS NEURONS IN THE HUMAN PERIAKVEDUCTAL GRAY

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Introduction: The periaqueductal gray matter is classically divided into four major nuclei: dorsal, medial, lateral and ventral, according to their cytoarchitectural feature. While some studies indicate that these nuclei are composed of similar cell types, there is some evidence that each of these nuclei are arranged in discrete groups of cells on the basis of their neuronal morphology and their afferent and efferent connection.

Materials and Methods: The neurons were labelled by Golgi staining from five human midbrain, obtained from medico-legal forensic autopsies of adult human bodies and free of significant brain pathology. Two-dimensional digital image of each periaqueductal gray neuron was recorded by a digital camera connected to a light microscope.

Results: The neurons of the periaqueductal gray were qualitatively analysed, and these cells were classified in two main classes. Taking into account the shape of the cell body, number of the primary dendrites, shape of the dendritic tree and their position within the periaqueductal gray, three subclasses of the large neurons and two subclasses of the small neurons have been recognized.

Conclusion: The present study supports the hypothesis that the periaqueductal gray matter could be subdivided into discrete cell groups according to their neuronal morphology.

Key words: Periaqueductal grey matter; Neuron; Human; Anatomy; Histology

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Uvod: Metopičan šav se nalazi na mestu spajanja dve čeonke kosti i nestaje u ranom detinjstvu. Kompletan metopičan šav (metopizam) pruža se od naziona do bregme. Nekompletan metopičan šav predstavlja ostatak šava između ovih orijentacionih tačaka.

Cilj: Cilj ovog rada je morfološka analiza metopičnog šava lobanja odraslih osoba.

Materijal i metode: U istraživanju su korišćene 44 lobanje sa metopičnim šavom (27 lobanja muškog i 17 ženskog pola) odraslih osoba koje pripadaju Osteološkoj zbirci Zavoda za anatomiju Medicinskog fakulteta u Novom Sadu. Lobanje su morfološki analizirane na osnovu makroskopskog izgleda kompletnog i nekompletnog metopičnog šava.

Rezultati: Kompletan metopičan šav uočen je kod 3 (6,8%) lobanje. Nekompletan linearan šav uočen je kod 13 (29,6%), cik cak kod 17 (38,6%), oblik slova H kod 1 (2,3%), oblik slova Y kod 3 (6,8%), oblik slova U kod 3 (6,8%), i oblik slova V oblik kod 4 (9,1%) lobanje.

Zaključak: Morfološki izgled metopičnog šava predstavlja značajan klinički podatak za radiologe i hirurge. Na prisutnost šava treba posumnjati prilikom rendgenskog pregleda vertikalne frakture središnjeg dela čeonke kosti.

Ključne reči: Frontalna kost; Metopični; Morfologija; Lobanja; Sutura; Čovek

MORPHOLOGY OF THE METOPIC SUTURE IN THE HUMAN ADULT SKULL

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Introduction: The metopic suture runs between the frontal bones and usually disappears in early childhood. When the metopic sutures are complete and extend from the nasion to the bregma, the condition is called metopism. If the sutures are not present throughout and occupies a small area between these two points, they are considered as incomplete metopic sutures.

The Aim: The aim of this study was to evaluate the morphology of the metopic suture in human adult skulls.

Materials and methods: The study included 44 dry adult skulls of both sexes (27 males and 17 females) collected at the Department of Anatomy, Medical faculty, Novi Sad. The skulls were macroscopically inspected for the presence of complete or incomplete metopic suture and the sutures were morphologically analyzed.

Results: The complete metopic suture was seen in 3 skulls (6.8%). Among the incomplete ones, 13 (29.6%) were linear, 17 (38.6%) were zig zag, 1 (2.3%) were H shaped, 3 (6.8%) were Y shaped, 3 (6.8%) were U shaped and 4 (9.1%) were V shaped.

Conclusion: The morphological details of metopic suture are important for the clinicians from the radiological and surgical point of view. These sutures may be misdiagnosed as vertical traumatic skull fractures extending in the mid-line in head injury patients.

Key words: Frontal bone; Metopic; Morphology; Skull; Suture; Human

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Uvod: Odnos dužine kažiprsta i domalog prsta (2D:4D) predstavlja marker za procenu prenatalne izloženosti testosteronu. Sklonost ka rizičnim poduhvatima se dovodi u vezu sa nižim vrednostima odnosa dužine drugog i četvrtog prsta.

Cilj: Cilj našeg istraživanja bio je da ispitamo da li postoji povezanost između odnosa dužine drugog i četvrtog prsta (2D:4D) i rizičnog ponašanja, poređenjem vrednosti ovog odnosa između zatvorenika i digitalnog indeksa izmerenog kod studenata medicine.

Materijal i metode: Ispitivanu grupu činilo je 50 zatvorenika, prosečne starosti 35,36±12,86 godina. Kontrolnu grupu su činila 42 studenta Medicine prosečne starosti 21,9±1,95 godina. Merene su dužine kažiprsta i domalog prsta na obe šake, a 2D:4D smo računali kao njihov količnik. Kod zatvorenika je uzet i podatak o vrsti krivičnog dela za koje ispitanik izdržava kaznu.

Rezultati: Zatvorenici su imali niže srednje vrednosti drugog i četvrtog prsta na obe šake, u odnosu na kontrolnu grupu, ali razlika nije bila statistički značajna. Niži 2D:4D odnos konstatovan je kod zatvorenika samo na desnoj šaci (0,97±0,04 vs. 0,99±0,03) i nije se značajno razlikovao od kontrolne grupe. Među zatvorenicima, oni koji su bili osuđeni zbog razbojništva imali su najniže vrednosti dužine drugog prsta na obe šake, a razlika je bila značajna u odnosu na one koji su bili osuđeni zbog posedovanja narkotika i u odnosu na osuđene zbog nasilničkog ponašanja.

Zaključak: Dobijeni rezultati ukazuju na povezanost dužine prstiju sa rizičnim ponašanjem.

Ključne reči: dužina prstiju, 2D:4D, rizično ponašanje, prenatalni testosteron.

SECOND TO FOURTH DIGIT RATIO AND RISK-TAKING BEHAVIOUR

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Introduction: The ratio of the second to fourth digit length (2D:4D) is known as a marker of prenatal exposure to testosterone. Risk-taking behaviour has been shown to be connected with 2D:4D.

Aim: The aim of our study was to examine connection between 2D:4D and risk-taking behaviour by comparison of 2D:4D ratios between prisoners and medical students.

Material and methods: Study group consisted of 50 male prisoners aged 35.36±12.86y while control group consisted of 42 medical students aged 21.9±1.95y. Lengths of second and fourth digit were measured and 2D:4D was calculated. Data on the types of crime in prisoners were also analysed.

Results: Prisoners had lower lengths of the second and fourth digit on the both hands comparing to control group but the difference was not statistically significant. Lower 2D:4D was found in prisoners only on the right hand (0.97±0.04 vs. 0.99±0.03) also without statistically significant difference. Among prisoners, those who were imprisoned because of banditry had lower length of second digit in comparison with other prisoners; this measure was significantly lower comparing to prisoners convicted because of possession of narcotics and those imprisoned because of violent behaviour.

Conclusion: Our results point to relationship between length of digits and risk-taking behaviour.

Key words: finger length, 2D:4D, risk-taking behaviour, prenatal testosterone.

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Uvod: Najčešći oblik otvora slabinskih kičmenih pršljenova je jednakostranični trougao. Kod ovog otvora detektujemo i modifikaciju oblika u vidu deteline sa tri lista. Slabinske pršljenove ovakvog otvora nazivamo trolisnim ili trefolnim. **Cilj rada:** Cilj ovog rada bilo je utvrđivanje prisustva trolisnog oblika slabinskog dela kičmenog kanala, kao i određivanje uloge ovog oblika kod pojave bola u donjem delu leđa.

Materijal i metode: U prvom delu rada izmereni su srednji sagitalni i srednji interpedunkularni prečnici kičmenih otvora, kao i površina otvora 52 slabinska kičmena pršljena. U drugom delu rada trolisni oblici kičmenih otvora identifikovani su kod 32 pacijenta na snimcima magnetne rezonance (MR) jačine 1.5 T.

Rezultati: Trolisni oblik pršljenjskih otvora prisutan je kod 18 od 50 slabinskih pršljenova (36%). Procentualno, najčešće je zastupljen na nivou L₅ (54,14%). U drugoj ispitivanoj grupi, na snimcima MR, prisustvo trolisnog oblika pršljenjskog otvora uočeno je kod 21 od 32 pacijenta (65,62%).

Zaključak: Trolisni oblik slabinskog kičmenog kanala je klinički značajan zbog povećane predispozicije pojave pritiska na slabinske i krsne korenove kičmenih živaca. Trolisna varijacija lumbalnog pršljenjskog otvora jasno se uočava na snimcima MR.

Ključne reči: MR; Trolisni; Trefolni; Kičmeni kanal; Bol

TREFOIL SHAPE OF THE LUMBAR VERTEBRAE

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Introduction: The most common shape of the lumbar vertebral foramen is even-sided triangle. Also, this foramen is identified with modification in which it is shaped like three-leafed clover. This kind of lumbar vertebrae are called trefoil.

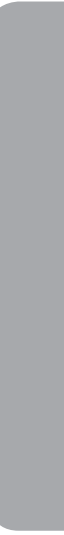
The Aim: The aim of this study was to identify the presence of trefoil shape of lumbar spinal canal, and to determine its role in low-back pain appearance.

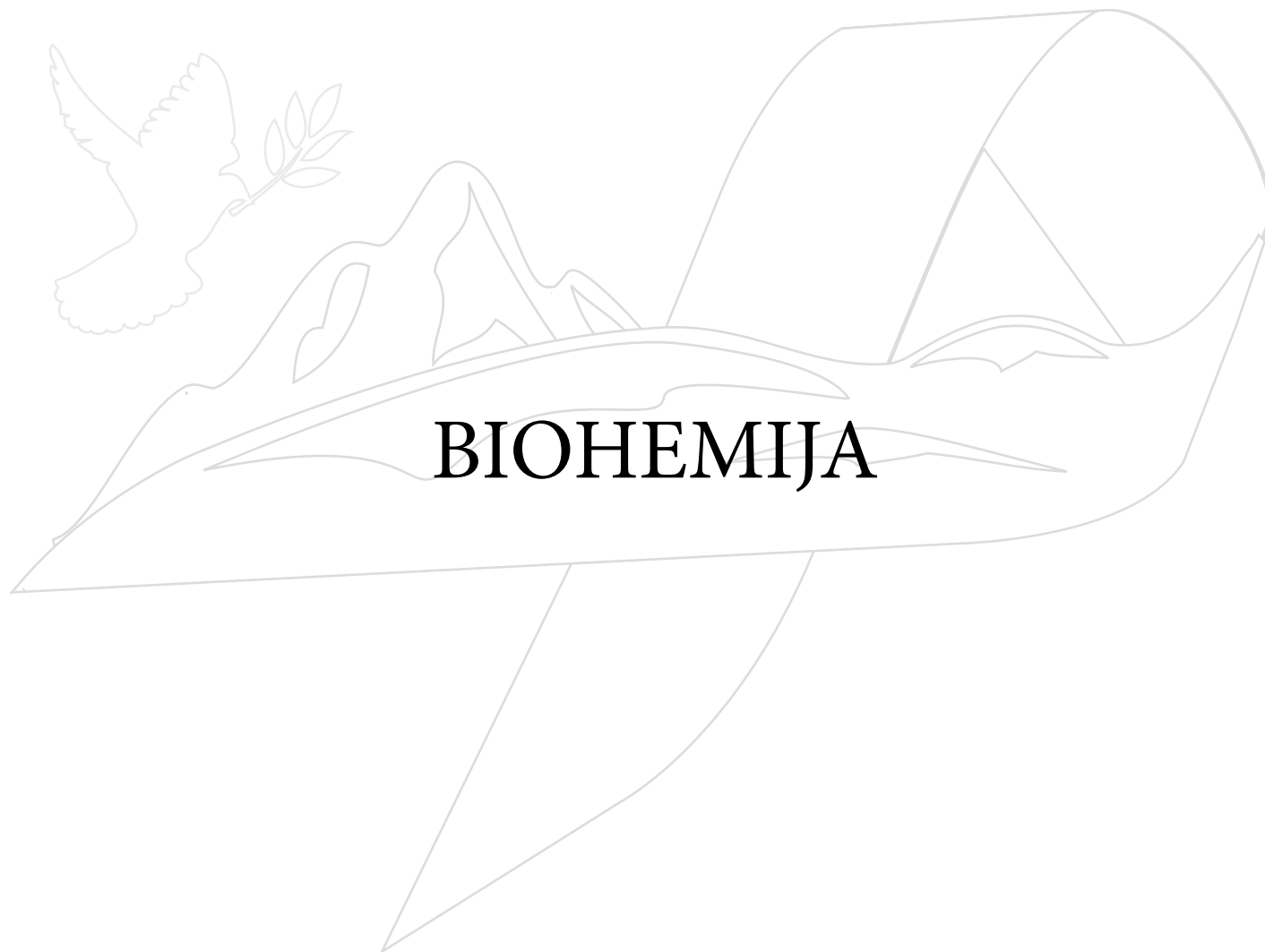
Materials and Methods: In the first part of the study midsagittal and midinterpeduncular diameters, and area of the vertebral foramina of 52 lumbar vertebrae were measured. In the second part of the study, trefoil shape of the lumbar foramina were identified on the MRI (1.5 T) images of 32 patients.

Results: Trefoil shape of vertebral foramina is present in 18 of 50 lumbar vertebrae (36%). Procentually, it was most commonly found at L₅ level (54.14%). In the second examined group, presence of trefoil foramina was identified on MRI images of 21 patients (65.62%).

Conclusion: The clinical relevance of the trefoil configuration was in a possible predisposition to compression of lumbar and sacral nerve roots. Trefoil variation in shape of the lumbar vertebral foramen can be clearly identified using the MRI.

Key words: MRI; Trefoil; Spinal canal; Low-back pain





ISPITIVANJE ANTITUMORSKOG DELOVANJA NOVOSINTETISANOG KOMPLEKSA RUTENIJUMA NA B16 ČELIJE MIŠIJEG MELANOMA *IN VITRO*

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Uvod: Maligni melanom je najznačajniji tumor melanocitnog sistema, visokog malignog potencijala i mogućnosti davanja udaljenih visceralnih metastaza. Zbog porasta incidencije oboljevanja ali i zbog nedovoljno adekvatnog odgovora na postojeće vidove terapije, u cilju unapređenja lečenja, kontinuirano se traga za novim, efikasnijim terapijskim sredstvima, naročito na polju hemioterapeutika.

Cilj: Ispitivanje potencijalnog antitumorskog dejstva novosintetisanog Ru(II) kompleksa na B16 čelijskoj liniji mišijeg melanoma

Materijal i metode: Čelijski vijabilitet određen je testom aktivnosti kisele fosfataze. Analiza čelijskog ciklusa, eksternalizacije fosfatidilserina i autofagije, izvršena je nakon bojenja čelija flouorohromima propidijum jodidom, aneksin/propidijum jodidom i akridin oranžom na protočnom citometru.

Rezultati: Ispitivana supstanca je pokazala visoku citotoksičnu aktivnost nakon 24-časovnog i 48-časovnog tretmana (odgovarajuće IC_{50} vrednosti su $6.7 \pm 1.3 \mu M$ odnosno $5.7 \pm 1.5 \mu M$). Takođe, u poređenju sa delovanjem cisplatinе, rutenijumski kompleks je pokazao bolji citotoksični efekat. Analizom fragmentacije DNK uočen je značajan porast procenta čelija sa hipodiploidnim sadržajem DNK – 3,25% (nakon tretmana u koncentraciji od $5 \mu M$), odnosno 14,92% (nakon tretmana u koncentraciji od $10 \mu M$), u odnosu na 1.65% u netretiranom, kontrolnom uzorku. Takođe je uočen i porast aneksin pozitivnih (Ann⁺) čelija: 14,65% ($5 \mu M$) odnosno 72,69% ($10 \mu M$) nakon 24-časovnog tretmana rutenijumskim kompleksom. Porast autofagije nakon tretmana Ru(II) kompleksom nije uočen.

Zaključak: Novosintetisani Ru(II) kompleks, primenjen u mikromolarnim koncentracijama, pokazuje znatnu antitumorsku aktivnost na B16 čelijama mišijeg melanoma. Zabeleženi rezultati ukazuju da je prevashodni mehanizam antitumorskog delovanja rutenijumskog kompleksa pokretanje procesa apoptoze.

Ključne reči: Ru(II) kompleks, B16 mišiji melanom, citotoksičnost, apoptoza, autofagija

ANTI-TUMOR EFFECT OF NOVEL RUTHENIUM COMPOUND ON B16 MOUSE MELANOMA CELL LINE *IN VITRO*

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Introduction: Due to the high incidence, malignant potential and mortality of malignant melanoma, developing of novel and potent cytostatic agents is often target of many studies.

The Aim: The aim of this study was to investigate the anti-tumor potential of novel Ru(II) complex on B16 mouse melanoma cell line.

Material and Methods: Cell viability was determined using acid phosphatase assay. Propidium-iodide, annexin-V-FITC/propidium-iodide and acridine-orange staining were used to determine the cell cycle distribution, presence of apoptosis and levels of autophagy by flow cytometry.

Results: Cell viability showed that novel ruthenium complex displays high cytotoxic activity following 24 and 48-hour treatment (IC_{50} values $6.7 \pm 1.3 \mu M$ and $5.7 \pm 1.5 \mu M$, respectively). DNA fragmentation analysis revealed marked increase in percentage of cells in subG₀ phase to 3.25% in applied concentration of $5 \mu M$ and 14.92% in applied concentration of $10 \mu M$, compared to 0.28% of cells in the control (untreated) samples. This finding indicates increase in DNA fragmentation as a result of the effect of Ru(II) complex. Analysis of phosphatidylserine externalization showed increase in Ann-positive (Ann⁺) cells: 14.65% ($5 \mu M$) and 72.69% ($10 \mu M$) Ann⁺ cells following 24-hour treatment, compared to 9.32% of Ann⁺ cells in the control samples. Treatment with this complex has not resulted in autophagy increase.

Conclusion: The novel Ru(II) complex displays potent anti-tumor activity to B16 mouse melanoma cell line in the micromolar concentration range. The observed anti-tumor effect seems to be, to important part, mediated by the apoptotic mechanism.

Key words: Ru(II) complex, B16 mouse melanoma cell line, cytotoxicity, apoptosis, autophagy

OKSIDATIVNI STRES NAKON REPERFUZIONOG OŠTEĆENJA IZAZVANOG TROMBOLITIČKOM TERAPIJOM KOD BOLESNIKA SA MOŽDANIM UDAROM

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Uvod: Pojačano stvaranje kiseoničnih slobodnih radikala je pokazano kod bolesnika sa akutnim moždanim udarom (AMU), kako u toku ishemiје, tako i tokom reperfuzije, koja predstavlja jedan od glavnih ciljeva lečenja AMU. Reperfuzija izazvana trombolitičkom terapijom može imati i štetne efekte, zbog nastanka oksidativnog stresa usled uspostavljanja reoksidogenacije tkiva.

Cilj: Cilj ovog istraživanja je procena stepena oksidativnog oštećenja proteina i lipida kod bolesnika sa AMU nakon primene trombolitičke terapije.

Materijal i metode: U istraživanje je uključeno 37 bolesnika sa AMU kod kojih je primenjena trombolitička terapija (t-PA) i 40 zdravih kontrola. Pokazatelji oksidativnog oštećenja proteina (sadržaj karbонilnih grupa (RCD) i koncentracija proteinskih tiol grupa (P-SH)) određivani su spektrofotometrijski, a oštećenja lipida (koncentracije urinarnih izoprostana (8-epi-PGF_{2α})) metodom imunoeseja.

Rezultati: Koncentracija P-SH je značajno smanjena kod bolesnika sa AMU 24h nakon primene t-PA u odnosu na kontrole (p=0.001). Koncentracije P-SH se postepeno povećava, pa nakon 72h nema značajne razlike između bolesnika i kontrola (p>0.05). Sadržaj RCD kod bolesnika sa AMU je značajno povećan 24h nakon intravenske infuzije t-PA u odnosu na kontrole (p=0.002). U narednih 48h, sadržaj RCD ostaje za oko 30% veći od vrednosti u kontrolama (p>0.05). Koncentracija 8-epi-PGF_{2α} kod bolesnika sa AMU je značajno povećana u odnosu na kontrole 24h i 48h nakon primene t-PA (p=0.001). Umereno smanjenje se vidi nakon 72h, mada vrednosti ostaju 1,5 puta veće u odnosu na kontrole (p=0.008).

Zaključci: Rezultati ukazuju na visok stepen oksidativnog oštećenja proteina i lipida kod bolesnika sa AMU nakon primene trombolitičke terapije.

Ključne reči: oksidativni stres, moždani udar, trombolitička terapija, izoprostani

OXIDATIVE STRESS AFTER THROMBOLYSIS-INDUCED REPERFUSION IN PATIENTS WITH STROKE

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Introduction: Increased reactive oxygen species production has been demonstrated in ischemic stroke, both during ischemia and reperfusion, one of the main goals in stroke treatment. Therefore, reperfusion might have some deleterious effects because oxidative stress can rapidly take place on reoxygenation.

The Aim: We aimed to determine the level of oxidative damage to proteins and lipids in patients with stroke treated with thrombolytic therapy.

Materials and Methods: A total of 37 patients with stroke, treated with tissue plasminogen activator (t-PA) and 40 healthy controls were included in the study. Byproducts of protein (reactive carbonyl derivatives (RCD) and protein thiol groups (P-SH)) and lipid (urinary isoprostanes (8-epi-PGF_{2α})) oxidative damage were measured spectrophotometrically and by enzyme immunoassay, respectively.

Results: P-SH levels were significantly decreased in stroke patients 24 h after t-PA administration in comparison to controls (p=0.001). Due to gradual increase in P-SH concentration, after 72h there was no significant difference between patients and controls (p>0.05). RCD content in stroke patients was significantly increased 24h after thrombolysis when compared to controls (p=0.002). In the following 48h, RCD content remained approximately 30% higher than in controls (p>0.05). Concentration of 8-epi-PGF_{2α} was significantly increased in stroke patients 24h and 48h after t-PA administration in comparison to controls (p=0.001). Mild decrease was observed after 72h, although concentration was still 1,5 higher than in controls (p=0.008).

Conclusion: It was established that high degree of thrombolysis-induced oxidative damage to proteins and lipids is present in patients with stroke.

Keywords: oxidative stress, stroke, thrombolytic therapy, isoprostanes

UTICAJ PERORALNOG DAVANJA ALUMINIJUMA NA EKSPRESIJU NADPH OKSIDAZE, AMILOIDA B I MARKERA NEURONA I GLIJE U MOZGU PUSTINJSKIH MIŠEVA

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Uvod: Aluminijum (Al) se smatra faktorom koji učestvuje u patogenezi Alchajmerove bolesti (AB). Molekularni mehanizmi njegovog dejstva nije poznat. Primećeno je da Al indukuje oksidativni stres. Enzim NADPH oksidaza (NOX) stvara slobodne radikale i ekspimirana je u gotovo svim ćelijama organizma. Pokazana je korelacija aktivnosti ovog enzima i kognitivnog deficita kod obolelih od AB. Amiloid b predstavlja jedan od najznačajnijih patoloških markera mozga u AB i njegovog nagomilavanje izaziva atrofiju i degeneraciju neurona. U degradaciji amiloida b učestvuju i enzimi matriks metaloproteinaze (MMP).

Cilj : Cilj našeg istraživanja je bio da se ispita uticaj subakutnog peroralnog davanja Al na ekspresiju NOX2, MMP-9, amiloida b, neuronalnog markera (NeuN) i markera astrocita (GFAP) u korteksu i hipokampusu mozga pustinskih miševa.

Materijal i metode: U istraživanju smo koristili pustinske miševe. Jednu grupu životinja tretirali smo sa $AlCl_3$ u dozi LD_{50} (0,74 g/kg telesne težine), a drugu sa NaCl u toku tri nedelje pomoću gastrične sonde. Ekspresiju NADPH oksidaze, MMP-9 kao i markere neurona i astrocita (NeuN i GFAP) određivali smo metodom *Western blot-a*, a prisustvo amiloida b imunohistohemijski u korteksu i hipokampusu.

Rezultati: NADPH oksidaza je bila povećano ekspimirana u korteksu tretiranih životinja. Povećanje ekspresije MMP-9 je zapaženo u korteksu, dok ekspresija NeuN i GFAP nije bila statistički značajno izmenjena ni u korteksu ni u hipokampusu. Ekspresija amiloida b je bila povećana u obe ispitivne strukture.

Zaključak: Al u mozgu pacova dovodi do promena koje odgovaraju promenama zapaženim u AB.

Ključne reči: Alchajmerova bolest, NADPH oksidaza, amiloid β , MMP-9, NeuN, GFAP

UTICAJ RISPERIDONA NA KONCENTRACIJU I METABOLIZAM GLUTATIONA U MOZGU PACOVA PERINATALNO TRETIRANIH FENCIKLIDINOM

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Uvod: Risperidon, atipični antipsihotik, se koristi u lečenju shizofrenije. Perinatalno tretiranje pacova fenciklidinom (PCP), nekompetitivnim antagonistom NMDA receptora, predstavlja jedan od najubedljivijih animalnih modela shizofrenije. Pokazano je da ovakva primena fenciklidina dovodi do smanjenja nivoa glutationa (GSH) i posledičnog povećanja oksidativnog stresa u centralnom nervnom sistemu koji učestvuje u patofiziologiji shizofrenije.

Cilj: Ispitivanje uticaja risperidona na koncentraciju i metabolizam glutationa kod pacova, perinatalno tretiranih fenciklidinom.

Materijal i metode: Wistar pacovi, mužjaci, su podeljeni u četiri grupe. Sve četiri grupe životinja su tretirane perinatalno 2, 6, 9. i 12.og postnatalnog (PN) dana i to dve sa NaCl i dve sa PCP-om (10 mg/kgTT). Prva grupa (NaCl grupa) je perinatalno dobila NaCl, a druga (PCP grupa) fenciklidin. Treća grupa (NaCl-RSP grupa), je perinatalno primila NaCl, a 35.og PN dana je započeta terapija risperidonom, koja je trajala 9 nedelja. Četvrta grupa (PCP-RSP grupa) je perinatalno primila PCP i takođe 35.og PN dana započela terapiju risperidonom na isti način kao i NaCl-RSP grupa. Životinje su žrtvovane 100. PN dana. U korteksu i hipokampusu određivane su koncentracije GSH i aktivnost glutation reduktaze (GR), gama-glutamil-cistein ligaze (γ -GCL) i glutation peroksidaze (GPx) spektrofotometrijskim metodama.

Rezultati: Dobijeni rezultati su pokazali da PCP dovodi do značajnog smanjenja koncentracije GSH i smanjenja aktivnosti enzima uključenih u njegov metabolizam, dok primena risperidona dovodi do normalizacije praćenih parametara.

Zaključak: Primena risperidona dovodi do reverzije promena u metabolizmu GSH koje se zapažaju posle perinatalnog tretmana PCP-om.

Ključne reči: Risperidon, GSH, GR, GPx, γ -GCL

EFFECTS OF PERORAL ADMINISTRATION OF ALUMINUM ON THE EXPRESSION OF NADPH OXIDASE, AMYLOID B AND NEURONAL AND ASTROCYTIC MARKERS IN THE GERBIL BRAIN

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Introduction: Aluminum (Al) is considered as a cofactor in the pathogenesis of Alzheimer's disease (AD). Molecular mechanisms of its action are unknown. It has been shown that Al induces oxidative stress. Enzyme NADPH oxidase (NOX) produces free radicals and exists in almost every cell in the body. The correlation between this enzyme and cognitive deficit in patients with AD has been shown. Amyloid β is one of the most important pathological markers of the brain in AD and its aggregation produces atrophy and degeneration of neurons. Enzymes matrixmetaloproteinases (MMP) participate in the degradation of amyloid β .

The Aim: The goal of our study was to determine the effects of subacute peroral administration of Al on the expression of NOX2, MMP-9, amyloid β and neuronal and astrocytic markers (NeuN and GFAP) in the gerbil brain.

Materials and methods: In our study we used gerbils. One group of animals was treated with $AlCl_3$, LD_{10} (0,74 g/kg body weight) and the other with NaCl, three weeks via a gastric tube. Expression of NADPH oxidase, MMP-9 and NeuN and GFAP was determined via *western blot*. Presence of amyloid β was determined by immunohistochemistry.

Results: NADPH oxidase and MMP-9 were overexpressed in the cortex of the treated animals. Expression of NeuN and GFAP was changed neither in the cortex nor in the hippocampus. Expression of amyloid β was increased in both structures.

Conclusion: Al produces changes that are characteristic of AD.

Key words: Alzheimer's disease, NADPH oxidase, amyloid β , MMP-9, NeuN, GFAP

INFLUENCE OF RISPERIDONE ON THE GLUTATION CONCENTRATION AND METABOLISM IN THE BRAIN OF THE RATS PERINATALLY TREATED WITH PHENCYCLIDINE

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Introduction: Risperidone, atypical antipsychotic, is used in treating schizophrenia. Perinatal administration of phencyclidine (PCP), a non-competitive antagonist of NMDA receptors, is one of the most convincing animal model of schizophrenia. It is demonstrated PCP administration leads to reduction of glutathione levels and subsequent increased oxidative stress in central nervous system which participates in the pathophysiology of schizophrenia.

Aim of the study: Evaluating the influence of risperidone on concentration and metabolism of glutathione in rats perinatally treated with PCP.

Material and methods: Wistar rats, males, were divided in four groups. All four groups were treated perinatally 2, 6, 9 and 12 postnatal (PN) days, two of them with NaCl and two with PCP (10mg/kgTT). First group (NaCl group) perinatally received NaCl, and second (PCP group) received phencyclidine. Third group (NaCl-RSP group) perinatally received NaCl (s.c.) and on 35 PN day started perioral risperidone treatment which continued next 9 weeks. PCP-RSP group perinatally received phencyclidine (s.c.) and also on 35 PN day started perioral risperidone treatment same as in NaCl-RSP group. Animals were sacrificed on 100 PN day. In cortex and hippocampus GSH concentrations, activities of GPx, GR and γ -GCL were determined using spectrophotometry methods.

Results: Results showed that PCP significant leads to reduction of GSH level and reduction of activities of enzymes involved in its metabolism, while use of risperidone leads to normalization of the parameters.

Conclusion: Risperidone treatment leads to reversion of disturbances in the glutathione metabolism observed after perinatal phencyclidine administration.

Key words: risperidone, GSH, GR, GPx, γ -GCL

ISPITIVANJE CITOTOKSIČNIH EFEKATA DIAZEPAMA NA MODELU B16 ČELIJSKE LINIJE, IN VITRO

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Uvod: Visoka incidenca i letalitet malignog melanoma, maligni potencijal i brzina metastaziranja, česti relapsi uz neefikasnost adjuvantne terapije predstavljaju razloge zbog kojih se ulažu veliki napor u pronalaženje kao i u ispitivanje molekularnih mehanizama dejstva potencijalnih citotoksičnih jedinjenja.

Cilj rada: Ispitivanje potencijalnog citotoksičnog efekta diazepama na B16 ćelije mišjeg melanoma i mehanizama odgovornih za njegovo antitumorsko delovanje.

Materijal i metode: Vijabilitet B16 ćelija mišjeg melanoma u kulturi je određen merenjem aktivnosti kisele fosfataze. Analiza potencijalnog mehanizma delovanja ispitivanog leka na B16 ćelije izvedena je primenom odgovarajućih fluorohroma i analizom na protočnom citofluorimetru. Bojenje propidijum jodidom, dihidrorodaminom, dihidroetidijumom i akridin-oranžom izvedeno je radi analize ćelijskog ciklusa, produkcije slobodnih kiseoničnih radikala, superoksidnih anjona i autofagije. Promena morfologije ćelija i prisustvo autofagolizozoma je praćeno primenom svetlosne odnosno fluorescentne mikroskopije.

Rezultati: Diazepam je ispoljio citotoksično dejstvo na B16 ćelije tokom 24h tretmana ($IC_{50}=389,42\mu M$). Analizom ćelijskog ciklusa zapažen je povećan procenat ćelija u G₂/M fazi pri koncentraciji diazepama koja je bliska IC_{50} ($400\mu M$) (50,25% u odnosu na kontrolu – 21,34%). Primećen je porast produkcije slobodnih kiseoničnih radikala, kao i superoksidnog anjona (2,83 puta i 1,49 puta, u odnosu na kontrolu). Utvrđeno je prisustvo autofagičnih vakuola i povećanje intenziteta narandžaste fluorescence (tretman – FL3/FL1=1,43; kontrolne ćelije FL3/FL1=1).

Zaključak: Ispitivani lek iz grupe benzodiazepina tokom 24h tretmana primenjen na B16 ćelije u kulturi u dozi od $400\mu M$, pokazuje antiproliferativno i citotoksično dejstvo u čijoj se osnovi verovatno nalazi povećana produkcija slobodnih kiseoničnih radikala koja indukuje ćelijsku smrt po tipu autofagije.

Ključne reči: citotoksičnost, B16 mišji melanom, diazepam, autofagija

INVESTIGATION OF DIAZEPAMS' CYTOTOXIC EFFECTS ON B16 MOUSE MELANOMA CELL LINE, IN VITRO

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Introduction: High prevalence and lethality of malignant melanoma, malignant potential and high rate of metastasis, frequent relapses, and the inefficiency of adjuvant therapy are reasons why great efforts are made in investigations of molecular mechanisms of potential cytotoxic compounds.

The Aim: To investigate potential cytotoxic effects of diazepam against B16 mouse melanoma cells and define a mechanism of its effect.

Material and methods: Viability rate of B16 treated cells was assessed by acid phosphatase assay. Potential mechanism of diazepam's action was investigated using flow cytometry analysis. Propidium-iodide, dihydrohodamine, dihydroxyetidum and acridine-orange staining were used to determine cell cycle distribution, levels of reactive oxygen species, superoxide anion production and autophagy, respectively. Fluorescence and light microscopy evaluation were made to determine morphological changes of treated cells.

Results: Diazepam demonstrated cytotoxic activity against B16 cells after 24-hour exposure ($IC_{50}=389,42\mu M$). When used in the same concentration ($400\mu M$) diazepam increased percentage of cells in G₂/M phase, compared to control (50.25% vs 21.34%). Free radicals and superoxide anion production after 24hour treatment were increased (2.83 and 1.49 fold increase, vs control, respectively). Fluorescent microscopy revealed the presence of autophagic vacuoles while flow cytometry analysis further evidenced increase of orange fluorescence (treated cells – FL3/FL1=1,43; control FL3/FL1=1).

Conclusion: Investigated benzodiazepine drug has significant antiproliferative and cytotoxic activity against B16 mouse melanoma cells. The possible antitumor mechanism of its action could be the induction of oxidative stress, which probably initiates autophagy.

Key words: cytotoxicity, B16 mouse melanoma, diazepam, autophagy

UTICAJ KALORIJSKE RESTRIKCIJE I TRETMANA METFORMINOM NA KLINIČKU SLIKU EKSPERIMENTALNOG AUTOIMUNSKOG ENCEFALOMIJELITISA KOD PACOVA DA SOJA

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Uvod: Eksperimentalni autoimuni encefalomijelitis (EAE) je najčešće korišćen životinjski model u ispitivanjima multiple skleroze, T-ćelijski posredovane autoimunske bolesti CNS-a. Metformin je najšire korišćen lek u terapiji diabetesa i svoje dejstvo postiže aktivacijom AMP-protein kinaze (AMPK). Prethodni studije su pokazale da kalorijska restrikcija može imati antiinflamatorno i neuroprotektivno dejstvo i da može značajno uticati na tok bolesti.

Cilj: Istraživanje analizira efekte Metformina i kalorijske restrikcije na razvoj EAE-a kod DA pacova.

Materijal i metode: U istraživanju su korišćeni pacovi oba pola starosti 2 do 6 meseci, koji su imunizovani homogenatom kičmene moždine uz kompletni Freundov adjuvans. Nakon imunizacije pacovi su podeljeni u 3 grupe. Jedna grupa je tretirana Metforminom (100mg/kg TT), druga je podvrgnuta kalorijskoj restrikciji gde je ukinuto 60% normalnog dnevnog unosa hrane i treća grupa predstavljala kontrolnu grupu koja je normalno hranjena i tretirana PBS-om. Pacovi su svakodnevno posmatrani počev od 6.dana nakon imunizacije.

Rezultati: Dobijeni rezultati su pokazali da se bolest pojavila ranije i u jačem stepenu u kontrolnoj grupi i grupi pacova tretiranih Metforminom, dok se kod pacova podvrgnutih kalorijskoj restrikciji javila kasnije i u znatno blažem obliku.

Zaključak: Na osnovu dobijenih rezultata može se zaključiti da Metformin nije imao uticaj na razvoj EAE-a kod tretiranih pacova, ali bi trebalo izvršiti dodatna ispitivanja da bi se mogli doneti ispravni zaključci o njegovim efektima. Kalorijska restrikcija je pokazala protektivno dejstvo na razvoj EAE-a, i uz pažljivu medicinsku negu se može smatrati kao potencijalni tretman u terapiji multiple skleroze.

Ključne reči: EAE, Metformin, kalorijska restrikcija

EFFECTS OF CALORIC RESTRICTION AND METFORMIN TREATMENT ON CLINICAL PICTURE OF EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS IN DA RATS

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Introduction: Experimental autoimmune encephalomyelitis (EAE) is most commonly used animal model for multiple sclerosis. Metformin is widely used drug for diabetes and mediates its action via activating AMP-activated protein kinase (AMPK). Studies have shown that caloric restriction may have anti-inflammatory and neuroprotective effects and may significantly change the course of the disease.

The Aim: This study analyzes the effects of Metformin and caloric restriction on the development of EAE in DA rats. **Materials and Methods:** In this research were used both male and female rats, that were immunized by spinal chord homogenate (SCH) with complete Freund's adjuvant. After immunization rats were divided in three groups. The first group was treated by Metformin (100mg/kg BW), the second was submitted to a calorie restriction equivalent to 60% of normal daily food intake and the third group was, control group with rats that were normally fed and treated by PBS. Rats were monitored daily with a beginning from the sixth day after immunization.

Results: The results have demonstrated that clinical signs of the disease were exhibited earlier and had had more severe course in control group and Metformin-treated group comparing to group of rats that were subjected to caloric restriction. Calorie restricted rats exhibited mild clinical signs and disease beginning was delayed.

Conclusion: According to these results, Metformin had no effect to the EAE development. Caloric restriction has shown protective effect, and combined with careful medical care could be explored as a potential treatment for multiple sclerosis.

Key words: EAE, Metformin, caloric restriction

ISPITIVANJE CITOTOKSIČNIH EFEKATA EKSTRAKTA SIDERITIS SCARDICA NA B16 ČELIJAMA MELANOMA MIŠA, IN VITRO

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Uvod: Iako danas postoje različiti terapijski pristupi, lečenje malignog melanoma i dalje predstavlja veliki izazov. Zbog toga postoji potreba za pronalaženjem novih i dopunskih supstanci koje na ćelije melanoma ispoljavaju citotoksične efekte ili pokazuju sinergističko dejstvo sa već postojećim i poznatim terapijskim antitumorskim lekovima.

Cilj rada: Cilj ovog rada bio je da se ispita uticaj ekstrakata biljke *Sideritis scardica* i njihovih sastavnih komponenti-apigenina i luteolina na ćelijski vijabilitet i produkciju slobodnih kiseoničnih radikala.

Materijal i metode: Svi eksperimenti su izvedeni na B16 ćelijskoj liniji melanoma miša. Za određivanje vijabiliteta B16 ćelija, koje su tokom 24h inkubirane sa dvostrukim razblaženjima ekstrakata *S. scardica*, odnosno apigeninom i luteolinom, korišćen je test kisele fosfataze, dok je produkcija slobodnih kiseoničnih radikala odedena merenjem intenziteta fluorescence fluorohroma dihidroksirodamina(DHR) na protočnom citofluorometru.

Rezultati: Najveće smanjenje vijabiliteta u odnosu na kontrolu (vijabilitet 100%, netretirane ćelije) se postiže primenom ekstrakta 2 (54,5% pri koncentraciji 100 µg/ml, p<0,05). Kako su najzastupljenije komponente ovog ekstrakta flavonoidi, apigenin i luteolin, pokazano je da luteolin takođe ispoljava citotoksično dejstvo (81,9% pri koncentraciji 12,5 µM, p<0,05). Merenjem intenziteta fluorescence DHR po 24h tretmanu sa apigeninom (25µM), luteolinom (25µM) i ekstraktom 2 (25µg/ml), uočeno je da sve ispitivane supstance, u navedenim koncentracijama, dovode do povećanja intenziteta produkcije slobodnih kiseoničnih radikala.

Zaključak: Ekstrakt 2 i flavonoidi, njihove sastavne komponente, dovode do smanjenja ćelijskog vijabiliteta B16 ćelija mišijeg melanoma, a da je jedan od mehanizama kojim se ovo citotoksično dejstvo može objasniti povećana produkcija slobodnih kiseoničnih radikala.

KLjučne reči: B16, *Sideritis scardica*, flavonoidi

EXAMINATION OF CYTOTOXIC EFFECTS OF THE SIDERITIS SCARDICA EXTRACT ON B16 MOUSE MELANOMA CELLS, IN VITRO

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Introduction: Despite the great variety of different treatment approaches, the therapies of malignant melanoma are still a great challenge. Therefore, there is a necessity for defining substances which could express cytotoxic effect on melanoma cells or could have synergistic activity with already known therapeutics.

The Aim: To examine the influence of *Sideritis scardica* plant extracts and their integral components, apigenin and luteolin, on the cell viability and production of reactive oxygen species (ROS).

Materials and Methods: All experiments were performed on B16 mouse melanoma cell line. After 24h cells treatment with appropriate dilutions of *S. scardica* extracts and their integral components, the viability was assessed by acid phosphatase method while ROS production was measured, using dihydrorhodamine 123 fluorochrom (DHR), on flow cytometer.

Results: Only extract 2 showed significant dose-dependent cytotoxicity (54.5 % of control when used in concentration of 100 µg/ml, p<0.05). Among all integral components of extract 2, flavonoids showed the most significant viability decline, with luteolin being the most potent one (81.9% when used in concentration of 12.5 µM, p<0.05). We also observed that apigenin (25µM), luteolin (25µM) and extract 2 (25µg/ml) increased the ROS production.

Conclusion: *Sideritis scardica* extract 2 and flavonoids, as its integral components, decreased the cell viability suggesting that the increased production of ROS might be responsible for their cytotoxic effect. Further investigations should explore the mechanism of this process and potential usage of these substances as a provisional agency in therapy of certain diseases.

Key words: B16, *Sideritis scardica*, flavonoids

UTICAJ RISPERIDONA NA EKSPRESIJU MARKERA NEURONA I GLIJE U MOZGU PACOVA PERINATALNO TRETIRANIH FENCIKLIDINOM

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Uvod: Perinatalna primena fenciklidina (PCP) predstavlja jedan od animalnih modela shizofrenije. Risperidon (RSP) je atipični antipsihotik i potentni antagonist D2 i 5-HT2 receptora. Neuron specifični nuklearni protein (NeuN) je lokalizovan u jedru i služi kao marker neurona. Gljalni fibrilarni kiseli protein (GFAP), intermedijerni filament, univerzalni je marker astrocита. Pokazano je smanjenje ekspresije oba markera u pacijenata obolelih od shizofrenije. **Cilj:** Ispitivanje uticaja risperidona na ekspresiju markera NeuN i GFAP u korteksu i hipokampusu pacova perinatalno tretiranih fenciklidinom.

Materijal i metode: Četiri grupe *Wistar* pacova su tretirane 2-og, 6-og, 9-og i 12-og postnatalnog (PN) dana fenciklidinom (10 mg/kg tm) ili fiziološkim rastvorom natrijum hlorida (s.c.). Od 35. PN dana dve grupe (jedna kontrolna i jedna eksperimentalna) dobijale su risperidon u vodi za piće. Životinje su žrtvovane PN dana 100. Ekspresija NeuN i GFAP u mozgu pacova određivana je metodom *Western* blota.

Rezultati: Ekspresija NeuN i u korteksu i hipokampusu pacova perinatalno tretiranih fenciklidinom je neizmjenjena u odnosu na kontrolnu grupu i risperidon ne dovodi do promene u njegovoj ekspresiji. Ekspresija GFAP u hipokampusu pacova perinatalno tretiranih PCP-om je statistički značajno smanjena u odnosu na kontrolnu grupu, dok je u korteksu nepromenjena. Primena risperidona dovodi do povećanja ekspresije GFAP u ovoj strukturi.

Zaključak: Pokazano je da perinatalna primena PCP-a ne utiče na ekspresiju markera neurona u obe strukture, ali da dovodi do smanjenja ekspresije GFAP u hipokampusu. Ovo bi moglo ukazivati na smanjenu funkciju astrocита. Primena risperidona dovodi do normalizacije ekspresije GFAP u ovoj strukturi.

KLjučne reči: fenciklidin, shizofrenija, risperidon

EFFECTS OF RISPERIDONE ON EXPRESION OF NEURONAL AND GLIAL MARKERS IN THE RAT BRAIN PERINATALLY TREATED WITH PHENCYCLIDINE

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Introduction: Perinatal phencyclidine (PCP) administration represents one of the actual animal models of schizophrenia. Risperidone (RSP), atypical antipsychotic, is potent antagonist of D2 and 5-HT2 receptors. Neuronal Nuclei (NeuN) is used as marker of neurons. Glial fibrillar acidic protein (GFAP) is marker of astrocytes. The reduction of expression of both markers was shown in schizophrenic patients.

Aim of the study: To examine the effects of risperidone on expression of neuronal and glial markers in the rat brain perinatally treated with phencyclidine.

Material and methods: Four groups of *Wistar* rats were treated on postnatal (PN) day 2, 6, 9 and 12 with either PCP (10 mg/kg) or saline s.c. From PN35, two groups (control and experimental) were receiving risperidone in drinking water. Rats were sacrificed on PN100. Expression of NeuN and GFAP in the cortex and hippocampus of the rat was determined by *Western* blot.

Results: The expression of NeuN in PCP group was unchanged both in cortex and hippocampus compared to the control group and it is shown that risperidone does not lead to changes in its expression. The expression of GFAP in hippocampus of PCP treated rats was significantly reduced, while in the cortex it was unchanged. Risperidone treatment led to increased expression of GFAP in this structure.

Conclusion: It was shown that perinatal PCP treatment didn't affect the expression of neuronal markers in both structures, but it decreased the expression of GFAP in hippocampus. This could indicate on reduced function of astrocytes. Risperidone treatment normalized expression in this structure.

Key words: schizophrenia, phencyclidine, risperidone.

POVEZANOST MARKERA INFLAMACIJE SA STEPENOM TEŽINE HRONIČNE SRČANE INSUFICIJENCIJE

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Uvod: Smatra se da je u hroničnoj srčanoj insuficijenciji (HSI) prisutna složena kaskada hroničnih inflamatornih reakcija, koja dovodi do miokardne disfunkcije i sindroma srčane insuficijencije. Zbog značajne uloge inflamacije kako u patogenezu, tako i u progresiji različitih oblika srčane insuficijencije, biomarkeri inflamacije su postali predmet intenzivnih istraživanja.

Cilj rada: Ispitivana je povezanost između nivoa hs-CRP, TNF- α , ICAM-1 i VCAM-1 u krvi bolesnika sa HSI sa težinom njihove bolesti.

Materijal i metode: Iz krvi 120 bolesnika sa HSI i 69 zdravih kontrola, ELISA testom su određivane koncentracije hs-CRP, TNF- α , ICAM-1 i VCAM-1 molekula. Bolesnici su podeljeni u četiri grupe po klasifikaciji Njujorskog kardiološkog društva (NYHA).

Rezultati: Rezultati su pokazali povećane koncentracije svih ispitivanih inflamatornih markera kod bolesnika sa HSI u odnosu na kontrolnu grupu, pri čemu je porast bio najizraženiji kod bolesnika sa najtežim stepenom HSI (NYHA IV) ($p < 0,001$). Pored toga, koncentracije hs-CRP i cirkulišućeg VCAM-1 bili su statistički značajno veće u grupi bolesnika sa NYHA III/IV u odnosu na NYHA I/II bolesnike i kontrolnu grupu ($p < 0,05$ odnosno $p < 0,01$). Statistički značajna povezanost između koncentracija VCAM-1 i ejekcione frakcije leve komore (LVEF) ($r = -0,213$, $p < 0,05$), ukazuje na jasnu vezu između nivoa ovog adhezivnog molekula sa težinom miokardne disfunkcije.

Zaključak: Određivanje koncentracije cirkulišućeg VCAM-1, zajedno sa hsCRP, može imati važnu ulogu u stratifikaciji bolesnika sa HSI, što upućuje na važnu ulogu ovih molekula u praćenju progresije bolesti.

Ključne reči: hronična srčana insuficijencija, hs-CRP, TNF- α , ICAM-1, VCAM-1

RELATIONSHIP BETWEEN MARKERS OF INFLAMMATION AND SEVERITY OF CHRONIC HEART FAILURE

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Introduction: Chronic heart failure (CHF) has been regarded as a complex cascade of chronic inflammatory reactions, causing gradual cardiac depression and the syndrome of heart failure. Inflammation is important in the pathogenesis and progression of many forms of heart failure and biomarkers of inflammation have become the subject of intense inquiry.

The aim: To assess the association between inflammatory markers (TNF-alpha, hs-CRP, ICAM-1, VCAM-1) and severity of chronic heart failure.

Materials and Methods: Plasma adhesion molecule levels, ICAM-1, VCAM-1, together with TNF-alpha and hs-CRP were determined in 120 chronic heart failure patients and 69 healthy controls by ELISA. Patients were divided into four groups based on New York Heart Association (NYHA) classification.

Results: Increased levels of all investigated inflammatory markers were found in chronic heart failure patients compared to controls, with the rise more pronounced in NYHA IV class ($p < 0,001$). In addition, VCAM-1 levels were significantly higher in NYHA III/IV patients in comparison to both NYHA I/II patients and controls ($p < 0,05$ and $p < 0,01$, respectively). Associations between VCAM-1 and LVEF ($r = -0,213$, $p < 0,05$), implied clear relationship between adhesion molecule levels with the severity of myocardial dysfunction.

Conclusion: Determination of VCAM-1, together with hsCRP, appears to be useful in stratification of patients with heart failure, which implies their important role in monitoring disease progression.

Key words: chronic heart failure, hs-CRP, TNF- α , ICAM-1, VCAM-1

UTICAJ RISPERIDONA NA KONCENTRACIJU LIPIDNIH PERKOSIDA I AKTIVNOST I EKSPRESIJU SUPEROKSID DIZMUTASE U MOZGU PACOVA PERINATALNO TRETIRANIH FENCIKLIDINOM

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Uvod: Fenciklidin (PCP) je antagonist NMDA receptora. Primena fenciklidina kod ljudi izaziva pozitivne i negativne simptome shizofrenije. Prenatalna primena fenciklidina kod pacova je prihvaćena kao eksperimentalni model shizofrenije. Risperidon, atipični antipsihotik, je antagonist D_2 i 5-HT receptora. Jedan od bitnih faktora u nastanku shizofrenije je oksidativni stres.

Cilj: Ispitati uticaj risperidona na aktivnost i ekspresiju superoksid dismutaze, kao i na koncentraciju lipidnih peroksida u korteksu i hipokampusu pacova perinatalno tretiranih fenciklidinom.

Materijal i metode: Četiri grupe *Wistar* pacova su tretirane 2-og, 6-og, 9-og i 12-og postnatalnog (PN) dana PCP-om (10 mg/kg tm) ili fiziološkim rastvorom natrijum hlorida (s.c.). Od 35. PN dana dve grupe: kontrolna (NaCl-RSPgrupa) i eksperimentalna (PCP-RSP grupa) dobijale su risperidon u vodi. Životinje su žrtvovane PN dana 100. Risperidon je primenjivan oralno u dozi 0,84 mg/kg TT/ dan. Aktivnost SOD i koncentracija lipidnih peroksida (MDA) su određivani spektrofotometrijski a ekspresija SOD *Western blot* tehnikom.

Rezultati: Aktivnost SOD u korteksu i hipokampusu pacova iz PCP grupe je bila značajno niža nego u kontroli. Primena risperidona je takođe dovela do značajnog smanjenja aktivnosti SOD, što nije praćeno značajnim promenama u ekspresiji SOD1 i SOD2. Koncentracija MDA u korteksu pacova bila je značajno povišena u odnosu na kontrolu samo u PCP-RSP grupi, dok je u hipokampusu bila značajno viša u PCP grupi u odnosu na kontrolnu grupu a primena risperidona je dovela do normalizacije.

Zaključak: Perinatalna primena PCP-a dovodi do povećanja pokazatelja oksidativnog stresa u mozgu tetiranih životinja, a risperidon deluje protektivno samo u hipokampusu.

Ključne reči: Shizofrenija, fenciklidin, risperidon, oksidativni stres.

EFFECT OF RISPERIDONE ON CONCENTRATION OF LIPID PEROXIDES AND EXPRESSION AND ACTIVITY OF SUPEROXID DISMUTASE I BRAIN OF RATS PERINATALLY TREATED WITH PHENCYCLIDINE

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Introduction: Phencyclidine(PCP) acts as a NMDA antagonist. Phencyclidine is capable of producing both positive and negative symptoms of schizophrenia. Perinatal PCP administration has been accepted as an experimental model of schizophrenia. Risperidone, atypical antipsychotic, acts as antagonist of D_2 and 5-HT receptors. One of the factors included in ethiopathology of the disease is oxidative stress.

The Aim: Determine the effects of risperidone on expression and activity of superoxide dismutase, and concentration of lipid peroxides in cortex and hippocampus of rats perinatally treated with phencyclidine.

Materials and Methods: Four groups of *Wistar* rats were treated on postnatal (PN) day 2, 6, 9 and 12 with either PCP (10 mg/kg) or saline s.c. From PN35, two groups: one control (NaCl-RSP) and one experimental (PCP-RSP) were receiving risperidone in drinking water at dosage 0,84 mg/kg/day. Rats were sacrificed on PN100. SOD activity and concentration of lipid peroxides (MDA) has been determined spectrophotometrically. SOD expression has been determined by Western blot technique.

Results: SOD activity in cortex and hippocampus from PCP group was significantly lower than control. Treatment with risperidone has also lead to significant decrease in SOD activity, which was not associated with changes in expression of SOD-1 and SOD-2. Concentration of MDA in cortex was significantly elevated in comparison to PCP-RSP group. Concentration of MDA in hippocampus was significantly higher in PCP-group than in control group, while risperidone treatment lead to normalisation.

Conclusion: Perinatal treatment of PCP leads to elevation of parameters of oxidative stress, and risperidone has protective effects only in hippocampus.

Keywords: Schizophrenia, phencyclidine, risperidone, oxidative stress.

ISPITIVANJE MEHANIZMA CITOTOKSIČNOG DEJSTVA α -SINUKLEINA
NA DIFERENTOVANE ČELIJE HUMANOG NEUROBLASTOMA, SH-SY5Y *IN VITRO*

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Uvod: Nakupljanje proteina α -sinukleina (ASYN) u vidu Levijevih tela predstavlja jedan od osnovnih patoloških supstrata Parkinsonove bolesti.

Cilj: Cilj ovog rada je da se utvrdi mehanizam kojim ASYN dovodi do oštećenja diferentovanih ćelija neuroblastoma, SH-SY5Y.

Materijali i metode: Eksperimenti su rađeni na 2 grupe ćelija, kontrolno transfekovanim SH-SY5Y (b-gal) i ćelijama koje prekomerno proizvode ASYN (a-syn^{*}). Ćelije su diferentovane *all-trans* retinoičnom kiselinom. Za praćenje nivoa ekspresije ASYN korišćena je metoda imunoblotova. Za ispitivanje ćelijskog vijabiliteta korišćeni su kristal violet i tripan plavo testovi. Analize ćelijskog ciklusa i aktivacije kaspaza izvršene su analizom ćelija protočnom citometrijom nakon primene odgovarajućeg fluorohroma (propidium jodid za ćelijski ciklus, Apostat za aktivaciju kaspaza).

Rezultati: Analizom ćelijskog vijabiliteta kristal violet testom uočeno je da dolazi do pada vijabiliteta nakon diferencijacije (6 dana), kao i da je pad vijabiliteta izraženiji kod a-syn^{*} ćelija. Primenom bojenja Tripan plavim je uočeno da je pad vijabiliteta kod α -syn^{*} ćelija posledica smrti ćelija usled toksičnog dejstva ASYN, a ne smanjene proliferacije ćelija. Analizom ćelijskog ciklusa uočen je povećan procenat α -syn^{*} ćelija u SubG₁ fazi ćelijskog ciklusa, što ukazuje na fragmentaciju DNK, a analizom aktivacije kaspaza uočena je povećana pan-kaspazna aktivnost kod ovih ćelija.

Zaključak: Prekomerna ekspresija ASYN dovodi do smanjenja vijabiliteta diferentovanih ćelija neuroblastoma, koji je posledica smrti ćelija usled toksičnog dejstva ASYN. Na osnovu rezultata dobijenih analizom ćelijskog ciklusa i aktivnosti kaspaza zaključujemo da je apoptoza potencijalni mehanizam citotoksičnog dejstva ASYN.

Ključne reči: α -sinuklein, citotoksičnost, apoptoza

MECHANISM OF CYTOTOXIC EFFECTS OF α -SYNUCLEIN
ON HUMAN NEUROBLASTOMA CELL LINE SH-SY5Y *IN VITRO*

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Introduction: The pathological hallmark of Parkinson's disease is the accumulation of α -synuclein (ASYN) in neurons. **The aim:** The aim of our study was to determine mechanism of cytotoxic effect of ASYN on differentiated human neuroblastoma SH-SY5Y cell line.

Materials and methods: All experiments were conducted in *all-trans* retinoic acid differentiated cells of neuroblastoma cell line SH-SY5Y, conditionally expressing *wild type* ASYN (a-syn^{*}), and the control SH-SY5Y cells (b-gal). Production of ASYN was detected using Western immunoblotting. The cell viability was assessed using Trypan Blue and crystal violet dye exclusion assays, whereas pan-caspase activity and cell cycle analysis were quantified using flow cytometry after Apostat and Propidium-iodide staining.

Results: The crystal violet assay demonstrated significant reduction of cell number in time-dependent manner in both differentiating a-syn^{*} cells, as well as in the control cells (b-gal). However, in the differentiating a-syn^{*} cells, the cell number was significantly lower. Differentiating a-syn^{*} showed significant increase in number of Trypan Blue-positive (dead) cells. The cell cycle analysis showed increase in percentage of cells with hypodiploid DNA content, thus indicating DNA fragmentation. Accordingly, flow-cytometric analysis revealed increase in activation of caspases. Those results indicate that apoptosis could be mechanism involved in ASYN cytotoxicity.

Conclusion: It could be concluded that the ASYN over-production induces cell death in the differentiated SH-SY5Y cells. ASYN over-expression induced DNA fragmentation and increase in caspase activation indicating to caspase-dependent apoptotic cell death of differentiating SH-SY5Y cells.

Key words: α -synuclein, cytotoxicity, apoptosis

POLIMORFIZAM GLUTATION S-TRANSFERAZE A1, M1 I T1
KOD PACIJENATA SA BALKANSKOM ENDEMSKOM NEFROPATIJOM

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Uvod: Balkanska endemska nefropatija (BEN) je bolest nepoznate etiologije. Kao mogući uzroci ispituju se činioci spoljašnje sredine i genetski faktori. U poslednje vreme su aktuelna ispitivanja polimorfizma pojedinih gena koji bi mogli da budu značajni u etiologiji BEN, naročito polimorfizam enzima koji učestvuju u metabolizmu ksenobiotika, kao što su glutation S-transferaze (GST). U familiji citosolnih GST najveći klinički značaj imaju delecioni polimorfizam *GSTM1* i *GSTT1* i polimorfizam jednog nukleotida *GSTA1*.

Cilj rada: Ispitivan je značaj polimorfizma *GSTA1*, *GSTM1* i *GSTT1* gena u nastanku BEN.

Materijal i metode: DNK je izolovana iz krvi 149 kontrola i 149 bolesnika sa BEN. Polimorfizam *GSTA1* gena određivan je analizom polimorfizma dužine restrikcionih fragmenata. Polimorfizam *GSTM1* i *GSTT1* gena je određivan reakcijom lančanog umnožavanja. Dobijeni rezultati su analizirani principima multinominalne logističke regresije.

Rezultati: Frekvencija *GSTA1* aktivnog genotipa (CC) je bila značajno niža u grupi bolesnika sa BEN (28%, p=0,042) nego u kontrolnoj grupi (41%). Nije uočena razlika u distribuciji *GSTM1* genotipa između bolesnika sa BEN i kontrolne grupe. Međutim, učestalost *GSTT1* aktivnog genotipa je bila viša kod bolesnika sa BEN (80%, p=0,047) nego kod kontrola (70%). Rezultati regresione analize su pokazali da su *GSTA1* genotipovi niske aktivnosti (CT+TT) i *GSTT1* aktivni genotip nezavisni faktori rizika za BEN (OR=1,82, p=0,015, 95%IP=1,12-2,98, odnosno OR=1,7, p=0,048, 95%IP=1,04-2,87).

Zaključak: Polimorfna ekspresija *GSTA1*, *GSTM1* i *GSTT1* utiče na individualnu osetljivost za nastanak BEN.

Ključne reči: *GSTA1*, *GSTM1*, *GSTT1*, balkanska endemska nefropatija.

GLUTATHIONE S-TRANSFERASE A1, M1 AND T1 POLYMORPHISM IN PATIENTS
WITH BALKAN ENDEMIC NEPHROPATHY

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Introduction: Balkan endemic nephropathy (BEN) is a disease of unknown etiology. Both environmental and genetic factors are currently being investigated as possible causes. The polymorphism of enzymes involved in xenobiotic metabolism, such as glutathione S-transferases (GST), potentially significant in BEN etiology, are receiving the most attention in genetic-epidemiological studies. Within the family of cytosolic GSTs, the deletion polymorphism of *GSTM1* and *GSTT1*, as well as single nucleotide polymorphism of *GSTA1*, possess the most clinical significance.

The Aim: We investigated the significance of *GSTA1*, *GSTM1* and *GSTT1* genetic polymorphism in BEN development.

Materials and Methods: DNA was isolated from the blood of 149 controls and 149 patients with BEN. Polymorphism of *GSTA1* gene was determined by PCR-RFLP (*polymerase chain reaction - restriction fragment length polymorphism*). Polymorphism of *GSTM1* and *GSTT1* genes was determined by multiplex PCR. The data obtained was analyzed using the principles of multinomial logistic regression.

Results: The frequency of *GSTA1*-active genotype (CC) was significantly lower in the group of patients with BEN (28%, p=0,042) in comparison with the control group (41%). No difference was found in the frequency of the *GSTM1* genotype between patients with BEN and controls. However, the frequency of *GSTT1*-active genotype was higher among patients (80%, p=0,047) compared to the control group (70%). Moreover, the results of regression analysis showed that *GSTA1* low activity genotypes (CT+TT) and *GSTT1*-active genotype contribute independently toward the risk of BEN (OR=1,82; p=0,015; 95%IP=1,12-2,98 and OR=1,70; p=0,048; 95%IP=1,04-2,87).

Conclusion: Polymorphic expression of *GSTA1*, *GSTM1* and *GSTT1* influences the individual susceptibility to BEN.

Key words: *GSTA1*, *GSTM1*, *GSTT1*, Balkan endemic nephropathy.

UTICAJ NOVOSINTETISANOG JEDINJENJA ESTARSKE PRIRODE NA DIFERENCIJACIJU HUMANE PROMIJELOCIJNE LEUKEMIJSKE ČELIJSKE LINIJE

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Uvod: Maligni tumori su jedan od najčešćih uzroka mortaliteta u svetu, a i kod nas. Podaci ukazuju da maligne bolesti krvi, leukemije, uzimaju značajan udeo u ukupnom mortalitetu i morbiditetu, te da u SAD od leukemije boluje ili se oporavlja oko 250 000 ljudi. Naročiti terapijski izazov predstavlja akutna promijelocitna leukemija (APL), koju odlikuje niska osetljivost na hemioterapijske lekove. Uvođenje lekova koji indukuju diferencijaciju leukemijskih blasta, u terapijske protokole za APL, se pokazalo korisnim, ali nedovoljno efikasnim. Usled toga, potraga za novim antitumorskim lekovima ne jenjava. Našu pažnju je privukao etil estar etilendiamin dicitloheksil propanske kiseline (L3), koji je pokazao značajne citotoksične efekte na HL-60 ćelijama humane promijelocitne leukemije *in vitro*.

Cilj: Ispitivanje sposobnosti L3 da indukuje diferencijaciju HL-60 ćelija, *in vitro*.

Materijal i metode: Promena morfologije HL-60 ćelija prema granulocitnom fenotipu, nakon tretmana, ispitivana je analizom ukalupljenih uzoraka obojenih toluidin plavim metodom svetlosne mikroskopije, kao i na ultratraknim isečcima tretiranih ćelija metodom elektronske mikroskopije. Ispitivanje ekspresije CD11b i CD15 membranskih receptora kao pokazatelja granulocitne diferencijacije na HL-60 ćelijama vršeno je metodom protočne citometrije korišćenjem antitela obeleženih fluorohromima.

Rezultati: Dobijeni rezultati pokazali su da u tretiranim ćelijama (48h; 12,5 µM) dolazi do formiranja nuklearnih impresija (svetlosna mikroskopija), i primarnih granula (elektronska mikroskopija). Povećanje intenziteta relativne fluorescencije u grupi tretiranih ćelija (protočna citometrija) govori u prilog povećane ekspresije CD11b i CD15 markera granulocitne diferencijacije.

Zaključak: Na osnovu dobijenih rezultata može se zaključiti da L3 indukuje diferencijaciju HL-60 ćelija ka granulocitnom fenotipu.

Ključne reči: etil estar etilendiamin dicitloheksil propanske kiseline, HL-60, diferencijacija

INFLUENCE OF NOVEL COMPOUND OF ESTERIC NATURE ON DIFFERENTIATION OF HUMAN PROMYELOCYTIC LEUKEMIC CELL LINE

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Introduction: Malignant tumors represent one of the most common causes of mortality in world. Data show that malignancies of blood, leukemias, take a significant part in total mortality and morbidity, and in USA 250 000 people have or are in remission from leukemia. Particular therapeutic challenge is acute promyelocytic leukemia (APL), which has low sensitivity to chemotherapeutic drugs. Introduction of agents that differentiate leukemic blast cells into therapy protocols for APL is useful, but insufficient. The search for novel antitumor drugs persists. Our attention was brought to ethylenediamine dicyclohexyl propanoic acid ethyl ester (L3), since it exhibited significant cytotoxic effects against HL-60 human promyelocytic leukemia cells.

The Aim: To investigate ability of L3 to induce differentiation of HL-60 cells, *in vitro*.

Materials and Methods: Changes in HL-60 cells morphology towards granulocytic phenotype, after the treatment, was analysed on toluidin blue stained embedded sections using light microscope, as well as on ultra thin sections using electron microscope. Examination of CD11b and CD15 membrane receptors expression, as markers of granulocytic differentiation of HL-60 cells, was conducted using flow cytometry after fluorochrome conjugated antibodies application.

Results: Obtained results showed that nuclear indentations (light microscopy) and primary granules (electron microscopy) are formed in treated cells (48h; 12,5 µM). Increase of relative fluorescence intensity in treated cells (flow cytometry) suggests overexpression of CD11b and CD15 markers of granulocytic differentiation.

Conclusion: We can conclude that L3 induces differentiation of HL-60 cells towards granulocytic phenotype.

Key words: ethylenediamine dicyclohexyl propanoic acid ethyl ester, HL-60, differentiation

ISPITIVANJE ANTITUMORSKOG DEJSTVA NOVOSINTETISANOG JEDINJENJA ESTARSKE PRIRODE NA SUBKUTANOM MODELU MIŠJEG MELANOMA

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Uvod: Maligni melanom je tumor koji pokazuje sklonost ka izrazitom limfogenom i hematogenom metastaziranju. Imajući u vidu visoku incidenciju malignog melanoma u svetskoj populaciji kao i nedovoljnu efikasnost dosadašnje terapije, ulažu se veliki napor u razvoj tj. sintezu supstance sa potencijalno boljim antimelanomskim delovanjem.

Cilj: Ispitivanje dejstva etil estra etilendiamin dicitloheksil propanske kiseline (comp.3) na subkutanom modelu mišjeg melanoma.

Materijal i metode: C57 *black* miševima subkutano su aplikovane B16 ćelije mišjeg melanoma. Eksperimentalna grupa miševa je tretirana etilnim estrom (comp. 3), dok je kontrolna grupa životinja primala rastvarač za estar (DMSO). Aplikacija supstance (LD₂₅) je vršena u toku tri nedelje u subakutnom režimu, intraperitonealno. Poslednjeg dana eksperimenta životinje su anestezirane i žrtvovane cervikalnom dislokacijom, nakon čega su izmerene mase i dimenzije tumora.

Rezultati: Nakon 10 dana od inokulacije melanomskih ćelija (B16), miševi su u obe grupe razvili makroskopski uočljive tumore. Postojao je trend povećanja telesne mase u obe grupe životinja, verovatno na račun uvećanja tumora, tokom celokupnog trajanja eksperimenta. Nakon žrtvovanja eksperimentalnih životinja i izolovanja tumorskih promena utvrđena je značajna razlika između kontrolne i eksperimentalne grupe u pogledu tumorske mase, ukazujući na dobru *in vivo* efikasnost ispitivane supstance.

Zaključak: Ispitivana supstanca je kod eksperimentalne grupe životinja pokazala izuzetnu efikasnost u pogledu smanjenja veličine tumora i zavrednela dalja *in vivo* ispitivanja mehanizma citotoksičnosti.

Ključne reči: maligni melanom, *in vivo*, citotoksičnost, etil estar

EXAMINATION OF ANTITUMOR EFFECT OF NEWLY SYNTHESIZED COMPOUNDS ESTER NATURE OF SUBCUTANEOUS MOUSE MELANOMA MODEL

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Introduction: Malignant melanoma is a tumor that shows a distinct preference for lymphatic and hematogenous metastasis. Given the high incidence of malignant melanoma in the world population and the lack of effectiveness of current therapies, great efforts are put into development and synthesis of substances with potentially better antimelanomic action.

The aim: Investigation of the effect of ethyl ester of propionic acid dicyclohexyl ethylenediamine (comp.3) of subcutaneous mouse melanoma model.

Material and Methods: C57 *black* mice were administered subcutaneously B16 mouse melanoma cells. The experimental group of mice was treated with ethyl ester (comp.3), unlike the control group which received the ester solvent (DMSO). Application of the substance (LD₂₅) was performed for three weeks in the subacute mode, intraperitoneally. On the last day of the experiment the animals were anesthetized and sacrificed with cervical dislocation, and measurement of tumor masses followed.

Results: After 10 days of melanoma cells (B16) inoculation, the mice in each group developed macroscopically visible tumors. Throughout the duration of experiment there was a trend of weight gain in both groups of mice, probably on the account of enlargement of tumor mass. Statistical analysis showed significant difference between control and experimental groups in terms of tumor mass, indicating good *in vivo* efficacy of the test substance.

Conclusion: The tested substance has shown remarkable efficacy in reducing tumor size ($p < 0.05$) in experimental group of animals indicating the need for further studies looking into the mechanisms of cytotoxicity.

Key words: malignant melanoma, *in vivo*, cytotoxicity, ethyl ester

**PROTEKTIVNI EFEKAT GLUTATIONA NA PARAMETRE OKSIDATIVNOG STRESA
U TKIVU BUBREGA PACOVA U USLOVIMA TROVANJA KADMIJUMOM**

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Uvod: Kadmijum je mikroelement koji je prisutan kao kontaminant u našem prirodnom okruženju. Ksantin oksidaza je centralni deo mehanizma oksidativnog oštećenja tkiva produkcijom superoksid anjon radikala. TBA reagujuće supstance (TBARS) su krajnji produkt i pokazatelj nivoa lipidne peroksidacije. Katalaza je oksidoreduktaza, katalizuje reakciju razgradnje vodonik peroksida na vodu i molekularni kiseonik, tako da se ubraja u enzime primarne antioksidativne zaštite. Glutation (GSH) je tripeptid L-γ-glutamil-L-cisteinil-glicin koji čini 90% ukupnih neproteinskih sulfidnih jedinjenja ćelije i esencijalni je kofaktor nekih enzima

Cilj rada: Cilj ovog rada je da se ispita uticaj kadmijuma na koncentraciju TBARS, kao i aktivnost ksantin oksidaze i katalaze u bubregu pacova, i da se utvrdi mogući protektivni efekat glutaciona u datim uslovima

Materijal i metode: U eksperimentu su korišćeni odrasli pacovi, ženskog pola Wistar soja, podeljeni u 4 grupe u zavisnosti od aplikacije kadmijuma i glutaciona. Specifična aktivnost ksantin oksidaze (XO) određivana je spektrofotometrijski po metodi Hashimoto i sar. Koncentracija TBA regujućih supstanci u homogenatu, određivana je spektrofotometrijskom metodom po Andreevoj i sar. Aktivnost katalaze u tkivima određivana je spektrofotometrijskom metodom po Gothu

Rezultati rada: Kadmijum značajno povećava aktivnost ksantin oksidaze i katalaze kao i nivo TBARS u odnosu na kontrolnu grupu ($p < 0,001$). S druge strane smanjena je aktivnost ksantin oksidaze, katalaze i nivo TBARS u grupi koja je pored Cd dobijala glutacion ($p < 0,001$).

Zaključak: Trovanje kadmijumom dovodi do povećanja aktivnosti ksantin oksidaze i katalaze i do povećanja nivoa TBARS, dok antioksidansi dati uz kadmijum dovode do smanjenja aktivnosti enzima i nivoa TBARS.

Ključne reči: kadmijum, ksantin oksidaza, TBARS, katalaza, glutacion,

**PROTECTIVE EFFECT OF GLUTATIONE ON THE PARAMETERS OF OXIDATIVE STRESS
IN KIDNEY IN RATS IN CONDITIONS OF CADMIUM POISONING**

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Introduction: Cadmium is a trace element that is present as a contaminant in our natural environment. Xanthine oxidase (XO) represents a central mechanism of oxidative tissue injury through the production of superoxide anion radical. TBA reactive substances (TBARS) as an indicator of the end product of lipid peroxidation. **Catalase is oxidoreductase, catalyzes the reaction of decomposition of hydrogen peroxide to water and molecular oxygen, so that is one of the primary enzymes of antioxidant protection. Glutathione (GSH) is a tripeptide L-γ-glutamil-L-glycine-cisteinil which accounts for 90% of total nonprotein sulfur compounds of cells and is an essential cofactor of some enzymes.**

Aim: The aim of this study was to investigate the effect of cadmium on the concentration of TBARS and the activity of xanthine oxidase and catalase in the kidney of rats, and to determine the possible protective effect of glutathione.

Materials and methods: The experiment used adult rats, female Wistar strain, divided into 4 groups depending on the application of cadmium and glutathione. The specific activity of xanthine oxidase (XO) was determined spectrophotometrically by the method of Hashimoto et al.

Results: Cadmium significantly increases the activity of xanthine oxidase and catalase and TBARS levels compared to controls ($p < 0.001$).

Conclusion: Cadmium intoxication leads to increased activity of xanthine oxidase and catalase, an increased level of TBARS levels while antioxidants provided with the cadmium lead to a reduction in enzyme activity and TBARS levels.

Key words: cadmium, xanthine oxidase, TBARS, catalase, glutathione.

**GENSKA VARIJABILNOST SOD2 C47T KOD PACIJENATA
SA SISTEMSKIM LUPUSOM ERITEMATODESOM I MULTIPLIM SKLEROZOM**

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Uvod: Sistemski lupus eritematodes (SLE) je multisistemska bolest autoimunog porekla. U patogenezi SLE bitnu ulogu imaju tri mehanizma, uticaj genetskih, negenetskih kao i imunoloških faktora. Multipla skleroza (MS) se klinički definiše kao bolest koju karakterišu epizode neuroloških deficita usled lezija bele moždane mase. Istraživanja pokazuju uticaj genetskih i imunoloških faktora na nastanak MS. Detektovan je Mn-SOD2 Ala→Val polimorfizam, čije prisustvo dovodi do smanjene aktivnosti ovog enzima antioksidativne zaštite pa dolazi do gomilanja slobodnih radikala koji dalje dovode do lipidne peroksidacije i promena na DNK molekulima, što se može dovesti u vezu sa patogenezom autoimunih bolesti poput SLE i MS.

Cilj: Za cilj ovog rada smo postavili ispitivanje prisustva polimorfizma na SOD2 Ala→Val kod pacijenata sa Sistemskim lupusom eritematodesom (SLE) i multiplom sklerozom (MS).

Materijal i metode: Prisustvo polimorfizma detektovano je na DNK izolovanom iz krvi pacijenata korišćenjem PCR-RFLP metode.

Rezultati: Naše istraživanje je pokazalo da postoji statistički značajno veća učestalost valinskih alela kod pacijenata sa SLE i sa MS, ali je frekvencija C/T genotipa značajno viša kod pacijenata sa MS nego frekvencija C/C i T/T genotipa. **Zaključak:** Iako dobijeni rezultati ne pokazuju direktnu vezu između ispitivanog polimorfizma na SOD2 i učestalosti SLE i MS, povećana učestalost valinske forme enzima kod ovih bolesnika ukazuje na moguću smanjenu antioksidativnu zaštitu u autoimunim bolestima. Iz tog razloga možemo zaključiti da oboleli od SLE i MS, nosioci valinske varijante MnSOD2 moraju dodatno nositi egzogene antioksidanse u cilju pojačanja antioksidativne zaštite i smanjenja oksidativnog stresa.

Ključne reči: superoksid dizmutaza, polimorfizam, Sistemski lupus eritematodes, multipla skleroza

**GENETIC VARIABILITY OF SOD2 C47T WITHIN PATIENTS
WITH SYSTEMIC LUPUS ERITEMATODES AND MULTIPLE SCLEROSIS**

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Introduction: Systemic lupus eritematodes (SLE) is multisystemic autoimmune disease. There is an influence of genetic, non-genetic and immune factors on pathogenesis of SLE. Multiple sclerosis (MS) is defined as a disease with episodes of neural deficiency. It is shown that immune and genetic factors participate in pathogenesis of MS. Polymorphism of an antioxidant enzyme Mn-SOD2 Ala→Val leads to increased free radicals concentration which are responsible for lipid peroxidation and changes on DNA molecules, which can be related to pathogenesis of SLE and MS.

Aim: The aim of this study was to determine polymorphism SOD2 Ala→Val within patients with Systemic lupus eritematodes (SLE) and multiple sclerosis (MS).

Materials and methods: Polymorphism was determined by PCR-RFLP method.

Results: Our results have showed significantly higher frequency of valine allele within patients with SLE and MS but the frequency of C/T genotype is significantly higher within patients with MS than the frequency of C/C and T/T genotypes.

Conclusions: Even though there isn't direct correlation between SOD2 polymorphism and frequency of SLE and MS, increased frequency of valine form of enzyme within these patients points that there is a possible decreased antioxidative protection within patients with autoimmune disease. Because of that we can conclude that patients with this polymorphism should take exogenous antioxidants in order to improve antioxidative protection and decrease oxidative stress.

Key words: superoxide dismutase, polymorphism, Systemic lupus erythematosus, multiple sclerosis

UTICAJ AGMATINA NA PARAMETRE NITROZATIVNOG STRESA U MOZGU PACOVA SA EKSPERIMENTALNIM AUTOIMUNIM ENCEFALITISOM

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Uvod. Eksperimentalni autoimuni encefalitis je inflamatorna, demijelinizirajuća bolest CNS i koristi se u cilju ispitivanja molekularnih mehanizama odgovora CNS tokom inflamacije.

Materijal i metode. EAE je izazivan supkutano aplikacijom mijelin bazičnog proteina (50 mg po ~ivotinji). Sprague-Dawley pacovi su bili podeljeni u pet grupa: I grupa - (K) je tokom trajanja eksperimenta dobijala 0,9% rastvor NaCl (i.p.), II grupa (EAE), III grupa (CFA) - CFA (0,2 ml supkutano), IV grupa (EAE + Agm) je nakon indukcije EAE tretirana agmatinom (75 mg/kg TM i.p.) i V grupa ~ivotinja (Agm) je dobijala samo agmatin u istoj dozi. Iivotinje su tretirane svakodnevno sve vreme trajanja eksperimenta od 0-og do 15-og dana uz svakodnevno praenjenje kliničkih simptoma EAE kod svake ~ivotinje. Jrtvovane 16-og dana od aplikacije MBP-a, a u homogenatu mozga su određivane koncentracije NO_2+NO_3 i S-nitrozotiola.

Rezultati. U eksperimentanom modelu EAE, agmatin je ispoljio snažno protektivno dejstvo u odnosu na kliničke simptome EAE. Koncentracija NO_2+NO_3 u mozgu EAE pacova je povećana ($p<0,001$) u odnosu na kontrolne vrednosti. Tretman agmatinom smanjuje koncentraciju NO_2+NO_3 kod EAE životinja. Nivo RSNO u CMVM i malom mozgu tretiranih životinja značajno raste nakon indukcije EAE ($p<0,05$ vs Kontrola) Kontinuirana primena agmatina je dovela do značajnog smanjenja nivoa nitrozotiola u oba ispitivana tkiva ($p<0,05$ vs EAE).

Zaključak. U osnovi inflamatornog odgovora CNS-a pacova sa EAE postoji nitroizivni stres, koji se uspešno koriguje tretmanom agmatinom nakon indukcije EAE. Dobijeni rezultati ukazuju na novi aspekt mehanizama koji se nalaze u osnovi neuroprotektivnog delovanja agmatina.

KLjučne reči: eksperimentalni autoimuni encefalitis, nitroizivni stres, agmatin

ISPITIVANJE AKTIVNOSTI KSANTIN OKSIDAZE U JETRI U EKSPERIMENTALNOJ HIPERURIKEMIJU TRETIRANOJ ALOPURINOLOM

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Uvod: Hiperurikemija (povećani nivo mokraćne kiseline u krvi) je veoma čest poremećaj, koji može biti prouzrokovan nizom endogenih i egzogenih faktora.

Cilj rada: Ispitivanje terapijskog efekta alopurinola na aktivnost ksantin oksidaze u jetri pacova i na funkcionalno stanje jetre, na eksperimentalnom modelu hiperurikemije izazvane oksonskom kiselinom (inhibitorom urikaze).

Materijal i metode: Za eksperiment su korišćeni beli pacovi Wistar soja, ženskog pola, tri meseca starosti, podeljeni u četiri eksperimentalne grupe: I kontrolna; II tretirana oksonskom kiselinom, III tretirana oksonskom kiselinom i alopurinolom; IV grupa tretirana alopurinolom, u desetodnevnom tretmanu. Za eksperiment je uzimana krv i jetra. Količina mokraćne kiseline u krvi, kao i aktivnost ALT i AST određivana je automatskim analizatorom, a aktivnost ksantin oksidaze u homogenatu jetre je određivana na bazi oslobođene mokraćne kiseline iz substrata ksantina.

Rezultati: Nivo mokraćne kiseline je bio skoro dva ipo puta viši u grupi koja je tretirana oksonskom kiselinom, u odnosu na kontrolu ($p<0,001$). Alopurinol je vrednosti mokraćne kiseline približio kontrolnim. Koncentracija enzima ALT i AST (markeri hepatocelularnog oštećenja) bila je povećana nakon tretmana oksonskom kiselinom, tretman alopurinolom bio je veoma uspešan u prevenciji hepatocelularnog oštećenja, a sam alopurinol nije značajno učestvovao u promeni aktivnosti ovih enzima.

Zaključak: Oksonska kiselina u desetodnevnom eksperimentu na pacovima značajno je povećala nivo mokraćne kiseline, kao i aktivnost ksantin oksidaze u jetri, a alopurinol je potvrdio svoje neprikosnovno mesto u terapiji hiperurikemija. Izolovani efekti alopurinola nisu bili statistički značajno izraženi, ali terapiji treba ipak pristupiti sa predostrožnošću.

KLjučne reči: hiperurikemija, oksonska kiselina, alopurinol, ksantin oksidaza.

INFLUENCE OF AGMATINE ON THE PARAMETRES OF NITROSATIVE STRESS IN THE BRAIN OF RATS WITH EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS

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Introduction. Experimental autoimmune encephalomyelitis is inflammatory demyelinating CNS disease used for the investigation of molecular mechanisms of CNS response to inflammation.

Material and methods. EAE was induced by subcutaneous injection of myelin basic protein (MBP) (50mg per animal). Sprague-Dawley rats were divided into five groups: I group - (C) treated by 0.9% rastvor NaCl (i.p.) during experiment course, II group (EAE), III group (CFA) - CFA (0.2 ml subcutaneously), IV group (EAE+Agm) treated by agmatine (75 mg/kg bw i.p.) upon EAE and V group (Agm) received only agmatine in the same dose. The animals were treated every day during experiment from day 0 to 15, and clinically scored every day. They were sacrificed on day 16 from MBP application. NO_2+NO_3 and S-nitrosothiol concentrations in rat whole encephalic mass (WEM) and cerebellum homogenates were determined

Results. In EAE experimental model, agmatine exerted strong protective effect on EAE clinical symptoms. NO_2+NO_3 concentrations in EAE rat brains were increased ($p<0.001$) compared to the control values. Agmatine treatment diminished NO_2+NO_3 levels in EAE animals. RSNO concentrations in WEM and cerebellum of treated rats significantly increased after EAE induction ($p<0.05$ vs Control). Continual agmatine application led to the significant reduction of RSNO levels in both examined tissues ($p<0.05$ vs EAE).

Conclusion. Nitrosative stress is the part of inflammatory response to EAE in rats. These changes are successfully suppressed by agmatine application, which could be the new aspect of the mechanisms underlying the neuroprotective effects of agmatine.

Key words: experimental autoimmune encephalitis, nitrosative stress, agmatine

HEPATIC XANTHINE OXIDASE ACTIVITY IN EXPERIMENTAL HYPERURICEMIA TREATED WITH ALOPURINOL

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Introduction: Hyperuricemia is a very common disorder, which can be caused by numerous factors.

The Aim: To examine therapeutic effects of allopurinol on xanthine oxidase activity in rat liver, and its effect on functional state of the liver, in an experimental model of hyperuricemia induced by oxonic acid.

Materials and Methods: Three months old, female rats of Wistar breed, were divided into four experimental groups: I control group, II treated with oxonic acid, III treated with oxonic acid and allopurinol, IV treated with allopurinol. After ten days, uric acid blood level, as well as ALT and AST activity were determined by automatic analyzer and xanthine oxidase activity was determined from the amount of uric acid released from xanthine-substrate in liver homogenate.

Results: The level of uric acid was almost two and a half times higher in the group treated with oxonic acid, compared to the control group ($p<0.001$). Allopurinol made uric acid values almost equal to the control ones. Concentration of ALT and AST enzymes was increased after potassium oxonate treatment, allopurinol treatment was very successful in preventing hepatocellular damage, and allopurinol itself did not have significant involvement in changing the activities of these enzymes.

Conclusion: Oxonic acid significantly increased uric acid level as well as xanthine oxidase activity in the liver, and allopurinol confirmed its undisputed place in the treatment of hyperuricemia. Although the isolated effects of allopurinol were not expressed significantly, the treatment still should be approached with caution.

Keywords: hyperuricemia, oxonic acid, allopurinol, xanthine oxidase.

UTICAJ KALCINEURINSKIH INHIBITORA NA PARAMETRE OKSIDATIVNOG STRESA KOD PACIJENATA SA TRANSPLANTIRANIM BUBREGOM

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Uvod: Transplantacija bubrega je danas najuspešnija metoda lečenja pacijenata sa HBI. Praćenje parametara oksidativnog stresa kod ovih pacijenata je veoma važno jer je njegovo prisustvo i nakon transplantacije potvrđeno u brojnim istraživanjima. Kalcineurinski inhibitori, ciklosporin i takrolimus, se danas široko primenjuju u cilju prevencije odbacivanja transplantiranog bubrega, ali je utvrđena i njihova povezanost sa porastom oksidativnog stresa.

Cilj rada: Praćenje parametara oksidativnog stresa kod pacijenata sa transplantiranim bubregom i utvrđivanje efekta ciklosporina i takrolimusa na ove parametre.

Materijal i metode: Ispitivanjem je obuhvaćeno 57 pacijenata sa transplantiranim bubregom koji su podeljeni na one koji su primali ciklosporin i na one koji su primali takrolimus. Kontrolnu grupu je činilo 22 zdrava ispitanika. U svim ispitivanim grupama su određivane koncentracije: MDA (TBARS) u plazmi i eritrocitima, AOPP, totalnih SH grupa i aktivnost katalaze.

Rezultati rada: Kod pacijenata sa transplantiranim bubregom, srednje vrednosti koncentracija TBARS u plazmi i eritrocitima, AOPP i totalnih SH grupa su statistički značajno više u odnosu na kontrolnu grupu. Utvrđena je statistički značajna pozitivna korelacija između AOPP i SH grupe, kao i MDA u plazmi i SH grupe. Većina parametara oksidativnog stresa (MDA u plazmi i eritrocitima, AOPP i aktivnost katalaze) nije pokazala statistički značajnu razliku između pacijenata koji su primali ciklosporin i onih koji su primali takrolimus.

Zaključak: Praćenje parametara oksidativnog stresa je važno kod pacijenata sa transplantiranim bubregom. Nije utvrđena značajna razlika između ovih parametara kod pacijenata koji su primali različitu terapiju.

Glavne reči: transplantacija bubrega, oksidativni stres, ciklosporin, takrolimus

THE EFFECT OF CALCINEURIN INHIBITORS ON OXIDATIVE STRESS PARAMETERS AFTER KIDNEY TRANSPLANTATION

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Introduction: Kidney transplantation is the most successful method of treatment for patients with CKD. Monitoring of oxidative stress parameters in these patients is very important because its presence after transplantation was confirmed in numerous studies. Calcineurin inhibitors, cyclosporine and tacrolimus, are fundamental for the currently used immunosuppressive protocols after transplantation, but also it was found their association with increased oxidative stress.

The aim: Monitoring of oxidative stress parameters in patients with renal transplant and determination of the difference between cyclosporine and tacrolimus effects on these parameters.

Material and methods: This study included 57 patients with kidney transplant divided in two groups, those who received cyclosporine and those who received tacrolimus. The control group consisted of 22 healthy persons. Concentrations of MDA (TBARS) in plasma and erythrocytes, AOPP and total thiol groups and catalase activity were determined in all experimental groups.

Results: In patients with renal transplant, concentration of TBARS in plasma and erythrocytes, AOPP and total thiol groups were significantly higher compared to the control group. There was a significant positive correlation between AOPP and total thiol groups, as well as in plasma MDA and total thiol groups. Most of the oxidative stress parameters (MDA in plasma and erythrocytes, AOPP and catalase activity) didn't show statistically significant difference between patients who received cyclosporine and those who received tacrolimus.

Conclusion: Oxidative stress parameters are significantly increased in patients with transplanted kidney. There was no significant difference between these parameters in patients who received different therapy.

Key words: kidney transplantation, oxidative stress, cyclosporine, tacrolimus

UTICAJ VALPROATA NA STANDARDNE BIOHEMIJSKE PARAMETRE KOSTOG METABOLIZMA KOD DECE SA EPILEPSIJOM

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Uvod: Dugotrajna primena Na-valproata može uzgredno remetiti mineralni metabolizam kosti u dece sa epilepsijom. Cilj rada je da se ispita uticaj Na-valproata (VPA) na standardne biohemijske parametre metabolizma kosti u serumu pacijenata sa epilepsijom uzrasta od 6-12 godina.

Materijal i metode: Odredili smo nivoe ukupnog (Ca) i jonizovanog kalcijuma (Ca⁺⁺), neorganskog fosfora (P) i ukupne alkaline fosfataze (ALP) u serumu kod 22 pacijenta sa epilepsijom, uzrasta od 6-12 godina, lečenih Na-valproatom duže od godinu dana. Dobijene rezultate smo upoređivali sa vrednostima u kontrolnoj grupi (35-oro zdrave dece) odgovarajućeg pola i uzrasta. U statističkoj analizi podataka upotrebili smo Student's t-test, Mann-Whitney U-test i Pearson-ovu korelaciju. Statistička značajnost je p<0,05.

Rezultati. Kod dece sa epilepsijom nisu uočena statistički značajna odstupanja u serumskim vrednostima ukupnog kalcijuma (2,42 ± 0,16 mmol/L prema 2,41 ± 0,13 mmol/L; p=0,87; n.z.), jonizovanog kalcijuma (1,23 ± 0,12 mmol/L prema 1,22 ± 0,05 mmol/L; p= 0,28; n.z.), neorganskog fosfora u (1,43±0,31 mmol/L prema 1,60±0,24 mmol/L; p=0,14; n.z.) i aktivnosti ALP (455,2 ± 241,06 U/L prema 318,69 ± 102,99; p=0,11; n.z.). Dužina lečenja nije uticala na serumske nivoe ovih parametara: ukupni Ca (r_{xy} = 0,01; n.z.), jonizovani Ca⁺⁺ (r_{xy} = 0,03; n.z.), neorganski fosfor (r_{xy} = - 0,01; n.z.) i ukupne ALP (r_{xy} = - 0,05; n.z.).

Zaključak. Vrednosti ukupnog i jonizovanog kalcijuma, neorganskog fosfora i aktivnosti ALP kod dece lečene Na-valproatom nisu bile značajno izmenjene u odnosu na kontrolnu grupu. Dužina lečenja nije uticala na standardne biohemijske markere metabolizma kosti.

Glavne reči: epilepsija, valproat, deca, fosfo-kalcijumski metabolizam

INFLUENCE OF VALPROATE ON BONE METABOLISM STANDARD BIOCHEMICAL PARAMETERS IN CHILDREN WITH EPILEPSY

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Introduction: Long-term valproate therapy may produce disturbances in bone mineral metabolism in children with epilepsy.

The aim: Was to evaluate valproate influence on bone metabolism standard biochemical parameters in children with epilepsy aged 6-12 years.

Materials and Methods: We measured serum total and ionized calcium, phosphorus and total alkaline phosphatase (ALP) levels in 22 patients with epilepsy aged 6-12 years who received valproate longer than one year. Patient group results were compared with results of age and gender matched control group (35 healthy children). For statistical analysis we used Student's t-test, Mann-Whitney U-test and Pearson's correlation. As statistical significance was p<0,05.

Results: There were not statistical significant differences in serum calcium levels (2,42 ± 0,16 mmol/L vs. 2,41 ± 0,13 mmol/L; p=0,87), ionized calcium (1,23 ± 0,12 mmol/L vs. 1,22 ± 0,05 mmol/L; p= 0,28), phosphorus (1,43±0,31 mmol/L vs. 1,60±0,24 mmol/L; p=0,14) and alkaline phosphatase activity (455,2 ± 241,06 U/L vs. 318,69 ± 102,99; p=0,11) in children with epilepsy compared with control. Therapy duration had no influence on mineral metabolism parameters levels: total Ca (r_{xy} = 0,01), ionized Ca⁺⁺ (r_{xy} = 0,03), phosphorus (r_{xy} = - 0,01) and total ALP (r_{xy} = - 0,05).

Conclusion: There were not statistical significant differences between serum total and ionized calcium, phosphorus and total alkaline phosphatase levels in patients treated with valproate compared with control.

Key words: epilepsy, valproate, children, calcium and phosphorus bone metabolism

UTICAJ ALOPURINOLA NA PARAMETRE OKSIDATIVNOG STRESA U BUBREZIMA PACOVA SA EKSPERIMENTALNO IZAZVANOM HIPERURIKEMIJOM

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Uvod: Mokraćna kiselina nastaje kao produkt razgradnje purina, dejstvom enzima ksantin oksidaze. U uslovima hiperurikemije, povišeni nivoi mokraćne kiseline deluju izrazito prooksidantno, dovodeći do oštećenja brojnih organa i sistema. Alopurinol deluje kao kompetitivni blokator ksantin oksidaze.

Cilj: Cilj ovog rada je da se ispita efekat alopurinola na parametre oksidativnog stresa u bubrezima pacova sa eksperimentalno izazvanom hiperurikemijom

Materijal i metode: U eksperimentu su korišćene ženke pacova Wistar soja, podeljene u 4 grupe: kontrolnu, grupu tretiranu oksonskom kiselinom (inducerom hiperurikemije), grupu tretiranu alopurinolom i grupu koja je primala kombinaciju oksonske kiseline i alopurinola. Nakon 10 dana, pacovi su žrtvovani i uzimani su im bubrezi i krv iz aorte. U 10% homogenatu bubega određivani su parametri oksidativnog stresa, TBA reagujuće supstance kao mera lipidne peroksidacije i glutation, važan antioksidans.

Rezultati: Merenjem ovih parametara pokazali smo da davanje alopurinola sa oksonskom kiselinom dovodi do značajnog smanjenja koncentracije mokraćne kiseline u odnosu grupu tretiranu samo oksonskom kiselinom. Vrednosti glukoze, uree i kreatinina nisu bile značajno promenjene. Koncentracija TBARS se u tkivu bubrega pacova sa izazvanom hiperurikemijom značajno povećava u odnosu na kontrolnu grupu. Alopurinol statistički značajno smanjuje koncentraciju TBARS. Koncentracija GSH je bila povećana kod pacova na istovremenom tretmanu oksonskom kiselinom i alopurinolom u odnosu na kontrolu.

Zaključak: Eksperimentalno izazvana hiperurikemija praćena je intenzivnim oksidativnim stresom u tkivu bubrega bez promene bubrežne funkcije. Primena alopurinola ima protektivno delovanje na parametre oksidativnog stesa.

Ključne reči: oksidativni stres, alopurinol, hiperurikemija, bubreg

EFFECTS OF ALLOPURINOL ON THE PARAMETERS OF OXIDATIVE STRESS IN KIDNEYS OF RATS WITH EXPERIMENTALLY INDUCED HYPERURICEMIA

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Introduction: Uric acid is created in a catabolic reaction of purins, catalyzed by xanthin oxidase. In a state of hyperuricemia, increased level of uric acid acts prooxidative, leading to damage of numerous organs and systems. Allopurinol is a competitive blocker of xanthin oxidase.

The Aim: The aim of this study was to investigate effects of allopurinol on parameters of oxidative stress in kidneys of rats with experimentally induced hyperuricemia

Materials and Methods: Study was performed on Wistar race female rats, divided in 4 groups: control, group treated with oxonic acid (hyperuricemia inducer), group treated with allopurinol and a group that received both oxonic acid and allopurinol. After 10 days, rats were sacrificed and kidneys and blood samples from aorta were taken. In 10% kidney homogenate we measured parameters of oxidative stress, TBA reacting substances as markers of lipid peroxidation and glutathione, an important antioxidant.

Results: Measurements have shown that applying allopurinol with oxonic acid leads to significant reduction of uric acid level compared to the group treated only with oxonic acid. Levels of glucose, urea and creatinine didn't change significantly. TBARS concentration in kidney of rats with induced hyperuricemia significantly increased in comparison to control. Allopurinol reduced TBARS concentration with statistical significance. GSH concentration was increased in rats treated with both oxonic acid and allopurinol, compared to control group.

Conclusion: Experimentally induced hyperuricemia intensifies oxidative stress in kidneys, without changing the renal function. Allopurinol application has protective effects on oxidative stress parameters.

Key words: oxidative stress, allopurinol, hyperuricemia, kidney

MOLEKULARNI MONITORING BCR-ABL TRANSKRIPTA I DIJAGNOSTIKA HRONIČNE GRANULOCITNE LEUKEMIJE

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Uvod: Translokacija Bcr-Abl gena je najznačajniji faktor u patogenezi hronične granulocitne leukemije (HGL), što je pokazao veliki broj molekularnih i kliničkih istraživanja. Aktivnost tirozin kinaze, koju kodira fuzijski gen, predstavlja osnovni molekularni događaj u malignoj transformaciji hematopoetskih ćelija.

Cilj rada: Ispitivanje uspešnosti primene metode kvantitativna u stvarnom vremenu – lančana reakcija polimeraze u detekciji Bcr-Abl gena kod obolelih od hronične granulocitne leukemije.

Materijal i metode: U radu smo koristili uzorke venske krvi pacijenata obolelih od HGL, uz pozitivan citogenetski nalaz Philadelphia hromozoma, lečenih na Klinici za Hematologiju Interne klinike Kliničkog centra Vojvodine u Novom Sadu. Nakon uzimanja uzoraka izolovana je RNA, sintetisana cDNA koja je analizirana metodom kvantitativne lančane reakcije polimeraze u stvarnom vremenu (qRT-PCR).

Rezultati: Primenom qRT-PCR metode izvršena je uspešna detekcija Bcr-Abl translokacije kod pacijenata sa HGL. Rezultate smo za svakog pacijenta izračunali kao normalizovan broj kopija transkripta Bcr-Abl gena (NCN), i to kao odnos broja kopija transkripta Bcr-Abl gena ($bcr-abl_{CN}$) i broja kopija transkripta referentnog gena Abl (abl_{CN}): $NCN = bcr-abl_{CN} / abl_{CN}$. Naši rezultati nedvosmisleno ukazuju na korelaciju rezultata dobijenih primenom citogenetskih analiza i metoda molekularne biologije. Prednost qRT-PCR metode se ogleda pre svega u mogućnosti detekcije fuzionog gena uz dodatni nalaz precizne lokalizacije egzona koji učestvuju u translokaciji.

Zaključci: Na osnovu naših rezultata možemo istaći zaključak da je primena kvantitativne RT-PCR metode optimalna u cilju detekcije Bcr-Abl translokacija kod ispitivanih pacijenata sa HGL, i da ovu metodu karakterišu preciznost, tačnost, reproducibilnost, specifičnost i senzitivnost.

Ključne reči: leukemija, qRT-PCR, molekularna dijagnostika.

MOLECULAR MONITORING OF BCR-ABL TRANSCRIPTS IN PATIENTS WITH CHRONIC MYELOGENOUS LEUCEMIA

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Introduction: Bcr-Abl gene translocation is the most important factor in the pathogenesis of chronic myeloid leukemia (CML), as shown by the results of numerous studies. Altered activity of tyrosine kinase coded by the fusion gene is the main molecular event in the malignant transformation of hematopoietic cells.

The Aim: Main aim of our study was to test the application of quantitative RT-PCR method in the detection of Bcr-Abl gene translocation in patients with CML.

Materials and Methods: CML patients' blood samples were analyzed. Patients were from the Hematology clinics of Clinical center of Vojvodina, and they had positive cytogenetic result for Philadelphia chromosome. RNA was isolated from blood samples, with subsequent cDNA synthesis and cDNA was the template for the quantitative real-time polymerase chain reaction (qRT-PCR) analysis of Bcr-Abl transcript expression.

Results: Our results showed the successful amplification of the Bcr-Abl transcript in CML patients. We calculated the results for each patient as a normalized number of Bcr-Abl gene transcripts (NCN), as a number of Bcr-Abl gene copies ($bcr-abl_{CN}$) and number of referent Abl gene copies (abl_{CN}): $NCN = bcr-abl_{CN} / abl_{CN}$. Our results indicate the correlation of cytogenetic Philadelphia positivity and Bcr-Abl molecular transcript. qRT-PCR method advantages are the precise detection of the fusion gene, with the additional result of the precise localization of exons involved in translocation.

Conclusion: The application of quantitative RT-PCR is the optimal method in the detection of Bcr-Abl gene translocation in patients with CML. This method is characterised by the precision, reproducibility, specificity and sensitivity.

Keywords: leukemia, qRT-PCR, molecular diagnostics.

IN VITRO ISPITIVANJE DEJSTVA NANOČESTICE
NA OZRAČENU ČELIJSKU LINIJU HUMANE LEUKEMIJE K562

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Uvod: Jonizujuće zračenje predstavlja jedan od najvažnijih vidova terapije maligniteta, pored hemio- i hirurške terapije. Citotoksičnost radioterapije ima značajne implikacije na lečenje maligniteta ali i predstavlja prepreku zbog oštećenja normalnih ćelija. Stoga je testiranje radioprotektora jedan od glavnih ciljeva razvoja nanomedicine i radiobiologije.

Cilj rada: Cilj rada bio je da se putem određivanja i komparacije broja vijabilnih ćelija nakon zračenja, u grupi pre-tretiranih i ne-tretiranih fulerenolom, ispita efikasnost citoprotektivnog delovanja nanočestice fulerenola u ozračenim malignom ćelijama (K562-ćelije humane leukemije).

Materijal i metode: U istraživanju smo koristili K562 ćelijsku liniju i fulerenol. Uzorke ćelija smo posadili u Petri posude, zapremine 5ml, zatim smo dodali fulerenol 30min pre ozračavanja. Eksperimentalne grupe ćelija su ozračene u linaernom akceleratoru, dozom od 2Gy po jednoj frakciji. Nakon isteka inkubacionog perioda od 24,48 i 72 časa, citotoksični efekat zračenja izražen ukupnim brojem ćelija je određen testom odbacivanja boje (dye exclusion test, DET), a vitalnost putem MTT testa, određivanjem metaboličke sposobnosti vijabilnih ćelija da redukuju tetrazolijum boju.

Rezultati: Poredjenjem vijabilnosti ćelija u fulerenol pre-tretiranim i ozračenim ćelijama, sa ćelijama koje su bile samo izložene zračenju ali bez tretmana fulerenolom, pokazane su značajne razlike. Takođe, ističe se i procenat citotoksičnosti, koji je najizraženiji u grupi ćelija koje su bile samo ozračene, dok su veoma slični rezultati dobijeni u grupi fulerenol pre-tretiranih ćelija i neozračenih ćelija.

Zaključak: Na osnovu naših rezultata komparativne analize preživljavanja ćelija K562 pre-tretiranih nanočesticom fulerenolom, pre izlaganja jonizujućem zračenju, možemo istaći zaključak da nanočestica fulerenol značajno doprinosi većem preživljavanju ozračenih ćelija.

Ključne reči: zračenje, nanočestice, vitalnost ćelija, maligne ćelije

IN VITRO TESTING OF NANOPARTICLE EFFECTS
ON IRRADIATED HUMAN CELL LINE K562

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Introduction: Ionizing radiation, together with chemo- and surgical therapy, represents one of the most important methods for treatment of malignant tumors. Normal tissue toxicity upon radiotherapy is the most important obstacle for the radiation application. Therefore, the analysis and testing of potential radioprotectors, represents one of the main issues in nanomedicine and radiobiology.

The Aim: Our main goal was to analyze and compare the number of viable cells after irradiation, both in fulerenol pre-treated and non-treated irradiated cell group, in order to analyze the potential cytoprotective effects of fulerenol in human K562 leukemia cell line.

Materials and methods: In our research we used K562 cell line and fullereneol. We seeded examples of the cells in Petri dishes, volume of 5 ml, then we added fullereneol 30 minutes before irradiation. K562 cells were irradiated with dose of 2 Gy for one fraction. In accordance with our main goal, we analyzed and compared the number of viable cells 24, 48 and 72 hours after the irradiation, in both fullereneol pre-treated and non-treated group. Viability and vitality of cells was measured by DET test and MTT test.

Results: Our results, obtained by comparative analysis of K562 vitality, may suggest the conclusion that fullereneol pre-treatment, before irradiation, significantly improved the survival of irradiated cells.

Key words: irradiation, nanoparticle, cell vitality, malignant cells

ISPITIVANJE IN VIVO CITOTOKSIČNE I ANTIOKSIDANTNE AKTIVNOSTI EKSTRAKTA
LISTA IMELE (*VISCUM ALBUM L.*) SA KLEKE ZA ČELIJE EHRlich-OVOG ASCITNOG TUMORA

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Uvod: Poznato je da maligne bolesti predstavljaju veliki problem u svetu, kao i da do maligne transformacije mogu dovesti različiti faktori, a među njima bi oksidativni stres mogao imati važnu ulogu. Evropska imela (*Viscum album L.*) je poluparazitska biljka, kojoj se, zbog fitohemijskog sastava, pripisuju citotoksična, imunomodulišuća, antiinflamacijska, anti/prooksidantna, pa i antitumorska dejstva. Međutim, postoji malo dostupne literature, koja ispituje moguću povezanost antitumorskog delovanja ekstrakata imele sa delovanjem na oksidativni stres.

Cilj: Cilj u ovom radu je bio 1) da se ispita u *in vivo* uslovima dejstvo vodenog ekstrakta imele sa kleke na rast Ehrlich-ovog ascitnog tumora implantiranog miševima; 2) da se ispita dejstvo ekstrakta na biohemijske parametre oksidativnog stresa određivanjem aktivnosti antioksidantnih enzima: ksantin oksidaze (XOD), katalaze (CAT), peroksidaze (Px), glutation peroksidaze (GSHPx) i glutation reduktaze (GR), zatim sadržaja redukovano glutatona (GSH), kao i intenziteta lipidne peroksidacije (LPx) u ćelijama tumora.

Materijal i metode: U radu je korišćen vodeni ekstrakt imele sa kleke, koji je davan eksperimentalnim životinjama intraperitonealno kao pretretman, tretman i posttretman. Vršeno je određivanje broja tumorskih ćelija, ćelijska vijabilnost kao i aktivnosti antioksidantnih enzima, sadržaja redukovano glutatona i intenziteta lipidne peroksidacije.

Rezultati: Značajno smanjenje incidence tumora je uočeno u svim grupama životinja koje su primale ekstrakt imele u poredenju sa kontrolnom grupom. Takođe, ekstrakt imele je značajno uticao na biohemijske parametre oksidativnog stresa.

Zaključak: Nakon tretmana Ehrlich-ovog ascitnog tumora sa *V. album* ekstraktom, došlo je do povećanja oksidativnog stresa u ćelijama, što je bilo praćeno smanjenjem zapremine ascitesa, vijabilnosti i broja tumorskih ćelija, odnosno smanjenjem incidence tumora.

Ključne reči: *Viscum album L.*, citotoksičnost, oksidativni stres, Ehrlich-ov ascitni tumor

IN VIVO EVALUATION OF THE CYTOTOXIC AND ANTIOXIDANT EFFECTS OF THE MISTLETOE
(*VISCUM ALBUM L.*) EXTRACT, COLLECTED FROM *JUNIPERUS COMMUNIS*,
ON EHRlich ASCITES TUMOUR CELLS

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Introduction: To date it is well known that malignant diseases are one of the major health problems in the world. Malignant transformation can be caused by a variety of factors, and among them, oxidative stress plays an important role. European mistletoe (*Viscum album L.*) is a semi parasitic plant, which, because of its phytochemical composition, has been attributed with cytotoxic, immunomodulatory, anti-inflammatory, and anti/prooxidant properties, as well as the antitumor effects. However, there is little available literature that examines the possible association of antitumor activity of *V. album* extracts with the effects of the extracts on oxidative stress.

The Aim: The aim of this study was: 1) to investigate *in vivo* effects of aqueous extract of European mistletoe collected from juniper on Ehrlich ascites tumour growth, implanted to mice; 2) to examine the effect of the extract on several biochemical parameters of oxidative stress, by determining of enzyme activities of: xanthine oxidase (XOD), catalase (CAT), peroxidase (Px), glutathione peroxidase (GSHPx) and glutathione reductase (GR), as well as reduced glutathione content (GSH) and intensity of lipid peroxidation (LPx) in tumour cells.

Material and Methods: Aqueous mistletoe extract (collected from juniperus), used in experiment, was intraperitoneally administered to experimental animals as a pretreatment, treatment and posttreatment. After treatment, tumour cell number were determined, cell viability, as well as activities of antioxidant enzymes, reduced glutathione content and intensity of lipid peroxidation.

Results: A significant reduction in the incidence of cancer was observed in all groups that received mistletoe extract compared to the control group. Also, mistletoe extract significantly changed the biochemical parameters of oxidative stress.

Conclusion: Increased level of oxidative stress in EAC cells after treatment with *V. album* was followed by ascites volume, cell viability and cell number decrease, and decreased tumour incidence.

Keywords: *Viscum album L.*, cytotoxicity, oxidative stress, Ehrlich ascites tumour

OPTIMIZACIJA I EVALUACIJA RFLP METODE ZA APOE
GENOTIPIZIRANJE

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Uvod: Polimorfizam apoE gena karakteriše prisustvo tri alela, e2, e3 i e4, koji kodiraju tri izoforme apolipoproteina E u plazmi E2, E3 i E4. Postojeća genetička varijabilnost rezultuje cistein-arginin izmenama na dve pozicije 112 i 158 u okviru aminokiselinske sekvence proteina ApoE. Genetski polimorfizmi apoE gena predstavljaju markere predikcije za razvoj brojnih poremećaja lipidnog statusa, što je pokazao veliki broj kliničkih ispitivanja.

Cilj: Cilj našeg istraživanja je bio ispitivanje uspešnosti primene metode detekcije polimorfizama dužine restrikcionih fragmenata (restriction fragment length polymorphism, RFLP) prilikom analize gena koji kodiraju sintezu izoformi ApoE lipoproteina.

Materijal i metode: Materijal korišćen u radu predstavljala je DNK koju smo izolovali iz krvi metodom sa fenolom i hloformom. PCR metodom umnožen je deo četvrtog egzona ApoE gena. PCR produkti podvrgnuti su sečenju sa HhaI restrikcionim enzimom. Dobljeni fragmenti razdvojeni su elektroforezom na 4% agarozu u TAE puferu i detektovani UV svetlom nakon dodatka etidijum bromida.

Rezultati: Naši rezultati pokazuju da je primena RFLP metode optimalna u cilju detekcije polimorfih oblika apoE gena. HhaI enzim seče gen na različitim mestima, u zavisnosti od prisustva mutacije na pozicijama 112 i 158 koje kodiraju različiti aleli.

Zaključak: Na ovaj način se jednostavno, brzo i efikasno, na osnovu različitih dužina isečenih fragmenata, nedvosmisleno određuje genotip pacijenata.

Gljučne reči: ApoE lipoprotein, apoE gen, RFLP, određivanje genotipa

OPTIMISATION AND EVALUATION OF RFLP METHOD FOR APOE
GENOTYPING

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Introduction: ApoE gene polymorphism is characterized by the presence of three common alleles, e2, e3 and e4, which encode three isoforms of apolipoprotein E in plasma E2, E3 and E4. The existing genetic variability resulting cysteine-arginine changes at two positions 112 and 158 in the amino acid sequences of ApoE protein. Genetic polymorphisms of apoE gene are predictive markers for the development of numerous disorders of lipid metabolism, already proven in a large number of clinical trials.

The aim: To investigate the application of RFLP method for the detections of genes coding for isoforms E2, E3 and E4.

Materials and Methods: Materials used in study represented DNA extracted from blood by standard procedure using chloroform and phenol. PCR method is used to amplify the coding sequence of fourth exon of the apoE gene. Amplification products were digested with HhaI. The fragments obtained were separated by electrophoresis on a 4% agarose gel in TAE buffer, and visualized by ethidium bromide fluorescence.

Results: Our results showed that the RFLP method is optimal for detection of apoE polymorphisms. The restriction enzyme HhaI achieved the cleavage of the gene on specific loci, directly depend of presence or absence of mutations at positions 112 and 158, of different alleles.

Conclusion: This method enable simple, rapid and efficient analysis of restriction fragment length polymorphisms, directly determining the patients genotype.

Keywords: ApoE lipoprotein, apoE gene, RFLP, genotyping

ISPITIVANJE *IN VIVO* CITOTOKSIČNE AKTIVNOSTI EKSTRAKTA PULPE BETA VULGARIS
ZA ČELIJE EHRlich-OVOG ASCITNOG TUMORA

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Uvod: Kancerogeneza predstavlja višestepeni proces formiranja malignog fenotipa ćelije, a smatra se da oksidativni stres, odnosno narušen antioksidantni status, može biti jedan od brojnih uzročnika maligne transformacije. Danas se maligne bolesti leče hirurškim i radiološkim metodama, kao i metodama hemoterapije. Cvekla (*Beta vulgaris*) i njeni konstituenti se ubrajaju među 10 vrsta povrća sa najizraženijim antioksidantnim svojstvima.

Cilj: Cilj istraživanja je ispitivanje *in vivo* uticaja ekstrakta cvekle na aktivnost antioksidantnih enzima u tumorskim ćelijama, kao i povezivanje ovog uticaja sa citotoksičnim dejstvom ekstrakta.

Materijal i metode: U *in vivo* uslovima ispitivano je dejstvo ekstrakta cvekle (BPE) na rast Ehrlichovog ascitnog tumora (EAC) implantiranog NMRI miševima i biohemijske parametre oksidativnog stresa (antioksidantni enzimi, redukovani glutation i intenzitet lipidne peroksidacije) u ćelijama tumora. Miševima je implantiran EAC i tretirani su sa BPE na različiti način zavisno od grupe. Nakon toga je izvršeno sakupljanje ascita EAC, i odredivan broj i vijabilnost ćelija tumora, kao i biohemijski testovi određivanja aktivnosti pojedinih antioksidantnih enzima.

Rezultati: Uočena je indukcija apoptoze/nekroze ćelija EAC kao i smanjenje ascitnog volumena i ćelijske vijabilnosti kod tumora tretiranih sa BPE. Najveće smanjenje broja tumorskih ćelija je uočeno u grupi koja je pretretirana sa BPE. Takođe, aktivnost antioksidantnih enzima je bila različita između netretiranih grupa i grupa tretiranih sa BPE.

Zaključak: Promene u aktivnosti antioksidantnih enzima zabeležene nakon administracije BPE dovode se u vezu sa indukcijom oksidativnog stresa u ćelijama EAC.

Gljučne reči: cvekla (*Beta vulgaris*), Ehrlichov ascitni tumor (EAC), antioksidantni enzimi, oksidativni stres, citotoksičnost

EXAMINATION OF THE CITOTOXIC ACTIVITY OF BEETROOT POMACE EXTRACT
ON THE EHRlich ASCITES TUMOUR CELLS *IN VIVO*

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Introduction: Carcinogenesis is a multistage process of the malignant cell phenotype formation, and it was suggested that oxidative stress i.e. imbalanced antioxidant status of the cell, could be one of the numerous causes of malignant transformation. To date the treatment of malignant diseases is based on different surgical and radiological methods, as well as chemotherapy. Beet (*Beta vulgaris*) and its phytochemical constituents is ranked among the 10 most powerful vegetables with the strong antioxidant properties.

The Aim: The aim of our research was to investigate *in vivo* effects of beetroot pomace extract (BPE) on the activities of antioxidant enzymes in tumour cells. Also, the aim of the research was to elucidate the connection with anti/prooxidant effect of the extract.

Materials and Methods: *In vivo* effect of BPE on EAC growth, implanted to NMRI mice was investigated, and several biochemical parameters of oxidative stress (antioxidant enzymes: XOD, CAT, Px, GSHPx, GR, GSH content, LPx intensity) were determined in tumour cells. Mice were implanted with EAC cells before, at the time and after treatment with BPE. The EAC ascites was collected, tumour growth was followed by measuring the EAC volume, number and viability of tumour cells was determined, as well as biochemical markers mentioned above.

Results: Induction of apoptosis/necrosis of EAC cells, as well as ascites volume and cell viability reduction was observed in mice treated with BPE. The largest decrease was observed in mice pretreated with BPE. The antioxidant enzymes activities showed significant alterations upon treatment with BPE.

Conclusion: Changes in the antioxidant enzymes activities observed after administration of BPE might be due to induction of oxidative stress in EAC cells.

Key words: Beetroot (*Beta vulgaris*), Ehrlich ascites tumour (EAC), antioxidant enzymes, oxidative stress, cytotoxicity

ODREĐIVANJE UKUPNE AKTIVNOSTI ALKALNE FOSFATAZE I TERMOSTABILNOG ISOENZIMA U KARCINOMIMA I DISPLAZIJAMA DOJKE

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Uvod: U proteinskom sadržaju tumora značajnu ulogu imaju enzimi koji sa teorijske tačke gledišta mogu biti dobri tumorski markeri, kako za dijagnostiku tako i za praćenje toka malignog oboljenja kod ljudi, s obzirom da odražavaju metaboličke promene u tumorima. Alkalna fosfataza je glikoprotein i nalazi se u ćelijskim membranama većine organa i tkiva. Ovaj enzim se pojavljuje u nekoliko molekularnih formi ili izoenzima. U toku maligne alteracije javlja se jedan izoenzim tzv. Reganov izoenzim koji je veoma sličan placentarnom izoenzimu.

Cilj: Cilj našeg istraživanja je bilo određivanje ukupne aktivnosti alkalne fosfataze i izoenzimskog oblika, Reganovog izoenzima, u uzorcima karcinoma dojke i displazijama dojke.

Materijal i metode: Uzorci, karcinomi dojke i displazije dojke dobijeni su od pacijenta koji su operisani u Institutu za onkologiju Vojvodine u Sremskoj Kamenici. Humana placenta doneta je sa Klinike za ginekologiju i akušerstvo Kliničkog centra Vojvodine u Novom Sadu. Određivanje ukupne aktivnosti ALP vršeno je kinetičkom metodom po Plummer-u. Temperatura stabilnost ALP ispitana je testom termostabilnosti na 65°C u različitim vremenskim intervalima inkubacije od 0, 10, 20, 40 i 60 minuta.

Rezultati: Analiza alkalne fosfataze u karcinomima i displazijama dojke pokazala je da je ukupna aktivnost enzima u karcinomima veća za osam puta u odnosu na displazije dojke. Ni u jednom uzorku karcinoma dojke i displazijama dojke nismo mogli da izmerimo termostabilni izoenzim alkalne fosfataze.

Zaključak: Dobijeni rezultati određivanja ukupne aktivnosti alkalne fosfataze i termostabilnog izoenzima alkalne fosfataze sugerišu da bi bili korisni u dijagnostici malignih tumora.

Ključne reči: Alkalna fosfataza, Reganov izoenzim, karcinom i displazije dojke

OPTIMIZACIJA PCR METODE

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Uvod: Humani apolipoprotein E (ApoE) ima tri prirodna izoformna glikoproteinska oblika, ApoE2, ApoE3 i ApoE4, koje kodiraju različiti aleli, stoga, u populaciji su prisutne osobe koje su homozigoti (e2/e2, e3/e3, e4/e4) ili heterozigoti (e2/e3, e3/e4, e2/e4) za dati genotip. Genetski polimorfizmi apoE gena predstavljaju markere predikcije za razvoj brojnih poremećaja lipidnog statusa i Alchajmerove bolesti što su pokazali rezultati velikog broja kliničkih ispitivanja.

Cilj: Osnovni cilj našeg istraživanja bilo je ispitivanje uspešnosti primene PCR-RFLP metode za utvrđivanje polimorfnosti apoE gena u humanoju populaciji.

Materijal i metode: U istraživanju su analizirani apoE geni u uzorcima DNK izolovane iz leukocita krvi zdravih subjekata. PCR amplifikacija je izvođena prema modifikovanoj metodi od Hixon i Vernier-a iz 1990. godine gde su prajmeri dizajnirani tako da amplifikuju kodirajuću sekvencu dela četvrtog egzona za apoE gen. RFLP sečenje dobijenih PCR produkata vršeno je HhaI restrikcionim enzimom.

Rezultati: Vizuelizacijom PCR produkata podvrgnutih elektroforezi na agaroznom gelu zapazili smo produkt od oko 250 baznih parova što znači da je amplifikacija željene sekvence bila uspešna. RFLP sečenjem PCR produkata i njihovom vizuelizacijom uočeni su fragmenti odgovarajuće dužine na osnovu kojih su određeni genotipi e2/e3, odnosno e3/e3 za dva zdrava subjekta.

Zaključak: Na osnovu naših rezultata možemo istaći zaključak da je primena PCR-RFLP metode optimalna u cilju detekcije polimorfni oblika apoE gena kod ispitivanih subjekata. Na ovaj način se jednostavno, brzo i efikasno, na osnovu različitih dužina isečenih fragmenata, određuje genotip pacijenta pri čemu PCR omogućava specifično umnožavanje ciljne sekvence potrebne za sečenje, povećavajući specifičnost metode.

Ključne reči: ApoE, PCR-RFLP metoda, određivanje genotipa

DETERMINATION OF THE TOTAL ALKALINE PHOSPHATASE ACTIVITY AND THERMOSTABLE ISOENZYME IN BREAST CANCER AND DYSPLASIA

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Introduction: In the protein content of tumor, an important role is played by enzymes that from a theoretical point of view can be useful tumor markers, both for diagnosis and for monitoring of malignant diseases in humans, since they reflect metabolic changes in tumors. Alkaline-phosphatase is a glycoprotein and is found in cell membranes of most organs and tissues. This enzyme occurs in several molecular forms, or isoenzymes. During malignant alteration a specific isoenzyme, so-called Reagan isoenzyme is identified, which is very similar to the placental isoenzyme.

The Aim: The aim of our study was to determine the total activity of the alkaline phosphatase and isoenzyme pattern shape, Reagan isoenzyme, in samples of the breast cancer and dysplasia.

Materials and methods: The samples, breast cancer and dysplasia, were obtained from patients who underwent surgery at the Institute of oncology of Vojvodina in Sremska Kamenica. Human placenta was taken from the University Hospital for Gynecology and Obstetrics of the Clinical Center of Vojvodina in Novi Sad. The determination of total ALP activity was carried out by the kinetic method defined by Plummer. Temperature stability of ALP was examined by thermostability assay at 65°C, at various intervals of incubation lasting for 0, 10, 20, 40 and 60 minutes.

Results: The analysis of alkaline phosphatase in breast cancer and dysplasia showed that the total activity of the enzyme in breast cancer is eight times higher than in breast dysplasia. We could not measure the thermostable alkaline phosphatase isoenzyme in any sample of breast cancer and breast dysplasia.

Conclusion: The results of the determination of total alkaline phosphatase activity and thermostable alkaline phosphatase isoenzyme, suggest that this method would be useful in the diagnosis of malignant tumors.

Key words: alkaline phosphatase, Reagan isoenzyme, breast carcinoma and dysplasia

OPTIMISATION OF PCR METHOD

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Introduction: Human Apolipoprotein E (ApoE) is synthesized in three main glycoprotein isoforms, ApoE2, ApoE3 i ApoE4, encoded by different gene alleles. Therefore, in human population both homozygots (e2/e2, e3/e3, e4/e4) and heterozygots (e2/e3, e3/e4, e2/e4) may be found, for the corresponding genotype. Genetic polymorphisms of ApoE gene are risk markers for prediction of numerous deregulations of lipid status and Alzheimer disease predisposition, as numerous clinical studies have shown.

The Aim: The main aim of our study was to investigate the application of PCR-RFLP method for the detection of polymorphisms of ApoE gene.

Materials and Methods: We analyzed the ApoE gene polymorphisms in DNA isolated from the blood of healthy individuals. PCR amplification was performed according to the modified Hixon and Vernier method, where the primers are designed so we may amplify the coding sequence of the forth exon within the ApoE gene. RFLP restriction of PCR product was performed by HhaI restriction enzyme.

Results: The visualization of PCR product after the electrophoresis on agarose gel, revealed that the product was 250 bp long, indicating the successful and specific PCR amplification. RFLP restriction produced the optimal fragment length that determined the genotypes e2/e3 and e3/e3 in our samples.

Conclusion: Our results showed that PCR-RFLP method is optimal for the detection of ApoE gene polymorphisms in healthy individuals. This method enables simple, rapid and efficient analysis of RFLPs, directly determining the patients genotype, with PCR reaction that enables specific amplification of target sequence required for cleavage, increasing the specificity of reaction.

Key words: ApoE, PCR-RFLP, genotyping

OKSIDATIVNO-STRESNI STATUS I NJEGOV DIJAGNOSTIČKI ZNAČAJ KOD PACIJENATA SA SEPSOM PREMA TEŽINI I ISHODU OBOLJENJA

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Uvod: Sepsa je sistemsko inflamatorno oboljenje sa prenatraženim imunim odgovorom, povećanim oksidativnim stresom (OS) i sniženom antioksidativnom zaštitom (AOZ). U sepsi dolazi do smanjenja koncentracije lipoproteinskih klasa, posebno HDL. Nosilac antioksidativne sposobnosti HDL čestice je enzim paraoksonaza 1 (PON1).

Cilj: Određivanje vrednosti pokazatelja OS statusa, posebno aktivnosti enzima PON1, te njihova korelacija sa kliničkim pokazateljima sepsa.

Materijal i metode: Ispitivanjem je obuhvaćeno 50 pacijenata sa dijagnozom sepsa. U serumu je na 24h u toku 4 dana određivana paraoksonazna (POX) aktivnost PON1, totalni antioksidantni status (TAS) i prooksidativno-antioksidativni balans (PAB). Podeljeni su na osnovu rizične vrednosti Apache skora (Apache ≥ 25 vs. Apache ≤ 24) i na osnovu ishoda bolesti (preživeli/umrli). Za poređenje vrednosti korišćen je Studentov t test.

Rezultati: Pacijenti iz rizičnije grupe po Apache skoru su tokom spraćenja imali niže vrednosti PAB (HKU) (I dan: 8,59 (5,23-14,10) vs. 17,37 (10,30-29,29) $p<0,001$; II dan: 13,60 (2,60-29,80) vs. 24,14 (13,26-43,92) $p<0,05$; III dan: 7,50 (3,62-15,52) vs. 23,52 (14,78-37,42) $p<0,05$; IV dan: 5,58 \pm 3,86 vs. 39,12 \pm 38,24 $p<0,01$), dok je TAS ($\mu\text{mol/L}$) bio značajno viši kod ovih pacijenata u odnosu na pacijente sa lakšim oblikom bolesti II dana (935,2 \pm 119,2 vs. 733,2 \pm 327,5 $p<0,05$). POX aktivnost (U/L) je bila značajno viša kod preživelih pacijenata u odnosu na umrle I i II dana (I dan: 139,44 \pm 124,79 vs. 73,44 \pm 51,79 $p<0,05$; 141,53 \pm 132,68 vs. 65,15 \pm 39,23 $p<0,05$).

Zaključak: Pacijenti sa sepsom se karakterišu sniženom PON1 aktivnošću, čije smanjenje korelira sa težinom stanja. Vrednosti parametara OS i AOZ suprotno od očekivanja ukazuju da sa težinom stanja raste i koncentracija redoks supstanci.

Ključne reči: sepsa, POX, PAB, TAS.

STATUS OF OXIDATIVE STRESS AND ITS DIAGNOSTIC VALUE IN SEPTIC PATIENTS, RELATION TO SEVERITY AND OUTCOME OF THE DISEASE

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Introduction: Sepsis is systemic inflammatory disorder characterized by irregular immune response, increased oxidative stress(OS) and decreased antioxidant protection(AOP). Circulating levels of lipoproteins are reduced in sepsis, especially HDL. The enzyme paraoxonase1 (PON1) is the main carrier of antioxidant capacity of HDL.

The Aim: Determining the value of OS status indicators, particularly PON1 enzyme activity, and their correlation with clinical indicators of sepsis.

Materials and Methods: We were evaluating 50 patients who were diagnosed with sepsis. During 4 days, once in 24h paraoxonase (POX) activity of PON1 was measured, total antioxidant status (TAS) and the prooxidant-antioxidant balance (PAB). Patients were divided into groups based on Apache score(AS) risk values (Apache ≥ 25 vs. Apache ≤ 24) and disease outcome (survived/died). For groups comparison we've used Student's t test.

Results: Patients with AS values > 25 had during 4 days lower values of PAB (HKU) (I day: 8,59 (5,23-14,10) vs. 17,37 (10,30-29,29) $p<0,001$; II day: 13,60 (2,60-29,80) vs. 24,14 (13,26-43,92) $p<0,05$; III day: 7,50 (3,62-15,52) vs. 23,52 (14,78-37,42) $p<0,05$; IV day: 5,58 \pm 3,86 vs. 39,12 \pm 38,24 $p<0,01$), while TAS($\mu\text{mol/L}$) was significantly higher in these patients than in patients with AS ≤ 24 on day II (935,2 \pm 119,2 vs. 733,2 \pm 327,5 $p<0,05$). POX activity (U/L) was significantly higher in survivors than in patients who died on day I and II (I day: 139.44 \pm 124.79 vs.73.44 \pm 51.79 $p<0,05$, vs. 141.53 \pm 132.68. 65.15 \pm 39.23 $p<0,05$).

Conclusion: Septic patients are characterized with decreased PON1 activity, which correlates with severity of condition. Values of OS and AOP, contrary the expectations, indicate that severity of condition increases the blood concentration of redox substances.

Key words: sepsis, POX, PAB, TAS.

DISLIPIDEMIJA, OKSIDATIVNI STRES I FAKTORI RIZIKA ZA RAZVOJ ATEROSKLEROTSKOG PROCESA KOD PACIJENATA SA HRONIČNOM BUBREŽNOM INSUFICIJENCIJOM

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Uvod: Hronična bubrežna insuficijencija (HBI) predstavlja progresivni gubitak renalne funkcije. Lipoproteinski profil ovih pacijenata postaje ateriogeniji, dolazi do razvoja reaktivnih kiseonikovih jedinjenja, nastanka oksidativnog stresa (OS) i razvoja kardiovaskularnih poremećaja.

Cilj: Cilj rada je da se utvrde promene u nivou parametara OS i lipidnog statusa kod pacijenata sa HBI i kontrolne grupe (KG) i da se utvrdi rizik za razvoj ateroskleroze na osnovu procene faktora rizika (FR).

Materijal i metode: U studiji je učestvovalo 100 pacijenata sa HBI na hemodijalizi i 187 zdravih osoba. Parametri lipidnog statusa su određivani komercijalnim testovima. Nivo superoksidnog anjona (SOA) je određen reakcijom sa nitroblutetrazolijumom, aktivnost paraoksonaze sa paraoksonom kao supstratom, iz njihovog odnosa je izračunat oksidativnostresni indeks (OSI). Uznaredovali produkti oksidacije proteina (AOPP) su određivani spektrofotometrijski sa kalijum-jodidom i sirćetnom kiselinom.

Rezultati: Koncentracije holesterola u HDL i LDL lipoproteinskim česticama kao i ukupnog holesterola (TC), su se razlikovale između pacijenata i kontrolne grupe (HDL: 0,98 \pm 0,34mmol/L vs. 1,35 \pm 0,31mmol/L, $p<0,001$; LDL: 2,57 \pm 0,89mmol/L vs. 3,41 \pm 1,19mmol/L, $p<0,001$; TC: 4,36 \pm 1,23mmol/L vs. 5,36 \pm 1,38mmol/L, $p<0,001$). SOA i AOPP su statistički značajno viši kod pacijenata u odnosu na KG (SOA: 217,85 \pm 9,66 $\mu\text{mol/min/L}$ vs. 30,69 \pm 9,66 $\mu\text{mol/min/L}$, $p<0,001$; AOPP: 424,50(1,14-971,42) $\mu\text{mol/L}$ vs. 18,35(4,17-33,4) $\mu\text{mol/L}$, $p<0,001$). Za procenu FR korišćeni su indeksi telesne mase, dužina trajanja hemodijalize, pol, hipoalbuminija, aterogeni indeks i starost pacijenta, pri čemu pacijenti sa najvišim FR imaju značajno nižu paraoksonaznu aktivnost ($p<0,05$) i značajno viši OSI ($p<0,05$) u odnosu na ostale pacijente.

Zaključak: Kod pacijenata sa HBI dislipidemija i povećan oksidativni stres povećavaju rizik za razvoj ateroskleroze.

Ključne reči: Hronična bubrežna insuficijencija, dislipidemija, oksidativni stres

DISLIPIDEMIA, OXIDATIVE STRESS AND ATHEROSCLEROSIS RISK FACTORS IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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Introduction: Chronic kidney disease (CKD) is a progressive loss in renal function. Lipoprotein profile in those patients becomes atherogenic, the development of reactive oxygen compounds occurs, which leads to oxidative stress (OS) and the development of cardiovascular disorders.

The Aim: The objective of this study is to detect changes in values of OS and lipid parameters in CKD patients and control group (CG), to determine the risk of atherosclerosis development based on the assessment of risk factors (RF).

Materials and Methods: 100 CKD patients at hemodialysis and 187 healthy controls participated in this study. Lipid parameters were determined by commercial tests. The level of superoxide anion (SOA) was determined by nitro-blue tetrazolium, activity of paraoxonase with paraoxon as a substrate and from their relationship was calculated oxidative stress index (OSI). Advanced oxidation protein products (AOPP) were determined by spectrophotometry with potassium-iodide and acetic acid.

Results: Concentrations of HDL-C, LDL-C and total cholesterol (TC), differed between patients and controls (HDL:0,98 \pm 0,34mmol/L vs. 1,35 \pm 0,31mmol/L, $p<0,001$; LDL:2,57 \pm 0,89mmol/L vs. 3,41 \pm 1,19mmol/L, $p<0,001$; TC:4,36 \pm 1,23mmol/L vs. 5,36 \pm 1,38mmol/L, $p<0,001$). SOA and AOPP were significantly higher in patients than in healthy population (SOA:217,85 \pm 9,66 $\mu\text{mol/min/L}$ vs. 30,69 \pm 9,66 $\mu\text{mol/min/L}$, $p<0,001$; AOPP:424,50(1,14-971,42) $\mu\text{mol/L}$ vs. 18,35(4,17-33,4) $\mu\text{mol/L}$, $p<0,001$). In assessing risk factors for developing disease complications we've used body mass index, duration of hemodialysis, sex, hypoalbuminemia, atherogenic index and patient age, where patients with the highest RF have significantly lower paraoxonase activity ($p<0,05$) and significantly higher OSI ($p<0,05$) compared to other patients.

Conclusion: In patients with CKD, dyslipidemia and higher level of OS increase the risk of developing atherosclerosis.

Keywords: chronic kidney disease, dyslipidemia, oxidative stress

POVEZANOST VELIČINE I RASPODELE SUBFRAKCIJA LIPOPROTEINA VISOKE GUSTINE SA STEPENOM TEŽINE OPSTRUKTIVNE APNEJE U TOKU SPAVANJA

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Uvod: Opstruktivna apneja u toku spavanja (engl. obstructive sleep apnea – OSA) udružena je sa pojavom dislipidemije, što može uticati na antiaterogena svojstva lipoproteina visoke gustine (HDL).

Cilj rada: Upoređivali smo raspodele HDL subfrakcija kod pacijenata sa OSA u odnosu na težinu bolesti.

Materijal i metode: HDL subfrakcije su razdvojene metodom vertikalne elektroforeze na gradijentu poliakrilamida kod 155 pacijenata, od kojih je 48 imalo blagi, 28 umeren, a 79 težak stepen OSA.

Rezultati: Sa progresijom bolesti dolazi do značajnog smanjenja veličine HDL čestica ($p<0,05$). HDL dijametar je bio u negativnoj korelaciji sa koncentracijom triglicerida, a u pozitivnoj sa koncentracijama HDL-holesterola i apolipoproteina A-I ($p<0,001$). Koncentracija triglicerida je bila u negativnoj korelaciji sa relativnim udelima HDL 2b ($p<0,01$) i 2a ($p<0,05$) subfrakcija, a u pozitivnoj sa udelima 3a ($p<0,01$) i 3b ($p<0,05$) čestica. Sa smanjenjem koncentracije HDL-holesterola, smanjivao se udeo HDL 2b ($p<0,01$), a rastao udeo manjih HDL 3a ($p<0,01$) i 3b ($p<0,05$) subfrakcija. Slično, kako se smanjivala koncentracija apolipoproteina A-I, smanjivao se udeo HDL 2b ($p<0,01$), a rastao udeo HDL 3c čestica ($p<0,05$). Manji dijometri HDL čestica su korelirali sa višim vrednostima indikatora stepena težine OSA - apneja/hipopneja indeksom ($p<0,01$) i brojem mikrobuđenja po satu (arousal index) ($p<0,05$). Indeks desaturacije i saturacija hemoglobina kiseonikom (SaO₂) manja od 90% su bili u negativnoj korelaciji sa HDL dijametrima ($p<0,05$), a u pozitivnoj sa relativnim udelom HDL 3a subfrakcija ($p<0,05$).

Zaključak: Sa progresijom OSA dolazi do preraspodele HDL subfrakcija ka manjim i gušćim česticama, što može povećati rizik za razvoj kardiovaskularnih bolesti.

Ključne reči: opstruktivna apneja u toku spavanja, HDL subfrakcije, kardiovaskularni rizik.

ASSOCIATIONS OF HIGH-DENSITY LIPOROTEIN SIZE AND SUBCLASSES DISTRIBUTIONS WITH SEVERITY OF OBSTRUCTIVE SLEEP APNEA

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Introduction: Patients with obstructive sleep apnea (OSA) often suffer from dyslipidemia. This may affect anti-atherogenic properties of high-density lipoproteins (HDL).

The Aim: We analysed HDL subclasses distributions in OSA patients with respect to disease severity.

Materials and Methods: HDL subclasses were separated by polyacrylamide gradient gel electrophoresis in 155 patients (48 with mild, 28 with moderate and 79 with severe OSA).

Results: Progression of OSA was associated with significant diminishing of HDL particle sizes ($p<0,05$). Additionally, HDL diameters correlated inversely with concentrations of triglycerides, but positively with levels of HDL-cholesterol and apolipoprotein A-I ($p<0,001$). Triglycerides concentrations were in negative associations with relative proportions of HDL 2b ($p<0,01$) and 2a ($p<0,05$), while in positive correlation with proportions of 3a ($p<0,01$) and 3b ($p<0,05$) subclasses. Diminishing of HDL-cholesterol level was accompanied with decreased proportions of HDL 2b ($p<0,01$) and increased percentages of smaller HDL 3a ($p<0,01$) and 3b ($p<0,05$) particles. Similarly, decrease in concentrations of apolipoprotein A-I was followed with reduction in relative proportions of HDL 2b ($p<0,01$), but rise in proportions of HDL 3c particles ($p<0,05$). Smaller HDL particles diameters were associated with higher values of indices of OSA severity: apnea/hypopnea index ($p<0,01$) and arousal index ($p<0,05$). Desaturation index and haemoglobin oxygen saturation (SpO₂) below 90 % correlated negatively with HDL particle sizes ($p<0,05$), while positively with relative proportions of HDL 3a subclasses ($p<0,05$).

Conclusion: Progression of OSA is followed by redistribution of HDL subclasses towards smaller, denser particles, which may enhance the risk for cardiovascular disease development.

Key words: obstructive sleep apnea, HDL subclasses, cardiovascular risk.

VELIČINA I SUBFRAKCIJE LIPOPROTEINA NISKE GUSTINE KOD PACIJENATA SA OPSTRUKTIVNOM APNEJOM U TOKU SPAVANJA

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Uvod: Opstruktivna apneja u toku spavanja (engl. *obstructive sleep apnea* – OSA) praćena je razvojem metaboličkog sindroma (MS) koji povećava rizik za razvoj kardiovaskularnih bolesti (KVB). Jedna od osnovnih karakteristika MS je dislipidemija koja je udružena sa promenama u veličini i raspodeli subfrakcija lipoproteina niske gustine (LDL).

Cilj rada: U našem istraživanju analizirali smo da li prisustvo MS utiče na veličinu i raspodelu LDL čestica kod pacijenata sa OSA.

Materijal i metode: : LDL čestice su razdvojene vertikalnom elektroforezom na gradijentu poliakrilamida kod 284 pacijenta sa OSA, od kojih 191 ima, a 93 nema MS.

Rezultati: Kod pacijenata sa MS koncentracije HDL-holesterola i apolipoproteina A-I bile su manje ($P<0,001$), a koncentracije triglicerida ($P<0,001$) i apolipoproteina B ($P<0,01$) značajno veće u odnosu na pacijente bez MS. Pacijenti sa MS imali su manji dijametar LDL čestica ($P<0,001$), a utvrđeno je i značajno smanjenje relativnog udela LDL I ($P<0,05$), a povećanje udela LDL III i LDL IV subfrakcija. LDL dijametar je negativno korelirao sa vrednostima serumskih triglicerida ($P<0,001$) i apolipoproteina B ($P<0,01$), a pozitivno sa koncentracijama HDL-holesterola i apolipoproteina A-I ($P<0,001$). Dijametri LDL čestica su bili u negativnoj korelaciji sa markerima insulinske rezistencije (koncentracija glukoze i insulina, HOMA indeks), obimom struka, kao i sa parametrima OSA [apneja/hipopneja indeks (AHI), broj mikrobuđenja po satu (arousal index), indeks desaturacije, saturacija hemoglobina kiseonikom (SaO₂) manja od 90%].

Zaključak: Naši rezultati pokazuju da prisustvo MS kod pacijenata sa OSA dovodi do preraspodele LDL subfrakcija ka manjim, gušćim aterogenim česticama, što može povećati rizik za razvoj KVB.

Ključne reči: opstruktivna apneja u toku spavanja, metabolički sindrom, male guste LDL čestice, ateroskleroza.

LOW-DENSITY LIPOROTEIN SIZE AND SUBCLASSES IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA

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Introduction: Patients with obstructive sleep apnea (OSA) often develop metabolic syndrome (MS) which may increase their cardiovascular risk. Dyslipidemia is one of the main characteristic of MS and it is associated with alternations in low-density lipoprotein (LDL) size and subclasses distribution.

The aim of study: This study investigates whether the presence of MS affects LDL size and subclasses distribution in OSA patients.

Material and methods: We used polyacrylamide gradient gel electrophoresis to separate LDL subclasses in 284 OSA patients. Data were compared between the patients with MS ($n=191$) and those without MS ($n=93$).

Results: Patients with MS had lower concentrations of HDL-cholesterol and apolipoprotein A-I ($P<0,001$) and significantly higher levels of triglycerides ($P<0,001$) and apolipoprotein B ($P<0,01$) than those without MS. We found that patients with MS had smaller LDL size ($P<0,001$), due to a reduction of LDL I ($P<0,05$) and concomitant increase of LDL III and LDL IV subclasses proportions. LDL particle size correlated inversely with serum triglycerides ($P<0,001$) and apolipoprotein B ($P<0,01$), and positively with HDL-cholesterol and apolipoprotein A-I ($P<0,001$) levels. Furthermore, LDL particle size was inversely associated with indicators of insulin resistance (glucose and insulin concentrations, HOMA index), waist circumference, as well as with parameters of OSA [apnea/hypopnea index (AHI), arousal index, desaturation index, hemoglobin saturation (SpO₂) below 90 %].

Conclusion: Our results show that LDL subclasses distribution in OSA patients with MS is shifted towards small, dense particles. The presence of such atherogenic particles might increase cardiovascular risk in OSA.

Key words: obstructive sleep apnea, metabolic syndrome, small, dense LDL, atherosclerosis.

LONGITUDINALNE PROMENE U PARAMETRIMA OKSIDATIVNO STRESNOG STATUSA KOD DECE NAKON HIRURŠKE INTERVENCIJE

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Uvod: Kardiohirurške intervencije kod dece dovode do promene oksidativno-stresnog statusa. Pojačana produkcija slobodnih radikala i smanjen kapacitet antioksidativne zaštite nastaju kao posledice ishemijske/reperfuzije koja se javlja tokom operacije.

Cilj rada: Cilj ove studije bilo je longitudinalno praćenje promene parametara oksidativno-stresnog statusa kod dece u preoperativnom i uskom postoperativnom periodu.

Materijal i metode: U našem ispitivanju učestvovalo je 75-oro dece prosečne starosti oko tri godine. Merenja su vršena neposredno pre operacije, 2h posle operacije, 6h posle operacije, 24h posle operacije, 48h posle operacije i 72h posle operacije. Od parametara oksidativnog stresa merena je koncentracija malondialdehida (MDA), prooksidativno-antioksidativni balans (PAB) i totalni oksidativni status (TOS). Aktivnost enzima paraoksonaze 1 (PON 1) i totalni antioksidativni status (TAS) su određivani kao parametri antioksidativne zaštite.

Rezultati: Nivo PAB-a statistički značajno raste 6h posle operacije i 24h posle operacije u poređenju sa tačkom 2h posle operacije. Neočekivano, koncentracija TOS-a statistički značajno pada 6h nakon operacije a zatim je uočeno blago povećanje koncentracije. Koncentracija MDA se značajno ne menja u ispitivanom vremenskom periodu. Statistički značajno smanjenje PON 1 aktivnosti uočeno je 72h nakon operacije, dok TAS nije pokazao značajnu promenu koncentracije.

Zaključak: Rezultati naše studije ukazuju na postojanje promena parametara oksidativno-stresnog statusa u toku uskog postoperativnog perioda praćenja. Značajno opadanje PON 1 aktivnosti udruženo sa porastom nivoa PAB-a nedvosmisleno potvrđuju stanje intenzivnog oksidativnog stresa.

Ključne reči: Kardiohirurške intervencije, oksidativni stres, PAB, TOS, PON1

LONGITUDINAL CHANGES IN OXIDATIVE STRESS PARAMETERS IN CHILDREN AFTER CARDIOSURGICAL TREATMENT

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Introduction: Cardiosurgical interventions in children could be followed by changes in oxidative stress status. Oxidative stress arises due to an imbalance between the formation of reactive oxygen species (ROS) and ROS clearance by components of the antioxidant defence system which is consequences of ischemia, developed during intervention.

Aim of study: The aim of this study was to investigate the longitudinal changes in oxidative stress status parameters in children immediately before the intervention and during the short postoperative periods.

Materials and methods: In our study were involved 75 children mean ages of about three years. Blood was sampled before surgery, 2 h after surgery, 6h after surgery, 24 hours after surgery, 48 h after surgery and 72 h after surgery. As a parameters of oxidative stress we measured malondialdehyde (MDA), prooxidative-antioxidative balance (PAB) and total oxidative status (TOS). Paraoxonase 1 (PON1) activity and total antioxidant status (TAS) were determined as a measures of antioxidant protection.

Results: PAB levels was significantly increased six and twenty four hours after intervention compared with the point two hour after. Unexpectedly, TOS concentrations significantly decrease in period of six hours after surgery, while a slight increase in TOS concentrations were noticed after this period. We didn't notice some changes in MDA concentrations during the study period. Statistically significant reduction in PON 1 activity was observed 72 h after surgery, while TAS showed no significant change in concentrations.

Conclusion: The results of our present study confirmed an increased oxidative stress during cardiosurgical treatment in children. A significant decrease in PON 1 activity accompanied with increased PAB levels, with no doubt, indicate the condition of intensive oxidative stress.

Key word: Cardiosurgical interventions, oxidative stress, PAB, TOS, PON1

POVEZANOST OKSIDATIVNOG STRESA SA RAZVOJEM I STEPENOM OPSTRUKTIVNE APNEJE U SPAVANJU

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Uvod: Opstruktivna apneja u spavanju (OSA) se karakteriše ponavljanim epizodama parcijalne ili potpune opstrukcije gornjih disajnih puteva u toku spavanja. Kod OSA pacijenata naizmenično se javljaju epizode hipoksije i normoksije, koje podsećaju na ishemijske/reperfuzijske događaje, što podstiče razvoj oksidativnog stresa (OS).

Cilj rada: Ispitati razlike u nivoima parametara OS kod OSA pacijenata i kontrolne grupe (KG), povezanost nivoa parametara OS sa stepenom OSA i postojanje razlike u prevalenci i težini OSA u odnosu na pol i telesnu masu.

Materijal i metode: U studiji je učestvovalo 355 OSA pacijenata i 187 zdravih osoba (KG) kojima su spektrofotometrijski određivane koncentracije malondialdehida (MDA), uznapredovalih produkata oksidacije proteina (AOPP), nivoi totalnog oksidativnog statusa (TOS), totalnog antioksidativnog statusa (TAS) i nivo prooksidativno-antioksidativnog balansa (PAB). Aktivnost superoksid dismutaze (SOD) i diazoksonazna aktivnost (DZO) enzima paraoksonaze 1 su određivane kinetičkim metodama.

Rezultati: Rezultati su pokazali da su vrednosti MDA, AOPP i TOS značajno više kod OSA pacijenata u odnosu na KG ($p<0,001$), a vrednosti DZO ($p<0,01$), SOD i TAS ($p<0,001$) značajno niže. Utvrdili smo da pacijenti u težem OSA stadijumu imaju značajno više koncentracije AOPP i MDA ($p<0,001$) u odnosu na pacijente sa blažim oblikom bolesti. Sa povećanjem indeksa telesne mase dolazi do promena u nivoima AOPP ($p<0,001$), MDA (0,001), PAB ($p<0,001$), TAS ($p<0,001$) i SOD ($p<0,05$). Vrednosti AOPP su značajno više kod muškaraca sa OSA u odnosu na žene sa OSA ($p<0,05$).

Zaključak: Promene u vrednostima parametara OS kod pacijenata sa OSA ukazuju na ulogu OS u razvoju OSA.

Ključne reči: Opstruktivna apneja u spavanju, oksidativni stres.

OXIDATIVE STRESS CONNECTION WITH DEVELOPMENT AND EXTENT OF OBSTRUCTIVE SLEEP APNEA

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Introduction: Obstructive sleep apnea (OSA) is characterized by repetitive episodes of partial or complete obstruction of the upper airways during sleep. OSA patients have episodes of hypoxia and normoxia, which are similar to ischemic/reperfusion events, and stimulate development of oxidative stress.

Objective: To investigate differences in levels of OS parameters in OSA patients and control group (CG), relationship between level of OS parameters and OSA degree, and difference in prevalence and severity of OSA compared to gender and body weight.

Material and methods: In this study participated 355 OSA patients and 187 healthy subjects (CG), who were spectrophotometrically measured concentrations of malondialdehyde (MDA), advanced oxidation protein products (AOPP), total oxidative stress level (TOS), total antioxidant status (TAS) and level of prooxidative-antioxidative balance (PAB). Activity of superoxide dismutase (SOD) and diazoxonase activity (DZO) of paraoxonase enzyme are measured by kinetic methods.

Results: Results have indicated that MDA, AOPP i TOS values are significantly higher in OSA patients compared to CG ($p<0,001$), and DZO ($p<0,01$), SOD i TAS ($p<0,001$) values significantly lower. We determined that patients with more severe OSA stadium have significantly higher AOPP and MDA ($p<0,001$) concentrations compared to patients with mild form of the disease. With increasing body mass index, there are changes in AOPP ($p<0,001$), MDA (0,001), PAB ($p<0,001$), TAS ($p<0,001$) and SOD ($p<0,05$) values. AOPP values are significantly higher in men with OSA compared to women with OSA ($p<0,05$).

Conclusion: Changes in the values of parameters OS in patients with OSA indicate the role of OS in development of OSA.

Key words: Obstructive sleep apnea, oxidative stress.

UTICAJ INFEKCIJE NA PARAMETRE BUBREŽNE FUNKCIJE KOD DECE SA PIJELONEFRITISOM

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Uvod: Pijelonefritis je inflamatorno oboljenje uzlaznog dela urinarnog trakta koje može dovesti do bubrežne insuficijencije. Među ranim markerima bubrežne insuficijencije izdvajaju se lipokalin, cistatin C, molekul oštećenih bubrega 1 (KIM-1). Sposobnost markera za rano otkrivanje bubrežne insuficijencije zavisi od njihove specifičnosti i oni ne bi trebali da se menjaju u prisustvu drugih patoloških stanja.

Cilj: Cilj rada je bio da se ispita uticaj infekcije na vrednosti lipokalina, cistatina C i KIM-1.

Materijal i metode: Ispitivanjem je obuhvaćeno 33 dece, prosečnog uzrasta 14 meseci, na prijemu i u vreme otpuštanja sa Odeljenja nefrologije, Univerzitetske dečje klinike. Boravak u bolnici je prosečno trajao 6 dana \pm 4,66 SD. Kao parametri bubrežne funkcije, u serumu ispitanih, određeni su cistatin C i lipokalin, dok su u urinu, određeni lipokalin i KIM-1.

Rezultati: Lipokalin u urinu se značajno razlikuje između pacijenata kod kojih je prisutna infekcija 115,37 ng/mL (91,70-139,05) i pacijenata bez infekcije 67,84 ng/mL (35,42-100,26), $p=0,022$ nakon 6 dana praćenja. Kod pacijenata bez infekcije uočeno je veći pad vrednosti lipokalina između dva određivanja u odnosu na pacijente sa infekcijom (p za interakciju=0,016). Vrednosti lipokalina u serumu, kao i vrednosti cistatina C u serumu i KIM-1 u urinu nisu se značajno promenile.

Zaključak: Lipokalin nije pouzdan parametar za praćenje promene bubrežne funkcije zato što infekcija može uticati na vrednosti ovog parametra. U tom slučaju se preporučuje korišćenje drugih parametara kao što su cistatin C i KIM-1.

Ključne reči: pijelonefritis, lipokalin, cistatin C, KIM-1.

THE EFFECT OF INFECTION ON PARAMETERS OF RENAL FUNCTION IN CHILDREN WITH PYELONEPHRITIS

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Introduction: Pyelonephritis is an inflammatory disease of the ascending part of the urinary tract that can lead to kidney failure. Among the early markers of renal failure are lipocalin, cystatin C, kidney injury molecule 1 (KIM-1). The ability of markers for early detection of kidney failure depends on their specificity and they should not be changed in the presence of other pathological conditions.

The Aim: The aim of this study was to investigate the effect of infection on the lipocalin, cystatin C and KIM-1 values.

Materials and Methods: The study involved 33 children, average age 14 months, at the time of admission and discharge from the Department of Nephrology, University Children's Hospital. The duration of hospitalization was an average of 6 days \pm 4.66 SD. As parameters of renal function, cystatin C and lipocalin were determined in serum, whereas lipocalin and KIM-1 were determined in urine.

Results: Lipocalin in urine was significantly different between patients with infection 115.37 ng/mL (91.70-139.05) and patients without infection 67.84 ng/mL (35.42-100.26), $p=0.022$ after 6 days of monitoring. The decline of lipocalin between two determinations was greater in patients without infection with respect to patients with infection (p for interaction=0.016). Values of lipocalin and cystatin C in serum and KIM-1 in urine were not significantly changed.

Conclusion: Lipocalin is not a reliable parameter in monitoring of changes in renal function because the infection can affect the values of this parameter. In this case, it is recommended to use other parameters such as cystatin C and KIM-1.

Keywords: pyelonephritis, lipocalin, cystatin C, KIM-1.

POVEZANOST CISTATINA C I PARAMETARA OKSIDATIVNOG STRESA SA RAZVOJEM ARI KOD DECE NAKON KARDIOHIRURŠKE INTERVENCIJE

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Uvod: Određeni broj studija dovodi u vezu kardiohirurške intervencije kod dece sa povećanim rizikom za razvoj akutne renalne insuficijencije (ARI).

Cilj rada: Cilj ove studije bio je ispitivanje parametara oksidativnog statusa i parametra za procenu funkcije bubrega kao potencijalnih markera za rano procenu rizika za razvoj ARI.

Materijal i metode: U istraživanju je učestvovalo 75-oro dece, prosečne starosti tri godine. Koncentracije cistatina C, lipokalina i KIM-a (kidney injury molecule-1) merene su u tri tačke, neposredno pre, 2h posle i 24h nakon operacije. U istim tačkama određivani su i parametri oksidativno-stresnog statusa. Od parametara oksidativnog stresa merena je koncentracija malondialdehida (MDA), prooksidativno-antioksidativni balans (PAB) i totalni oksidativni status (TOS).

Rezultati: Nivo PAB-a i koncentracije TOS-a i MDA bile su statistički značajno veće kod dece koja su razvila ARI u poređenju sa decom koja nisu i to i pre operacije i u tačkama nakon operacije. Cistatin C nije bio statistički značajno različit pre operacije ali je uočeno da koncentracije postaju statistički značajno više nakon operacije u grupi pacijenata koji su razvili ARI. Univarijantna binarna logistička regresiona analiza je pokazala da cistatin C, kao i parametri oksidativnog stresa imaju značajnu prediktivnu sposobnost za izdvajanje pacijenata koji su razvili ARI. Dijagnostička tačnost cistatina C u kombinaciji sa PAB-om i MDA u procesu odvajanja dece koja su razvila ARI je ocenjena kao odlična (AUC=0,839).

Zaključak: Ovim istraživanjem se ukazuje na potrebu detaljnijeg ispitivanja cistatina C kao i parametara oksidativnog stresa u cilju brže procene rizika za razvoj ARI kod dece, kardiohirurških pacijenata.

Ključne reči: Akutna renalna insuficijencija, cistatin C, PAB, MDA, oksidativni stres

ASSOCIATION OF CYSTATIN C AND OXIDATIVE STRESS PARAMETERS WITH ARF DEVELOPMENT IN CHILDREN AFTER CARDIOSURGICAL TREATMENT

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Introduction: A number of studies indicate that cardiosurgical treatments in children could be associated with high risk of acute renal failure (ARF) development.

Aim of study: The aim of this study was to investigate the oxidative status parameters and parameters of renal function as potential markers for early risk rating for ARF development.

Material and methods: The study included 75 children, average age of three years. The concentrations of cystatin C, lipocalin and kidney injury molecule-1 (KIM-1) were measured at three points, just before, two hours after surgery and twenty four hours after treatment. In the same time, we also measured the parameters of oxidative-stress status. As a parameters of oxidative stress we determined malondialdehyde (MDA), prooxidative-antioxidative balance (PAB) and total oxidative status (TOS).

Results: PAB levels, TOS concentrations and MDA concentrations were significantly higher in children who developed ARF, before the intervention also as after surgery. Cystatin C was not significantly different before surgery but after the intervention cystatin C concentrations became significantly higher in patients with ARF. Univariate binary logistic regression analysis showed that cystatin C, and parameters of oxidative stress have significant predictive ability in process of discrimination the patients who developed ARF. Diagnostic accuracy of cystatin C in combination with PAB and MDA in discrimination the patients who develop ARI was rated as excellent (AUC = 0.839).

Conclusion: The results of this study indicates the need for further investigation of cystatin C also as oxidative stress parameters in ARI connected pathologies in children.

Key words: Acute renal failure, cystatin C, PAB, MDA, oxidative stress.

PARAMETRI OKSIDATIVNOG STATUSA KOD DECE SA AKUTNIM PIJELONEFRITISOM
KAO POKAZATELJI DUŽINE TRAJANJA AKUTNE INFLAMACIJE I RAZVOJA BUBREŽNE INSUFICIJENCIJE

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Uvod: Akutni pijelonefritis (APN) predstavlja inflamatorno oboljenje bubrežnog tubulointersticijuma. Inflamatorni proces se karakteriše povećanim oksidativnim stresom i može da progredira u hronični oblik i dovede do insuficijencije bubrega.

Cilj: Cilj rada je da se utvrdi povezanost parametara oksidativno-stresnog statusa sa trajanjem akutne infekcije i rizikom za razvoj insuficijencije bubrega kod dece sa APN.

Materijal i metode: Ispitivanjem je obuhvaćeno 33 dece, prosečnog uzrasta 14 meseci, na prijemu i u vreme otpuštanja sa Odeljenja nefrologije, Univerzitetske dečje klinike. Boravak u bolnici je prosečno trajao 6 dana \pm 4,66 SD. U serumu su određeni totalni oksidantni status (TOS), totalni antioksidantni status (TAS) i prooksidativno-antioksidativni balans (PAB), marker inflamacije C-reaktivni protein (CRP) i parametri bubrežne funkcije, urea i kreatinin. Ispitanici su podeljeni u grupe prema vrednostima CRP-a u vreme otpuštanja iz bolnice (CRP>10 mg/L- produžena infekcija i CRP<10 mg/L-odsustvo infekcije) i riziku za oštećenje bubrega (urea i kreatinin>90-og percentila i urea i kreatinin<90-og percentila).

Rezultati: Utvrđeno je da se sa povećanjem vrednosti TAS-a, povećava i verovatnoća za dužu infekciju (OR=14,47; P=0,046), kao i da TAS poseduje umerenu tačnost za razdvajanje pacijenata sa različitim verovatnoćom za produženu infekciju (AUC=0,756; p<0,001).

Pokazano je da se sa sniženjem vrednosti PAB-a značajno povećava verovatnoća za bubrežnu insuficijenciju (OR=0,994; 95%CI=0,988-0,999) i da PAB ima dobru sposobnost (AUC=0,869; p<0,001) razdvajanja dece sa velikom i malom verovatnoćom za oštećenje bubrega.

Zaključak: Povišene vrednosti TAS-a i snižene vrednosti PAB-a povezane su sa većom verovatnoćom nastanka duže inflamacije i bubrežne insuficijencije, odnosno mogli bi da posluže u diferencijalnoj dijagnostici i prognozi toka bolesti.

Ključne reči: oksidativni stres, akutni pijelonefritis, bubrežna insuficijencija, inflamacija

OXIDATIVE STRESS PARAMETERS IN CHILDREN SUFFERING FROM ACUTE PYELONEPHRITIS
AS INDICATORS OF ACUTE INFLAMMATION PERSISTENCE AND KIDNEY FAILURE DEVELOPMENT

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Introduction: Acute pyelonephritis (APN) is an inflammatory renal tubulointerstitial disease. The inflammation is characterized by increased oxidative stress and can progress into a chronic form and lead to kidney failure.

Aim: The aim of this study was to determine the correlation between oxidative-stress status parameters and acute inflammation persistence and renal failure development in children with APN.

Material and methods: The study included 33 children, averagely 14 months old, on admission and during hospital discharge. The average hospital stay lasted 6 \pm 4,66 SD days. Total oxidant status (TOS), total antioxidant status (TAS) and prooxidant-antioxidant balance (PAB), inflammation marker C-reactive protein (CRP) and renal function parameters, urea and creatinine, were analyzed in patients' serums. Patients were compared regarding the presence of infection (CRP>10-infection present; CRP<10 mg/L-infection absent) and the degree of renal impairment (urea and creatinine>90th percentile; urea and creatinine<90th percentile).

Results: It was determined that increasing TAS values increase the likelihood of a longer infection (OR=14,47; P=0,046), and that TAS has a moderate accuracy potential for separating patients with different probability of longer infection (AUC=0,756; p<0,001).

It was shown that decreasing PAB values significantly increase the likelihood of developing renal failure (OR=0,994; 95%CI=0,988-0,999) and that PAB has a good discriminatory ability for separating children with high from those with low renal impairment probability (AUC=0,869; p<0,001).

Conclusion: Higher values of TAS and reduced values of PAB are associated with higher probability of prolonged inflammation and renal failure occurrence and could be used for differential diagnosis and prognosis of the disease.

Key words: oxidative stress, acute pyelonephritis, renal failure, inflammation

PRACENJE BIOMARKERA CITOLIZE HEPATOCITA U SERUMU BOLESNIKA
SA AKUTNIM VIRUSNIM HEPATITISOM TIPA A

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Uvod. Tokom akutnog virusnog hepatitisa (AVH) oštećenje hepatocita obuhvata samo citoplazmatski prostor iz koga se aspartat aminotransferaza (AST) i alanin aminotransferaza (ALT) izliva u serum u približno istim količinama. Međutim, aktivnost ALT je uvek viša od aktivnosti AST, što se dešava uglavnom zbog brže inaktivacije AST, kao i zbog prethodne lokalizacije AST u mitohondrijama hepatocita.

Cilj. Ispitivanje sindroma citolize hepatocita tokom AVH merenjem aktivnosti ALT, citoplazmatske AST, ukupne laktat dehidrogenaze (LDH) i jetrinih izoenzima LDH (LDH₄ i LDH₅).

Materijal i metode. Ispitivanjem je obuhvaćeno 45 bolesnika sa AVH. Svaki ispitanik je podvrgnut venepunkciji: na prijemu, 5-7. dana hospitalizacije, 12.-14. dana, 20.-22. dana i na otpustu sa klinike. Kontrolnu grupu je činilo 30, HIV i HbsAg negativnih, davalaca krvi. Aktivnost AST, ALT i ukupne LDH određivana je standardnim biohemijskim metodama, dok je za izdvajanje izoenzima LDH korišćen rastvor uree (2mol/L).

Rezultati. Tokom prve nedelje hospitalizacije izmerena je maksimalna aktivnost ALT i AST u serumu bolesnika, kao i značajno povećanje odnosa ALT/AST u odnosu na kontrolnu grupu (p<0.001). Maksimalno povećanje aktivnosti izoenzima jetre LDH₄ i LDH₅ bilo je u prvoj nedelji hospitalizacije, što je uticalo na povećanje aktivnosti ukupne LDH u serumu. Značajna povezanost aktivnosti enzima ALT (U/L) i LDH_{4,5} (U/L) (r=0.68), kao i AST (U/L) i LDH_{4,5} (U/L) (r=0.67) (p<0.001) u serumu ispitanika, pri korelacionoj analizi, ukazuje na povećanu propustljivost ćelijskih membrana inficiranih hepatocita.

Zaključak. U serumu obolelih od AVH postoji izrazit porast aktivnosti enzima koji ukazuju na citolizu hepatocita: ALT, AST ukupna LDH i jetrini izoenzimi laktat dehidrogenaze LDH₄ i LDH₅.

Ključne reci: hepatociti, izoenzimi, alanin aminotransferaza, aspartat aminotransferaza.

MONITORING OF BIOMARKERS HEPATOCYTE INJURY IN THE SERUM
OF PATIENTS WITH ACUTE VIRAL HEPATITIS A

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Introduction: During acute viral hepatitis (AVH) covers only damage to the hepatocyte cytoplasmic space from which the aspartate aminotransferase (AST) and alanine aminotransferase (ALT) released into the serum in approximately equal amounts. However, ALT activity was always higher than the activities of AST, which is mainly due to faster inactivation of AST and the AST predominant localization in the mitochondria of hepatocytes.

Aim: Testing syndrome injury hepatocytes during AVH measuring ALT activity, cytoplasmic AST, total activity lactate dehydrogenase (LDH) and liver LDH isoenzymes (LDH4 and LDH5).

Materials and methods: The study involved 45 patients with AVH. Each subject underwent venipuncture: on admission, 5-7. hospital days, 12.-14. days, 20.-22. days and at discharge from the clinic. The control group consisted of 30, HIV and HbsAg negative, blood donors. Activity of AST, ALT and total LDH was determined by standard methods, while the separation of LDH isoenzymes used urea solution (2mol/l).

Results: During the first week of hospitalization was measured maximal activity of ALT and AST in the serum of patients and a significant increase in ALT / AST in comparison to the control group (p < 0.001). The maximum increase in activity of the liver isoenzyme LDH4 LDH5 and was the first week of hospitalization, which resulted in the increase of total LDH activity in serum. Significant association of the enzyme ALT activity (U/l) and LDH4-5 (U/l) (r = 0.68) and AST (U/l) and LDH4-5 (U/l) (r = 0.67) (p < 0.001) in patients, the correlation analysis, indicating increased permeability of cell membranes of infected hepatocytes.

Conclusion: In the serum of patients with AVH is a marked increase in enzyme activity indicating injury hepatocytes: ALT, AST, total LDH and liver isoenzymes lactate dehydrogenase LDH4 LDH5.

Keywords: hepatocytes, isoenzymes LDH, alanine aminotransferase, aminotransferase aspartat.

**NIVO LIPIDNIH PEROKSIDA I OKSIDACIONIH PRODUKATA PROTEINA,
AKTIVNOST KATALAZE KOD PACIJENATA OBOLELIH OD HRONIČNOG PROSTATITISA**

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Uvod: Hronični bakterijski prostatitis (klasifikovan kao kategorija II prostatitisa od strane Nacionalnog instituta za zdravlje) se dijagnostikuje kada se pozitivne bakterijske kulture dokažu u prostatičnoj tečnosti. U kategoriju IIIa klasifikovani su pacijenti kod kojih nije dokazano prisustvo bakterija u prostatičnoj tečnosti ali je prisutan inflamatorni infiltrat u sekretu prostate. Lipidna peroksidacija je najizraženiji negativni mehanizam u delovanju RVK. Uznepredovali produkti oksidacije proteina (AOPP) se formiraju tokom povišenog nivoa oksidativnog stresa. Katalaza (EC 1.11.1.6) je oksidoreduktaza koja se ubraja u enzime primarne antioksidativne zaštite.

Cilj rada: Cilj ovog istraživanja bio je da se utvrdi nivo oksidativnog stresa izražen kroz koncentracije TBARS i AOPP, kao i aktivnost katalaze kao jednog od enzima antoksidativne zaštite u pacijenata obolelih od hroničnog prostatitisa u odnosu na zdrave ispitanike.

Materijal i metode: U ispitivanje je uključeno 27 ispitanika od kojih je 17 bolesnika sa dijagnostikovanim hroničnim prostatitisom i 10 zdravih ispitanika podeljenih u 3 grupe u odnosu na tip bolesti. Koncentracija TBARS u homogenatu, određivana je spektrofotometrijskom metodom po Andreevoj i sar. Koncentracija AOPP u tkivu određivala se spektrofotometrijskom metodom po Vitku i sar.

Rezultati: Nivo TBARS i AOPP i je statistički značajno povišen kod pacijenata sa hroničnim prostatitisom tip II i IIIa u odnosu na zdrave ispitanike ($p < 0,001$).

Zaključak: Oksidativni stres je fenomen usko povezan sa tokom bolesti kod pacijenata obolelih od hroničnog prostatitisa što se ogleda kroz povećan nivo TBARS i AOPP uz smanjenje aktivnosti katalaze.

Ključne reči: Hronični prostatitis, TBARS, AOPP, katalaza

**LEVEL OF LIPID PEROXIDE AND PROTEIN OXIDATION PRODUCTS,
CATALASE ACTIVITY IN PATIENTS WITH CHRONIC PROSTATITIS**

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Introduction: Chronic bacterial prostatitis (classified as category II prostatitis by the National Institutes of Health) is diagnosed when a positive bacterial culture of prostatic fluid is proved. In IIIa category are classified patients who have no proof of the presence of bacteria in prostatic fluid but in prostatic fluid inflammatory infiltrate is present. Lipid peroxidation is the most negative mechanism in action of the ROS. Advanced oxidation protein products (AOPP) are formed during high levels of oxidative stress.

The Aim: The aim of this study was to determine the level of oxidative stress expressed through the concentration of TBARS and AOPP, and catalase activity as one of the antioxidant enzyme in the plasma of patients with chronic prostatitis compared to healthy subjects.

Materials and methods: The study included 27 patients of whom 17 patients diagnosed with chronic prostatitis and 10 healthy subjects divided into 3 groups according to type of disease. The concentration of TBARS in the homogenate was determined by spectrophotometric method by Andreeva et al. AOPP concentrations in the tissue was measured by the spectrophotometric method by Vitko.

Results: The level of TBARS and AOPP were significantly higher in patients with chronic prostatitis type II and IIIa compared to healthy subjects ($p < 0.001$).

Conclusion: Oxidative stress is a phenomenon closely related to the course of disease in patients with chronic prostatitis which is reflected in increased levels of TBARS and AOPP with the reduction of catalase activity.

Key words: chronic prostatitis, TBARS, AOPP, catalase

**ЕФЕКАТ ЈОНА НАТРИЈУМА И ХОЛИНА НА АКТИВНОСТ
АДЕНИЛАТ ЦИКЛАЗЕ КОРЕ МОЗГА ПАЦОВА**

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Увод: Ензими који катализују синтезу сАМР-а из АТР-а припадају фамилији аденилат циклaza (AC). Активност ензима регулисана је екстра и интрацелуларним стимулусима. Моновалентни јони представљају основне саставне компоненте свих ћелија. Ефекат деловања неуротрансмитера у CNS-у заснива се на промени пропустљивости мембране неурона за моновалентне и дивалентне јоне. Неуротрансмитери могу директно и/или индиректно да утичу на пропустљивост мембране неурона за наведене јоне, као и на активност Na,K-АТРазе. Неуротрансмитери у CNS-у који користе AC систем, индиректно, путем промене продукције и садржаја сАМР-а, утичу на пропустљивост и активни транспорт поменutih моновалентних катјона.

Циљ: Циљ нашег експеримента био је испитивање деловања моновалентних јона NaCl-а и холин Cl-а на активност аденилат циклaзног система коре мозга пацова.

Материјал и методе: Након декапитације и одвајања коре мозга мужјака пацова соја Wistar, испитиван је ефекат различитих концентрација NaCl-а и холин Cl-а на активност аденилат циклaзног система. Концентрације испитиваних соли кретале су се од 1–200 mM. Изолација синаптичких мембрана извршена је по методи Gurd-а и сарадника, а активност комплекса AC је одређивана према количини синтетисаног сАМР-а у јединици времена у односу на 1 mg протеина AC комплекса. Садржај синтетисаног сАМР-а одређиван је по методи Geisler-а и сарадника.

Резултати: Наши резултати су показали да деловањем моновалентних јона холина⁺ и Na⁺ у распону од 30 до 200 mM у присуству 1mM MgCl₂ долази до статистички значајног смањења активности аденилат циклaзног система. При концентрацијама јона Mg²⁺ од 10 mM и 100 mM MgCl₂, моновалентне соли холина и натријума нису мењале активност аденилат циклaзе. Статистички сигнификантни инхибиторни ефекат на активност AC примећен је приликом стимулације активности AC са 5 μM GTPγS у комбинацији са растућим концентрацијама холин-Cl и NaCl. **Закључак:** У зависности од концентрација јона MgCl₂, испитивани јони холина⁺ и Na⁺ испољавали су инхибиторни ефекат на активност AC.

Кључне речи: Аденилат циклaза, моновалентни јони, кора мозга.

**EFFECTS OF SODIUM AND CHOLINE IONS ON THE ACTIVITY OF ADENYLATE CYCLASE SYSTEM
IN RAT BRAIN CORTEX**

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Introduction: The enzymes that catalyze synthesis of the cyclic AMP (cAMP) from ATP represent a large family of enzymes referred as adenylate cyclases (AC). The activity of AC is regulated both by extracellular and intracellular ligands. Monovalent ions represent basic compounds of all cells. The effect of the CNS neurotransmitters is based on the changes in permeability of membranes for both monovalent and divalent ions. Neurotransmitter can directly or indirectly affect the permeability of the neuron membranes for mentioned ions, as well as on the Na,K-ATPase activity. Neurotransmitter that use AC system, changing both the production and the amount of cAMP, demonstrate indirect effect on both the permeability and active transport of mentioned ions.

Aim: The aim of our study was to determine the effect of both choline⁺ and Na⁺, in the form of their Cl⁻ salts, on the AC activity in the synaptic membranes of rat brain cortex.

Methods: After both the decapitation and the brain cortex removal of male Wistar rats, the effect of the different concentrations of NaCl and choline Cl on the activity of adenylate cyclase was investigated. The concentration range of investigated salts ranged from 1 to 200 mM. The isolation of the synaptic membranes was performed according to Gurd et al., the AC complex activity was determined by the amount of synthesized cAMP per time in correlation to 1 mg of proteins of the AC complex. The amount of the synthesized cAMP was measured according to Geisler and colleagues.

Results: Our results demonstrated statistically significant inhibitory effect of both choline⁺ and Na⁺ (from 30 to 200 mM in the presence of 1 mM MgCl₂) on the AC activity. In the presence of higher Mg²⁺ ions concentrations (10 mM and 100 mM MgCl₂), tested monovalent ions did not significantly affect the AC activity. In the stimulated AC with 5 μM GTPγS there was statistically significant inhibitory effect on AC activity as a function of increasing concentration of Na⁺ and choline⁺. However, the increased concentrations of tested monovalent ions did not change the GTPase activity of G-protein in AC complex in the presence of 0.5 μM GTP.

Conclusion: Therefore, monovalent ions Na⁺ and choline⁺ demonstrated inhibitory effect on the AC activity directly correlating to Mg²⁺ concentration.

Key words: Adenylate cyclase, monovalent ions, brain cortex.





DERMATOVENEROLOGIJA

POUZDANOST KLINIČKE I DERMOSKOPSKE DIJAGNOZE TUMORA KOŽE MALIH DIMENZIJ

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Uvod. Tumori kože su najčešći tumori čoveka. Među tumorima kože svakako najznačajnije mesto pripada malignom melanomu. To je jedan od najmalignijih tumora čoveka sa izraženom sklonošću za ranim davanjem limfogenih i hematogenih metastaza, sa alarmirajućim porastom incidence tokom poslednjih decenija.

Cilj rada. Ispitati pouzdanost kliničke i dermoskopske dijagnoze pri pregledu tumora kože malih dimenzija.

Materijal i metode. Ispitano je 30 tumorskih promena kože malih dimenzija kod 57 osoba od čega je bilo 24 muškaraca i 33 žena, starosti od 11 do 85 godina, srednjeg godišta 44.77. Istraživanje je obavljeno na Klinici za kožne i polne bolesti u Nišu.

Rezultati. Maligni melanom je patohistološki dijagnostikovao u 8.77% slučajeva, od čega je lentigo maligni melanom u 3.51%. Najčešće sumnjive lezije koje su ekscipirane i patohistološki verifikovane pripadale su grupi nevusa. Displastični nevusi bili su najčešće promene koje su izazivale sumnju (22.81%) Klinička dijagnoza malignog melanoma slagala se sa patohistološkom u 40.00%. Od svih tumorskih lezija seboreična keratoza je najčešće klinički tačno dijagnostikovana (83.33%). Tačnost dermoskopske dijagnoze za maligni melanom iznosila je 80.00%, odnosno u tom procentu su se dermoskopska i patohistološka dijagnoza slagale.

Zaključak. Dermoskopija kao pomoćna metoda značajno poboljšava kliničku dijagnozu malignog melanoma u ranom stadijumu razvika, u odnosu na klinički pregled značajno poboljšava dijagnostičku tačnost za sve tumorske lezije sem za seboreičnu keratozu gde je preciznost kliničke dijagnoze iznosila 83.33%.

Ključne reči: maligni melanom, dermoskopija

RELIABILITY OF CLINICAL AND DERMOSCOPIC DIAGNOSIS OF SKIN CANCERS OF SMALL DIMENSIONS

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Introduction. Skin tumors are the most common human tumors. Among tumors of the skin is certainly the most important place belongs to melanoma. This is one of the most malignant human tumors with a marked propensity for early and giving metastases, with the alarming increase in incidence in recent decades.

The Aim. To examine the reliability of clinical and dermoscopic diagnosis for viewing small skin tumors of small size.

Materials and methods. We examined 57 people (24 men and 33 women) with clinical and dermoscopic methods, aged 11 to 85 years, mean age 44.77. The study was conducted at the Department of Dermatology and venereal diseases in Niš.

Results. Melanoma was histologically diagnosed in 8.77% cases, of which the lentigo malignant melanoma at 3.51%. Most often suspicious lesions that are excised and histologically verified belonged to a group of nevi. Dysplastic nevi were the most common changes that gave rise to suspicion (22.81%) Clinical diagnosis of melanoma with histopathologic match at 40.00%. Of all tumor lesions seboreic keratosis is usually diagnosed clinically accurate (83.33%). Accuracy of dermoscopic diagnosis of melanoma was 80.00%, respectively in the percentage of the dermoscopic and histopathological diagnosis disagreed.

Conclusion. Dermoscopy as an auxiliary method significantly improves the clinical diagnosis of malignant melanoma in early stages of development, in relation to the clinical examination significantly improves diagnostic accuracy for all the lesions of seboreic keratosis, except for where the accuracy of clinical diagnosis was 83.33%.

Keywords: malignant melanoma, dermoscopy

DERMATITIS HERPETIFORMIS DUHRING NA KLINICI ZA DERMATOVENEROLOGIJU KCS U BEOGRADU U PERIODU OD JANUARA 2002. DO JANUARA 2012. GODINE

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Uvod: Dermatitis herpetiformis Duhring (DHD) je pruriginozno, hronično, papulo-vezikulozno (bulozno) oboljenje koje je udruženo sa asimptomatskom ili simptomatskom gluten senzitivnom enteropatijom (celijačna bolest (CB)) i granularnim IgA depozitima u vrhovima dermalnih papila.

Cilj: analiza učestalosti DHD među polovima i starosnim grupama lečenih pacijenata, dužine trajanja simptoma pre postavljanja dijagnoze i učestalost CB.

Materijal i metode: U retrospektivnoj studiji je pregledana i analizirana medicinska dokumentacija - istorije bolesti i kartoni pacijenata Klinike za dermatovenerologiju KCS, Medicinski fakultet, Univerziteta u Beogradu, u periodu od januara 2002. do januara 2012. godine. Podaci su obrađeni tabelarno, grafički i statistički.

Rezultati: Ispitivana grupa sastojala se od 24 ispitanika muškog pola (54,5%) i 20 ženskog pola (46,5%) bez značajne razlike u distribuciji po polu ($t=0.364$, $p=0.546$), uzrasta 9- 75 godina. Dužina trajanja simptoma DHD pre postavljanja dijagnoze: 61,4% pacijenata je imalo simptome godinu dana, 15,9% je imalo simptome u trajanju od 1-5 godina a 22,7% je imalo simptome preko 5 godina ($t=15.864$, $p=0.000$). Učestalost CB kod pacijenata obolelih od DHD je prosečno 18,2%. Kod pacijenata starijih od 30 godina, učestalost CB iznosi 25%, dok kod mlađih od 30 godina iznosi 75% što je statistički visoko signifikantno ($t=9.705$, $p=0.002$).

Zaključak: DHD se smatra kožnom manifestacijom glutenske preosetljivosti. Uprkos ovoj činjenici, većina pacijenata sa DHD ima klinički asimptomatsku CB, pogotovo kod pacijenata starijih od 30 godina. Najčešće trajanje simptoma pre postavljanje dijagnoze je godinu dana. Značajno češće oboljevanje od CB je kod mlađih od 30 godina.

Ključne reči: Duhring, dermatitis herpetiformis, gluten, celijačna bolest, uzrast

DERMATITIS HERPETIFORMIS DUHRING IN THE CLINIC OF DERMATOVENEROLOGY KCS IN BELGRADE IN THE PERIOD JANUARY 2002. - JANUARY 2012.

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Introduction: Dermatitis herpetiformis Duhring (DHD) is a pruritic, chronic, papulo-vesiculous (bullous) disease associated with symptomatic or asymptomatic gluten sensitive enteropathy (celiac disease (CD)) and granular IgA deposits in the tips of dermal papillae.

The Aim: To analyse DHD incidence, sex and age distribution of the patients, the duration of symptoms before diagnosis, and the frequency of CD.

Material and Methods: This study reviewed and analyzed medical records – hospital and outpatients of the Clinic of Dermatovenerology KCS, Faculty of Medicine, University of Belgrade in the period January 2002. - January 2012. Data were analyzed tabelar, graphical and statistical.

Results: The study included 24 men (54.5%) and 20 women (46.5%) without statistically significant difference between sexes ($t=0.364$, $p=0.546$) aged 9-75 years. Duration of symptoms before the diagnosis of DHD: 61.4% of patients had symptoms one year, 15.9% had symptoms lasting 1-5 years and 22.7% had symptoms for over 5 years ($t=15.864$, $p=0.000$). The frequency of CD among patients with DHD was 18.2%. The frequency of CD is 25% in older than 30 years, and 75% in the younger ones. This was statistically highly significant ($t=9.705$, $p=0.002$).

Conclusion: The DHD is considered a cutaneous manifestation of gluten hypersensitivity. However, most patients with DHD had clinically asymptomatic CD, especially older than 30 years. The most frequent duration of symptoms before establishing the diagnosis was within one year. Younger than 30 years, significantly more frequent develop CD.

Keywords: Duhring, dermatitis herpetiformis, gluten, celiac disease, age

UZROČNICI KOLONIZACIJE I INFEKCIJE ULKUSA NA POTKOLENICI

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Uvod: Mešovita infekcija često prati pojavu ulkusa na potkolenicama bez obzira na etiologiju, pri čemu je potrebno razlikovati bakterijsku kontaminaciju od infekcije. Cilj rada je da se ispita mikrobn flora ulkusa kod pacijenata lečenih na Klinici za dermatovenerologiju Kliničkog centra Srbije, kao i eventualna povezanost sa faktorima komorbiditeta (dijabetes, gojaznost, malignitet, deficit imuniteta) i pojavom infekcije.

Materijal i metode: Retrospektivna klinička studija je obuhvatila 100 pacijenata kojima je prilikom prijema u bolnicu uziman bakteriološki bris dna ulceracije. Podaci su dobijeni iz istorija bolesti pacijenata, a obrađeni su metodama deskriptivne i analitičke statistike (procena učestalosti, relativni brojevi, hi kvadrat test).

Rezultati: Od ukupno 212 briseva, *Pseudomonas aeruginosa* je izolovan kod 118 (55,66%), *Staphylococcus aureus* kod 105 (49,53%), a izolovane su i druge vrste bakterija u znatno manjem procentu. Celulitisom su bile praćene 33 ulceracije (15,57%) koje većinom nisu bile udružene sa faktorima komorbiditeta, a njihov mikrobiološki profil se nije značajno razlikovao od ostalih.

Zaključci: *Pseudomonas aeruginosa* je u našoj studiji dominantna bakterijska vrsta (28,30%), dok je u literaturi procentualno najviše zastupljen *Staphylococcus aureus*. Od 100 naših pacijenata, 33 je imalo faktore komorbiditeta, pri čemu je dijabetes bio najviše zastupljen. Bakteriološki profil ulceracija kod pacijenata koji su imali faktore komorbiditeta nije se razlikovao od profila ostalih ulceracija. Samo mali broj pacijenta sa ulkusom ima kliničke znakove infekcije, pa treba izbegavati dugotrajne ili učestale antibiotske terapije kada to nije neophodno.

Ključne reči: ulkusa na potkolenici, celulitis, bakteriološki profil

THE CAUSES OF COLONIZATION AND INFECTION OF THE LOWER LEG ULCERS

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Introduction: Mixed bacterial infections often follow the appearance of ulcers on the lower legs, regardless of etiology, with the need to make a difference between bacterial infections and colonization.

The Aim: to determine the microbiological profile of ulcers in patients treated at the Department of Dermatovenerology, Clinical Center of Serbia, and possible association with comorbid factors (diabetes, obesity, malignancy, immune deficiencies) and the occurrence of infection.

Material and Methods: A retrospective clinical study included 100 patients of whom bacterial swab from ulcer was taken on admission to hospital. Data were obtained from the medical records of patients and were analyzed by descriptive and analytical statistics.

Results: Of the 212 swabs, *Pseudomonas aeruginosa* was isolated in 118 (55.66%), *Staphylococcus aureus* in 105 (49.53%); other types of bacteria were isolated in a lower percentage. Cellulitis followed 33 ulcers (15.57%); most of them were not in association with factors of comorbidity, and their microbiological profile was not significantly different.

Discussion: In our study, *Pseudomonas aeruginosa* was the dominant bacteria (28.30%), while in the literature dominant was *S.aureus*. Among our 100 patients, 33 had comorbid factors, with the diabetes as the most frequent. Bacteriological profile of ulcerations in patients who had comorbid factors was not different from the profiles of other ulcerations. Small number of patients with ulcer disease has clinical signs of infection and therefore long-term or repeated antibiotic therapy in these patient should be avoided if it is not necessary.

Key words: lower leg ulcer, cellulitis, bacteriological profile

KLINIČKE KARAKTERISTIKE I TERAPIJA TINEAE CAPITIS KOD DECE U NOVOM SADU 2007.-2012.GODINE

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Uvod: Tinea capitis, gljivična infekcija kapilicijuma, se najčešće javlja u dečijem uzrastu.

Cilj: Cilj istraživanja je bio utvrditi kliničke karakteristike i predstaviti terapiju gljivične infekcije kapilicijuma kod dece.

Materijal i metode: Ispitivanje je sprovedeno kao retrospektivna studija bolesnika uzrasta od 0 do 18 godina, lečenih na Odseku za dermatologiju u Institutu za zdravstvenu zaštitu dece i omladine Vojvodine u Novom Sadu, od Januara 2007. do Januara 2012. godine. Istraživanjem je obuhvaćeno 79 pacijenata sa dijagnozom Tinea capitis; 32 devojčice i 47 dečaka. Pacijenti su pregledani klinički i pod Woodovom lampom, a uzorci mikroskopski i kultivisani na Sabouraudovom agaru.

Rezultati: Superfijalna Tinea capitis je dijagnostikovana kod 51 (64,56%), a kerion Celsi kod 28 (35,44%) pacijenata. Najčešći uzročnik je bio *Microsporum canis*, kod 21/50 ispitanika (42%), dok je *Trichophyton mentagrophytes* izolovan kod 14/50 (28%) dece. U terapiji smo koristili terbinafin kod 37 (46,83%) pacijenata, ketokonazol kod 26

(32,91%) i itraconazol kod 3 (3,79%) pacijenta.

Kod 13 ispitanika (16,45%) lečenje je nakon jednog antimikotika nastavljeno drugim. Svi pacijenti su pored sistemske terapije primenjivali i lokalnu terapiju s imidazolskim preparatima, šamponom i kremom, uz epilaciju. Postignuto je izlečenje kod 100% pacijenata.

Zaključak: U periodu od 2007. do 2012. *Microsporum canis* je bio najčešći uzročnik Tinea capitis. Terbinafin, ketokonazol i itraconazol su bili efikasni i bezbedni lekovi u terapiji gljivične infekcije kapilicijuma kod dece.

Ključne reči: tinea capitis, deca, terapija.

CLINICAL CHARACTERISTICS AND THE THERAPY OF TINEAE CAPITIS IN CHILDREN IN NOVI SAD FROM 2007-2012.

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Introduction: Tinea capitis is a fungal infection of the scalp, the most common in childhood.

The aim: The aim of this study was to establish the clinical characteristic and to present management options of tinea capitis in children.

Materials and methods: The retrospective study included patients aged 0 to 18 age, treated at the Department of Dermatology at the Institute for child and youth health care of Vojvodina in Novi Sad, from January 2007 to January 2012. The research included 79 patients with diagnosis of tinea capitis; 32 girls and 47 boys. Patients were examined clinical and with Wood's light, and the samples were subjected to direct microscopic examination and cultivated on Sabouraud's agar.

Results: Superficial tinea capitis was diagnosed in 51 (64,56%), while kerion Celsi was found in 28 (35,44%) of patients. The most common etiologic agent was *Microsporum canis* in 21/50 (42%), while *Trichophyton mentagrophytes* was positive in 14/50 (28%) children. Terbinafine was used in 37 (46,83), ketoconazole in 26 (32,91%) and itraconazole in 3 (3,79%) patients. In 13 cases (16,45%) after one antimicrobial, therapy was continued with another drugs. In all patients, topical imidazole shampoo and cream are used after the epilation, together with systemic therapy. The cure rate was 100%.

Conclusion: During the period between 2007-2012. *Microsporum canis* was the most causative agent of tinea capitis. Terbinafine, ketoconazole and itraconazole were effective and safe in therapy of the scalp infection in children.

Key words: tinea capitis, children, therapy.

ANALIZA ZNANJA, STAVOVA I PONAŠANJA BEOGRADSKE SREDNJOŠKOLSKE POPULACIJE PO PITANJU IZLAGANJA PRIRODNIIM I VEŠTAČKIM IZVORIMA UV ZRAČENJA

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Uvod: Incidencija melanoma je u stalnom porastu širom sveta. UV radijacija, bleđa put, prisustvo i broj nevusa kao i pozitivna porodična anamneza su najvažniji faktori rizika za njegov razvoj. Produženo izlaganje suncu u detinjstvu i adolescenciji povećava rizik za nastanak raka kože u odraslom dobu.

Cilj: Cilj ovog rada je da se analizira znanje, stavovi i ponašanje beogradske srednjoškolske populacije po pitanju izlaganja prirodnim i veštačkim izvorima UV zračenja.

Materijal i metode: Studija je izvedena anketiranjem 549 učenika 3. i 4. razreda u 4 beogradske srednje škole. Anketa se sastojala od 32 pitanja: pitanje o polu, mesecu i godini rođenja, stepenu obrazovanja roditelja, 9 pitanja o upotrebi solarijuma, 9 pitanja o ponašanju na suncu tokom letnjih meseci, 4 pitanja o ličnoj i porodičnoj anamnezi i fototipu kože, kao i 7 pitanja o stavu i opštoj informisanosti o štetnosti UV zračenja. Od statističkih metoda korišćeni su procena učestalosti i relativni brojevi, kao metode deskriptivne statistike.

Rezultati: Čak 39% ispitanika je koristilo solarijum bar jednom u životu, 38% planira da ga koristi i u budućnosti. Četvrtina anketiranih provodi više od 3 sata leti na plaži bez zaštite, a svega trećina njih nije izgorela nijednom prošlog leta. Preko polovine nikada ne štiti mladeže prilikom sunčanja. Samo polovina đaka zna šta je melanom, dok je 37% odgovorilo da ne zna.

Zaključak: Svest o faktorima rizika koje nosi izlaganje suncu, kao ni opšta informisanost o melanomu kao oboljenju nije na zavidnom nivou među beogradskom srednjoškolskom populacijom. Stoga je od ključne važnosti sprovođenje edukativnih programa u srednjim školama.

Ključne reči: rak kože, UV zraci, srednjoškolska populacija

ANALYSIS OF KNOWLEDGE, ATTITUDES AND BEHAVIOUR REGARDING EXPOSURE TO NATURAL AND ARTIFICIAL UV RADIATION AMONG BELGRADE HIGHSCOOL STUDENTS

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Introduction: The incidence of melanoma has been increasing worldwide. UV radiation, fair skin, nevi and family history of melanoma are major risk factors for melanoma development. Extended sun exposure during childhood or adolescence increases the probability of skin cancer in adulthood.

The aim: The aim of this study was to analyse knowledge, attitudes and behaviour regarding exposure to natural and artificial UV radiation among Belgrade highschool students.

Material and methods: The study was conducted using questionnaire among 549 students of 3rd and 4th grade in 4 Belgrade highschools. The questionnaire had 32 questions: questions about gender, date and month of birth and parent's education, 9 questions regarding sunbed use, 9 questions regarding behaviour in sun during summer months, 4 questions regarding personal and family history and phenotypic skin type as well as 7 questions regarding attitude and general knowledge about effects of UV radiation. As for statistical methods, assesment of frequency rate and relative numbers were used as methods of descriptive statistics.

Results: As many as 39% of participants had used sunbed at least once, 38% plan on using it in the future. One quarter spends more than 3 hours in the sun on the beach during summer without any protection, only one third of participants had not experienced sunburn during last summer. Over half of them never protects their moles during sunbathing. Only one half of students knows what melanoma is, while 37% stated that they do not know.

Conclusion: General awareness of risk factors regarding sun exposure as well as general knowledge about melanoma are not on high level among Belgrade highschool students. Therefore, it is extremely important to conduct adequate education programmes in highschools.

Key words: skin cancer, UV radiation, highschool students

KLINIČKO-EPIDEMIOLOŠKA ANALIZA PACIJENATA SA PEMFIGUSOM LEČENIH NA KDV KCS U PERIODU 2007-2011. GODINE

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Uvod: Pemfigus je autoimunska, organ-specifična dermatozna, koja zahvata kožu i sluznice i ako se ne leči najčešće se završava letalnim ishodom.

Ciljevi rada: Analizirati epidemiološke (pol, uzrast) i kliničke (vrsta oboljenja, lokalizacija, morfologija lezija, principi lečenja) parametre, kao i smrtnost obolelih u odnosu na pol.

Materijal i metode: Retrospektivnom studijom obuhvaćeni su pacijenti hospitalno lečeni na Klinici za dermatovenerologiju Kliničkog centra Srbije (KDV KCS), u periodu od 2007-2011. godine. Podaci su prikupljeni iz medicinske dokumentacije: ambulantni karton i bolnička istorija bolesti, a obrađivani metodama deskriptivne i analitičke statistike.

Rezultati: Prikazani su deskriptivno, tabelama i grafikonima. Od ukupnog broja obolelih oboljenje se javilo kod 65 muškaraca i 75 žena (odnos polova, približno: 1:1,2). Najčešća forma bolesti je pemfigus vulgaris (70,8% muškaraca i 78,7% žena). Oboljenje se javlja u prosečno 48. godini kod muškaraca i 53. godini kod žena. Od ukupnog broja obolelih i koža i sluzokože su zahvaćene u najvećem procentu: 57,2%. Konvencionalna terapija je primenjivana češće nego pulsna: kod 63,1% muškaraca i 56% žena. Prosečan broj ciklusa pulsa je 14,7 kod muškaraca i 11,1 kod žena. Od svih 140 pacijenata umrlo je 9(6,9%).

Zaključak: Oboljenje je češće u odrasloj populaciji sa upadljivo najzastupljenijom formom pemfigusa vulgarisa kod oba pola. U kliničkoj slici kod oba pola dominiraju od primarnih eflorescencija bule, a od sekundarnih erozije, koje zahvataju kod većine obolelih i kožu i sluznice. Kod pacijenata su primenjivana oba vida terapije sa malo češćom konvencionalnom u odnosu na pulsnu terapiju. Smrtni ishod je bez statistički značajne razlike među polovima, ali ne malog procenta u odnosu na ukupni broj obolelih.

Ključne reči: pemfigus, učestalost, kliničke i epidemiološke karakteristike

CLINICAL-EPIDEMIOLOGY ANALISES OF PATIENTS WITH PEMPHIGUS TREATED AT DERMATOVENEROLOGY CLINIC, CLINICAL CENTRE OF SERBIA FROM 2007-2011.

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Introduction: Pemphigus is autoimmune, organ-specific dermatosis, which infects skin and mucous membranes and without treatment, usually ends lethally.

The aim: Evaluate epidemiological (sex, age) and clinical (type of disease, localisation and type of lesions, way of treatment) parameters, and mortality of both sexes.

Materials and methods: Retrospective study includes patients who were treated at Dermatovenerology clinic, Clinical centre of Serbia, since 2007. until 2011. Informations are collected from medical documentation: medical records and hospital history, and analyzed by descriptive and analytical statistic methods.

Results: They are showed descriptively, by tables and graphs. Among the patients, there were 65 males and 75 females (approximately 1:1,2). The most common subtype of disease is pemphigus vulgaris (70,7% males and 78,7% females). The disease occurs approximately at the age 48 for male and 53 for female patients, and affects skin and mucous membranes in 57,2%. Conventional therapy is used more often than pulsed: 63,1% males and 56% females. The average number of pulses is 14,7 for males and 11,1 for females. From all 140 patients, 9(6,9%) ended lethally.

Conclusion: Pemphigus appears usually in adult population and the most common subtype is pemphigus vulgaris. In clinical presentation, bullae and erosions are the most dominant skin lesions. Skin and mucous membranes are usually both affected. Conventional therapy is more usual than pulse therapy. There is no statistically important difference between male and female number of death cases, but the total percent of death cases isn't small.

Key words: pemphigus, frequency, clinical and epidemiological characteristics

EVALUACIJA KLINIČKIH I LABORATORIJSKIH PARAMETARA OBOLELIH OD LICHEN RUBER PLANUS-A LEČENIH NA KLINICI ZA DERMATOVENEROLOGIJU KCS U PERIODU OD 2010-2011. GODINE

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Uvod: Lichen ruber planus (LRP) je hronična, recidivantna dermatoza, sa prevalencijom od 0,5 do 1% u opštoj populaciji. Etiologija i provokirajući faktor je nepoznat, mada se kod nekih slučajeva navode lekovi i virusna infekcija. Oboljenje se pretežno sreće kod odraslih osoba i nema izrazitu predilekciju za pol. Promene se javljaju na koži i sluzokoži

Cilj: Utvrditi distribuciju LRP prema polu, uzrastu i lokalizaciji promena. Evaluacija kliničkih i laboratorijskih parametara kod obolelih i udruženost LRP-a sa drugim oboljenjima

Materijal i metode: Retrospektivnom studijom obuhvaćeni su svi pacijenti sa različitim oblicima lichen planusa, hospitalno lečeni na KDV KCS u periodu od 2010. do 2011. godine.

Rezultati: Hospitalno lečen 81 pacijent sa LRP, 68 (84%) ženskog pola i 13 (16%) muškog pola. Prosečna dob javljanja oboljenja iznosila je 58 godina za žene i 56 godina za muškarce. Najzastupljenija klinička lokalizacija promena je na ekstremitetima, trupu i oralnoj mukozii. Udruženost LRP s kardiovaskularnim oboljenjima zabeležena je kod 47 (58%) pacijenata, sa psihijatrijskim oboljenjem kod 20 (24.7%), sa drugim dermatovenerološkim oboljenjem kod 40 (41%) pacijenata. Nalaz laboratorijski parametara: 20 (24.7%) pacijenata sa povišenom sedimentacijom (SE), 24 (29.7%) pacijenta sa povišenim ukupnim holesterolom, 15 (18.5%) pacijenata sa povišenim trigliceridima. Kod 14 (17.3%) pacijenata postojala je alergija na lekove.

Zaključci: Studija je pokazala veću učestalost LRP kod ženskog pola. Udruženost LRP sa kardiovaskularnim, psihijatrijskim i drugim dermatovenerološkim oboljenjima. Postojanje povišenih vrednosti holesterola kod skoro trećine ispitanih pacijenata

Ključne reči: lichen ruber planus, klinički parametri, laboratorijski parametri

EVALUATION OF CLINICAL AND LABORATORY PARAMETERS OF PATIENTS WITH LICHEN RUBER PLANUS, TREATED AT THE CLINIC OF DERMATOVENEROLOGY, CLINICAL CENTRE OF SERBIA, FROM 2010-2011.

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Introduction: Lichen ruber planus (LRP) is a chronic skin disease. Etiology and provoking factors are unknown, although as possible starters are given drugs and viral infections. The disease is mostly seen in adults and there is no distinct gender predilection. Changes occur on both skin and mucosa.

The Aim: To identify distribution of LRP by sex, age and localisation. Evaluation of clinical and laboratory parameters in patients and association with other diseases.

Materials and Methods: This retrospective study included all patients with various forms of LRP, hospitalized at the Clinic of Dermatovenerology, Clinical Center of Serbia from 2010 to 2011.

Results: From 81 hospitalized patients with LRP, 68 (84%) were female and 13 (16%) males. The average age of the disease was 58 years in women and 56 years in men. The most common clinical localization are the extremities, body and oral mucosa. The association of LRP with cardiovascular disease was noted in 47 (58%) patients, with psychiatric disease in 20 (24.7%), and with other dermatovenerological disease in 40 (41%) patients. Results of laboratory parameters are: 20 (24.7%) patients with an elevated sedimentation, 24 (29.7%) patients with elevated cholesterol, 15 (18.5%) patients with elevated triglycerides. Fourteen (17.3%) patients had an allergy to different medications.

Conclusion: The study showed a higher incidence of LRP in females. The association of LRP with cardiovascular, psychiatric and other dermatovenerological disease were noted. The existence of elevated cholesterol levels was observed in almost one third of patients.

Keywords: lichen ruber planus, clinical parameters, laboratory parameters

EVALUACIJA KLINIČKIH I LABORATORIJSKIH PARAMETARA OBOLELIH OD BULOZNOG PEMFIGOIDA LEČENIH NA KLINICI ZA DERMATOVENEROLOGIJU KCS U PERIODU OD 2010-2011. GODINE

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Uvod: Pemfigoid bullosus (PB) je hronično, autoimuno bulozno oboljenje kože koje ređe zahvata sluzokože. Histopatološki se odlikuje subepidermalnim rascepom koji nastaje klivažom. Imunopatološki se karakteriše nalazom linearnih depozita C3 i IgG duž zone epidermalne bazalne membrane.

Cilj: Utvrditi distribuciju PB prema polu, uzrastu i lokalizaciji promena. Evaluacija kliničkih i laboratorijskih parametara obolelih od PB i udruženost sa drugim oboljenjima.

Materijal i metode: Retrospektivna studija kojom je obuhvaćeno 64 pacijenta hospitalno lečenih na Klinici za dermatovenerologiju KCS u periodu od 2010-2011 godine.

Rezultati: Od 64 hospitalno lečenih pacijenata sa buloznim pemfigoidom (PB) 36 (56%) ženskog pola i 28 (44%) muškog pola. Prosečna dob javljanja oboljenja iznosila je 58 godina kod žena i 56 godina kod muškaraca. Najzastupljenija klinička lokalizacija promena, kod obolelih od buloznog pemfigoida je na ekstremitetima 53 (82.8%) i trupu 48 (75%). U studiji je zabeležena udruženost buloznog pemfigoida sa sledećim oboljenjima: kardiovaskularnim kod 40 (58%) pacijenata, respiratornim 11 (17%), dijabetes melitusom 17 (27%), gastrointestinalnim oboljenjima 10 (16%), neoplazmama 7 (11%) i drugim dermatovenerološkim oboljenjem kod 23 (36%) pacijenata. Povišenu sedimentaciju preko 20mm/1.h imalo je 22 pacijenta, povišene leukocite preko $10 \times 10^9/L$ imalo je 7 (11%) pacijenata, povišene vrednosti uree preko 9 mmol/L ima 18 (28%) a kreatinin iznad 100 $\mu\text{mol/l}$ ima 9 (14%) pacijenata.

Zaključci: Studija je pokazala veću učestalost buloznog pemfigoida kod ženskog pola, udruženost sa kardiovaskularnim, respiratornim, endokrinim i drugim dermatološkim oboljenjima kao i cistične promene bubrega.

Ključne reči: pemfigoid bullosus, laboratorijski parametri, klinički parametri, pridružene bolesti

EVALUATION OF CLINICAL AND LABORATORY PARAMETERS OF PATIENTS WITH BULLOUS PEMPHIGOID TREATED AT THE CLINIC OF DERMATOVENEROLOGY, CLINICAL CENTRE OF SERBIA, FROM 2010-2011.

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Introduction: Pemphigoid bullosus (PB) is a chronic, autoimmune bullous skin disease that rarely involves mucous tissues. Histopathology is characterized by subepidermal separation. Immunopathological findings are characterized by linear IgG and C3 deposition along the epidermal basement membrane zone.

The Aim: To determine the distribution of PB by sex and age, as well as the site of skin lesions. Evaluation of clinical and laboratory parameters of patients with PB and association with other diseases.

Materials and Methods: A retrospective study which included 64 patients treated at the Clinic of Dermatovenerology Clinical Center of Serbia, from 2010-2011.

Results: From 64 hospitalized patients of PB, 36 (56%) were female and 28 (44%) males. The mean age of onset was 58 years for women and 56 years for men. The most common clinical distribution was on the limbs 53 (82.8%) and trunk 48 (75%). We observed the association of PB with the following diseases: cardiovascular in 40 (58%) respiratory disorders 11 (17%), diabetes mellitus 17 (27%), gastrointestinal disease 10 (16%), neoplasms 7 (11%) and other dermatology disorders in 23 (36%) patients. Increased sedimentation has found in 22 patients, elevated white blood cell count 7 (11%) patients, elevated serum urea in 18 (28%) and creatinine in 9 (14%) patients.

Conclusion: The study showed a higher incidence of bullous pemphigoid in females, the association with cardiovascular, respiratory, endocrine and other dermatological diseases and cystic renal changes.

Keywords: bullosus pemphigoid, laboratory parameters, clinical parameters, associated disorders.

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Uvod: Od psorijaze tokuje 1-3% svetske populacije. Kod približno 31-45% pacijenata sa psorijazom prve manifestacije bolesti javljaju se tokom detinjstva i perioda adolescencije. Psoriasis pustulosa je ekzudativna forma psorijaze, koju karakteriše prisustvo sterilnih pustula na eritematозnoj osnovi i retka je u periodu detinjstva i adolescencije.

Cilj: Analiza epidemioloških i kliničkih karakteristika pustuloznih formi psorijaze u dečijem uzrastu i periodu adolescencije, terapijskih modaliteta, efekata terapije kod pacijenata lečenih od PP od 1992-2011. godine na Odeljenju za decu i omladinu KDV KCS.

Materijal i metode: Podaci su dobijeni iz istorija bolesti, a njihov prikaz izražen je u vidu procentualnih i apsolutnih vrednosti. Od statističkih metoda korišćen je procentualni odnos i standardna devijacija.

Rezultati: Od 232 hospitalno lečenih pacijenata mlađih od 18 godina obolelih od različitih formi psorijaze, 18 (7,76%) je imalo pustulozni oblik bolesti, podjednako dijagnostikovano kod pacijenata muškog i ženskog pola (50%). Prosečna starost pacijenata u vreme javljanja prvih promena je bila 3,82±5,03 godina. Najčešća primarna prezentacija bila je *Psoriasis pustulosa generalisata* kod 7 pacijenata (38,89%), za njom sledi *Psoriasis pustulosa annularis* kod 6 pacijenata (33,33%). Nakon postizanja remisije, prilikom recidiva u sekundarnim prezentacijama nije bilo razlike. Prosečna doza acitretina kod pacijenta iznosila je 0,75 mg/kg, minimalna primenjavana doza bila je 0,13 mg/kg i maksimalna 1,2 mg/kg. Pacijenti su praćeni od 2 do 20 godina.

Zaključak: Psoriasis pustulosa je retka u periodu detinjstva i adolescencije. Učestalost po polu je ujednačena. Kod svih pacijenata postignut je zadovoljavajući terapijski efekat acitretinom uz primenu lokalne terapije.

Ključne reči: psorijaza, pustulozna, detinjstvo, adolescencija, acitretin

PUSTULAR PSORIASIS IN CHILDHOOD RETROSPECTIVE STUDY

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Introduction: Psoriasis affect 1-3% of population. Approximately 31-45% of patients manifest signs before the age of 20 years. Pustular psoriasis (PP) is characterized by sterile nonfollicular pustules arising on erythematous base.

The aim: Assessment of epidemiological and clinical characteristics in 18 patients with PP treated at the Pediatric Department, Institute of Dermatovenerology, Clinical Centre of Serbia, from 1992 to 2011, most frequent primary and secondary presentation of disease in childhood, presentation of therapeutic protocols and its success.

Materials and methods: Data were obtained from the medical records of patients. Collected data were given in the form of percentage and absolute values and analyzed by percentage ratio and standard deviation.

Results: A review of 232 patients with childhood psoriasis found a 18 (7,76%) with pustular forms of disease, equally diagnosed between male and female patients (50%). The mean age of onset was 3,82±5,03 years. The most common primary presentation in our patients was *Generalized pustular psoriasis* in 7 patients (38,89%), followed by *Psoriasis pustulosa annularis* in 6 (33,33%) patients. There was no difference in the appearance of secondary presentation among our patients. The average dose of acitretin in our patients was 0,75 mg/kg. The minimum and maximum doses were 0,13 mg/kg and 1,2 mg/kg respectively. A follow up period was from 2 to 20 years.

Conclusion: Pustular psoriasis is rare during childhood and adolescence. Incidence by gender is equal. All patients achieved a satisfactory therapeutic effect of acitretin with the use of local therapy.

Key words: psoriasis, pustular, childhood, adolescence, acitretin

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Увод: Фејсбук је интернет сајт који представља виртуелну заједницу људи сличних интересовања. Око 40 % корисника ове социјалне мреже су испод 25 година старости, што обухвата младе школског узраста и студенте. Више од 80 % адолесцената има проблема са акнама, а око 50 % не зна довољно о њима.

Циљ: Циљ овог истраживања је да се уз размену информација и искустава у лечењу акни код адолесцената, фејсбук искористи за прикупљање информације везаних за врсту и ефекат терапије коју адолесценти примењују, као и о ефекту постојања акни на њихово психичко и социјално здравље.

Материјал и метод: Оформљен је нови фејсбук профил под називом «Мрзим акне а ти». Свим пријатељима (њих 377) је послат анкетни лист преко опције личне поруке на фејсбуку, који су они попуњену вратили на мејл bubuljice@hotmail.com, такође искоришћена је и опција “наaskanе”.

Резултати: Студија је трајала 3 месеца и за то време 103 фејсбук пријатеља, адолесцената са акнама, је попунило и вратило попуњену анкету. 48 (46.6%) њих користи антибиотик за лечење бубуљица. Нежељено дејство јавило се код 3 њих. Троје користи ретиноиде, а 8 (7.8%) њих контрацептивне пилуле. Показано је да код 50 (48.5%) испитаника негативно утиче на самопоуздање, а код 67 (65%) на расположење.

Закључак: Резултати овог фејсбук истраживања су потврдили да и поред широке палете лекова и препарата не постоји адекватан лек за лечење бубуљица, али индивидуалним прилагођавањем, формирањем адекватног третмана, њиховом редовном и адекватном применом може се одржати ремисија и спречити појава релапса.

Кључне речи: фејсбук, бубуљице, лечење.

THE INFLUENCE OF THE FACEBOOK PROFILE TO CHANGING INFORMATION AND EXPERIENCE IN ACNE TREATMENT IN ADOLESCENTS

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Introduction: The facebook is social network, and 40 % of members are adolescents. 80% of them have problem with acne, but less than 50 % know how to treat them right.

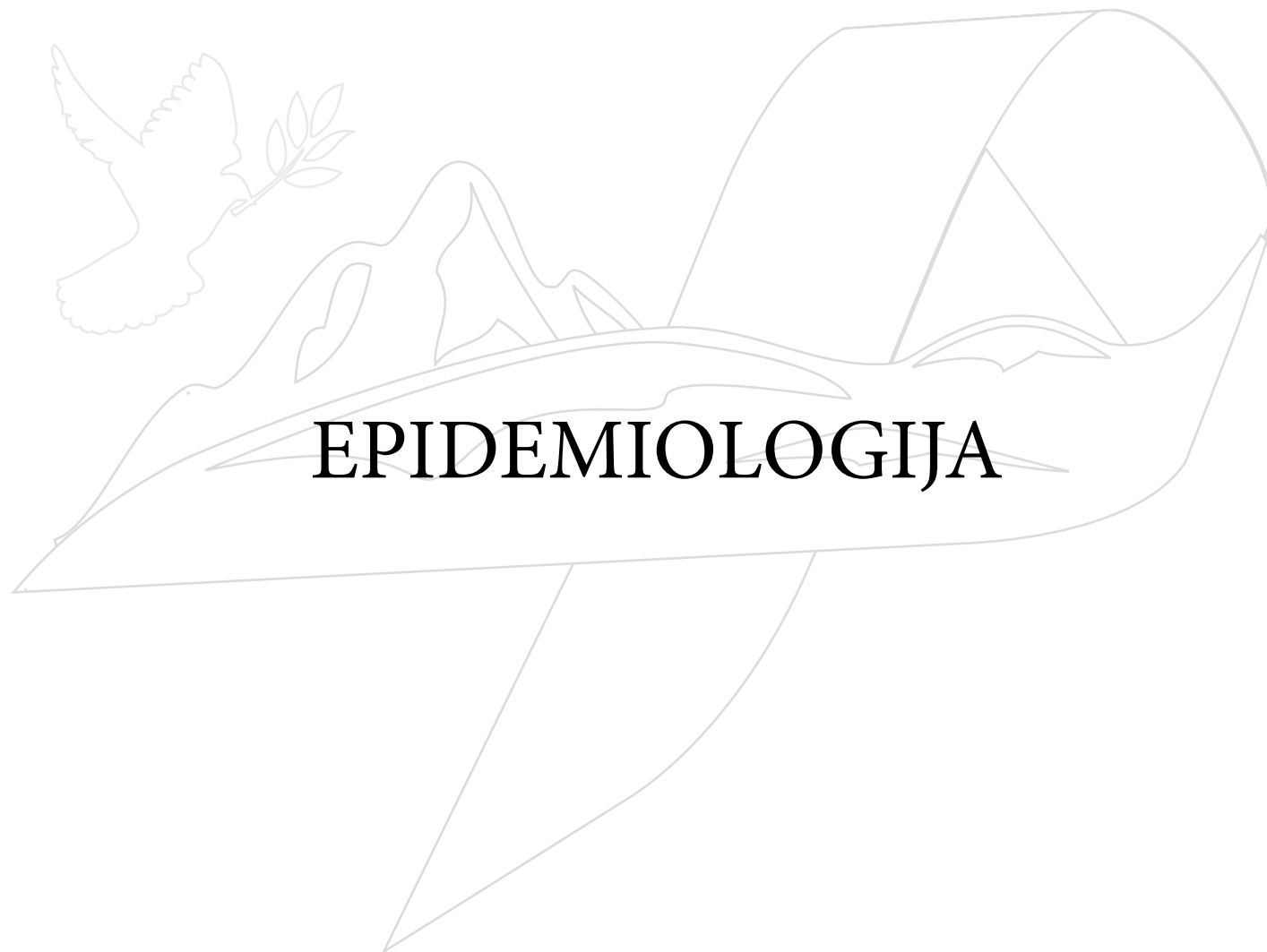
Aim: The aim of this study is that through exchange of information and experience in the treatment of acne in adolescents, collect and analyzed information regarding the nature and effect therapies applied by adolescents, as well as the effect of existence acne on their mental and social health.

Method: It was created Facebook profile called on Serbian “Мрзим акне а ти”. All the friends (377) list was sent the survey via the personal message on Facebook that they would return the completed on mail bubuljice@hotmail.com, also the “chat” on Facebook is used.

Results: The study lasted 3 months and during that time 103 Facebook friends, adolescent with acne, filled in a completed survey. 48 (46.6%) of them use antibiotics to treat acne. Side effects occurred in 3 of them. Three use retinoids, and 8 (7.8%) them the pill. It was shown that in 50 (48.5%) friends acne negatively affect on self-esteem, and in 67 (65%) on their mood.

Conclusion: The results of this Facebook research confirmed that despite the use of variety of medicines and cleaning and skin care as well as treatment for acne, from conventional and traditional medicine, there is no cure for acne. Use of adequate treatment from a combination of a wide range of drugs and medicines, is the goal for maintain remission and prevent relapse.

Key words: facebook, acne, treatment.



**FAKTORI RIZIKA ZA DIJABETES MELITUS TIP 2
MEĐU STUDENTIMA MEDICINSKOG FAKULTETA U BEOGRADU**

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Uvod: U svetu dolazi do porasta broja obolelih od dijabetesa melitusa tip 2, a očekuje se da će do 2025. godine najveći porast biti među osobama mlađim od 69 godina.

Cilj rada: Ispitati da li postoji razlika u faktorima rizika za razvoj DM tip 2 između studenata i studentkinja prve godine Medicinskog fakulteta Univerziteta u Beogradu.

Materijal i metode: U okviru ove studije preseka, sprovedene u toku jedne nedelje tokom maja meseca 2011. godine, je uključeno 358 studenata (134 muškaraca i 224 žena) prve godine Medicinskog fakulteta u Beogradu. Podaci su prikupljeni upitnikom, koji su sami studenti popunjavali. U statističkoj analizi podataka korišćen je χ^2 test.

Rezultati: Između studenata i studentkinja nije postojala značajna razlika u odnosu na uzrast, mesto stanovanja, broj članova domaćinstva i socijalno-ekonomske uslove. Između ispitivanih grupa nije bilo značajne razlike u navikama vezanim za ishranu i aktivno pušenje. Studentkinje su značajno češće konzumirale kafu i čaj, značajno češće su bile izložene pasivnom pušenju u kući/studentskom domu i značajno su češće dnevno učile van ispitnog roka 3 i više sati dnevno u odnosu na studente. Međutim, studenti su značajno češće konzumirali alkohol i značajno su češće imali prekomernu telesnu težinu i gojaznost, prema indeksu telesne mase, u odnosu na studentkinje.

Zaključak: Neophodni su preventivni programi kojima bi se među studentima smanjila učestalost faktora rizika koji doprinose pojavi dijabetesa melitusa tip 2.

Ključne reči: dijabetes melitus tip 2, faktori rizika, studenti

**RISK FACTORS FOR TYPE 2 DIABETES MELLITUS
AMONG STUDENTS OF THE FACULTY OF MEDICINE IN BELGRADE**

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Introduction: There is a growing number of diabetic patients worldwide, and by 2025 the greatest increase is expected among people younger than 69.

The aim: To examine whether there is a difference between male and female students of the Medical faculty, University in Belgrade, in terms of DM2 risk factors.

Materials and methods: This cross-sectional study was conducted during one week in May 2011, and it included 358 first-year students (134 males and 224 females) of the Medical faculty in Belgrade. Data was collected via a questionnaire, which students filled in themselves. A χ^2 (chi-square) test was used in statistical analysis.

Results: There was no significant difference between male and female students in terms of age, place of residency, number of household members or socioeconomic status. The difference in habits such as diet and active smoking was also not registered. Female students consumed coffee and tea significantly more often, they had been exposed to passive smoking more, and a greater number of them spent over 3 hours a day studying in the exam-free periods in comparison with male students. On the other hand, male students consumed alcohol and were overweight or obese, according to the body mass index, more often than female students.

Conclusion: It is necessary to create prevention programs for the reduction of DM2 risk factors among students.

Key words: diabetes mellitus, risk factors, student population

**FAKTORI KOJI UTIČU NA UPUĆIVANJE PACIJENATA NA SAVETOVANJE
I TESTIRANJE NA HIV U PRIMARNOJ ZDRAVSTVENOJ ZAŠTITI U OPŠTINI NOVI BEČEJ**

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Uvod: Pre 31 godinu HIV i AIDS su se pojavili i od tada su veliki problem za javno zdravlje. Oko 3500 osoba u Srbiji ne zna da je inficirano HIV-om jer infekcija dugo može prolaziti asimptomatski i tada je jedini način otkrivanja testiranje. DPST je jedna od osnovnih karika u službama za prevenciju HIV-a. Učešće ustanova primarne zdravstvene zaštite treba da bude jedno od ključnih elemenata, jer su one prvi nivo kontakta sa pacijentima.

Cilj: Utvrditi koji faktori utiču na upućivanje pacijenata na savetovanje i testiranje na HIV u DZ Novi Bečej i utvrditi mogućnosti delovanja na njih.

Materijal i metode: U decembru 2011.godine u opštini Novi Bečej urađena je studija preseka. Ciljano sastavljeni anonimni upitnik popunila je 31 osoba. To su lekari opšte prakse i lekari specijalisti zaposleni u DZ Novi Bečej.

Rezultati: Blizu 40% lekara je nekad nekog pacijenta posavetovalo i uputilo na HIV testiranje, najčešći razlozi su im bili oni povezani sa seksualnim ponašanjem pacijenta. Oko 60% lekara nikad nije. Kod 23% lekara pacijenti su se sami javljali. Najčešći razlozi su im bili psihološke i seksualne prirode. 60% lekara misli da se osebe same ne javljaju jer ih je strah od male sredine. Samo 23% lekara zna šta je DPST. Lekari misle da treba edukativno delovati kako na njih same, tako i na građane i otvoriti DPST centar u Novom Bečeju. Oko 50% lekara svoje znanje o HIV-u smatra dobrim, 60% je imalo edukacije na temu HIV-a, a 70% misli da im je potrebna dodatna edukacija.

Zaključak: Dva glavna faktora koji utiču na upućivanje pacijenata na savetovanje i HIV testiranje su lekari i građani Novog Bečea. Na njih treba delovati edukacijama i otvaranjem DPST centra.

Ključne reči: HIV, savetovanje, testiranje, primarna zdravstvena zaštita

**FACTORS AFFECTING THE REFERRAL OF PATIENTS TO HIV COUNSELING
AND TESTING IN PRIMARY CARE IN THE MUNICIPALITY OF NOVI BECEJ**

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Introduction: 31 year ago HIV and AIDS have emerged, and since then have been a major problem for public health. Around 3500 people in Serbia don't know that they are infected with HIV, because infection may long time pass asymptotically, and then testing is the only way of discovering it. VCT is fundamental link in the services of HIV prevention. The share of primary health care should be one of the key elements because they are the first level of contact with patients.

The Aim: To determine which factors affect the referral of patients to HIV counseling and testing in primary health care in Novi Becej and determine possibility of acting on them.

Materials and methods: In Decembar 2011 in the municipality of Novi Becej, cross sectional study was done. 31 people filled out an anonymous questionnaire specifically prepared. These are general practitioners and specialists working in the health center in Novi Becej.

Results: Nearly 40% of physicians have advised and sent patients to HIV testing, most common reasons were those associated with patient's sexual behavior. Around 60% of physicians never have. In 23% of doctors patients themselves reported. The most common reasons were their psychological and sexual nature. 60% of doctors think that people themselves do not appear because they are afraid of small communities. Only 23% of doctors know what VCT stands for. Doctors think they should act as educational to themselves and to the citizens, and VCT center should be open in Novi Becej. About 50% of doctors consider their knowledge about HIV as good, 60% had educations about HIV, and 70% think they need additional education.

Conclusion: Two main factors affecting the referral of patients to HIV counseling and testing are physicians and citizens of Novi Becej. They both should be educated and VCT center should be opened in Novi Becej.

Key words: HIV, counseling, testing, primary health care

KVALITET ŽIVOTA ŽENA OBELELIH OD RAKA DOJKE PRE I POSLE MASTEKTOMIJE

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Uvod: Istraživanje kvaliteta života od velike je važnosti za procenu ishoda lečenja žena obolelih od raka dojke.

Cilj rada: analiza kvaliteta života pacijentkinja obolelih od raka dojke mesec dana posle mastektomije.

Materijal i metod: Primenjena je kohortna studija koju su činile pacijentkinje kojima je dijagnoza postavljena 2011. godine. Podaci o kvalitetu života prikupljani su generičkim upitnicima EQVAS i EQSD.

Rezultati: Istraživanjem je obuhvaćeno ukupno 45 žena, prosečne starosti $60 \pm 10,1$, (34-83). Prosečna ocena ukupnog zdravstvenog stanja koje su dale pacijentkinje pre mastektomije bila je $87,9 \pm 10,01$ a mesec dana posle bila je značajno niža $78,9 \pm 12,01$, ($p < 0,01$). Pre mastektomije 28(62,2%) pacijentkinja odgovorilo je da nema nikakve bolove, skoro dva puta manje imalo je umerene bolove 17(37,8%), ($p < 0,01$). Posle mastektomije značajno se povećao broj pacijentkinja koje su imale umerene bolove 34 (75,6%), bez bolova 10 (22,2%) a jedna žena imala je izrazite bolove 1(2,2%). Pre mastektomije najviše pacijentkinja odgovorilo je da su umereno zabrinute 28(62,2%), 15(33,3%) je odgovorilo da nije zabrinuto, a samo 2 (4,4%) žene su bile vrlo zabrinute. Posle mastektomije, povećao se broj pacijentkinja koje su bile umereno zabrinute 33(73,3%), pet puta se smanjio broj žena koje nisu bile zabrinute 3 (6,7%) i značajno se povećao broj žena koje su bile izrazito zabrinute 9(20%).

Zaključak: Posle mastektomije došlo je do značajnih promena u kvalitetu života kod svih pacijentkinja. Pacijentkinje mlađe od 50 godina lošije su ocenile svoje zdravstveno stanje i imale su niži kvalitet života. Na pad kvaliteta života najviše su uticali bol i zabrinutost/depresija.

Ključne reči: rak dojke, kvalitet života, mastektomija

QUALITY OF LIFE FOR WOMEN WITH BREAST CANCER BEFORE AND AFTER MASTECTOMY

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Introduction: Measuring quality of life in breast cancer patients is of importance in assessing treatment outcomes.

The Aim: The aim of the paper was to evaluate the impact of mastectomy on the quality of life among women with breast cancer.

Material and Methods: The cohort study was done. Quality of life was measured using the EQVAS and EQSD questionnaires.

Results: In all, 45 patients diagnosed with breast cancer in 2011, mastectomy was performed. The average score in EQVAS before the mastectomy was $87,9 \pm 10,01$ and a month after, the average score was significantly lower and its value was $78,9 \pm 12,01$, ($p < 0,01$). There were higher number of patients who didn't have any pains before the mastectomy 28(62,2%), and 17 (37,8%) had moderate pains, ($p < 0,01$). A month after mastectomy there were significantly more patients who had moderate pains 34(75,6%), without any pains there were 10 (22,2%) and only one woman answered that had got severe pains 1(2,2%). One month after mastectomy there were higher number of patients who were moderate depressed 33 (73,3%), there were five times less women who didn't be depressed 3(6,7%) and there were significantly more women who were severe depressed 9(20%).

Conclusion: Patients who were younger than 50 years of age had lower scores in EQVAS and lower quality of life. However, patients reported problems with global quality of life, pain and depression.

Keywords: breast cancer, quality of life, mastectomy

AKCIDENTALNI KONTAKT SA KRVLJU I DRUGIM POTENCIJALNO INFektivNIM TELESNIM TEČNOSTIMA STUDENTA MEDICINE

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Uvod: Studenti medicine su izloženi profesionalnom riziku od nastanka akcidenata (povreda iglom i oštrim predmetima), što može dovesti do nastanka krvno prenosivih bolesti. Cilj rada je sagledavanje učestalosti akcidenata kod studenata medicine, redovnosti prijave akcidenta, kao i nivoa znanja studenata iz ove oblasti.

Cilj: Cilj rada je sagledavanje učestalosti akcidenata kod studenata medicine, redovnosti prijave akcidenta, kao i nivoa znanja studenata iz ove oblasti.

Materijal i metod: Sprovedena je studija prevalencije među studentima šeste godine Medicinskog fakulteta u Beogradu. Korišćen je anonimni upitnik koji je obuhvatao je podatke o demografskim karakteristikama, akcidentima, postupcima prilikom upotrebe igle i oštrih predmeta, o vakcinalnom statusu, kao znanje i stavove u vezi sa krvlju prenosivim bolestima.

Rezultati: Upitnik je popunilo 240 studenata šeste godine medicine (32,9% studenata i 67,1% studentkinja). Dvadeset studenata (8,4%) je imalo kontakt sa krvlju ili telesnim tečnostima, najčešće (40%) usled uboda na iglu. Akcident je najčešće nastao u sobi pacijenta. Oko polovine studenata (55%) je prijavilo akcident. Većina studenata je znala za rizik od nastanka hepatitisa B postojanje vakcine, ali 52,9% nije bilo vakcinisano. Veliki broj studenata je naveo da mu je potrebna dodatna edukacija iz ove oblasti.

Zaključak: Akcidenti i njihovo neprijavlivanje su relativno česti kod studenata medicine. Potrebna je dodatna edukacija studenata i strategija koja će povećati prijavu akcidenata kao i svest da to treba da se uradi.

Ključne reči: studenti medicine, ekspozicija na krv, studija prevalencije

ACCIDENTAL CONTACT WITH BLOOD AND OTHER POTENTIALLY INFECTIOUS BODY FLUIDS AMONG MEDICAL STUDENTS

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Introduction: Medical students are at risk for occupational needlestick injuries (NSIs) which can result in exposure to blood-borne pathogens and substantial health consequences.

Objective: The aim of this study was to determine the frequency of NSIs and the knowledge, attitude and practices of these students regarding their prevention.

Material and methods: The cross-sectional study was conducted among and sixth-year at Faculty of Medicine, Belgrade. Anonymous questionnaire was used containing data about demographic characteristics, self-reported blood and body fluid exposures and knowledge about occupational needlestick injuries.

Results: Questionnaire was filled in and given back by 240 studenata (32,9% males and 67,1% females). Twenty students (8,4%) reported exposures, the most frequent were needlestick injuries (40%). The majority of the exposures occurred in the patient room. Fifty-five percent of students reported these accidents. Most of students have known the risk of acquiring hepatitis B infection and that there was a vaccine but 52,9% are not vaccinated. The majority of students claimed that they do need further education about NSIs.

Conclusion: Needlestick injuries and underreporting of these injuries are common among medical students. Further education and strategies aimed at improving reporting and creating a culture of reporting should be implemented.

Key words: medical students, needlestick injury, cross-sectional study

STAVOVI I PONAŠANJE STUDENATA MEDICINE DRUGE GODINE
NA MEDICINSKOM FAKULTETU U FOČI O KONZUMIRANJU DUVANA

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Uvod: Pušenje je navika koja ima teške posledice po zdravlje ljudi. Mladi ljudi su najviše izloženi posledicama pušenja. Pušenje je direktno povezano sa koronarnom bolešću srca, karcinomom bronha i hroničnim obstruktivnim bronhitisom.

Cilj: Cilj našeg reada bio je da se sazna učestalost pušenja među studentima druge godine Medicinskog fakulteta u Foči.

Metod: Studija je izvedena na Medicinskom fakultetu u Foči uz pomoć anonimnog anketnog lista koji je sastavljen od 20 pitanja. U ovoj studiji analizirali smo odgovore 55 studenata (32,7 %-muškaraca; 67,3 %-djevojaka).

Rezultati: U analiziranoj grupi bilo je 60% nepušača, 29,1% pušača i 10,9% povremenih pušača. Kod studenata koji su se izjasnili kao pušači ili povremeni pušači, dužinu pušačkog staža imali su: do 6 mjeseci 5,4% studenata, od 7 mjeseci do 4 godine bilo je 20% ispitanika i 14,5% studenata je pušilo od 5-8 godina.

Zaključak: Naši rezultati pokazuju da je procenat studenata pušača na Medicinskom fakultetu veoma veliki i da bi mjere prevencije u vidu široke kampađe o štetnosti pušenja sigurno smanjile broj pušača.

Ključne riječi: pušenje, učestalost, važnost.

ATTITUDES AND PRACTICE OF SECOND YEAR MEDICAL STUDENTS
AT FACULTY OF MEDICINE IN FOCA ABOUT TOBACCO SMOKING

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Introduction: Smoking is the habit which has bad influence on health of people. Young people are the most exposed to consequences of smoking. Smoking is directly connected to coronary heart disease, carcinoma of bronchi and chronic obstructive pulmonary disease.

Goal: The aim of this study was to investigate frequency and causes of smoking in the second year students at the Medical Faculty in Foca.

Material and Methods: The study was performed at the Medical Faculty in Foca by using unsigned questionnaire with 20 questions. In this study, we have analyzed the answers of 55 students (32,7 %-male; 67,3 %-female).

Results: In the analyzed group, there were 60% nonsmokers, 29,1% smokers and 10,9% occasional smokers. In the students declared as smokers or occasional smokers, the length of the period of smoking was divided in the following way: up to 6 months-there were (5,4%) students, from 7 months to 4 years there were (20%) students and from 5 to 8 years there were (14,5%) students.

Conclusion: Our results suggest that the percentage of students smokers at the Medical Faculty in Foca is very high and that the prevention would certainly decrease number of smokers.

Keywords: smoking, frequency, importance.

KRETANJE OBOLEVANJA OD TUMORA KOLONA, REKTOSIGMOIDNOG PRELAZA
I REKTUMA U CENTRALNOJ SRBIJI ZA PERIOD 1999-2009. GODINE

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Uvod: Prema standardizovanim stopama incidencije, rak kolorektuma (17,3/100.000) je treći vodeći uzrok obolevanja u svetu, i to iza raka pluća (23/100.000) i raka dojke (20,1/100.000).

Cilj: Analiziranje kretanja obolevanja od raka kolona, rektosigmoidnog prelaza i rektuma u centralnoj Srbiji za period od 1999. godine do 2009. godine.

Materijal i metode: U okviru ove deskriptivne studije, prikupljeni su podaci o obolima od tumora kolona, rektosigmoidnog prelaza i rektuma iz Republičkog zavoda za statistiku i to za period 1999-2009. godine. U analizi podataka korišćene su uzrasno specifične i standardizovane stope incidencije, kao i regresiona analiza. Standardizovane stope incidencije dobijene su metodom direktne standardizacije, a kao standardna populacija korišćena je populacija sveta.

Rezultati: U centralnoj Srbiji u 2009. godini standardizovana stopa incidencije (na 100.000) za rak kolona iznosila je 19,9 za muškarce i 11,2 za žene, za rak rektosigmoidnog prelaza 2,4 za muškarce i 1,2 za žene, a za rak rektuma 13,4 za muškarce i 6,7 za žene. Muškarci, u poređenju sa ženama, više obolevaju od sva tri maligna tumora.

Zaključak: U cilju smanjivanja broja oboljelih od raka kolona i rektuma neophodno je redukovati faktore rizika koji dovode do nastajanja ovih oboljenja, kao i rano sprovođenje skrininga.

Ključne reči: kolon, rektum, tumor.

MOVEMENT OF MORBIDITY FROM COLON CANCER, RECTOSYMOIDAL
AND RECTAL CANCER IN CENTRAL SERBIA IN THE PERIOD 1999-2009.

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Introduction: According to standardized incidence rates, colorectal cancer (17,3/100.000) is the third leading cause of morbidity in the world, behind lung cancer (23/100.000) and breast cancer (20,1/100.000).

The Aim: To analyse movement of cancer across central Serbia in the period 1999-2009.

Materials and Methods: In this descriptive study data on patients with colon cancer, rectal and rectosigmoidal cancer were collected from the Statistical Office for the period 1999-2009. In data analysis were used age-specific and standardized incidence rates and regression analyses. Standardized incidence rates were obtained by direct standardization, and as the standard population is used population of the world.

Results: In central Serbia in 2009. standardized incidence rate (per 100.000) for colon cancer was 19,9 for men and 11,2 for women; for rectosigmoidal cancer was 2,4 for men and 1,2 for women; and for rectal cancer was 13,4 for men and 6,7 for women. Men, compared to women, suffer three times often from all three diseases.

Conclusion: In order to reduce the number of patients with colon and rectal cancer is necessary to reduce risk factors that lead to development of this disease and implement adequate screening for early diagnose.

Keywords: colon, rectum, cancer.

UČESTALOST NAVIKE PUŠENJA CIGARETA MEĐU STUDENTIMA NOVOSADSKOG UNIVERZITETA

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Uvod: Pušenje predstavlja jedan od glavnih preventabilnih uzroka smrtnosti u svetu. Značajan je faktor za nastanak masovnih nezaraznih bolesti.

Cilj: Istražiti rasprostranjenost navike pušenja cigareta kod studenata Univerziteta u Novom Sadu.

Metode: Istraživanje je sprovedeno među studentima Univerziteta u Novom Sadu u periodu od oktobra 2010. do aprila 2011. godine. Ispitivanje je uključilo 800 studenata prve i završne godine studija (uzrast 20-24 godina), polna struktura je bila podjednako zastupljena. Kao instrument korišćen je anketni upitnik koji je specijalno sastavljen za potrebe ovog istraživanja. Statistička obrada vršena je u SPSS 17.0.

Rezultati: Velika je učestalost navike pušenja cigareta među novosadskim studentima, jer 26,7% ispitanih studenata puši cigarete ($p<0,001$). Veći je broj muških ispitanika (30%) u odnosu na ženske ispitanike (23,5%) i ta razlika je statistički značajna ($p<0,08$). Prvi kontakt sa cigaretama najveći procenat studenata (6,25%) je imao sa 15 godina, za razliku od studentkinja koje su u najvećem procentu (5%) prvi kontakt imale sa 18 godina ($p>0,05$). Više od 15 cigareta dnevno popuši 8,7% muških ispitanika i 4,5% ženskih ispitanika i postoji statistički značajna razlika prema polu ($p<0,02$). Postoji statistički značajna povezanost ($p<0,01$) navike pušenja, kao i broja dnevno popušanih cigareta sa postignutim uspehom na studijama.

Zaključak: Svaki treći student puši cigarete. Studenti muškog pola su češći konzumenti. Rezultati istraživanja ukazuju na neophodnost intenzivnijeg sprovođenja primarne prevencije organizovanim, sveobuhvatnim, preventivnim aktivnostima kod mladih.

Ključne reči: pušenje, studenti, faktor rizika, masovne nezarazne bolesti

PREVALENCE OF TOBACCO SMOKING HABIT AMONG STUDENTS OF THE UNIVERSITY OF NOVI SAD

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Introduction: Tobacco smoking represents one of the main causes of death in the world. It is the major factor for causing mass non-communicable diseases.

The Aim: To determine the extent of tobacco smoking among students in Novi Sad.

Materials and methods: This research was conducted among students of the University of Novi Sad in the period from October 2010 until April 2011. The study involved 800 students from the first and final study years (age from 20 to 24), both sexes were equally represented. A special questionnaire was designed for this study. Statistical analysis was performed in Statistical Package for the Social Science 17.0.

Results: There was a high prevalence of consumption of tobacco among students in Novi Sad, because tobacco is being used by 26.7% of students. Male students (30%) most often had contact with tobacco, and there was statistically significance difference ($p<0,08$). Male students (6.25%) often had the first contact with tobacco at the age of 15, and female students (5%) most often had the first contact with tobacco at 18 ($p>0,05$). There had been a large percentage of male respondents (8.7%) that used more than 15 cigarettes at day, and there were statistically significant difference between gender ($p<0,02$). There was statistically significant ($p<0,01$) correlation between habit of tobacco smoking, number of cigarettes and achieved success at studies.

Conclusion: Contact with tobacco was had third students. Male students most often had contact with cigarettes. These results indicate the necessity of primary prevention and organization, comprehensive and preventive activities at adolescents.

Keywords: smoking, students, risk factor, mass non-communicable diseases

OBOLEVANJE I UMIRANJE OD RAKA DOJKE KOD ŽENA U CENTRALNOJ SRBIJI U PERIODU 1999–2009.

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Uvod: Rak dojke je treći najučestaliji kancer na svetu, a najčešći maligni tumor i uzrok smrti kod žena.

Cilj rada: Ispitivanje trenda incidencije i mortaliteta od raka dojke kod žena na području centralne Srbije deskriptivno-epidemiološkom studijom.

Materijal i metode: Podaci o obolevanju i umiranju od raka dojke dobijeni su iz nepublikovanog materijala Instituta za javno zdravlje Srbije „Dr Milan Jovanović-Batut“. U analizi podataka računata su uzrasno-specifične stope, standardizovane stope i linearni trend. Standardizovane stope dobijene su metodom direktne standardizacije, a kao standardna populacija korišćena je evropska populacija.

Rezultati: U periodu od 1999-2009. godine u centralnoj Srbiji od raka dojke oboležalo je u proseku 2800, a umiralo 1068 žena godišnje. Analiziranjem standardizovane stope incidencije i mortaliteta u posmatranom periodu nije uočeno postojanje statistički značajnih promena linearnog trenda. U starijim uzrasnim grupama 55–64 ($y=179,95+5,59x$, $p=0,03$), 65–74 ($y=177,53+4,96x$, $p=0,003$) i 75 i više godina ($y=152,73+2,62x$, $p=0,04$) zapaža se statistički značajan porast trenda incidencije. U uzrasnim grupama 35–44 i 45–54 godine uočava se značajan pad trenda mortaliteta ($y=16,59-0,39x$, $p=0,04$; $y=56,29-1,53x$, $p=0,004$), dok je za starije uzrasne grupe, 65–74 i 75 i više godina, zabeležen porast mortaliteta od raka dojke u posmatranom periodu ($y=73,68+2,69x$, $p<0,001$; $y=105,8+3,14x$, $p=0,003$).

Zaključak: S obzirom na porast trenda i incidencije i mortaliteta u starijim uzrasnim grupama, potrebno je uvođenje organizovanijeg i sveobuhvatnijeg mamografskog skrininga, kao i poboljšanje mera primarne prevencije, delujući na faktor rizika, posebno u populaciji starijih žena.

Ključne reči: rak dojke, incidencija, mortalitet, centralna Srbija

INCIDENCE AND MORTALITY OF BREAST CANCER IN WOMEN IN CENTRAL SERBIA DURING THE PERIOD 1999–2009.

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Introduction: Breast cancer is the third most frequent cancer globally and the most common malignancy and cause of death among women.

The Aim: The aim of the study was to analyze incidence and mortality rates of breast cancer in Central Serbia during the period 1999–2009.

Materials and Methods: The data was gathered from as yet unpublished material from the Institute for Public Health of Serbia „Dr Milan Jovanović-Batut“. In data analysis age-specific rates, age adjusted rates and linear trends were calculated. Standardized rates were calculated by the method of direct standardization and the standard European population was used.

Results: During the period 1999–2009 there were 2800 breast cancer cases and 1068 deaths per year. Analysis of the age adjusted incidence and mortality rates in the observed period shows no statistically significant changes. Age adjusted incidence rates show significantly increasing tendency in older age groups 55–64 ($y=179.95+5.59x$, $p=0.030$), 65–74 ($y=177.53+4.96x$, $p=0.003$) and 75 years of age and older ($y=152.73+2.62x$, $p=0.040$). For older age groups (65–74 and 75 years of age and older, $y=73.68+2.69x$, $p<0.001$; $y=105.8+3.14x$, $p=0.003$) there is also an increase in mortality of breast cancer in the observed period.

Conclusion: Bearing in mind increasing tendency of incidence and mortality rates in older age groups there is an obvious need to improve preventive measures, as well as improve early detection of breast cancer by mammography screening program.

Key words: breast cancer, incidence, mortality, Central Serbia

STAVOVI I ZNANJA U VEZI SA UPOTREBOM KONTRACEPTIVA U POPULACIJI MUŠKIH STUDENATA MEDICINSKOG FAKULTETA UNIVERZITETA U BEOGRADU

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Uvod: Upotreba oralnih kontraceptiva omogućava ženama planiranje porodice i kontrolu nad svojim reproduktivnim zdravljem. Uprkos širokoj upotrebi oralne kontraceptivne pilule (OKP), neke studije su pokazale slabu informisanost u problematiku ovog leka.

Cilj: Cilj ovog istraživanja je da se analiziraju znanja i stavovi u populaciji muških studenata medicine beogradskog univerziteta o dejstvu OKP.

Materijal i metode: Ova studija preseka je sprovedena od 28. novembra do 20. decembra 2011. Obuhvatilo je 237 studenata muškog pola Medicinskom fakultetu u Beogradu. Podaci su dobijeni putem anonimnog upitnika. Statistička analiza je obuhvatila metode deskriptivne statistike, χ^2 -test i korelacionu analizu.

Rezultati: Najveći broj ispitanika (91,1%) je naveo da zna šta je OKP. Svaki peti student (20%) ne zna da li njegova partnerka koristi OKP. Kao izvor informacija o piluli ispitanici najčešće koriste internet, a nešto više od četvrtine (28,5%) se uopšte ne informiše o piluli. Većina (55,3%) je pokazala srednji nivo poznavanja željenih i neželjenih efekata pilule. Više godine studija su visoko statistički značajno povezane sa boljim poznavanjem ovih efekata ($p=0,536, p<0,001$).

Tri četvrtine (77,9%) ispitanika nije čulo za kontraceptivnu pilulu za muškarce. Uočena je visoko statistički značajna korelacija između godine studija i informisanosti o postojanju muške OKP ($p=-0,319, p=0,001$), stavu da ona doprinosi postojećim kontraceptivnim sredstvima ($p=-0,196, p=0,003$) kao i stavu da bi takvu pilulu koristili ($p=-0,193, p=0,003$).

Zaključak: Rezultati naše studije ukazuju na potrebu promocije OKP u sredstvima javnog informisanja kao i podizanje svesti o aktivnom učešću muškaraca u odlukama povezanim sa zdravljem partnerki.

Ključne reči: oralna kontraceptivna pilula, stavovi, muškarci, beogradski univerzitet

ATTITUDES AND KNOWLEDGE REGARDING THE USE OF CONTRACEPTIVES IN POPULATION OF MALE STUDENTS FACULTY OF MEDICINE, UNIVERSITY OF BELGRADE

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Introduction: Despite worldwide use of oral contraceptive pill (OCP) some studies showed poor knowledge about this medication.

The Aim: Purpose of this study was to analyze knowledge and attitudes about OCP in the population of male medical students.

Materials and methods: Cross-sectional study was carried out from November to December 2011. It comprised 237 male students in the Faculty of Medicine University of Belgrade who filled in an anonymous questionnaire. In statistical analysis methods of descriptive statistics were used as well as Chi square and correlation testing.

Results: Every fifth male (20%) does not know if his partner uses the pill or not. Internet is most commonly used source of information, while more than one fourth (28,5%) does not inform themselves about the pill. More than half of males (55,3%) demonstrated medium level of knowledge about pill effects. Advancing years in the faculty were highly statistically significantly associated with more profound knowledge on these effects ($p=0,536, p<0,001$). Three fourths (77,9%) of students have never heard of the male contraceptive pill. There was a highly statistically significant correlation between advancing year in school and notion of the male pill ($p=-0,319, p=0,001$), opinion that such a pill contributes to the existing measures of contraception ($p=-0,196, p=0,003$) and positive attitude on its use ($p=-0,193, p=0,003$).

Conclusion: Our results indicate that there is a need for further promotion of the pill in mass media as well as raising awareness on male engagement in health-related decisions of their partners.

Key words: oral contraceptive pill, attitudes, males, Belgrade University

STAVOVI I PONAŠANJE SREDNJOŠKOLACA U FOČI U VEZI SA SEKSUALNO PRENOSIVIM INFEKCIJAMA

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Uvod: Polno prenosive infekcije (PPI) se prenose prvenstveno seksualnim kontaktom i čine veliku grupu oboljenja koja su izazvana različitim mikroorganizmima. Danas u Bosni i Hercegovini su tabu za nastavnike i roditelje da razgovaraju sa djecom o seksualnom ponašanju uključujući i o PPI u kući i u školi, a glavni razlog za to su religijske i kulturne barijere.

Cilj: Cilj istraživanja bio je da se ispituju znanje i stavovi srednjoškolaca u Foči u odnosu na polno prenosive infekcije.
Materijal i metode: Studija je izvedena među 50 učenika gimnazije i 50 učenika medicinske srednje škole, trećeg razreda, koji su anketirani u periodu Maj-Jul 2009. godine anonimnim epidemiološkim upitnikom.

Rezultati: Većina ispitanih učenika (92.1%) su izjavili da su čuli za PPI, ali samo mali broj njih zna koji su simptomi udruženi sa PPI (22%). Oko 90% ispitanih je izjavilo da su sposobni da zaštite sebe od neke PPI, ali takođe 20% njih je priznalo da su bili u rizičnoj situaciji da dobiju neku od PPI. Većina (92%) je opisalo više od jedan izvor informacija o PPI, televizija je izvor koji su srednjoškolci najviše pominjali, dok ni jedan ispitanik nije naveo roditelja kao izvor informacija.

Zaključak: Znanje srednjoškolaca o prevenciji i simptomima koji su udruženi sa nekom PPI na niskom nivou u odnosu na njihov nivo obrazovanja. Učenici srednje medicinske škole su pokazali bolje znanje u odnosu na učenike gimnazije. Najznačajniji izvor informacija o PPI za srednjoškolce predstavljaju televizija i internet.

Ključne riječi: Polno prenosive infekcije, simptomi, srednjoškolci.

KNOWLEDGE, ATTITUDES AND PRACTICE ABOUT SEXUALLY TRANSMITTED DISEASES AMONG SECONDARY SCHOOL STUDENTS

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Introduction: Sexually transmitted diseases (STDs) are infections which main way of transmission is sexual contact, they are composed of group of diseases induced with different type of microorganisms. In this time in Bosnia and Herzegovina it is a taboo for teachers and parents to talk with children about sexual matters including STDs in schools and at home because of religious and cultural barriers.

Goal: The aim of this study was to investigate the knowledge and attitudes towards sexual behavior and STDs among secondary school students.

Methods: The study was conducted in one secondary school among 50 medical and 50 gymnasium students in Foca, from May to July 2009. The students were interviewed by well designed anonymous questionnaire.

Results: Most of the examined students (92.1%) said that they have heard about STDs, but just a small number of them know symptoms associated with STDs (22%). About 90% respondents said were capable of preventing themselves from contracting STDs, however 20% of them admitted that they were at risk of contracting STDs. Majority (92%) described more than one source of information on STDs, television was the source which was most commonly mentioned, whilst none of them cited parents as source of information.

Conclusion: Our results suggest that the students' knowledge about prevention, to describe symptoms associated with STDs and their way of transmission is in poor level with regard to the students' levels of education. Medical students showed better knowledge compared to gymnasium students. Mass media is still the more effective means of educating the students on STDs.

Keywords: Sexually transmitted diseases, symptoms, secondary school students.

ZNANJE UČENIKA O HIV-U I NJHOVI STAVOVI O SOCIJALNIM KONTAKTIMA SA HIV POZITIVNIM I OBOLELIM OSOBAMA

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Uvod: Prema podacima *HIV/AIDS Surveillance in Europe*, u periodu od 2001. do 2010. godine u Evropi je ukupno registrovano 712.477 novoinficiranih osoba HIVom. Iste godine u Srbiji je registrovano 145 novoinficiranih osoba, tako da se može ubrojiti u zemlje koje imaju relativno nisku stopu novoimficiranih i obolelih od side.

Cilj rada: Cilj ovog ispitivanja je da utvrdi znanje učenika srednjemedicinske škole u Leskovcu o HIVu i njihove stavove prema HIV pozitivnim i obolelim osobama.

Materijal i metode: Metodom slučajnog uzorka odabrano je 102 učenika trećih razreda. Ispitivanje je sprovedeno u 2011. godini, a za prikupljanje podataka o ispitivanim stavovima i znanju korišćen je epidemiološki upitnik.

Rezultati: Od 102 anketirana učenika odgovorilo je 95. 100% učenika znalo je da se HIV prenosi putem krvi i da se ne prenosi vazduhom, 59% da se prenosi majčinih mlekom. Sve medijume u kojima se može naći HIV znalo je 29.5% ispitanika. Svi ispitanici znali su da se HIV prenosi seksualnim kontaktom i intravenskom narkomanijom upotrebom zajedničkih špricева i igala, a preko 97% znalo je da se ne prenosi razgovorom, rukovanjem i poljupcem u obraz. Pozitivan odnos prema svim ispitivanim stavovima ima svega 10 učenika (10.5%).

Zaključak: Učenici nedovoljno poznaju sve medijume u kojima se može naći HIV, kao i načine prenosnja, što iziskuje njihovu dodatnu edukaciju.

Ključne reči: HIV, Sida, znanje, stavovi, učenici

STUDENTS KNOWLEDGE ABOUT HIV AND THEIR ATTITUDES ABOUT SOCIAL CONTACTS WITH HIV POSITIVE AND PERSONS WHO HAVE AIDS

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Introduction: According to data from *HIV/AIDS Surveillance in Europe* from year 2001. to 2010. in Europe is registered 712.477 newinfected persons with AIDS. In the same year in Serbia are registered 145 newinfected persons, so we can make a statement that it can be included in countries which have relatively low rate newinfected and diseased from AIDS.

The Aim: Goal of this examination is to determine level of knowledge of students in medical high school in Leskovac about HIV and their attitude about HIV positive persons and those who have AIDS.

Material and methods: Using method of random sample we chose 102 students of third grade. Examination is managed in year 2011, and for collection of data about attitudes and knowledge we used epidemiological questionnaire.

Results: From 102 examined students answered 95. 100% of student knew that HIV transfers by blood, and that can't be transferred by air, 59% knew that HIV transfers by breast milk. All mediums in which HIV can be found knew only 29.5% examinee. All examinee knew that HIV can be transferred by sexual contact and intravenous drug use when drug addicts use same syringe and needles, and more than 97% knew that HIV can't be transferred by talking, handshaking and kiss in the cheek. Positive aspect about all questioned attitudes had only 10 students (10.5%).

Conclusion: Students have insufficient knowledge about all kinds of mediums that contain HIV, and ways of transferring the virus, which needs more education.

Keywords: HIV, Sida, knowledge, attitude, pupils

UČESTALOST FAKTORA RIZIKA ZA NASTANAK HIPERTENZIJU KOD PACIJENATA DOMA ZDRAVLJA „SVETI LUKA“ U BILECI

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Uvod: Arterijska hipertenzija se smatra jednim od vodećih uzroka za nastanak moždanog udara, infarkta miokarda, srčane insuficijencije, arterijskih aneurizmi i drugih oboljenja. Rana dijagnoza i terapija sprečavaju nastanak ovih oboljenja.

Cilj: Cilj istraživanja je utvrđivanje učestalosti faktora koji doprinose razvoju hipertenzije i faktora koji utiču protektivno u populaciji koja dolazi na preventivne preglede u Dom zdravlja „Sveti Luka“ u Bileći.

Materijal i metode: U ispitivanje je uključeno 113 ispitanika (57 osoba ženskog pola i 56 osoba muškog pola) koji su dolazili na preventivne preglede kod dva ljekara porodične medicine u DZ „Sveti Luka“ u Bileći. Ispitivana je učestalost hipertenzije u odnosu na starost, gojaznost, porodičnu anamnezu, hronične bolesti, pušenje, konzumiranje alkohola, upotrebu svežeg voća i povrća, te mlijeka i mliječnih proizvoda u ishrani i, konačno, u odnosu na stepen obrazovanja.

Rezultati: Hipertenzija je bila značajno češća kod starijih i gojaznih ispitanika oba pola. Hipertenzija je značajno češća kod ispitanika muškog pola koji boluju od neke hronične bolesti što nije pronađeno za ispitanike ženskog pola. Učestalost hipertenzije nije značajno češća ni kod pušača ni kod ispitanika sa pozitivnom porodičnom anamnezom kod oba pola, ali je značajno češća kod ispitanika muškog pola koji češće konzumiraju alkohol kao i kod ispitanika ženskog pola koje rjeđe konzumiraju voće. Nije uočena statistički značajna razlika u učestalosti hipertenzije u odnosu pol, unos povrća i obrazovni nivo ispitanika.

Zaključak: Faktori rizika za nastanak i razvoj hipertenzije značajno su prisutni među pacijentima Doma zdravlja „Sveti Luka“ u Bileći. Ljekari primarne zdravstvene zaštite mogu da odigraju značajnu ulogu u ranoj dijagnostici hipertenzije i motivisanju svojih pacijenata za prihvatanje zdravog stila života.

Ključne reči: hipertenzija, faktori rizika, protektivni faktori

FREQUENCY OF RISK FACTORS FOR THE OCCURRENCE OF HYPERTENSION AT PATIENTS OF HEALTH CENTER „SVETI LUKA“ IN BILECA

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Introduction: Arterial hypertension is consider one of the leading causes for the occurrence of stroke, myocardial infarction, heart failure, arterial aneurysm and other diseases. Early diagnosis and treatment prevent the occurrence of these diseases.

The Aim: The aim of our research was to establish the occurrence of factors contributed to development of hypertension and protective factors in population which is coming at preventive examinations in local ambulance „Sveti Luka“ in Bileca.

Materials and methods: The total sum of 113 subjects (57 women and 56 men) who went to preventive examinations in local ambulance „Sveti Luka“ in Bileca was included in the study. The occurrence of hypertension with regard to age, obesity, family history, chronic diseases, smoking, consumption of alcohol, intake of fresh fruit, fresh vegetables and milk or dairy products as same as educational level was examined.

Results: Study has shown a statistical significance in more often appearance of hypertension in elderly and overweight people at both sexes. Statistical significance was proved in higher frequency of hypertension in men with some chronic disease and more frequent intake of alcohol as same as in women who use fruit less frequently in their diet. We have not found statistical significance in higher occurrence of hypertension between sexes, among less educated people and those who rarely consume vegetables.

Conclusion: Risk factors for establishment and development of hypertension among patients of Health center „Sveti Luka“ in Bileca are significantly present. Primary care physicians can play a significant role in early diagnosis of hypertension and motivate their patients to accept a healthy lifestyle.

Key words: hypertension, risk factors, protective factors

UPOTREBA INTERNETA STUDENATA MEDICINE

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Uvod: Internet je postao značajno sredstvo u medicinskoj edukaciji širom sveta.

Cilj: Cilj rada je sagledavanje u kojoj meri studenti medicine koriste internet.

Materijal i metode: Studija preseka je sprovedena među studentima prve i šeste godine studija Medicinskog fakulteta u Beogradu. Korišćen je anonimni upitnik koji je sadržavao pitanja o socio-demografskim karakteristikama studenata i upotrebi interneta.

Rezultati: Upitnik je popunilo i vratilo 638 studenata (304 sa prve i 334 sa šeste godine studija). Oko 95% studenata ima svoj kompjuter. Veliki procenat studenata (96,70%) je navelo da koristi internet. Oko tri četvrtine studenata (75,6%) koristi internet svakog dana, prosečno 6,97±8,09 sati nedeljno. Značajno veći procenat studenata ($p=0,02$) smatra da internet pruža bogatstvo informacija, dok veći procenat studenata prve godine ($p=0,003$) misli da internet može da zameni interpersonalnu komunikaciju. Značajno veći procenat studenata šeste godine koristi internet za dobijanje dnevnih informacija, kao i za pretraživanje literature ($p<0,001$). Preko 90% studenata medicine pristupa internetu da bi našli materijal za učenje.

Zaključak: Internet omogućava studentima medicine da povećaju svoje znanje i da brzo dobiju najnovije informacije, ne samo iz svakodnevnog života, već i iz gradiva koje uče.

Ključne reči: Korišćenje interneta, studenti medicine, studije preseka

INTERNET USE AMONG MEDICAL STUDENTS

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Introduction: The internet is increasingly being used worldwide in imparting medical education and improving its delivery.

Objective: The aim of this study was to evaluate the pattern of internet access and utilization by medical students.

Material and Methods: This cross-sectional study was conducted in among first and sixth-year medical students. Anonymous questionnaire was used containing data about social and demographic characteristics and internet use.

Results: A total of 638 medical students (304 first year student and 334 sixth year student) returned the questionnaire. About 95% of students have own computer. Majority of the respondents (96.70%) reported experience with internet use. About three quarters of students (75.6%) use the internet regularly, every day. The mean duration of internet use was 6.97±8.09 hours per week. A significantly higher percentage of sixth-year students ($p=0.02$) believes that the internet provides a wealth of information, while first year students think ($p=0.003$) that internet can replace interpersonal communication. Significantly higher proportion of sixth-year students was using internet for general information ($p<0.001$) and for medical literature searching. More than 90% of all students, without the difference between groups, were using internet for learning purposes.

Conclusion: The internet facility has enabled medical students to enhance their academic excellence by providing them the latest information and access to the worldwide information.

Key words: Internet use, medical students, cross-sectional study

TREND OBOLEVANJA I UMIRANJA OD RAKA DOJKE U POPULACIJI MUŠKARACA CENTRALNE SRBIJE

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Uvod: Rak dojke je vodeći maligni tumor u ženskoj populaciji, dok je u muškoj populaciji retko stanje. Procenjuje se da je 2008. godine u svetu od raka dojke obolelo 1,38 miliona ljudi, a umrlo 458.000.

Cilj: Cilj ove deskriptivne epidemiološke studije bio je da analizira kretanje obolevanja i umiranja od raka dojke kod muškaraca u Centralnoj Srbiji, u periodu 1999-2009. godine.

Materijal i metode: U anlizni podataka korišćene su uzrasno specifične i standardizovane stope incidencije i mortaliteta i linearni trend.

Rezultati: Rak muške dojke je ne spada u među deset vodećih lokalizacija malignih tumora u Centralnoj Srbiji sa prosečnom standardizovanom stopom incidencije 1,35/100.000 i mortaliteta 0,45/100.000 za period.1999-2009. godine. Rak muške dojke je retko stanje, i čini 2,09% karcinoma dojke, što je više nego u ostalim regionima sveta. Stope obolevanja i umiranja rastu sa uzrastom i najviše su kod najstarijih osoba uzrasta preko 70 godina. U Centralnoj Srbiji došlo je do porasta obolevanja od raka dojke kod žena u uzrasnoj grupi 60-69 godina ($y=176,219+6,733x$, $p=0.004$) i do značajnog porasta umiranja u muškoj populaciji ($y=0,320+0,021x$, $p=0,044$), naročito u uzrasnoj grupi od 60-69 godina ($y=1,101+0,196x$, $p=0,044$). Značajan porast umiranja zapažen je kod žena u uzrastu 60-69 godina ($y=72,515+1,678x$, $p=0.001$) i starijih od 70 godina ($y=91,436+3,411x$, $p=0,001$), dok je u uzrastu 40-49 godina ($y=36,050-1,128x$, $p=0.004$) zapaženo opadanje.

Zaključak: U cilju redukcije mortaliteta od raka dojke neophodno je unapređenje mera primarne (eliminisanje faktora rizika) i sekundarne prevencije (skrining i adekvatno lečenje).

Ključne reči: incidencija, mortalitet, rak dojke, epidemiologija

TREND INCIDENCE AND MORTALITY FROM BREAST CANCER IN MALE POPULATION OF CENTRAL SERBIA

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Introduction: Breast cancer is the most frequent cancer among women, while in men is rare disease. In 2008 in world, there were an estimated 1.38 million new breast cancer cases diagnosed and 458.000 died.

The aim: The aim of this descriptive epidemiologic study was to analyze trend incidence and mortality from breast cancer in men of Central Serbia during the period 1999-2009.

Material and methods: In data analysis we used age specific and standardised incidence and mortality rates and linear regression.

Results: Male breast cancer is not in ten leading localization cancer in Central Serbia with incidence 1,35/100.000 and mortality 0,45/100.000. Male breast cancer is rare condition, accounting for 2.09% of all breast cancer cases and that is more frequent than in the other parts in the world. Incidence and mortality rates increase with age and the highest rates are in age group 70+. Significant increase in incidence rates was noticed in women in age group 60-69 years ($y=176,219+6,733x$, $p=0.004$). Significant increase in mortality was noticed among men ($y=0,320+0,021x$, $p=0,044$) especially in age group 60-69 ($y=1,101+0,196x$, $p=0,044$) and among women in age groups 69-69 and over 70 ($y=72,515+1,678x$, $p=0.001$; $y=91,436+3,411x$, $p=0,001$). Among women, in age group 40-49 we noticed significant decrease in mortality ($y=36,050-1,128x$, $p=0.004$).

Conclusion: In order to reduce mortality from breast cancer it is necessary to perform adequate primary (elimination of risk factors) and secondary prevention measures (scrining and adequate therapy). and appropriate therapy.

Keywords: Incidence, Mortality, Breast Cancer, Epidemiology

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Uvod: Profesionalna izloženost krvlju i telesnim tečnostima predstavlja značajan problem vezan za zdravlje zdravstvenih radnika, jer može da dovede do prenošenja virusa kao što su HIV virus i virusi hepatitisa B i C.

Cilj: Cilj ovog rada je sagledavanje učestalosti, mesta i načina nastanka akcidenata kao i mogućih uzroka koji su doveli do njihove pojave kod zdravstvenih radnika.

Materijal i metode rada: Sprovedena je studija prevalencije među zdravstvenim radnicima tri univerzitetske bolnice u Beogradu. Korišćen je anonimni upitnik koji je obuhvatao podatke o demografskim karakteristikama, izloženosti krvlju i telesnim tečnostima, kao i okolnostima pod kojim je do akcidenta došlo.

Rezultati: Upitnik je popunilo i vratilo 216 zdravstvenih radnika (78,2% medicinskih sestara/tehničara i 21,8% lekara). Bar jedan akcident tokom radnog staža imalo je 60,6% ($n = 131$) zdravstvenih radnika; 25,9% njih u poslednjih 12 meseci. Medicinske sestre/tehničari su češće imali akcidente nego lekari ($\chi^2=3,44$ $p=0,05$). Akcident je značajno češće nastao u operacionoj sali ($\chi^2=3,44$ $DF=3$ $p=0,001$). Među faktorima koji su doprineli nastanku akcidenta, ponovno zatvaranje igle ($p=0,003$) i pranje i čišćenje instrumenata nakon hirurške intervencije ($p=0,001$) bilo je češće kod medicinskih sestara/tehničara, dok kod lekara akcident češće nastao je pre korišćenja igle ili oštrog instrumenta ($p=0,004$). Samo 41,2% zdravstvenih radnika je prijavilo akcident svojim nadležnim. Kompletano vakcinisano sa tri doze vakcine protiv hepatitisa B bilo je 50,2% ispitanika.

Zaključak: Zabeležena je visoka učestalost akcidenta zdravstvenih radnika tokom njihovog rada u bolnici. Primena bezbedne medicinske opreme poboljšala bi bezbednost i zdravlje zaposlenih.

Ključne reči: profesionalna izloženost, zdravstveni radnici, krv, telesne tečnosti

OCCUPATIONAL EXPOSURE OF HEALTH CARE WORKERS TO BLOODBORNE DISEASES

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Introduction: Occupational exposure to blood and body fluids is a serious concern for healthcare workers.

Objective: The aim of this study was to determine the frequency and circumstances of occupational blood and body fluids exposures among healthcare workers.

Material and Methods: Cross-sectional study was conducted in three university hospitals in Belgrade. Anonymous questionnaire was used containing data about demographic characteristics, self-reported blood and body fluid exposures and circumstances of percutaneous injuries.

Results: Questionnaire was filled in and returned by 216 healthcare workers (78.2% nurses and 21.8% doctors). 60.6% ($n=131$) of participant healthcare workers had sustained at least one needlestick injury during their professional practice; 25.9% of them in the last 12 months. Of occupational groups, nurses have higher risk to experience needlestick injuries than doctors ($\chi^2=3.44$ $p=0.05$). The majority of the exposures occurred in the operating theatre ($\chi^2=3.44$ $DF=3$ $p=0.001$). Among factors contributing to the occurrence of needlestick injuries, recapping needles ($p=0.003$) and decontamination/cleaning instruments after surgery ($p=0.001$) were most frequent among nurses, while use of a needle before intervention was common among doctors ($p=0.004$). Only 41.2% of healthcare workers had reported their injuries to a nearby supervisor. 50.2% of healthcare workers were vaccinated with three doses of Hepatitis B vaccine.

Conclusion: There is a high rate of needlestick injuries in the daily routine of a hospital. Implementation of safety devices would lead to an improvement in medical staff's health and safety.

Key words: occupational exposure, healthcare workers, blood, body fluids

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Uvod: Alkohol je treći najveći faktor rizika u svetu za nastanak bolesti, a produkti alkohola su odgovorni za 9% svih oboljenja u evropskom regionu

Cilj: Istražiti rasprostranjenost upotrebe alkohola među studentima Univerziteta u Novom Sadu.

Metode: Istraživanje je sprovedeno među studentima Univerziteta u Novom Sadu u periodu od oktobra 2010. do aprila 2011. godine. Ispitivanje je uključilo 800 studenata prve i završne godine studija (uzrast 20-24 godine), polna struktura je bila podjednako zastupljena. Kao instrument korišćen je anketni upitnik koji je specijalno sastavljen za potrebe ovog istraživanja. Statistička obrada vršena je u SPSS 17.0.

Rezultati: Čak 91% ispitanika je probalo alkohol u toku života ($p<0,001$), a takođe je i velika učestalost povremenog i svakodnevnog konzumiranja alkohola među novosadskim studentima (81,6%). Veći broj muških ispitanika (87,7%) konzumira alkohol u odnosu na ženske ispitanike (77,5%), i ta razlika je statistički značajna ($p<0,06$). Prvi kontakt sa alkoholom najveći broj studenata (27,3%) i studentkinja (21,8%) imao je sa 15 godina ($p>0,05$). Jednom mesečno studentkinje u većem procentu piju u odnosu na studente, i ta razlika je statistički značajna ($p<0,01$). Postoji statistički značajna povezanost ($p<0,01$) između upotrebe alkohola i postignutog uspeha na studijama.

Zaključak: Tek svaki deseti student Univerziteta u Novom Sadu nikad nije probao alkohol, dok osam od deset ispitanih studenata pije povremeno ili svakodnevno. Studenti muškog pola češće konzumiraju alkohol. Rezultati istraživanja ukazuju na neophodnost intezivnijeg sprovođenja primarne prevencije organizovanim, sveobuhvatnim, preventivnim aktivnostima kod mladih.

Ključne reči: alkohol, studenti, faktor rizika

CONSUMPTION OF ALCOHOL AMONG STUDENTS OF THE UNIVERSITY OF NOVI SAD

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Introduction: Alcohol is third largest risk factor for causing diseases in the world and products of alcohol are responsible for 9% of all diseases in European region.

The Aim: To determine the extent of alcohol consumption among students in Novi Sad.

Materials and methods: This research was conducted among students of the University of Novi Sad in the period from October 2010 until April 2011. The study involved 800 students from the first and final study years (age from 20 to 24), both sexes were equally represented. A special questionnaire was designed for this study. Statistical analysis was performed in SPSS (Statistical Package for the Social Science) 17.0.

Results: Even 91% of respondents was consumed alcohol at least once in a lifetime ($p<0,001$), and although there was a high prevalence of occasionally and everyday alcohol usage among students (81.6%). Male students (87.7%) most often had contact with alcohol, and there was statistically significance difference between gender ($p<0,06$). Students of both sexes most often had the first contact with alcohol at the age of 15 ($p>0,05$). There had been a large percentage of female respondents that consumed alcohol once a month, and there were statistically significant difference between gender ($p<0,01$). There was statistically significant ($p<0,01$) correlation between alcohol consumption and achieved success at studies.

Conclusion: Contact with alcohol was not had one of ten students, and eight of ten respondents was consumed alcohol occasionally or everyday. Male students most often had contact with alcohol. These results indicate the necessity of primary prevention and organization, comprehensive and preventive activities at adolescents.

Keywords: alcohol, students, risk factor

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Uvod: Vakcinacija je najefikasnija preventivna mera protiv gripa i doprinosi smanjivanju komplikacija i letalnih ishoda posebno kod osoba sa komorbiditetom.

Cilj: Cilj ove studije preseka je bio da ispita znanje, stavove i ponašanje studenata medicine u vezi sa vakcinom protiv gripa.

Materijal i metode: U studiju je uključeno 413 od 510 studenata četvrte godine Medicinskog fakulteta u Beogradu, od kojih su anketom prikupljeni podaci o njihovom znanju, stavovima i ponašanju u vezi sa vakcinom protiv gripa. U statističkoj analizi podataka korišćen je χ^2 test.

Rezultati: Od 413 studenata 14,0% je bilo vakcinisano protiv sezonskog gripa. Glavni razlozi za vakcinisanje (58 studenata) bili su: zaštita od gripa (71%), preporuka lekara (34%) i zaštita okoline (29%), a glavni za odbijanje (355 studenata) nedostatak vremena, zaboravnost (25%), sumnja u efikasnost vakcine i njeno protektivno dejstvo (19%) i jak imunitet (14%). Vakcinisani studenti u značajno većem procentu, u odnosu na nevakcinisane, smatraju da je vakcina najbolja preventivna mera protiv sezonskog gripa ($p=0,001$), da je efikasna u prevenciji bolesti ($p=0,031$), da je odlična mera za zaštitu ljudi u okolini ($p=0,005$) i da je koristi mnogo veća u odnosu na neželjene reakcije ($p=0,027$). Vakcinisani studenti će se vakcinisati i u budućnosti ($p=0,001$) u značajno većem procentu nego nevakcinisani, i u značajno većem procentu smatraju da je važno da se ljudi vakcinišu protiv gripa ($p=0,001$).

Zaključak: Vakcinisani studenti mnogo više veruju u efikasnost vakcine protiv gripa u odnosu na nevakcinisane.

Ključne reči: grip, studenti medicine, vakcina

KNOWLEDGE ATTITUDE AND BEHAVIOR OF STUDENTS OF MEDICINE ABOUT INFLUENZA VACCINE

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Introduction: Influenza vaccine is the most effective mean of preventing influenza infection and its severe complications.

The aim: The aim of this cross-sectional study was to analyze knowledge, attitudes and beliefs regarding influenza vaccination among medical students.

Material and method: 413 students of fourth year at the Faculty of medicine in Belgrade were identified and received a self-administered questionnaire.

Results: Influenza vaccination coverage was low at a rate 14,04%. The most common reason for being vaccinated among 58 students were: self-protection from disease (71%), recommendation from doctors (34%), protection of other people (29%), and the most common reason for not being vaccinated among 355 students were: lack of time and forgetfulness (25%), belief that vaccine is not effective (19%) and lack of perception of own risk (14%). Vaccinated students think that vaccine is the best preventive measure for influenza infection in comparison to unvaccinated students ($p=0,001$), that is effective in disease prevention ($p=0,031$), that they are in risk to spread infection to other people ($p=0,005$), that vaccine is useful in comparison to adverse effects ($p=0,027$), that they will vaccinate in the future ($p=0,001$), and that all medical students should be vaccinated ($p=0,001$). Vaccinated students are aware of risk among pregnant women.

Conclusion: Vaccinated students are more aware of efficacy and necessity of influenza vaccine in comparison with nonvaccinated students.

Keywords: influenza, medical students, vaccine

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Uvod: Oralna kontraceptivna pilula (OKP) je kombinacija sintetskih ženskih polnih hormona koji se koriste u prevenciji neželjene trudnoće ali kod dismenoreičnih tegoba.

Cilj: Cilj ovog istraživanja je bio da se kvantifikuje rasprostranjenost upotrebe OKP kao i da se analiziraju znanja i stavovi populacije ženskih studenata medicine u vezi sa ovim lekom.

Materijal i metode: Istraživanje je dizajnirano kao studija preseka i sprovedeno u periodu od 28. novembra do 20. decembra 2011. godine. Obuhvatilo je 461 studentkinja Medicinskog fakulteta u Beogradu. Podaci su dobijeni putem anonimnog upitnika. Statistička analiza je obuhvatila metode deskriptivne statistike, χ^2 -test i korelacionu analizu (Spirmanov test korelacije ranga).

Rezultati: Prevalencija upotrebe OKP je 11,3%. Najčešće se upotrebljava na petoj godini (32,7%), dok je najmanje zastupljena na prvoj (9,6%). Više od trećine (38,3%) koristi OKP kao vid hormonske terapije za regulisanje menstrualnog ciklusa. U pogledu poznavanja željenih i neželjenih efekata pilule, većina studentkinja (66,7%) je pokazala srednji nivo informisanosti. Primećena je visoko statistički značajna povezanost između godine studija i obimnijeg poznavanja ovih efekata ($p=0,448$, $p<0,001$). Najveći procenat ispitanica (83,5%) nije čuo za kontraceptivnu pilulu za muškarce, ali zato 70% smatra prihvatljivo da njihov partner koristi mušku pilulu ukoliko bi ona imala istu efikasnost i bezbednost kao ženska.

Zaključak: U našoj studentskoj populaciji OKP se koristi kao terapijsko sredstvo za regulaciju menstrualnog ciklusa. Studentkinje medicine su uglavnom dobro obavешtene o dejstvima pilule, međutim, potrebna je njena dodatna promocija, uzimajući u obzir da je ona u našoj zemlji dostupna svima.

Ključne reči: prevalencija, oralna kontraceptivna pilula, studenti, beogradski univerzitet

PREVALENCE OF ORAL CONTRACEPTIVES USE AMONG MEDICAL STUDENTS OF THE UNIVERSITY OF BELGRADE

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Introduction: Oral contraceptive pill (OCP) represents a combination of synthetic female sex hormones which are used in prevention of unwanted pregnancy.

The Aim: Purpose of this investigation was to quantify distribution of OCP use and to analyze knowledge and attitudes about this medicine in the population of female medical students.

Materials and methods: Cross-sectional study was carried out from November to December 2011. It comprised 461 female students in the Faculty of Medicine University of Belgrade who filled in an anonymous questionnaire.

Results: Prevalence of OCP use was 11,3%. It is most frequently taken in the fifth year (32,7%). More than one third of subjects (38,3%) uses OCP as hormonal therapy for menstrual cycle regulation. Regarding effects of the pill, most students (66,7%) demonstrated medium knowledge level. There was highly statistically significant correlation between more advancing years in the faculty and broader knowledge of these effects ($p=0,448$, $p<0,001$). Majority of our participants (83,5%) have not heard of the male contraceptive pill. 70% considers it is acceptable that their partner uses the male pill as long as it has the same efficiency and safety as that of females.

Conclusion: In our female student population OCP is used as a therapeutic measure for regulating menstrual problems. Medical students are mainly well informed about pill effects, nevertheless, its further promotion is needed considering it is available to everyone without prescription.

Key words: prevalence, oral contraceptive pill, students, Belgrade University

KRETANJE TRENDI MORTALITETA OD KARCINOMA CERVIKSA U POPULACIJI BEOGRADA OD 1993. DO 2007.GODINE

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Uvod: Karcinom cerviksa (KC) je u našoj zemlji najučestaliji maligni tumor ženske populacije posle karcinoma dojke, a njegova stopa incidencije se kreće oko 27/100 000. U pogledu rizika od umiranja od ovog karcinoma, mortalitet varira prema istom modelu kao i incidencija. Primećeno je da je stopa mortaliteta u Srbiji druga po učestalosti na evropskom kontinentu.

Cilj rada: Cilj ovog istraživanja je sagledavanje trenda mortaliteta KC u populaciji žena Beograda.

Materijal i metode: Kao izvor podataka o umiranju korišćen je nepublikovani materijal Gradskog zavoda za statistiku u Beogradu. U analizi podataka korišćene su stope mortaliteta (specifične po uzrastu i standardizovane) kao i linearni trend. Stope mortaliteta na 100.000 stanovnika standardizovane su metodom direktne standardizacije, uz korišćenje evropske standardne populacije. Za procenu značajnosti koeficijenta linearne regresije korišćen je Fisherov test.

Rezultati: Prosečna standardizovana stopa mortaliteta KC u ispitivanom periodu iznosila je 7,8/100.000 (95% IP 7,27-8,31). Rizik od smrtnog ishoda od KC u populaciji žena u Beogradu povećao se sa uzrastom, tako da su najviše stope mortaliteta zabeležene u najstarijoj (75 i više godina) uzrasnoj kategoriji i to 54,97/100.000 (95% IP 41,67-68,26). Najniže stope mortaliteta od KC registrovane su u uzrastu od 25 do 34 godine – 1,74/100.000 (95% IP 1,19-2,30). Standardizovane stope mortaliteta od KC imaju tendenciju statistički značajnog porasta, prema linearnom modelu, za posmatrani period ($y=6,69+0,14x, p=0,008$).

Zaključak: Potrebna je intenzivna promocija skrininga KC i obuhvatanje, bez razlika, svih uzrasnih grupa.

Ključne reči: karcinom cerviksa, trend, Beograd

THE MOVEMENT TREND IN MORTALITY FROM CERVICAL CANCER IN POPULATION OF BELGRADE SINCE 1993. BY 2007.YEAR

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Introduction: Cervical cancer (CC) is, after breast cancer, the second most common malignant tumor in the female population of our country with incidence rate of around 27 per 100 000. Regarding mortality, its rates correspond to incidence variations. It was documented that mortality rates in Serbia are the second most frequent in Europe.

The Aim: Purpose of this research is to evaluate cervical cancer mortality trends over time in the female population of Belgrade.

Materials and methods: Data were collected from published and unpublished materials of the Municipal Institute of Statistics in Belgrade. In order to assess CC mortality, we calculated rates according to age as well as the linear trend. Mortality rates per 100 000 were standardized through direct standardization method using European standard population. F-test has been performed for analysis of the linear regression coefficient.

Results: Average standardized CC mortality rate from 1993 to 2007 was 7,8/100.000 (95% CI 7,27-8,31). The risk of dying in women suffering from CC increased with age, thus the highest rates were recorded in the eldest age group (75 and over) - 54,97/100.000 (95% CI 41,67-68,26). The lowest CC rates were found in the age group 25- 34 years (1,74/100.000 95% CI 1,19-2,30). Standardized mortality rates has statistically significant increasing tendency for the period analyzed ($y=6,69+0,14x, p=0,008$).

Conclusion: Vigorous promotion of screening program for CC is required with particular emphasis that no age group is omitted from it.

Key words: cervical cancer, trend, Belgrade

UTICAJ ANGINE PEKTORIS NA KVALITET ŽIVOTA OBOLELIH OD AKUTNOG INFARKTA MIOKARDA

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Uvod: Angina pektoris ima negativan uticaj na kvalitet života pacijenata.

Cilj: Cilj rada bio je da proceni uticaj angine pektoris na kvalitet života obolelih od infarkta miokarda mesec dana posle obolevanja.

Materijal i metod: Primenjena je prospektivna kohortna studija. Studijom je obuhvaćeno 160 novodijagnostikovanih pacijenata, životne dobi 30-79 godina, iz grada Niša. Za istraživanje HRQL primenjena su dva generička upitnika: EuroQoL VAS i EurQoL 5 Dimension. Angina pektoris rangirana je prema klasifikaciji koju je predložilo kanadsko kardiovaskularno udruženje.

Rezultati: Od ukupnog broja pacijenata bilo je 106(66.7%) muškaraca i 54(33.3%) žene. Muškarci i žene bile su slične starosti (61.13±8.63 vs 61.86±9.39). Prosečne ocene angine pektoris na prijemu u bolnicu bile su slične kod muškaraca i žene 3.27±0.59 vs 3.19±0.55. Mesec dana posle infarkta miokarda, prosečne ocene angine pektoris bile su značajno manje nego na prijemu, 0.92±0.43a vs 0.89±0.46. Kod muškaraca kod kojih je primenjena primarna koronarna intervencija prosečne ocene angine pektoris bile su značajno niže nego kod muškaraca koji su lečeni trombolitičkom terapijom (0.98±0.31 vs 1.04±0.20, p<0.001). Žene koje su lečene trombolitičkom terapijom imale su značajno niže prosečne ocene angine pektoris u odnosu na žene koje su lečene primenom primarnom koronarnom intervencijom (0.76±0.58 vs 1.04±0.20, p<0.001).

Zaključak: Smanjivanje angioznih bolova primenom adekvatne terapije imalo je najviše je uticaja na popravljanje kvaliteta pacijenata.

Ključne reči: angina pektoris, kvalitet života, infarkt miokarda

ANGINA PEKTORIS INFLUENCE ON LIFE QUALITY OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Introduction: Angina pektoris has negative influence on the patient's quality of life.

The Aim: The aim of the paper was to evaluate the health-related quality of life in patients one month after the acute myocardial infarction.

Material and methods: Prospective cohort study was done. The study involved 160 patients, 30 to 79 years of age from the city of Niš. The self-administrated questionnaires were used: EuroQoL VAS (EQVAS) and EuroQoL 5 Dimension (EQ5D). Angina pektoris was ranked according to the Canadian Cardiovascular Society Classification (CCS).

Results: Men and women evaluated their health condition in a similar way (60.48±11.98 vs 60.55±12.24). Patients who were undergone to primary coronary intervention (PCI) had greater average scores on EuroQoL VAS than the patients who were treated with thrombolytic therapy (68.69±9.67 vs 52.31±7.87, p<0.001). Modest and severe problems were the most presented in answers to these questions: pain/discomfort, anxiety/depression and self-care. Both men (0.92±0.43 vs 3.27±0.59, p<0.001) and women (0.89±0.46 vs 3.19±0.55, p<0.001) had significantly lower average marks of angina pektoris one month after the acute myocardial infarction than at the admission to the hospital.

Conclusion: One month after the myocardial infarction the quality of life in patients was very impaired and lower. Those patients also had the lower average marks of angina pektoris and the higher health-related quality of life. Patients who undergone to the PCI evaluated their health condition as better than the patients who were treated with thrombolytic therapy.

Keywords: angina pektoris, quality of life, infarctus myocardi

ZLOUPOTREBA ALKOHOLA U OSNOVNIM ŠKOLAMA

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Uvod: Na osnovno-školskom uzrastu od svih psihoaktivnih supstanci najčešća je zloupotreba alkohola. Konzumiranje alkohola povezano je sa štetnim posledicama kako u odrasloj dobi, tako i u adolescenciji. Međutim, dejstva alkohola na psiho fizičko stanje mladog organizma su neuporedivo negativnija i sa ozbiljnim posledicama na ukupno zdravlje nego što je slučaj kod konzumiranja alkohola od strane odrasle osobe. Te posledice su često nepopravljive i osećaju se u svim aspektima života mladog čoveka. Smatrajući da je osnovna škola prvo mesto gde otpočinje konzumiranje alkohola, ukazujemo na potrebu veće informisanosti učenika i neophodnost rada na prevenciji sa učenicima što mlađeg uzrasta.

Cilj: Cilj našeg istraživanja je da se proceni rasprostranjenost zloupotrebe alkohola u osnovnim školama kao i da se ukaže na eventualne socio-demografske varijable koje su povezane sa ovom pojavom.

Materijal i metode: Za dobijanje podataka ispitanici su anketirani putem anonimne ankete. Anketa je posebno osmišljena za ovo istraživanje. Uzorak za anketiranje je činilo 663 mlade osobe, muškog i ženskog pola, koji su učenici osnovnih škola u Novom Sadu, Šidu, Šajkašu i Budisavi.

Rezultati i zaključak: Problem zloupotrebe alkohola je veoma zastupljen u osnovnim školama. Grupa visokog rizika su učenici muškog pola, sa sela, viših razreda, dovoljnog uspeha i oni koji su odgovarali netačno na pitanje da li je alkohol psihoaktivna supstanca. Na ovu grupu učenika trebalo bi obrati posebnu pažnju prilikom sprovođenja preventivnih programa. Prevenciju treba započeti što ranije. Program prevencije treba da se sprovodi kako u gradskim školama, tako i u seoskim.

Ključne reči: alkohol, mladi, psihoaktivne supstance, osnovna škola.

ALCOHOL ABUSE IN ELEMENTARY SCHOOLS

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Introduction: If we looked at the representation of psychoactive substances in the adolescent period, we see that alcohol is the most common. Consumption of alcohol is associated with adverse consequences both in adult period and in adolescence. However, the effects of alcohol on the physical condition of the young organism are much more negative and with serious consequences on overall health than in the case of adults. These consequences are often irreversible and give them a starting point for all aspects of the life of a young man. Considering that the primary school is the place of first alcohol consumption, we point to the need of student informing and prevention work in the younger ages.

Goal: The aim of this study was to assess the prevalence of alcohol abuse in primary schools as well as to point to possible socio-economic variables that are associated with this phenomenon.

Material and methods: To obtain the data the examinees were interviewed through a questionnaire. It was created only for the purpose of this research. The sample for the survey is consisted of 663 young people, male and female, who are pupils of elementary schools in Novi Sad, Šid, Šajkaš and Budisava.

Results and conclusion: The problem of alcohol abuse is a major in elementary schools. A high-risk students are male, from villages, higher grade, sufficient success and those who responded incorrectly to the question of whether the alcohol is psychoactive substance. For this group of students should be paid special attention in prevention programs. Prevention should start as early as possible. Prevention programs should be implemented both in urban schools, and rural.

Key words: alcohol, young people, psychoactive substances, primary school.



PRIMENA UREĐAJA TIPA PROTOČNE ČELIJE U BIOFARMACEUTSKOJ KARAKTERIZACIJI PREPARATA: I SPITIVANJE BRZINE RASTVARANJA NIMESULIDA IZ TABLETA SA TRENUTNIM OSLOBAĐANJEM

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Uvod: Ispitivanjem brzine rastvaranja lekovite supstance iz farmaceutskih preparata, uz odabir adekvatnih uslova ispitivanja, moguće je simulirati ponašanje lekovite supstance *in vivo*, čime se isključuje potreba za dodatnim kliničkim procenama.

Cilj: Cilj ovog rada je da se ispita mogućnost primene uređaja tipa protočne čelije za *in vitro* procenu biofarmaceutskih svojstava tableta sa trenutnim oslobađanjem nimesulida.

Materijal i metode: Brzina rastvaranja nimesulida iz dva preparata ispitana je u uređaju tipa protočne čelije i u aparaturi sa lopaticama, u medijumima različitih pH vrednosti bez/sa dodatkom surfaktanta (saharozna laurat ili polisorbato 80), kao i metodom izmene pH vrednosti medijuma sa surfaktantom. Za procenu sličnosti dobijenih profila korišćene su vrednosti faktora sličnosti (f_1) i razlike (f_2). Rezultati *in vitro* ispitivanja su, primenom dekonvolucionog pristupa uspostavljanju *in vitro-in vivo* korelacije (IVIVC), upoređeni sa profilom apsorpcije nimesulida *in vivo* predviđenim pomoću GastroPlus™ programskog paketa.

Rezultati: Ispitivanja su pokazala da se, sa dodatkom surfaktanta, povećava brzina rastvaranja nimesulida, no stepen povećanja zavisi od osobina formulacije, vrste dodatog surfaktanta i primenjene aparature. Izračunate f_1 i f_2 vrednosti ukazuju na značajne razlike u brzini rastvaranja nimesulida iz ispitivanih preparata pri primenjenim eksperimentalnim uslovima. Rezultati IVIVC su pokazali da se ispitivanjem u uređaju tipa protočne čelije, uz izmenu pH vrednosti medijuma sa surfaktantom, dobijaju profili koji daju dobru korelaciju sa *in vivo* vrednostima.

Zaključak: Dobijeni rezultati su pokazali da se predloženom metodom pH izmene, uz dodatak surfaktanta, u uređaju tipa protočne čelije može uspešno simulirati proces rastvaranja nimesulida *in vivo*.

Glavne reči: nimesulid, brzina rastvaranja, protočna čelija, pH izmena, IVIVC.

IZRADA I ISPITIVANJE ČVRSTIH DISPERZIJA KARBAMAZEPINA I NOSAČA TIPA MAGNEZIJUM-ALUMINIJUM-METASILIKATA I SILICIJUM-DIOKSIDA

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Uvod: Novije adsorbense/nosače prirodnog ili sintetskog porekla karakteriše veliki kapacitet adsorbovanja leka, kao i brojne mogućnosti kontrolisanog, usporenog ili pulsog oslobađanja lekovite supstance.

Cilj rada: Izrada i ispitivanje čvrstih disperzija karbamazepina sa adsorbensima tipa magnezijum-aluminijum metasilikata i silicijum-dioksida sintetskog i prirodnog porekla.

Materijal i metode: Karbamazepin je rastvaran u koncentrovanom etanolu, a nakon toga nanošen na sledeće nosače: magnezijum-aluminijum-metasilikat (Neusilin FL2, Neusilin UFL2), silicijum-dioksid (Silisia 320), u odnosu lek/nosač: 1:1, 1:2, 1:4, 1:6. Istim postupkom, karbamazepin je nanošen na dijatomejsku zemlju (amorfni silicijum-dioksid prirodnog porekla) u odnosima 1:2 i 1:4. Ispitivanje brzine rastvaranja karbamazepina iz izrađenih disperzija izvedeno je u aparaturi sa rotirajućim lopaticama (fosfatni pufer pH 6.8, 50rpm, zapremina 900ml). Praćena je brzina oslobađanja karbamazepina iz komercijalnih tableta- Galepsin, Galenika AD.

Rezultati: Sa povećanjem udela Neusilin FL2, Neusilin UFL2 i Silisia 320, povećava se brzina oslobađanja karbamazepina, dok se pri primeni različitih udela dijatomejske zemlje ne menja. Brzina oslobađanja karbamazepina se respektivno povećavala primenom Neusilin FL2, Silisia 320, Neusilin UFL2. Primenom dijatomejske zemlje tokom prvih 60min oslobodilo se 42,68% i to kinetikom nultog reda, sa površine nosača, a nakon toga, u toku sledećih 240min oslobodilo se još 20% karbamazepina iz pora nosača. Kada je kao nosač korišćen Neusilin UFL2 u odnosu 1:6 oslobodeno 76,79%, pri primeni dijatomejske zemlje 42,68%, a u komercijalnom preparatu 56,44% karbamazepina, nakon 60min.

Zaključak: Izradom čvrstih disperzija karbamazepina i adsorbensa tipa magnezijum-aluminijum-metasilikata i silicijum-dioksida, moguće je postići kako veoma brzo oslobađanje leka, tako i modifikovano/produženo oslobađanje, koje se, u određenim slučajevima, može opisati kinetikom nultog reda.

Glavne reči: karbamazepin, magnezijum-aluminijum-metasilikat, silicijum-dioksid, dijatomejska zemlja

BIOPHARMACEUTICAL CHARACTERIZATION OF DRUG PRODUCTS USING FLOW-THROUGH CELL APPARATUS: DISSOLUTION RATE STUDIES ON NIMESULIDE IMMEDIATE-RELEASE TABLETS

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Introduction: With the right choice of experimental conditions, dissolution test might be used to evaluate drug *in vivo* performance, thus serving as a surrogate for clinical studies.

The Aim: The objective of this study was to investigate the applicability of a flow-through apparatus to *in vitro* assess biopharmaceutical properties of nimesulide immediate-release tablets.

Materials and Methods: Dissolution studies of two commercially available nimesulide tablets were carried out in a flow-through cell and rotating paddle apparatus, using various buffer media without/with the addition of surfactant (sucrose-laurate or polysorbate 80), and according to "pH change of media containing surfactant" method. The obtained profiles were compared using similarity (f_2) and difference (f_1) factors. *In vitro-in vivo* correlation (IVIVC) based on deconvolution approach was applied to assess the relationship between the *in vitro* and *in vivo* data. GastroPlus™ software package was used for computer simulations.

Results: The obtained results indicated apparent enhancement of nimesulide dissolution in the presence of surfactants. However, the degree of dissolution enhancement was highly influenced by surfactant type, formulation factors, and the dissolution apparatus employed. Calculated f_1 and f_2 values indicated significant differences between the two products under employed experimental conditions. IVIVC results indicated high level of correlation between the *in vitro* profiles obtained with a flow-through cell, using media pH change method, and drug *in vivo* absorption profile.

Conclusion: The presented data indicated feasibility of a proposed pH change method, using flow-through apparatus to reflect nimesulide *in vivo* dissolution behavior.

Keywords: nimesulide, dissolution rate, flow-through cell, pH change, IVIVC.

EXAMINATION OF SOLID DISPERSIONS OF CARBAMAZEPINE WITH MAGNESIUM-ALUMINUM METASILICATE AND SILICON DIOXIDE CARRIERS

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Introduction: Novel adsorbences/ carriers, natural or synthetic, are characterised with large adsorption capacity, as well as different types of controlled, sustained and pulsed release.

The Aim: Examination of solid dispersions of Carbamazepine with natural or synthetic adsorbences- Magnesium-Aluminum Metasilicate and Silicon Dioxide carriers.

Materials and Methods: Carbamazepine was diluted in Ethanol, 96% and then incorporated on carriers: Magnesium-Aluminum Metasilicate (Neusilin FL2, Neusilin UFL2) and Silicon Dioxide (Silisia 320) in weight ratios drug/carrier: 1:1, 1:2, 1:4, 1:6. Carbamazepine was also incorporated in Diatomite (amorphous, natural Silicon Dioxide) in ratios 1:2, 1:4. Drug release testing of dispersions was performed in the rotating paddle apparatus (phosphate buffer pH=6.8, 50rpm, volume 900ml). Drug release profile of Carbamazepine from commercial tablets- Galepsin, Galenika AD, was also examined.

Results: With increasing the ratios of Neusilin FL2, Neusilin UFL2, Silisia 320, drug release of Carbamazepine is also increasing, while using different ratios of Diatomite stays constant. Drug release was increased using Neusilin FL2, Silisia 320, Neusilin UFL2, respectively. Using Diatomite, during first 60min, 42.68% was released (zero order kinetic), from the surface of carrier, and then, in next 240min, 20% more was released. After 60min, percentage of released drug using Neusilin UFL2 (1:6), Diatomite and commercial tablet were 76.79%, 42.68% and 56.44%, respectively.

Conclusion: Making solid dispersions of Carbamazepine and Magnesium-Aluminum Metasilicate as well as Silicon Dioxide carriers, is the most effective method of improving the dissolution rate, achieving modified/sustained release, which can be sometimes described as zero order kinetic.

Key words: Carbamazepine, Magnesium-Aluminum Metasilicate, Silicon Dioxide, Diatomite

RAZVOJ POZITIVNO NAELEKTRISANIH NANOEMULZIJA: PREFORMULACIONA STUDIJA

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Uvod: Pozitivno naelektrisane ulje u vodi (U/V) nanoemulzije (PNE) su efikasni nosači za lekovite supstance koji, zahvaljujući poboljšanoj supstantivnosti nakon topikalne primene (npr. koža ili sluzokoža oka), mogu produžiti kontaktno vreme i olakšati penetraciju i permeaciju leka u/kroz kožu/sluzokožu.

Cilj rada: Cilj ovog rada bio je razvoj fizički stabilnih PNE, malog dijametra kapi, variranjem tipa surfaktanta i katjonskih amfifila/kosurfaktanta (KA).

Materijal i metode: Pripremljene su dve serije PNE sa 20% (m/m) triglicerida srednje dužine lanca i 4% (m/m) surfaktanta. Prva serija stabilizovana je smešom polisorbata 80 (P80) i lecitina (L), uz variranje KA, a druga C₈-C₁₀ alkil poliglukozidnim (APG) surfaktantom uz iste KA. Na uređaju Ultra Turrax dobijene su preemulzije, koje su podvrgnute homogenizaciji pod visokim pritiskom (Emulsiflex C3, Avestin, Canada). Primenjeno je pet ciklusa homogenizacije, pri pritisku od 300 bara. Veličina kapi i površinsko naelektrisanje kapi (zeta potencijal) određivani su na uređaju Zetasizer Nano-ZS 90 (Malvern Instruments, UK).

Rezultati: U cilju procene preliminarnе fizičke stabilnosti, neposredno nakon izrade i nakon 7 i 14 dana čuvanja uzorka, mereni su zeta potencijal, polidisperzni indeks (PI), veličina kapi, električna provodljivost i pH. PNE sa zeta potencijalom višim od +30 i nižim od -30mV smatraju se stabilnim. Nakon dodatka KA, vrednosti zeta potencijala su bile više od +30mV. Emulzija stabilizovana smešom P80 i L imala je vrednost nižu od -30mV. Veličina kapi bila je u opsegu od 172.7 do 298nm, a PDI u rasponu 0.112 – 0.248.

Zaključak: Dobijene su fizički stabilne nanoemulzije sa pozitivno naelektrisanim površinom čestica, kao potencijalni nosači negativno naelektrisanih API.

Ključne reči: nanoemulzije, surfaktanti, katjonski amfifili/kosurfaktanti, zeta potencijal

DEVELOPMENT OF A POSITIVELY CHARGED NANOEMULSIONS: A PREFORMULATION STUDY

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Introduction: Positively charged oil-in-water (O/W) nanoemulsions (PNE) are effective carriers for drugs which can, by enhanced substantivity after topical application (for example, on skin or eye mucous membrane), prolong skin/mucous membrane contact, and facilitate penetration or permeation of drug into the skin/mucous membrane.

The Aim: To develop physically stable PNE, with small droplet diameter, by variation of both surfactant types and cationic amphiphiles/co-surfactants (CA).

Materials and Methods: Two series of PNE were prepared with 20% (m/m) of medium-chain triglycerides and 4% (m/m) surfactant. First series was stabilised by mixture of polysorbate 80 (P80) and lecithin (L), with varying of CA, and the second one by mixture of C₈-C₁₀ alkylpolyglucoside (APG) surfactant and the same CA. Preemulsions were acquired by Ultra Turrax machine and were subjected to the high pressure homogenisation (Emulsiflex C3, Avestin, Canada). Five cycles of homogenization at a pressure of 300 bar were applied. Droplet size and zeta potential were measured on Zetasizer Nano-ZS 90 (Malvern Instruments, UK).

Results: Preliminary physical stability was evaluated by measuring of zeta potential, polidispersity index (PI), droplet size, electrical conductivity and pH. Samples were taken immediately after preparation and 7 and 14 days after. PNE with zeta potential above +30mV and below -30mV are considered stable. After the addition of CA, zeta potential values were higher than +30mV. Emulsions stabilized with a mixture of P80 and L, had a value less than -30mV. Droplet size was in the range of 172.7-298nm, while PI range was 0.112-0.248.

Conclusion: Physically stable nanoemulsions with positively charged particle surface are obtained as potential carriers of negatively charged API.

Keywords: nanoemulsions, surfactants, cationic amphiphile/co-surfactants, zeta potential

ISPITIVANJE UTICAJA FAKTORA FORMULACIJE NA OSLOBAĐANJE KARBAMAZEPINA IZ PREPARATA IZRADENIH POSTUPKOM EKSTRUZIJE TOPLJENJEM

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Uvod: Primena ekstruzije topljenjem u farmaceutskoj industriji je u poslednjoj deceniji usmerena na razvoj formulacija sa teško rastvoljivim lekovitim supstancama, kao i na razvoj formulacija sa modifikovanim oslobađanjem lekovite supstance. Veliki broj faktora može uticati na modifikaciju brzine oslobađanja leka iz ekstrudata.

Cilj rada: Ispitivanje uticaja molekulske mase i udela polietilenoksidnih polimera (PEO), udela lekovite supstance i dužine ekstrudata na brzinu rastvaranja karbamazepina, kinetiku bubrenja i erozije ekstrudata, izrađenih postupkom ekstruzije topljenjem.

Materijal i metode: Ekstrudati su sadržali karbamazepin (5-25%), Poloxamer 407 (15-25%; Lutrol F-127, BASF, Nemačka) i polietilen oksidni polimer PEO WSR (50-80%; Dow, SAD). Korišćeni su polimeri molekulske mase 2–7x10⁶. Ispitivanje brzine rastvaranja karbamazepina iz pripremljenih ekstrudata praćeno je tokom 8 sati. Praćene su promene u masi i dimenzijama ekstrudata tokom njihovog bubrenja i erozije.

Rezultati: Do značajnijeg smanjenja brzine oslobađanja karbamazepina dolazi sa povećanjem molekulske mase polimera, povećanjem udela polimera i povećanjem udela karbamazepina. Dužina ekstrudata ne utiče značajnije na brzinu rastvaranja karbamazepina. Analizom procesa bubrenja i erozije utvrđeno je da formulacije sa polimerima veće molekulske mase sporije bubre i pokazuju manji procenat erozije, uzrokujući tako i usporavanje brzine rastvaranja karbamazepina (30% u odnosu na 80% oslobođenog karbamazepina nakon 3 sata).

Zaključak: Pravilnim odabirom vrste i udela polimera i odgovarajućeg udela lekovite supstance moguće je razviti formulaciju koja pokazuje željenu kinetiku oslobađanja lekovite supstance. Ekstrudati koji sadrže 25% karbamazepina, 15% Poloxamer 407 i 60% PEO WSR-303 polimera molekulske mase 7x10⁶ pokazuju usporeno oslobađanje karbamazepina tokom 8 sati.

Ključne reči: ekstruzija topljenjem, PEO polimeri, karbamazepin, modifikovano oslobađanje lekovite supstance, bubrenje, erozija

INFLUENCE OF THE FORMULATION FACTORS ON CARBAMAZEPINE RELEASE FROM THE HOT-MELT EXTRUDED PREPARATIONS

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Introduction: Although the major focus for the HME technology is the development of formulations to increase the efficacy of poorly water-soluble compounds, there has also been an increase in the application of HME for the development of controlled release formulations.

The Aim: Investigation of the influence of polyethylene oxide (PEO) polymers molecular weight and fraction, carbamazepine fraction and extrudates length on carbamazepine dissolution rate and extrudates swelling and erosion kinetics.

Materials and Methods: Extrudates contained carbamazepine (5-25%), Poloxamer 407 (15-25%; Lutrol F-127, BASF, Germany) and polyethylene oxide polymer PEO WSR (50-80%; Dow, USA). Polymers of molecular mass 2–7x10⁶ were used. Dissolution test for the hot-melt extrudates was conducted for 8 hours. Changes in extrudates mass and dimensions were monitored during swelling and erosion studies.

Results: Results have demonstrated that significant decrease of carbamazepine dissolution rate comes with: increase in polymer molecular mass and ratio, or with increase in the ratio of carbamazepine. Extrudates length doesn't affect carbamazepine dissolution rate significantly. Dissolution rate profiles were compared using similarity and difference factors. Analyzing the processes of swelling and erosion it was concluded that formulations with higher polymer molecular mass swell slower and erode less, causing decrease of carbamazepine dissolution rate (30% in comparison to 80% of carbamazepine released after 8 hours).

Conclusion: Choosing the right polymer type and ratios of polymer and active substance, it's possible to develop formulation that provides desired drug release. Extrudates containing 25% carbamazepine, 15% Poloxamer 407 and 60% PEO WSR-303 polymer (with molecular mass of 7x10⁶) demonstrate sustained release of carbamazepine for 8 hours.

Key words: hot-melt extrusion, PEO polymers, carbamazepine, modified drug release, swelling, erosion

FORMULACIJA I KARAKTERIZACIJA SAMO-MIKROEMULGUJUĆIH SISTEMA ZA ORALNU ISPORUKU IBUPROFENA

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Uvod: Razvoj samo-dispergujućih nosača je značajna savremena strategija za unapređenje oralne isporuke teško rastvorljivih lekovitih supstanci. Samo-mikroemulgujući sistemi za isporuku lekovitih supstanci (SMEDDS) su izotropne smeše ulja i hidrofilnih surfaktanata koje se spontano disperguju u vodenim medijumima (npr. tečnosti u GIT-u) pri čemu se formiraju ulje-u-vodi (u/v) mikroemulzije. Dispergovanje SMEDDS je uglavnom brzo, ali ovakvi sistemi su pogodni i za postizanje produženog oslobađanja lekovite supstance. Razvoj SMEDDS nosača zahteva obiman istraživački rad.

Cilj: Formulacija i karakterizacija SMEDDS za oralnu isporuku ibuprofena (lekovita supstanca iz 2. grupe prema BSK).

Materijal i metode: Selekcija SMEDSS zasnovana je na ispitivanju velikog broja koncentrata pripremljenih od surfaktanta (Labrasol[®], Gattefosse), kosurfaktanta (Cremophor[®]RH40, BASF) i ulja (srednjelančani trigliceridi (MCT) ili maslinovo ulje). Karakterizacija koncentrata sa 10% ibuprofena obuhvatila je ispitivanje precipitacije lekovite supstance/stabilnost disperzija koncentrata u vodenom medijumu (0,1M HCl i fosfatni pufer pH 7,2 (USP)), raspodele veličine kapi i *in vitro* brzine oslobađanja lekovite supstance.

Rezultati: Formiranje u/v mikroemulzija (Z-ave<100nm) detektovano je u najširem rasponu masenog odnosa surfaktant/kosurfaktant (K_m) (od 9/1 do 1/9) i pH vrednosti u prisustvu 10% MCT. PCS analizom potvrđeno je da ispitivani SMEDDS efikasno solubilizuju ibuprofen. Količina oslobodjenog ibuprofena iz SMEDDS (u obliku mekih kapsula sa 200 mg ibuprofena) dostizala je 70% pri $3/7 < K_m < 7/3$. Iz uzoraka u kojima preovladava jedan od surfaktanata u smeši ($K_m < 3/7$ or $K_m > 7/3$) oslobodila se celokupna količina ibuprofena za 10-60 min.

Zaključak: Optimizacija udela sastojaka omogućila je formulaciju SMEDDS sa ibuprofenom. Brzina oslobađanja lekovite supstance bila je dominantno uslovljena K_m vrednošću.

Ključne reči: oralna isporuka; SMEDDS; ibuprofen.

FORMULATION AND CHARACTERISATION OF SELF-MIKROEMULSIFYING DRUG DELIVERY SYSTEMS (SMEDDS) FOR ORAL DELIVERY OF IBUPROFEN

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Introduction: Dosing poorly soluble drugs dissolved in self-dispersing formulations is beneficial for oral delivery improvement. Self-microemulsifying drug delivery systems (SMEDDS) are isotropic mixtures of oils and hydrophilic surfactants, which form oil-in-water (o/w) microemulsions by dilution in aqueous media (e.g., gastrointestinal fluids). Although SMEDDS typically achieve great dispersion rate, they are also promising carriers for sustained drug release. SMEDDS development is still based on trial and error.

The Aim: To formulate and characterise SMEDDS for ibuprofen (BCS Class II drug).

Materials and Methods: Screening of SMEDSS was based on the evaluation of numerous concentrates comprising surfactant (Labrasol[®], Gattefosse), cosurfactant (Cremophor[®]RH40, BASF) and oil (medium chain triglycerides (MCT) or olive oil). The concentrates loaded with 10% of ibuprofen were characterized for drug precipitation/stability on dilution in 0,1M HCl and phosphat buffer pH 7.2 (USP), droplet size distribution and *in vitro* drug release.

Results: The formation of o/w microemulsions (Z-ave<100nm) was detected within the wide range of surfactant-to-cosurfactant mass ratio (K_m) (from 9/1 to 1/9) and pH values in concentrates containing 10%w/w of MCT. PCS analysis confirmed that selected SMEDDS prevent the drug precipitation in aqueous media. Ibuprofen release from SMEDDS (containing 200 mg of the drug in soft capsules) was up to 70% at $3/7 < K_m < 7/3$. When content of individual surfactants prevailed (at $K_m < 3/7$ and $K_m > 7/3$) the drug release was completed in 10-60 min.

Conclusion: Optimisation of the surfactants and oil content enabled formulation of ibuprofen SMEDDS. The drug release rate was controlled by K_m value.

Keywords: oral drug delivery; SMEDDS; ibuprofen.

GRANULACIJA TOPLJENJEM U UREĐAJU TIPA FLUIDIZIRAJUĆEG SISTEMA: PRIMENA METODOLOGIJE POVRŠINE ODGOVORA U ANALIZI UTICAJA FAKTORA FORMULACIJE I PROCESNIH PARAMETARA

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Uvod: Granulacija topljenjem u uređaju tipa fluidizirajućeg sistema je relativno nova metoda koja ima značajne prednosti u odnosu na konvencionalne metode. Podrazumeva upotrebu vezivnih sredstava sa relativno niskom temperaturom topljenja, koja mogu biti dodata u vidu rastopa (metoda raspršivanja) ili u vidu čvrstih čestica koje se tope u toku samog postupka (*in situ* metoda).

Cilj: Cilj ovog rada bila je analiza uticaja koncentracije veziva, pritiska vazduha za raspršivanje i temperature otopljenog veziva na raspodelu veličine i protočna svojstva granula.

Materijal i metode: Granulacija je izvođena na uređaju Mycrolab fluid bed processor (OYSTAR Hüttlin, Nemačka) koji je modifikovan uvođenjem dodatnih grejača. Gelucire 44/14 (Gattefosse, Francuska), lauroilpolioksiglicerid, je korišćen kao vezivno sredstvo. U preliminarnoj fazi ispitivan je raspon koncentracija veziva pri kojima je moguće postići kontrolisan proces granulacije, kao i uticaj temperature otopljenog veziva na karakteristike granula. Uticaj koncentracije veziva i pritiska vazduha za raspršivanje je dalje analiziran primenom centralnog kompozit dizajna.

Rezultati: Dobijeni rezultati ukazuju na izražen uticaj temperature otopljenog veziva i temperature ulaznog vazduha na karakteristike dobijenih granula. Pokazano je da se pri sadržaju veziva između 10% i 28% mogu dobiti granulati prihvatljivih karakteristika. Analiza uticaja sadržaja veziva i pritiska vazduha za raspršivanje ukazuje na to da je neophodno dobro poznavanje procesa i pažljiv odabir vrednosti ovih faktora kako bi se dobile granule željene veličine i dobrih protočnih svojstava.

Zaključci: Rezultati dobijeni u ovom radu ukazuju na to da se primenom metodologije površine odgovora može postići bolje razumevanje i kontrola postupka granulacije topljenjem.

Ključne reči: granulacija topljenjem, uređaj tipa fluidizirajućeg sistema, metodologija površine odgovora.

MELT GRANULATION IN FLUIDIZED BED: APPLICATION OF RESPONSE SURFACE METHODOLOGY FOR ANALYSIS OF THE INFLUENCE OF FORMULATION AND PROCESS PARAMETERS

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Introduction: Melt granulation in fluidized bed is emerging technique that has significant advantages over conventional granulation methods. It involves the use of binders with relatively low melting point, which can be added either in the form of molten liquid (spray-on procedure) or as discrete particles that melt during the process (*in situ* procedure).

The Aim: The aim of this study was to investigate the influence of binder content, spray air pressure and molten binder temperature on granule size distribution and granule flowability.

Materials and Methods: Granulation process was performed in the Mycrolab fluid bed processor (OYSTAR Hüttlin, Germany), which was modified by introducing additional heaters. Gelucire 44/14, lauroyl polyoxyglyceride, was used as meltable binder. In the preliminary phase of the present study, the range of binder concentrations that result in controllable granulation process and the influence of molten binder temperature on granule characteristics were investigated. The influence of binder content and spray air pressure was further investigated using central composite design.

Results: The results obtained indicate pronounced influence of molten binder temperature and inlet air temperature on granule characteristics. It was shown that binder content between 10% and 28% percent results in acceptable granule characteristics. Analysis of the effect of binder content and spray air pressure indicate that thorough process understanding and careful adjustment of these factors is needed in order to obtain granules of desired size and good flow properties.

Conclusion: The results obtained indicate that response surface methodology can be applied for better understanding and control of melt granulation process.

Keywords: melt granulation, fluid bed processor, response surface methodology.

**DERMALNA RASPOLOŽIVOST HIDROKORTIZONA IZ PODLOGA STABILISANIH
ALKIL POLIGLUKOZIDNIM EMULGATOROM: *IN VIVO* VAZOKONSTRIKTORNI TEST**

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Uvod: Kortikosteroidi su najčešće primenjivani lekovi u dermatologiji zbog svog antiinflamatornog i imunosupresivnog efekta. Poznato je da indukujе izbeljivanje kože kao posledica vazokonstrikcije mikrovaskulature kože što se može koristiti za ispitivanje njihove dermalne raspoloživosti.

Cilj: Cilj ovog rada je poređenje dermalne raspoloživosti hidrokortizona (HC) iz podloga stabilisanih prirodnim alkil poliglukoziidnim emulgatorom, radi procene uticaja primenjenog nosača na isporuku leka.

Materijal i metode: U model podlogama variran je dodatak korastvarača/penetracionih inhensera: izopropanol (10%), glicerol (20%) i propilenglikol (20%). HC (1%) je u izrađene podloge inkorporiran suspendovanjem. Farmakodinamska aktivnost HC iz podloga ispitana je kroz dve *in vivo* studije pod okluzijom. Pilot studija: uzorci (25 mg/cm²) su ostavljeni u kontaktu sa kožom tokom osam definisanih vremenskih intervala (0,25-6h). Tokom naredna 24h vršena su merenja eritema indeksa (EI- parametar farmakodinamskog odgovora) i transepidermalnog gubitka vode (TEGV- parametar integriteta kožne barijere). Studija dermalne raspoloživosti: nakon izlaganja kože uzorcima tokom vremena D₁, ED₅₀ i D₂ (rezultat pilot studije), vrednosti EI i TEGV merene su nakon 2, 4, 6, 20 i 24h.

Rezultati: Pilot studija ukazuje na maksimalnu permeaciju HC u stratum corneum 6h od aplikacije uzoraka što se može objasniti saturacijom SC rastvorenom frakcijom leka uz uspostavljanja ravnoteže između dalje permeacije i eliminacije. Dobjene površine ispod krive praćenog smanjenja EI (PIK_{0-24h}) ukazuju da su uzorci sa propilenglikolom i izopropanolom uslovlili najsnažnije izbeljivanje kože.

Zaključci: Najbolja dermalna raspoloživost HC pokazana je iz model podloga sa propilenglikolom i izopropanolom. Dodatak navedenih korastvarača/inhensera nije značajno uticao na povećanje TEGV, odnosno integritet kožne barijere.

Ključne reči: vazokonstriktorni test, alkil poliglukoziidi, hidrokortizon.

**HYDROCORTISONE DERMAL BIOAVAILABILITY FROM
ALKYL POLYGLUCOSIDE EMULSIFIER-STABILISED BASES: *IN VIVO* SKIN BLANCHING ASSAY**

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Introduction: Corticosteroids are the most frequently prescribed topical drugs due to their anti-inflammatory and immunosuppressive effect. They are known to induce skin blanching through vasoconstriction of cutaneous vessels which may be employed for their dermal bioavailability assessment.

The Aim: The aim of this work was to compare hydrocortisone (HC) skin absorption from bases stabilized with a natural-origin alkyl polyglucoside emulsifier, and evaluate influence of the carrier on drug delivery.

Materials and Methods: Model bases were prepared with varying co-solvents/penetration enhancers: isopropanol (10%), glycerol (20%) and propylene glycol (20%). HC (1%) was suspended in the prepared bases. HC pharmacodynamic activity from samples was evaluated through two *in vivo* studies under occlusion. Pilot study: skin was exposed to samples (25mg/cm²) for eight different dose durations (0,25-6h). Throughout the following 24h, erythema index (EI- pharmacodynamic response parameter) and transepidermal water loss (TEWL- skin barrier integrity) were assessed. Dermal bioavailability study: after three dose durations D₁, ED₅₀ and D₂ (data obtained through pilot study), EI and TEGV were measured after 2, 4, 6, 20 and 24h.

Results: Pilot study revealed that maximal HC stratum corneum permeation has occurred 6h after sample application, possibly due to the SC saturation by the dissolved drug and equilibrium between further permeation and drug elimination. Obtained areas under the curves of the recorded EI decrease (AUC_{0-24h}) indicate that propylene glycol and isopropanol-loaded samples have induced significant skin blanching.

Conclusion: Enhanced HC dermal bioavailability was shown from the investigated bases containing propylene glycol or isopropanol. The addition of the varied co-solvents/enhancers has not significantly affected TEWL, i.e. skin barrier integrity.

Keywords: vasoconstriction, alkyl polyglucosides, hydrocortisone.

**UPOREDNA PROCENA DERMALNE RASPOLOŽIVOSTI KORTIKOSTEROIDA:
METODA SA TRAKAMA VS. VAZOKONSTRIKTORNI TEST**

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Uvod: *Tape stripping* (TS) predstavlja *in vivo* metodu ispitivanja perkutane penetracije lekova kojom se može predvideti njihova raspoloživost kroz kožu. Zasniva se na sukcesivnom skidanju slojeva stratum corneuma (SC) adhezivnim trakama, nakon definisanog vremena od aplikacije uzoraka. Do usvajanja konačnog protokola ispitivanja, neophodan je rad na optimizaciji metode.

Cilj: Cilj rada je poređenje rezultata dermalne raspoloživosti hidrokortizona (HC) dobijenih TS tehnikom sa vazokonstriktornim testom kao, izuzev kliničkih studija, jedinom regulatorno prihvaćenom metodom ispitivanja lekova koji se primenjuju na koži.

Materijal i metode: Ispitivanje je sprovedeno na podlogama stabilisanim alkil poliglukoziidnim emulgatorom novije generacije, uz variranje korastvarača/penetracionih inhensera: izopropanol (10%), glicerol (20%) i propilenglikol (20%). Nakon 3h od aplikacije uzoraka, sukcesivno je uklonjeno 10 adhezivnih traka na koje je izvršen ujednačeni pritisak (140g/cm²). Nakon ekstrakcije i određivanja leka sa traka (HPLC), dobijeni su penetracioni profili HC. Vazokonstriktorni test sproveden je nakon izlaganja kože uzorcima tokom 1.5, 3 i 6h. Vrednosti eritema indeksa (EI- parametar farmakodinamskog odgovora) merene su nakon 2, 4, 6, 20 i 24h.

Rezultati: Dobjeni penetracioni profili uzoraka (zavisnost koncentracije HC i normalizovane debljine uklonjenog SC) ukazuju na značajno bolju penetraciju HC iz uzoraka sa propilenglikolom i izopropanolom. Ovi rezultati su u saglasnosti sa sprovedenim vazokonstriktornim testom s obzirom da su za iste uzorke dobijene najveće površine ispod krive praćenog smanjenja EI (PIK_{0-24h}).

Zaključci: Komparativna primena dve *in vivo* metode ukazuje da se TS može uspešno koristiti za ispitivanje dermalne raspoloživosti lekova, uz očiglednu prednost da se može primeniti za lekove iz različitih terapijskih grupa.

Ključne reči: *tape stripping*, vazokonstriktorni test, hidrokortizon.

**COMPARATIVE CORTICOSTEROID DERMAL BIOAVAILABILITY ASSESSMENT:
TAPE STRIPPING METHOD VS. SKIN BLANCHING ASSAY**

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Introduction: *Tape stripping* (TS) is an *in vivo* method of percutaneous penetration assessment of topical drugs that could predict their skin bioavailability. It involves successive removal of stratum corneum (SC) layers with adhesive tapes, after defined dose duration. However, until a final investigation protocol is adopted, further optimization of the method is required.

The Aim: The aim of the study was to compare hydrocortisone (HC) dermal bioavailability data obtained through TS technique with those acquired with skin blanching assay as, with the exception of clinical trials, the only established *in vivo* investigation for topical drugs.

Materials and Methods: Tests were conducted on bases stabilized with a novel alkyl polyglucoside emulsifier, with several co-solvents/penetration enhancers: isopropanol (10%), glycerol (20%) and propylene glycol (20%). 3h after sample application, 10 adhesive tapes were successively removed after being submitted to uniform pressure (140g/cm²). After suitable drug extraction and quantification (HPLC), HC penetration profiles were obtained. Skin blanching assay was performed after three dose durations (1.5, 3 and 6h). Erythema index (EI- pharmacodynamics response parameter) was measured after 2, 4, 6, 20 and 24h.

Results: Calculated penetration profiles (HC concentration vs. normalized SC depth removed) imply an enhanced HC penetration from propylene glycol and isopropanol-loaded samples. Results obtained are in accordance with the conducted skin blanching assay since the same samples induced the highest areas under the curves of the monitored EI depletion (AUC_{0-24h}).

Conclusion: Comparative evaluation of the two *in vivo* methods indicate that TS may be successfully applied for dermal bioavailability assessment of topical drugs, with an apparent advantage of being applicable to drugs from different therapeutic groups.

Keywords: *tape stripping*, vasoconstriction, hydrocortisone.

PROCENA UTICAJA FORMULACIJSKIH I PROCESNIH PARAMETARA
NA REOLOŠKE KARAKTERISTIKE I FIZIČKU STABILNOST U/V KOZMETIČKIH EMULZIJA:
Plackett Burman-ov EKSPERIMENTALNI DIZAJN

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Uvod: Poligliceril-3 distearat (Cremophor® GS 32) je savremeni nejonski emulgator, koji se zbog visoke kompatibilnosti sa kožom preporučuje za izradu kozmetičkih u/v emulzija za različite namene.

Cilj rada: Cilj rada je bio da se primenom *Plackett Burman*-ovog eksperimentalnog dizajna proceni značajnost uticaja različitih formulacijskih i procesnih parametara na reološke karakteristike i fizičku stabilnost u/v emulzija stabilizovanih upotrebom emulgatora poligliceril-3 distearat.

Materijal i metode: Postupkom izrade toplo/toplo izrađeno je osam uzoraka emulzija, pri čemu su varirani sledeći faktori: koncentracija emulgatora (3% i 5%), udeo masne faze (20% i 40%), vrsta masnih amfifila (cetil alkohol, stearyl alkohol, stearinska kiselina, gliceril stearat), faza u kojoj je rastvoren emulgator, redosled dodavanja faza i brzina mešanja u toku izrade (650 o/min i 1050 o/min). Rezultati dobijeni 72h nakon izrade emulzija (pH vrednosti, vrednosti električne provodljivosti, visine odvojenog sloja nakon testa centrifugiranja, reološki parametri: maksimalni i minimalni prividni viskoziteti i histerezne površine) su analizirani primenom metode *Plackett Burman*-ovog eksperimentalnog dizajna.

Rezultati: Na osnovu dobijenih rezultata, primenom metode *Plackett Burman*-ovog eksperimentalnog dizajna, utvrđeno je da koncentracija emulgatora poligliceril-3 distearata, udeo masne faze i vrsta masnih amfifila imaju najveći uticaj na fizičku stabilnost i reološke karakteristike ispitivanih u/v kozmetičkih emulzija.

Zaključak: Primenjena metoda *Plackett Burman*-ovog eksperimentalnog dizajna omogućava dobijanje velikog broja informacija o uticaju različitih formulacijskih i procesnih parametara na kvalitet kozmetičkih emulzija, izradom malog broja uzoraka, što može biti od velikog praktičnog značaja.

Ključne reči: poligliceril-3 distearat, u/v emulzije, reologija, fizička stabilnost, eksperimentalni dizajn

PROCENA UTICAJA VRSTE I KONCENTRACIJE LIPOFILNIH KOEMULGATORA
NA REOLOŠKE KARAKTERISTIKE I FIZIČKU STABILNOST U/V KOZMETIČKIH KREMOVA
PRIMENOM METODA EKSPERIMENTALNOG DIZAJNA

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Uvod: Cetearil glukozid (TEGO® Care CG 90, Evonik, Nemačka) je savremeni, prirodni nejonski emulgator iz grupe alkilpoliglukozida. Biodegradabilan je i u niskim koncentracijama pogodan za izradu stabilnih kozmetičkih U/V kremova za različite namene.

Cilj rada: Procena uticaja vrste i koncentracije lipofilnih koemulgatora na reološke karakteristike i fizičku stabilnost U/V kozmetičkih kremova primenom D-optimalnog eksperimentalnog dizajna.

Materijal i metode: Kremovi, sa udelom masne faze od 30%, stabilizovani su upotrebom 1% cetearil glukozida i izrađeni postupkom toplo/toplo. Formulacije su se razlikovale po tipu lipofilnog koemulgatora (stearinska kiselina, stearyl alkohol, cetil alkohol, glicerilstearat) i/ili njihovom međusobnom odnosu, u ukupnom udelu od 5%. Pripremljenim kremovima, 72h nakon izrade, određene su pH vrednosti, vrednosti električne provodljivosti, visine odvojenog sloja nakon testa centrifugiranja, prividni viskoziteti (maksimalni i minimalni) i histerezna površina. Odgovarajućim statističkim metodama procenjen je uticaj vrste i koncentracije lipofilnih emulgatora na navedene parametre.

Rezultati: Rezultati ispitivanja su pokazali da stearinska kiselina i glicerilstearat značajno utiču na pH vrednost i električnu provodljivost ispitivanih kremova, dok su vrednosti prividnih viskoziteta i histerezne površine pod dominantnim uticajem glicerilstearata.

Zaključak: Primenom metoda eksperimentalnog dizajna moguće je, na relativno jednostavan način, proceniti uticaj formulacijskih parametara na kvalitet kremova, što može da bude od velikog praktičnog značaja u razvoju novih formulacija kozmetičkih kremova.

Ključne reči: cetearil glukozid, lipofilni koemulgatori, U/V kremovi, reologija, fizička stabilnost, eksperimentalni dizajn

EVALUATION OF THE INFLUENCE OF FORMULATION AND PROCESS PARAMETERS
ON THE RHEOLOGICAL PROPERTIES AND PHYSICAL STABILITY OF THE O/W COSMETIC EMULSIONS:
Plackett Burman EXPERIMENTAL DESIGN

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Introduction: Polyglyceryl-3 distearate (Cremophor® GS 32) is a nonionic emulsifier with good physiological compatibility, suitable for the manufacture of cosmetic O/W emulsions.

The Aim: The aim of this study was to evaluate significance of the influence of different formulation and process parameters on the rheological properties and physical stability of the o/w emulsions stabilized by polyglyceril-3 distearate using *Plackett-Burman* experimental design.

Material and Methods: Eight samples were prepared using hot/hot procedure varying the following factors: the concentrations of emulsifier (3% and 5%) and oil phase (20% and 40%), type of fatty amphiphile (cetyl alcohol, stearyl alcohol, stearic acid, glyceryl stearate), the phase in which the emulsifier is added, the order of phase addition and stirring speed during preparation (650 rpm and 1050 rpm). Results obtained 72h after the preparation (values of pH and electrical conductivity, the height of separate layers after centrifugation test, apparent viscosities and hysteresis area were analyzed using *Plackett-Burman* experimental design).

Results: Based on the results obtained using the *Plackett-Burman* experimental design it was determined that the concentrations of emulsifier and oil phase and the type of fatty amphiphile had the greatest influence on the physical stability and rheological properties of the investigated o/w cosmetic emulsions.

Conclusion: *Plackett-Burman* experimental design method allows evaluation of the influence of various formulation and process parameters on the quality of cosmetic emulsions on the basis of relatively few samples prepared, which can be of great importance in practice.

Key words: polyglyceryl-3 distearate, o/w emulsions, rheology, physical stability, experimental design

APPLICATION OF EXPERIMENTAL DESIGN METHODS
TO ASSESS THE EFFECT OF LIPOPHILIC CO-EMULSIFIER TYPE AND CONCENTRATION
ON THE RHEOLOGICAL PROPERTIES AND PHYSICAL STABILITY OF O/W COSMETIC CREAMS

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Introduction: Cetearyl Glucoside (TEGO® Care CG 90, Evonik, Germany) is a natural, nonionic emulsifier of an alkyl polyglucoside type, belonging to the new biodegradable surfactant generation. Stable cosmetic O/W all-purpose creams are achieved at low concentration level of cetearyl glucoside.

The Aim: Assessment of lipophilic co-emulsifier type and concentration effect on the rheological properties and physical stability of O/W cosmetic creams through application of D-optimal experimental design.

Materials and Methods: Creams containing 30% oil phase, were stabilized with 1% of cetearyl glucoside and prepared using hot/hot procedure. The lipophilic co-emulsifier type (stearic acid, stearyl alcohol, cetyl alcohol, glyceryl stearate) and concentration ratio were varied, up to 5%. The values of electrical conductivity and pH, height of the separated layer after centrifugation test, apparent viscosities (maximal and minimal) and hysteresis area were investigated 72h after preparation. The effect of lipophilic co-emulsifier type and concentration on specified parameters was determined by using appropriate statistical methods.

Results: Study results had shown significant influence of stearic acid and glyceryl stearate on pH and electrical conductivity values, while apparent viscosity values and hysteresis area were directly affected by glyceryl stearate.

Conclusion: Influence of formulation parameters on creams' quality can simply be assessed through application of experimental design methods. These methods are expected to have practical importance for new cosmetic cream formulations development.

Key words: Cetearyl Glucoside, lipophilic co-emulsifiers, O/W creams, rheology, physical stability, experimental design methods

UTICAJ POMOĆNIH MATERIJALA NA FARMACEUTSKOTEHNOLOŠKE OSOBINE TABLETA

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Uvod: Ekscipijensi se dodaju u preparat kako bi im se povećala masa, otklonili nedostaci lekovite supstance i olakšala primena. Vežvna sredstva kod tableta osiguravaju povezivanje čestica lekovite supstance i sredstva za dopunjavanje u veće aglomerate, pri čemu poboljšavaju osobine proticanja i kompresibilnosti. Vrsta i količina upotrebljenog veziva pokazatelj je čvrstoće i raspadljivosti tableta.

Cilj rada: bio je ispitivanje uticaja različitih tipova vezivnih sredstava na fizičko-hemijske i farmaceutsko-tehnološke osobine formulacija tableta sa litijum-karbonatom.

Materijal i metode: Metodom vlažne granulacije, izrađene su četiri formulacije tableta, sledećeg sastava: odgovarajuće vezivno sredstvo u potrebnoj koncentraciji (vodeni rastvori: skrob, 10%; želatina, 4%; karmeloza-natrijuma, 5% i alkoholni rastvor Kollidon®-a, 5%) i ostale komponente (litijum-karbonat 300 mg po tableti; laktoza, monohidrat; magnezijum stearat). Sadržaj litijum-karbonata, izgled izrađenih tableta i raspadljivost su određeni po propisu Ph. Jug. IV, a variranje mase, čvrstina i friabilnost po propisu Ph. Jug. V.

Rezultati rada: Raspadljivost tableta kod svih formulacija ne zadovoljava farmakopejski propis. Tablete izrađene sa skrobom i želatinom zadovoljavajućeg su sadržaja aktivne supstance, izgleda tableta, friabilnosti, čvrstine i variranja mase, dok su tablete sa karmeloza-natrijumom zadovoljavajućeg sadržaja aktivne supstance i variranja mase, a nezadovoljavajućeg izgleda tableta, friabilnosti i čvrstine. Tablete sa Kollidon® zadovoljavajućeg su sadržaja aktivne supstance, variranja mase i izgleda tableta, a nezadovoljavajuće kod friabilnosti i čvrstine.

Zaključak: Predložene formulacije tableta litijum-karbonata imaju zadovoljavajući integritet – čvrstoću, friabilnost i izgled, kao i sadržaj lekovite supstance, ali ne i raspadljivost – što ukazuje na nedostatak sredstva za raspadanje i potrebu korigovanja formulacija.

Ključne reči: tablete; sredstva za vezivanje; skrob, kukuruzni; želatina; karmeloza-natrijum; Kollidon®

EFFECT OF EXCIPIENTS ON PHARMACEUTICAL AND TECHNOLOGICAL PROPERTIES OF TABLETS

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Introduction: Excipients are added to product in order to increase weight and facilitate implementation. Binders provide connecting particles of medicinal substances and means, supplementing agglomerates, which improved flow properties and compressibility. Type and amount of binder is an indicator of the strength and disintegration.

Aim: To evaluate influence of different types of binders on physical-chemical and pharmaceutical-technological properties of tablet formulation lithium carbonate.

Material and methods: wet granulation method, developed four formulations of tablets, following composition: suitable binder in required concentration (aqueous solution: starch, 10%; gelatin, 4%; sodium-carboxymethylcellulose, 5% and 5% alcoholic solution of Kollidon®, 5%) and other components (lithium carbonate 300 mg per tablet, lactose monohydrate, magnesium stearate). Determination of lithium carbonate, visual appearance and testing disintegration performed by the regulations of Ph. Jug. IV, and testing mass, hardness and friability by the regulations of Ph. Jug. V.

Results: Disintegration of tablet formulation doesn't meet pharmacopoeial regulations. Tablets with starch and gelatin satisfied requests for determination of lithium carbonate, visual appearance, testing mass, hardness and friability, while tablets with sodium-carboxymethylcellulose satisfied requests for determination of lithium carbonate, testing mass but not for visual appearance, hardness, friability. Tablets with Kollidon® satisfied requests for lithium carbonate, testing mass, visual appearance, and haven't satisfied request for hardness, friability.

Conclusion: Formulation of lithium carbonate tablets have sufficient integrity-strength, friability, appearance, content of drug, but not disintegration, which indicates a lack of means for decomposition and need to correct formulations.

Keywords: tablets, binders, corn starch, gelatin, sodium carboxymethylcellulose, Kollidon®

VISKOZNE KAPI ZA OČI SA DEKSPANTENOLOM

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Uvod: Kapi za oči su najčešće primenjivani lekoviti oblici u oftalmologiji, ali pokazuju kao nedostatak vrlo kratak kontakt sa rožnjačom. Moguće rešenje ovog problema je povećanje viskoziteta kapi za oči. Takođe, značajno je i neophodno izraditi viskozne kapi za oči sa dekspantenolom za pacijente kod kojih je zabranjeno primeniti kapi sa konzervansom i usled njihove nedostupnosti na tržištu kao jednodoznih preparata.

Cilj rada: Cilj je da se analizom dostupne literature i postojećih preparata, formulišu i ispituju viskozne kapi za oči sa dekspantenolom.

Materijal i metode: Analizom dostupne literature i postojećih preparata formulisali smo rastvor dekspantenola sa hidroksipropilmetilcelulozom, prema farmakopejskim propisima i zahtevima Dobre Proizvođačke Prakse, tako da je koncentracija dekspantenola 3%. Potencijometrijsko određivanje pH vrednosti vršeno je direktnim uranjanjem elektrode u preparat. Sadržaj je određen primenom RP-HPLC metode. Sterilnost je ispitana po zahtevima koje propisuje Ph. Jug. V.

Rezultati: Preparat ispunjava farmakopejske zahteve za sterilnost, a sadržaj dekspantenola je u okviru dozvoljenih odstupanja. Izrađene kapi obezbeđuju dobru podnošljivost na osnovu izmerene pH vrednosti. Rezultati pokazuju da će pacijent dobiti preparat zadovoljavajućeg kvaliteta koji će ispoljiti optimalno terapijsko delovanje pri lečenju određenog oboljenja oka.

Zaključak: Striktnim poštovanjem utvrđenih i validiranih postupaka i procesa u izradi, omogućavamo obolelom da primeni bezbedan i efikasan lek.

Ključne reči: Viskozne kapi, oči, dekspantenol

VISCOUS EYE DROPS WITH DEXPANTHENOL

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Introduction: Eye drops are most commonly applied forms in ophthalmology, but show a lack of such a brief contact with the cornea. A possible solution is to increase the viscosity of the eye drops. Also, it is significant and necessary to produce viscous eye drops with dexpanthenol for the patients who are forbidden to apply drops with preservative, and due to their unavailability in the market as single dose preparations.

The Aim: The aim is to analyze the available literature and existing products, formulate and examine viscous eye drops with dexpanthenol.

Materials and Methods: The analysis of available literature and existing products helped us to formulate solution of dexpanthenol with hydroxypropylmethylcellulose, in accordance with pharmacopoeial regulations and requirements of the Good Manufacture Practice, so that the concentration of dexpanthenol is 3%. Potentiometric determination of pH values was performed by direct immersion of the electrode in preparation. The content was determined by applying RP-HPLC method. Sterility was tested by the requirements prescribed by the Ph. Jug. V.

Results: The preparation meets pharmacopoeial requirements for sterility, and the content of dexpanthenol is within the requirements. Made drops ensure good compatibility on the basis of the measured pH values. The patient will get a satisfactory quality product that will bring out the optimal therapeutic effect in treating certain diseases of the eye.

Conclusion: Respect the established and validated procedures and processes in the development, enable the sick to apply safe and effective medicine.

Key words: Viscous drops, eyes, dexpanthenol

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Conclusion: Respect the established and validated procedures and processes in the development, enable the sick to apply safe and effective medicine.

Key words: Viscous drops, eyes, dexpanthenol

PRIMENA RAZVIJENIH POPULACIONIH MODELA KARBAMAZEPINA – BAJESOVA ANALIZA

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Uvod: Inicijalno postavljeni režimi doziranja (RD) se mogu korigovati putem pravila linearne farmakokinetike (FK) i izračunatih individualnih FK parametara, koristeći ili ne prethodno razvijene populacione modele. Značaj populacionih modela je razmatranje inter- i intraindividualne varijabilnosti u FK leka. Primenom Bajesove analize moguće je iskoristiti ove modele u individualizaciji RD. Tako, na osnovu izmerenih koncentracija i populacionog FK modela, koji uključuje izvore varijabilnosti, procenjujemo FK parametre za određenog pacijenta.

Cilj rada: Procena potrebe za prilagođavanje RD karbamazepina (CBZ) kod pacijenata primenom Bajesove analize uz korišćenje različitih populacionih FK modela.

Materijal i metode: Bajesova analiza sprovedena primenom NONMEM softvera (verzija 6, *IconDevelopments*). Razvijeni populacioni modeli za procenu relativnog klirensa (CL/F) CBZ daju ulazne komande modelovanja. Modeli su u obzir uzimali različite faktore identifikovane kao izvori varijabilnosti CL/F: godine, telesna masa, doza CBZ, koterapija valproinskom kiselinom i fenobarbitonom. Procena je izvršena u grupi od 46 pacijenata, a podaci dobijeni u toku terapijskog monitoringa.

Rezultati: Primena Bajesove analize pokazala je potrebu za prilagođavanjem RD za 8 pacijenata (17,39%) korišćenjem jednog, odnosno za 7 pacijenata (15,22%) uz preostala dva populaciona modela. Kod ostalih, prvobitno postavljeni RD bio je adekvatan. Kod ukupno 5 istih pacijenata je uočena potreba za korekcijom RD u sva tri modela. Od ukupno 9 pacijenata kod 4 je postojala potreba za smanjenjem, a kod preostalih za povećanjem ukupne dnevne doze CBZ.

Zaključak: Populacioni modeli su korisni kao smernice za prilagođavanje RD, a konkretne odluke o korekciji RD treba sprovediti za svakog individualnog pacijenta, u zavisnosti od terapijskog odgovora i podnošljivosti.

Ključne reči: karbamazepin, populacioni model, varijabilnost, režim doziranja, Bajesova analiza

APPLICATION OF DEVELOPED POPULATION PHARMACOKINETIC MODELS OF CARBAMAZEPINE - BAYESIAN ANALYSIS

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Introduction: Initially determined drug dosage regimens (DR) can be adjusted using linear pharmacokinetic (PK) rules, and by calculating individual PK parameters considering or not previously developed population models. Population models are important because they include both inter- and intraindividual PK variability of drug. Bayesian analysis can allow the use of these models in individualization of DR. Thus, based on measured concentrations and population PK model, which includes all sources of variability, individual patient's PK parameters can be predicted.

Aim: Consideration the need for carbamazepine (CBZ) DR adjustment, using Bayesian analysis and different population PK models.

Materials and Methods: Bayesian analysis was conducted using NONMEM software (version 6, *IconDevelopments*). Developed population models for estimating relative clearance (CL/F) of CBZ were used to create input modeling commands. The models consider various factors identified as sources of variability in CL/F: age, body weight, CBZ daily dose, cotherapy with valproic acid and phenobarbital. The prediction of individual CBZ CL/F was made in a group of 46 patients whose data were obtained during therapeutic drug monitoring.

Results: Application of Bayesian analysis showed the need for DR adjustment in 8 patients (17.39%) using one, or 7 patients (15.22%) using other two population models. Other patients already had optimal DR. In 5 patients DR adjustment was necessary according to all three models. Among 9 patients, 4 required dose reduction while others needed increase in CBZ daily dose.

Conclusion: Population models can be useful as guidelines for adjusting DR, but the final decisions are based on individual patient's therapeutic response and drug tolerability.

Keywords: carbamazepine, population model, variability, dosing regimen, Bayesian analyses

UTICAJ STAROSTI, POLA I KOMEDIKACIJE NA KLIRENS LAMOTRIGINA U PACIJENATA SA EPILEPSIJOM

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Uvod: Lamotrigin (LTG) se često primenjuje u terapiji parcijalnih i generalizovanih epileptičnih napada, kod dece i odraslih, zajedno sa valproinskom kiselinom (VPK) i karbamazepinom (KBZ). KBZ je induktor a VPK inhibitor izoenzima UGT1A4 koji je najzastupljeniji u metabolizmu LTG (70%).

Cilj rada: Ispitati uticaj istovremene primene VPK i/ili KBZ, pola i starosti pacijenata na klirens (CLs) LTG u pacijenata sa epilepsijom.

Materijal i metode: U istraživanju je učestvovalo 65 pacijenata, starosti 3-45 godina, koji su lečeni na Institutu za mentalno zdravlje, KBC Srbija. Pacijenti su primenjivali LTG+KBZ (18 pacijenata), LTG+KBZ+VPK (11 pacijenata) i LTG+VPK (36 pacijenata). U uzorcima plazme su određivane minimalne i maksimalne koncentracije LTG u stanju ravnoteže. U statističkoj analizi je korišćen Mann-Whitney U-test.

Rezultati: Pacijenti na terapiji LTG+VPK+KBZ su imali značajno povećan CLs LTG (0,1835 L/h/kg) u poređenju sa grupom LTG+VPK (0,0380 L/h/kg; $p < 0,001$), i značajno smanjen CLs LTG u poređenju sa grupom LTG+KBZ (0,3653 L/h/kg; $p < 0,05$). Kod osoba ženskog pola na terapiji LTG+VPK CLs LTG je bio značajno veći u poređenju sa osobama muškog pola (0,0457 i 0,0272 L/h/kg; $p < 0,05$). U istoj grupi je CLs LTG bio značajno veći kod pacijenata mlađih od 12 godina (0,0434 naspram 0,0275 L/h/kg; $p < 0,05$).

Zaključak: U prisustvu KBZ je značajno ubrzana eliminacija LTG, dok je u prisustvu VPK usporena. U prisustvu VPK, LTG se brže može eliminisati kod pacijenata mlađih od 12 godina i pacijenata ženskog pola. Rezultati istraživanja ukazuju na moguću korist od prilagođavanja doza LTG u zavisnosti od pola, starosti i komedikacije pacijenata.

Ključne reči: farmakokinetika, lamotrigin, valproinska kiselina, karbamazepin, interakcije

INFLUENCE OF AGE, GENDER AND COMEDICATION ON LAMOTRIGINE CLEARANCE IN PATIENTS WITH EPILEPSY

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Introduction: Lamotrigine (LTG) is often prescribed together with valproic acid (VPA) and carbamazepine (CBZ) for partial and generalised seizures, in both children and adults. CBZ is an inducer while VPA is an inhibitor of the UGT1A4 isoenzyme, which is predominantly involved in the LTG metabolism (70%).

The Aim: To evaluate the influence of simultaneous administration of VPA and/or CBZ, gender and age on LTG clearance (CLs) in patients with epilepsy.

Materials and methods: The study included 65 patients from the Institute of mental health, Clinical Centre, Serbia, aged 3-45 years. They were treated with LTG+CBZ (18 patients), LTG+CBZ+VPA (11 patients) and LTG+VPA (36 patients). Peak and trough concentrations of LTG were measured from plasma samples in steady state. Statistical analysis was performed using the Mann-Whitney U-test.

Results: Patients on the LTG+VPA+CBZ therapy had significantly higher CLs of LTG (0,1835 L/h/kg) compared to the LTG+VPA group (0,0380 L/h/kg; $p < 0,001$), and lower CLs of LTG compared to the LTG+CBZ group (0,3653 L/h/kg; $p < 0,05$). Females on LTG+VPA, had higher CLs of LTG than male patients in the same group (0,0457 vs 0,0272 L/h/kg; $p < 0,05$). In the same group, patients under 12 years had higher LTG CLs compared to older patients (0,0434 vs 0,0275 L/h/kg; $p < 0,05$).

Conclusion: LTG is eliminated faster when CBZ is coadministered, while when VPA is coadministered LTG elimination is slower. When VPA is coadministered, LTG might be eliminated faster in patients under 12 years and in females. The results indicate that there might be a therapeutic benefit of LTG dose-adjustment according to gender, age and comedication.

Key words: pharmacokinetics, lamotrigine, valproic acid, carbamazepine, interactions

METODE INTERNE VALIDACIJE RAZVIJENOG POPULACIONOG FARMAKOKINETIČKOG MODELA KARBAMAZEPINA

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Uvod: Validacija populacionih farmakokinetičkih modela može biti eksterna ili interna. Eksterna podrazumeva upotrebu grupe pacijenata koja nije bila uključena u građenje modela. Interna validacija obuhvata različite metode kojima se testira kvalitet modela na grupi pacijenata uključenih u finalni populacioni model.

Cilj: Evaluacija razvijenog populacionog farmakokinetičkog modela karbamazepina metodama interne validacije.

Materijal i metod: Za internu validaciju je korišćen softver NONMEM (ver.6, ICON Developments). Tehnike validacije su obuhvatile: *Jackknife*, *bootstrap*, metod uklanjanja i ukrštene validacije. Za *Jackknife* tehniku je iz populacije dobijeno 265 setova podatka tako da je u svakom setu po jedan pacijent isključivan. *Bootstrap* metodom je dobijeno 200 novih setova podataka slučajnim odabirom pacijenata uz ponavljanje. Metodom ukrštene validacije je dobijeno 5 podgrupa podataka uz isključivanje po 20% pacijenata. U svakom od setova su procenjene vrednosti parametara i izračunato je odstupanje od parametara finalnog modela.

Rezultati: Procenjene vrednosti parametara *Jackknife* metodom su odstupale za maksimalno 3% od parametara finalnog modela, osim parametra uticaja dnevne doze fenobarbitona koji je odstupao do 6.7%. Razlika vrednosti objektivne funkcije za *Jackknife* setove podataka je pokazala doprinos svakog pacijenta u identifikovanim faktorima varijabilnosti. Metodom uklanjanja dobijeni odnos kovarijanse i Cook-ov skor ukazuju da 3 pacijenta imaju visoke vrednosti oba parametra čime najviše doprinose preciznosti procenjenih finalnih parametara. Nijedan pacijent nema vrednost odnosa kovarijanse manju od granične 0.5. *Bootstrap* metodom i ukrštenom validacijom dobijeni su rezultati za 95% interval pouzdanosti parametara koji odgovaraju vrednostima parametara finalnog modela.

Zaključak: Rezultati interne validacije populacionog modela karbamazepina ukazuju da je dati model odgovarajući i stabilan.

Ključne reči: farmakokinetički populacioni model, interna validacija, karbamazepin

METHODS OF INTERNAL VALIDATION OF DEVELOPED POPULATION PHARMACOKINETIC MODEL OF CARBAMAZEPINE

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Introduction: Internal validation includes a variety of methods used to test the quality of model on a patients included in obtaining the final model.

The aim: Evaluation of population pharmacokinetic model of carbamazepine using internal validation methods.

Materials and methods: Software used for internal validation was NONMEM (ver.6, ICON Developments). Applied validation techniques were: *Jackknife*, *bootstrap*, *case-deletion*, and *cross-validation*. For *Jackknife* technique 265 data sets were derived, so that in each set one patient was excluded. With *bootstrap* method 200 new data sets were obtained. For *cross-validation* five sub-groups were obtained by exclusion of 20% of patients. In each of the sets parameter values were assessed, and its deviation from the values of the final model was calculated.

Results: Using *Jackknife* method, the estimated parameter values did not deviate more than 3% of the final model parameters, except parameter that influences the daily dose of phenobarbiton which deviated 6.7%. The difference of objective function values for the *Jackknife* data sets showed the contribution of each patient in the identified factors of variability. In *case-deletion* method the covariance ratio and Cook's score indicated that 3 patients had high values of both parameters demonstrating that they contribute the most to the precision of the final estimated parameters. None of the patients has covariance ratio less than the limit 0.5. The results of *bootstrap* and *cross-validation* showed that 95% confidence interval of estimated parameters correspond to the values of the tested final model parameters.

Conclusion: The results of internal validation of population carbamazepine model suggest that the model is appropriate and stable.

Key words: pharmacokinetic population model, internal validation, carbamazepine

RAZVOJ SINTETSKOG PUTA ZA DOBIJANJE SKELETA PRIRODNOG ANTIMALARIKA- KORIALSTONIDINA

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Uvod: Malaria je infektivna bolest, izazvana parazitom iz roda Plasmodium, koja se prenosi ubodom zaraženog komarca. Bolest je široko rasprostranjena u tropskim krajevima, pretežno u Africi, i godišnje ubije skoro milion ljudi. Svetska zdravstvena organizacija(WHO) procenjuje da od ukupnog broja umrle dece u Africi, 20% umre zbog malarije. Lečenje malarije i dalje predstavlja veliki izazov zbog čega postoji stalna potreba za novim, efikasnijim i jeftinijim lekovima. Korialstonidin je alkaloid izolovan iz biljke Alstonia coriacea, familija Apocynaceae, koji pokazuje značajnu antimalarijsku aktivnost.

Cilj rada: Sinteza skeleta prirodnog antimalarika- korialstonidina.

Materijal i metode: Ključna reakcija u sintezi je zatvaranje sedmočlanog prstena Hekovom (Heck) reakcijom koja predstavlja C-C kuplovanje aril halogenida i alkena u prisustvu paladijuma kao katalizatora u baznoj sredini.

Rezultati: Intramolekulskom ciklizacijom zatvoren je sedmočlani prsten, skelet korialstonidina u relativno dobrom prinosu.

Zaključak: Sintetisan biciklični proizvod, koji predstavlja skelet prirodnog antimalarika, otvara mogućnost dalje modifikacije u cilju potpune sinteze molekula korialstonidina.

Ključne reči: Korialstonidin, Hekova reakcija.

DEVELOPMENT OF SYNTHETIC ROUTE TOWARDS SKELETON OF NATURAL ANTIMALARIAL PRODUCT - CORIALSTONIDINE

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Introduction: Malaria is an infectious disease caused by parasites of the species Plasmodium that are spread from person to person through the bites of infected mosquitoes. Disease is widely spread in tropical regions, mostly in Africa, and it takes nearly one million lives per year. World Health Organization(WHO) estimates that 20% of all childhood deaths in Africa are due to malaria. Treatment of malaria still represents big challenge. That is why there is a constant need for new, more efficient and cheaper medicaments. Corialstonidin is an alkaloid isolated from plant Alstonia coriacea, family Apocynaceae, with significant antimalaric activity.

The Aim: Synthesis of natural antimalaric skeleton (Corialstonidine).

Materials and Methods: The key reaction in synthesis is the seven-membered ring formation using Heck reaction: C-C coupling between aryl halide and alkene in the presence of palladium catalyst under basic conditions.

Results: Bicyclic seven-membered ring, skeleton of alkaloid corialstonidine, was formed by intramolecular Heck cyclization in relatively good yield.

Conclusion: Synthesised bicyclic product opens possibility for further modification in order to complete the synthesis of molecule corialstonidine.

Key words: Corialstonidine, Heck reaction.

PALADIJUMOM KATALIZOVANA SINTEZA HETEROBICIKLIČNIH JEDINJENJA IZ ALENSKIH DERIVATA PROLINA

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Uvod: Paladijumom katalizovana reakcija nukleofilnog napada na alenski sistem se koristi u sintezi brojnih visoko funkcionalizovanih molekula. Oblast našeg interesovanja bila je mogućnost razvijanja metodologije intramolekulske ciklizacije derivata (S)-prolina koji sadrže alensku funkcionalnu grupu, uz primenu reakcije paladijumom katalizovanog nukleofilnog napada prolinskog azota na alenski sistem.

Cilj rada: Sinteza novih, visoko funkcionalizovanih, bicikličnih jedinjenja, koja sadrže heteroatom, koristeći kao polazna jedinjenja alenske derivate (S)-prolina.

Materijal i metode: Alenski derivat (S)-prolina (1 ekv.), aril-jodid (1 ekv.), Pd(OAc)₂ (0,1 ekv.) i PPh₃ (0,2 ekv.), u DMF-u kao rastvaraču. Stuktura i čistoća sintetisanih jedinjenja i intermedijera potvrđena je ¹H NMR, ¹³C NMR i masenom spektroskopijom.

Rezultati: Supstrat za ciklizaciju je dobijen reakcijom karboksilne grupe N-Boc prolina i benzil-2,3-butadienil amina pomoću DCC-a kao katalizatora. Deprotekcijom Boc zaštitne grupe pomoću CF₃COOH dobijena je slobodna amino grupa koja je nukleofil u ciklizaciji na alenski sistem. Sintetisano heterobicyklično jedinjenje postoji u obliku dva diastereoizomera u odnosu 1:1, iako se zbog hiralnosti supstrata očekivao jedan diastereoizomer u višku.

Zaključak: Sintetisana su heterobicyklična jedinjenja visoke funkcionalizovanosti, koja pokazuju sličnost sa brojnim biološki aktivnim jedinjenjima (npr. dipeptidima koji su poznati antimikrobni agensi). Ova metodologija se može primeniti za sintezu nekoliko bicikličnih prirodnih proizvoda, iz relativno jednostavnih prekursora.

Ključne reči: (S)-prolin, alen, aromatični jodid, heterobicyklično jedinjenje

PALLADIUM CATALYSED SYNTHESIS OF HETEROBICYCLIC COMPOUNDS OF ALLENYL-PROLINE DERIVATIVES

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Introduction: Palladium catalyzed nucleophile addition on the allene moiety was used in the synthesis of a many highly functionalized molecules. The area of our interest was the possibility to develop a methodology of intramolecular cyclization of allenyl-(S)-proline derivatives using palladium catalyzed reaction of nucleophile addition on allenyl functional group.

The Aim: Synthesis of new, highly functionalized, bicyclic compounds which contains heteroatom by using derivatives of allenyl-(s)-proline as starting compounds. Structure and purity of the synthesized compounds and intermediates was confirmed by ¹H NMR, ¹³C NMR and mass spectroscopy.

Materials and Methods: (S)-proline derivate (1 eq.), Aryl-iodide (1 eq.), Pd(OAc)₂ (0.1 eq.) and PPh₃ (0.2 equiv.) in DMF as solvent.

Results: Substrate for cyclization was obtained by reaction of carboxylic groups of N-Boc proline and benzyl-2,3-butadienil amine with DCC as a catalyst. Deprotection of Boc protective group by using CF₃COOH gave free amino group which was nucleophile in the cyclization to allene moiety. Synthesized heterobicyclic compound exist as two diastereoisomers in a 1:1 ratio, although because of the chirality of substrate one diastereoisomer was expected in surplus.

Conclusion: Heterobicyclic highly functionalized compounds were synthesized, which show similarities with a number of biologically active compounds (eg, dipeptide, which are well known antimicrobial agents). This methodology could be used for the synthesis of several bicyclic natural product from relatively simple precursors.

Keywords: (s)-proline, allene, aromatic-iodide, bicyclic compound

ODREĐIVANJE SADRŽAJA METALA U UZORCIMA MESA
PRIMENOM ATOMSKO EMISIONOG SPEKTROMETRA SA INDUKOVANO SPREGNUTOM PLAZMOM

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Uvod: Određivanje sadržaja metala u mesu važan je parametar njegovog kvaliteta. Metoda izbora za određivanje metala u različitim realnim uzorcima je indukovano spregnuta plazma sa atomskim emisionim spektrometrom (ICP-AES), iz razloga jer ima najširi linearni opseg, najveću osetljivost, najniži limit detekcije za metale, kao i mogućnost multielementarne analize

Cilj rada: Određivanje sadržaja metala u uzorcima goveđeg i svinjskog mesa primenom ICP- AES, radi utvrđivanja njegovog kvaliteta.

Materijal i metode: Tačnost metode potvrđena je primenom referentnih standardnih rastvora. ICP-AES uređaj (Model Elan 9000, Perkin Elmer, Massachusetts, USA) korišćen je za određivanje sadržaja Cd, Cu, Fe i Zn u uzorcima svinjskog i goveđeg mesa i svinjskoj džigerici. Razaranje i priprema uzoraka vršena je u mikrotalasnoj peći za digestiju u prisustvu azotne kiseline i vodonik peroksida. Analizirani sadržaj određen je metodom kalibracione krive.

Rezultati: Kadmijum se u svinjskom mesu nalazi 1, 7282 puta više nego što je dozvoljeno, a u goveđem mesu 1, 7448 puta više od dozvoljene vrednosti. Sadržaj bakra i cinka u ispitivanim uzorcima je u dozvoljenim granicama. Količina gvožđa u svinjskoj džigerici je 189,2 µg/kg, svinjskom mesu 89, 775 µg/kg, goveđem mesu 87, 795 µg/kg.

Zaključak: U ispitivanim uzorcima mesa detektovan je povećan sadržaj kadmijuma, pa ovom ispitivanju treba dati veći značaj. ICP-AES se može koristiti kao metoda za određivanje sadržaja metala u uzorcima mesa.

Ključne reči: metali, meso, mikrotalasna digestija

DETERMINATION OF METAL CONTENT IN MEAT SAMPLES
USING ATOMIC EMISSION SPECTROMETER WITH INDUCED COUPLED PLASMA

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Introduction: Determination of metal content in meat is an important parameter of its quality.

The method of choice for the determination of metals in real samples is inductively coupled plasma with atomic emission spectrometer (ICP-AES), because it has the widest linear range, the highest sensitivity and lowest detection limit for metals and the possibility of analyzing many elements in the same time.

The aim: Determination of metals in samples of beef and pork meat using ICP-AES, in order to determine its quality.

Materials and Methods: The accuracy of the method was confirmed using the reference standard solutions. ICP-AES device (Model Elan 9000, Perkin Elmer, Massachusetts, USA) was used for the determination of Cd, Cu, Fe and Zn in samples of pork and beef, and pork liver. The destruction of the sample preparation was performed in a microwave oven for digestion in the presence of nitric acid and hydrogen peroxide. The analyzed content was determined using the calibration curve.

Results: Cadmium was found in pork 1, 7282 times more than allowed, in beef 1, 7448 times more than the allowed values. The content of copper and zinc in the analyzed samples is within tolerable limits. The amount of iron in the liver is 189.2 µg/kg, pork 89, 775 µg/kg, beef 87, 795 µg/kg.

Conclusion: In analysed meat samples was detected higher content of cadmium, and this study should be given more importance. ICP-AES can be used as a method for determination of metals in meat samples.

Key words: metals, meat, microwave digestion

SPECIJACIONA ANALIZA Fe(II) I Fe(III) PRIMENOM DERIVATIVNE SPEKTROFOTOMETRIJE

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Uvod: Prema IUPAC-u specijaciona analiza je proces kojim se identifikuju i određuju različite hemijske i fizičke forme nekog elementa u realnim uzorcima i od značaja je za analize Fe(II) i Fe(III).

Cilj rada: Ponovljivost rezultata objavljene metode [1] za istovremeno određivanje Fe(II) i Fe(III) upotrebom helatnog reagensa 2-(5-brom-2-piridilazo)-5-dimetilaminofenol-a (5-Br-PADAP) i primena na odabran realan uzorak.

Materijal i metode: Spektri kompleksa formiranih na optimalnoj pH vrednosti 7 (1M CH₃COONH₄) snimljeni su u opsegu 400-900nm; 100nm/min; interval očitavanja 0,480 (instrument GBC Cintra20). Drugi izvodi digitalnih derivativnih spektara dobijeni su sa parametrom za smanjenje šuma (smoothing points 17) korišćenjem metode nultog preseka.

Rezultati: ApSORPCIONI spektari Fe(II) i Fe(III) pokazuju maksimume na različitim talasnim dužinama uz značajno preklapanje spektralnih traka. Za spektar kompleksa Fe(III) dobijeno je odstupanje od rada [1] u oblasti I od 500-570nm, a i spektari za dve najniže koncentracije (1,43mM i 2,86mM) su pomereni hipsohromno. Dobijeni rezultati su pokazali da prvi izvodi nisu dovoljni za rezoluciju preklapljenih traka pa je potrebna primena drugog izvoda. Radna talasna dužina za određivanje Fe(II) je I nultog preseka za Fe(III) na 604,32nm (amplituda ²D_{604,32}). Radna talasna dužina za određivanje Fe(III) je I nultog preseka za Fe(II) na 567,32nm (amplituda ²D_{567,32}). Linearnost je utvrđena za oblast koncentracija 5,71-34,28mM za Fe(III) i Fe(II). Zbog odstupanja ispitana je samo jedna (ekvimolarna) smeša-dobijene recovery vrednosti su 94,8% za Fe(III) i 84,1% za Fe(II).

Zaključak: Uža oblast koncentracija je uslovljena primenom amplituda na pseudosatellitu za Fe(II) i satelitu za Fe(III).

[1] K.Sözgen and E.Tütem, Anal.Sci. 2001,17supp., i861-i864.

Ključne reči: Fe(II), Fe(III), derivativna spektrofotometrija

SPECIATION ANALYSIS OF Fe(II) AND Fe(III) USING DERIVATIVE SPECTROPHOTOMETRY

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Introduction: Speciation analysis (IUPAC) identifies and determines different chemical and physical forms of an element in real samples, and is important for the analysis of Fe(II) and Fe(III).

The Aim: The reproducibility of published method [1] for simultaneous determination of Fe(II) and Fe(III) using chelate reagent 2-(5-Bromo-2-Pyridylazo)-5-Diethylaminophenol (5-Br-PADAP), and its application on selected sample.

Material and methods: The spectra of the complexes formed at the optimum pH value of 7 (1M CH₃COONH₄) were recorded in the range of 400-900nm; 100nm/min; data interval 0.480 (GBC Cintra20). The second derivative digital spectra were obtained with the smoothing points 17, using the zero-crossing method.

Results: The absorption spectra of Fe(II) and Fe(III) show peaks at different wavelengths with significant spectral overlap. Spectrum of Fe(III) complex shows deviation from the original work [1] in the I range of 500-570nm, while the spectra for the two lowest concentrations (1.43mM and 2.86mM) showed hypsochromic shift. The results show that the first derivatives are not sufficient for resolving spectral overlap, so application of the second derivative is required. Working I for the determination of Fe(II) is I at zero-crossing of Fe(III) at 604.32nm (amplitude ²D_{604,32}). Working I for the determination of Fe(III) is I at zero-crossing of Fe(II) at 567.32nm (amplitude ²D_{567,32}). Linearity established for the concentration range from 5.71 to 34.28mM for Fe(II) and Fe(III). Because of differences, only equimolar mixture was examined - recovery values were 94.8% for Fe(III), and 84.1% for Fe(II).

Conclusion: Narrow-concentration range was determined using the amplitude at pseudosatellite for Fe(II) and satellite for Fe(III).

[1] K.Sözgen E.Tütem, Anal.Sci. 2001,17 supp., i861-i864.

Key words: Fe(II), Fe(III), derivative spectrophotometry

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Uvod: Hrom karakteriše velika mobilnost u životnoj sredini, a kao posledica široke industrijske primene ispituje se sorpcija Cr(VI) na različitim biosorbentima za prečišćavanje zagađenih voda.

Cilj: Utvrđivanje razlika u IR spektrima prilikom hemijske obrade, između različitih modifikacija sorbenata (HCl i HNO₃) kao i poređenje ovih uzoraka pre i posle sorbovanja Cr(VI).

Materijal i metode: Uzorci piljevine belog bora (*Pinus sylvestris*, *Pinaceae*) hemijski obrađeni dejstvom HCl (1M) ili HNO₃ (1M), a zatim tretirani rastvorom kalijum-dihromata u 0,1M HCl (0,88mg; 3,53mg; 1g u 10ml); posle sorpcije (15min) filtrirani (lončić B3), isprani destilovanom vodom do neutralnog pH, osušeni u vakuum sušnici (Heraeus, Thermoscientific, 60°C, 2h). Snimanje spektara na FT-IR spektrofotometru (NICOLET IS10, Thermoscientific), tehnikama KBr tablete i višestruke refleksije.

Rezultati: Uočeni gubitak trake na 1738 cm⁻¹ (neobrađena piljevina) kod oba uzorka nakon hemijske obrade kiselinama, može se objasniti hidrolizom estarskih grupa, kao i pomeranje traka sa 3352cm⁻¹ (neobrađena) na 3339cm⁻¹ (HNO₃ modifikacija) i 1058cm⁻¹ na 1051cm⁻¹ što se može pripisati delimičnoj oksidaciji -OH grupa. Utvrđena pomeranja IR traka, za 1g/10ml dihhromata, za dva različito modifikovana biosorbenta pre i posle sorpcije na sledećim talasnim brojevima: 3351-3343cm⁻¹ (HCl modifikacija), 3339-3360 cm⁻¹ (HNO₃ modifikacija) karakteristične za -OH grupe, kao i 1604-1658 cm⁻¹ (HCl) i 1659-1657 cm⁻¹ (HNO₃) karakteristične za -CONH₂. Ovi podaci ukazuju na moguće učešće -OH i -CONH₂ u elektrostatičkom vezivanju Cr(VI).

Zaključak: Dobijena su pomeranja u IR spektrima slična pomeranjima za druge vrste biosorbenata objavljene u literaturi.

Ključne reči: hrom(VI), biosorpcija, IR spektri

CHROMIUM(VI) SORPTION – BIOSORBENT IR SPECTRA ANALYSIS

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Introduction: Chromium is characterised by high environmental mobility, and as a consequence of it's widespread industrial apply, Cr(VI) sorption on various biosorbents is analysed as a possibility of waste waters purification.

The Aim: Determining the differences in biosorbent IR spectra during the chemical treatment of the sorbent, between different modifications as well as comparing these samples before and after Cr(VI) sorption.

Materials and Methods: Samples of Scot's Pine (*Pinus sylvestris*, *Pinaceae*) sawdust are treated with acids (HCl (1M) or HNO₃ (1M)) and exposed to the potassium dichromate solution in 0.1M HCl (0.88mg; 3.53mg; 1g in 10ml, contact time-15min). After the sorption they are filtered (B3), rinsed with distilled water until the neutral pH, dried in vacuum dryer (Heraeus, Thermoscientific, 60°C, 2h). FT-IR spectrometric (NICOLET IS10, Thermoscientific) analysis is conducted using KBr and ATR techniques.

Results: Absorption peak at 1738 cm⁻¹ (untreated sawdust) is lost in both samples after the chemical treatment with acids which can be explained with esters hydrolysis. Shifts from 3352cm⁻¹ (untreated) to 3339cm⁻¹ (HNO₃ modification) and 1058cm⁻¹ to 1051cm⁻¹ can be associated to partial oxidation of the -OH groups. Significant shifts in differently modified sorbents before and after Cr(VI) sorption (1g/10ml) are noticed on following wavenumbers: 3351-3343cm⁻¹ (HCl modification), 3339-3360 cm⁻¹ (HNO₃ modification) characteristic for -OH groups, as well as 1604-1658 cm⁻¹ (HCl) and 1659-1657 cm⁻¹ (HNO₃) characteristic for -CONH₂. This indicates possible involvement of -OH and -CONH₂ functional groups in electrostatic chromium binding.

Conclusion: Bands shifts in obtained IR spectra are similar to those on other sorts of biosorbents published in literature.

Key words: chromium(VI), biosorption, IR spectra

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Uvod: Fluoridi su biološki značajni joni koji imaju uticaj na kvalitet zuba i koštanog sistema, kao i na nastanak malignih oboljenja. Neadekvatan unos ovog jona ima negativne posledice na zdravlje. Bazirano na ovoj činjenici, postoje preporuke o sadržaju fluorida u vodi za piće.

Cilj: Cilj rada je određivanje sadržaja fluorida u pijaćim vodama sa teritorije Republike Srbije primenom jonske hromatografije.

Materijal i metode: Analizirani su uzorci iz 4 gradska vodovoda (Raška, Zlatibor, Beograd i Sremska Mitrovica), izvorska voda sa Zlatibora i flaširane mineralne vode Aqua Viva i Knjaz Miloš). Korišćen je jonski hromatograf Dionex DX-300, kolona IonPack AS9-HC (4mm) uz supresor ASRS ULTRA (4mm) i prethodno konstruisanje kalibracione krive korišćenjem serije standardnih rastvora. Mobilna faza je 9 mM Na₂CO₃, brzina protoka 1,0 mL/min.

Rezultati: Sadržaj fluorida u uzorcima: od 0,07 mg/L do 0,52 mg/L za uzorke izvorske i voda iz gradskih vodovoda; 0,18 mg/L za vodu Aqua Viva i 1,84 mg/L za Knjaz Miloš; t_{ret} = 3,68 min, RSD = 0,04%, LOD = 0,01 ppm, LOQ = 0,03 ppm.

Zaključci: Sadržaj fluorida u vodama tri gradska vodovoda i izvorske vode sa Zlatibora je niži od preporučenog, dok voda iz gradskog vodovoda Sremska Mitrovica sadrži optimalnu koncentraciju fluorida. Sadržaj fluorida mineralne vode Aqua Viva odgovara deklarisanom, dok u vodi Knjaz Miloš je veći od deklarisanog. Prema Pravilniku o zahtevima za prirodnu mineralnu vodu, flaširana voda Knjaz Miloš mora biti deklarirana kao "voda nepogodna za svakodnevno korišćenje za bebe i decu mlađu od sedam godina".

Ključne reči: Fluoridi, voda za piće, jonska hromatografija

FLUORIDE DETERMINATION IN DRINKING WATER SAMPLES

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Introduction: Fluorides are ions with great bio-importance, primarily influence on the tooth and skeleton system quality, as well as malignity occurrence. Inappropriate intake of fluorides has negative health consequences. Based on this fact, recommendations about fluoride content in drinking water are well-established.

Aim and scope: Aim of this contribution was to determine the fluoride content in drinking water samples from several locations in Republic of Serbia by ion chromatography.

Material and methods: Analyzed samples were obtained from 4 municipal supply systems (Raška, Zlatibor, Belgrade and Sremska Mitrovica), Zlatibor sprinkle, and two bottled mineral waters (Aqua Viva and Knjaz Miloš). For fluoride determination Ion chromatograph Dionex DX-300 was used with column IonPack AS9-HC (4mm) and suppressor ASRS ULTRA (4mm); mobile phase was 9mM Na₂CO₃, with flow rate 1.0mL/min. Calibration curve was constructed by recording series of standards.

Results: Determined fluoride contents: 0.07mg/L – 0.52mg/L for sprinkle and municipality tap waters; Aqua Viva 0.18 mg/L and Knjaz Miloš 1.84 mg/L. t_{ret} = 3.68 min, RSD = 0.04%, LOQ and LOD were determined to be 0.03 and 0.01 ppm.

Conclusions: Fluoride contents in three municipal tap waters and Zlatibor sprinkle water were considerable lower than recommended. Only water provide by Sremska Mitrovica water supply systems were with optimal fluoride content. Aqua Viva has fluoride content same as declared while Knjaz Miloš higher than declared. According to "Gaudiness for natural mineral waters" Knjaz Miloš has to be assigned as "water not suitable for daily use for babies and children below seven years old".

Keywords: Fluoride, drinking water, ion chromatography

**POREĐENJE IZRAČUNATIH I HROMATOGRAFSKI (TLC)
DOBIJENIH HIDROFOBNIH PARAMETARA ACE INHIBITORA**

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Uvod: U ovom radu proučavana je lipofilnost odabranih inhibitora angiotenzin konvertujućeg enzima (ACE). Ispitivana je zavisnost izračunatih hidrofobnih parametara, logP vrednosti i hidrofobnih parametara ACE inhibitora dobijenih metodom normalno-fazne i reverzno-fazne tankoslojne hromatografije (RP i NPTLC).

Cilj: Cilj rada bio je da se, nastavljajući prethodna istraživanja, ispituju zavisnosti izračunatih logP vrednosti i hromatografski dobijenih hidrofobnih parametara (R_M^0 i C_0) ACE inhibitora.

Materijal i metode: Hidrofobni parametri ACE inhibitora, logP vrednosti, izračunati su primenom računarskih programa (www.vclab.org, www.malinspiration.com). Hromatografski hidrofobni parametri ACE inhibitora (R_M^0 i C_0) dobijeni su u prethodnim istraživanjima pod uslovima RP i NPTLC metoda.

Rezultati: Izračunati hidrofobni parametri, logP vrednosti, korelisani su sa hromatografski dobijenim parametrima hidrofobnosti, R_M^0 i C_0 vrednostima. Dobra zavisnost dobijena je između izračunatih i hidrofobnih parametara dobijenih metodom RPTLC (r prosečno 0,90), dok su parametri hidrofobnosti dobijeni NPTLC metodom pokazali su lošije slaganje sa izračunatim logP vrednostima (r prosečno 0,60). Od izračunatih logP vrednosti najbolju zavisnost sa hromatografski dobijenim parametrima hidrofobnosti pokazale su vrednosti logP_{Kowwin} i milogP (r prosečno 0,95).

Zaključak: U ovom istraživanju proučavana je zavisnost izračunatih logP vrednosti, i hromatografski dobijenih hidrofobnih parametara ACE inhibitora. Utvrđeno je dobro slaganje izračunatih i hidrofobnih parametara dobijenih RPTLC metodom, čime je potvrđeno da je RPTLC metoda pogodna za ispitivanje lipofilnosti ACE inhibitora. Takođe, utvrđeno je da matematički izračunati hidrofobni parametri mogu na odgovarajući način da prikažu lipofilnost ACE inhibitora.

Ključne reči: ACE inhibitori, lipofilnost, logP, TLC.

**RELATIONSHIP BETWEEN CALCULATED AND CHROMATOGRAPHICALLY (TLC)
OBTAINED ACE INHIBITORS HYDROPHOBICITY PARAMETERS**

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Introduction: In this paper the lipophilicity of several angiotensin converting enzyme (ACE) inhibitors was investigated. The correlation between calculated logP values and chromatographically obtained hydrophobicity parameters, were examined.

The Aim: Continuing previous studies, the aim of this research was the examination of relationship between ACE inhibitors calculated logP values and previously chromatographically obtained hydrophobicity parameters, R_M^0 and C_0 values.

Materials and Methods: The ACE inhibitors hydrophobicity parameters, logP values, were calculated using computer programs (www.vclab.org, www.malinspiration.com), while chromatographic hydrophobicity parameters, R_M^0 and C_0 values, were previously obtained by the use of RP and NPTLC methods.

Results: The ACE inhibitors hydrophobicity parameters, logP values, were correlated with chromatographically obtained hydrophobicity parameters, R_M^0 and C_0 values. The good relationships were obtained between calculated logP values and hydrophobicity parameters R_M^0 and C_0 obtained in RPTLC (r approximately 0.90). The hydrophobicity parameters obtained by NPTLC showed lower correlations with calculated logP values (r approximately 0.60). The best correlations with R_M^0 and C_0 values showed logP_{Kowwin} and milogP (r approximately 0.95) hydrophobicity parameters.

Conclusion: In this research the relationship between ACE inhibitors logP values and chromatographically obtained hydrophobicity parameters was investigated. The good agreement between calculated and hydrophobicity parameters obtained in RPTLC was established, confirming RPTLC as suitable method for ACE inhibitors investigations. Also, the calculated hydrophobicity parameters, logP values can be useful in ACE inhibitors lipophilicity examination.

Keywords: ACE inhibitors, lipophilicity, logP, TLC.

**SKRINING REZIDUA ORGANOHLORNIH PESTICIDA
U VOĆU I POVRĆU PRIMENOM GASNE HROMATOGRAFIJE SA MASENOM SPEKTROMETRIJOM**

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Uvod: Pesticidi predstavljaju rizik za ljudsko zdravlje i usled dugotrajne izloženosti njihovim reziduama unetim putem hrane i vode u organizam mogu se pojaviti hronični efekti. Bezbednost namirnica osigurana je propisanim maksimalnim dozvoljenim koncentracijama rezidua pesticida.

Cilj: Procena efikasnosti QuEChERS / GC-MS skrining metode za identifikaciju rezidua organohlornih pesticida, zasnovane na primeni softvera za dekonvoluciju spektara (DRS).

Materijal i metode: Kao uzorci za ispitivanje korišćeni su ekstrakti organski gajenih krompira, kruške, grožđa i šargarepe, pripremljeni QuEChERS metodom, i fortifikovani smešom organohlornih pesticida na više koncentracionih nivoa. Ispitan je uticaj koncentracije pesticida i tipa matriksa na identifikacionu sposobnost primenjene GC-MS skrining metode uz upotrebu DRS softvera. Određen je limit identifikacije pesticida u izabranim matriksima.

Rezultati: Dobijeni rezultati su pokazali porast broja identifikovanih pesticida sa porastom koncentracije. U svim ispitanim matriksima 350% ciljnih pesticida dostiže fiksiranu vrednost AMDIS podudaranja (370) na koncentracionom nivou 25ug/kg, a sa porastom koncentracionog nivoa na 100ug/kg, raste i broj identifikovanih pesticida na 87-100%, u zavisnosti od matriksa. Dobijene vrednosti limita identifikacije su ispod 25ug/kg za 350% organohlornih pesticida u svakom od ispitanih matriksa. Pesticidi delta-HCH i hlortalonil nisu identifikovani u matriksu šargarepa ni na najvišem ispitanom koncentracionom nivou (250ug/kg).

Zaključak: Limit identifikacije skrining metode ispod 25ug/kg dostignut je za preko 50% ispitanih organohlornih pesticida. Da bi se omogućila identifikacija rezidua većeg broja pesticida pri koncentracijama od 10ug/kg, potrebno je unapređenje analitičke metodologije.

Ključne reči: QuEChERS, pesticidi, GCMS

**SCREENING OF ORGANOCHLORINE PESTICIDE RESIDUES
IN FRUIT AND VEGETABLES BY GAS CHROMATOGRAPHY - MASS SPECTROMETRY**

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Introduction: Pesticides represent a risk to human health, and due to long exposure of organism to their residues in food and water chronic effects may arise. Food safety is secured by legally defined maximum allowable concentration of pesticide residues.

The aim: Assessment of effectiveness of QuEChERS/GC-MS screening method for identification of organochlorine pesticide residues, based on application of Deconvolution Reporting Software (DRS).

Materials and methods: Samples used for research were extracts of organic potatoe, pear, grape and carrot, prepared by QuEChERS method, and fortified with mixture of organochlorine pesticides at various concentration levels. The applied GC-MS screening method with DRS software was tested for the effects of pesticide concentration and matrix type on the identification ability of the method. Limits of identification of pesticides were determined in selected matrices.

Results: The number of identified pesticides raised with increasing concentration. In all studied matrices 350% of target pesticides reached the fixed AMDIS matching value (370) at concentration level of 25ug/kg. With increasing concentration levels up to 100ug/kg, the number of target pesticides raised to 87-100%, depending on the matrix. For 350% of tested organochlorine pesticides the limit of identification was below 25ug/kg in all matrices. Pesticides delta-HCH and chlortalonile are not identified in the carrot matrix even at the highest tested concentration (250ug/kg).

Conclusion: For more than 50% of tested organochlorine pesticides limit of identification was below 25ug/kg. To enable identification of residues of a higher number of pesticides at concentration of 10ug/kg, it is necessary to improve analytical methodology.

Key words: QuEChERS, pesticides, GCMS

ODREĐIVANJE KOFEINA KAO INDIKATORA ANTROPOGENOG ZAGAĐENJA U UZORCIMA DUNAVSKE VODE

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Uvod: Važnost čistoće površinskih voda kao dela ekosistema zahteva rigoroznu zaštitu od kontaminacije ksenobiotičima. Potencijalni hemijski pokazatelj zagađenja voda je kofein, kao supstanca antropogenog porekla. Kofein je prisutan u više od 60 biljaka, mnogim pićima kao i nekim produktima hrane. Smatra se da su glavni načini dospavanja kofeina u otpadne vode putem urina ili ispuštanjem hrane, pića ili farmaceutskih supstanci koje sadrže kofein direktno u slivnike i odvodne cevi domaćinstava.

Cilj: Osnovni cilj ovog rada je određivanje sadržaja kofeina u uzorcima reke Dunav na teritoriji Novog Sada u Republici Srbiji.

Materijal i metode: U radu su analizirani uzorci površinskih slojeva reke Dunav, uzorkovani u julu i novembru, sa 7 najznačajnijih tačaka na teritoriji Novog Sada. Sadržaj kofeina u ispitivanim uzorcima je određen primenom visokoeфикаsne tečne hromatografije (HPLC).

Rezultati: Na sredini, desnoj i levoj strani Dunava nije detektovan kofein ni u julu ni u novembru, dok su u okolini Cepelina i Rokovog potoka kvantifikovane koncentracije čije su se vrednosti kretale od 0-1 ng/L. Koncentracija kofeina u okolini Ratnog ostrva bila je u opsegu 0.0163-84.05 ng/L, dok je opseg u uzorcima kod Mornarice iznosio 0.032-84.24 ng/L.

Zaključak: Najveća vrednost koncentracije kofeina detektovana je u okolini Ratnog ostrva u julu, odnosno kod Mornarice u novembru, i iznosila je oko 84 ng/L. Dobijeni rezultati ukazuju na prisustvo ljudskog zagađenja reke Dunav na teritoriji Novog Sada. Dalja istraživanja bi trebala biti usmerena ka identifikaciji i kvantifikovanju i drugih farmaceutika u vodenim sistemima koji bi ukazivali na glavne uzročnike zagađenja, a u cilju očuvanja životne sredine i zdravlja ljudi.

Ključne reči: kofein, Dunav, kontaminacija

DETERMINATION OF CAFFEINE AS HUMAN WASTE INDICATOR IN THE DANUBE RIVER SAMPLES

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Introduction: The importance of purity of surface water as part of ecosystems requires rigorous protection from contamination by xenobiotics. The potential chemical indicators of water pollution is caffeine as a substance of anthropogenic origin. Caffeine is present in more than 60 plants, many drinks and some food products. The main ways of getting caffeine into sewage are considered to be via urine or discharge of food, drink and pharmaceutical substances containing caffeine directly into the gutters and household drains.

Aim: The main goal of this study is to determine caffeine content in the samples of the River Danube in Novi Sad in Republic of Serbia.

Material and methods: In this study, the samples of surface water of the River Danube in seven major points in the territory of Novi Sad are analyzed in July and November 2011. Caffeine content of analyzed samples was determined using high-performance liquid chromatography (HPLC).

Results: In the middle, right and left side of the River Danube caffeine was not detected neither in July nor in November, while the quantified concentration values of caffeine around the Rokov potok and Cepelin ranged from 0-1 ng/L. The concentration of caffeine near Ratno ostrvo ranged from 0.0163-84.05 ng/L and near Mornarica ranged from 0.032-84.24 ng/L.

Conclusion: The highest concentration of caffeine (84 ng/L) was detected near Ratno ostrvo in July and near Mornarica in November. The results indicate presence of human pollution of the Danube River in Novi Sad. Further research should be focused on identifying and quantifying other pharmaceuticals in the aquatic systems that would indicate the main causes of pollution.

Key words: caffeine, the Danube, contamination

PROCENA QuEChERS METODE ZA ANALIZU REZIDUA ORGANOHLORNIH PESTICIDA U VOĆU I POVRĆU – EFEKAT MATRIKSA

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Uvod: Pesticidi se široko koriste u poljoprivrednoj praksi za kontrolu štetočina. Najvažniji nedostatak upotrebe pesticida je njihova toksičnost, zbog čega su njihove rezidue javnozdravstveni problem i zakonski su regulisane. Efekat matriksa može imati značajan uticaj u analizi rezidua pesticida u namirnicama. **Cilj:** Ocena efikasnosti QuEChERS metode za ekstrakciju i prečišćavanje uzoraka voća i povrća u smislu hromatografskih interferenci i uticaja matriksa pri analizi rezidua organohlorinih pesticida primenom gasne hromatografije sa masenom spektrometrijom.

Materijal i metode: Za studiju su korišćeni uzorci organski gajenog voća i povrća. Za pripremu uzoraka korišćena je QuEChERS metoda, a za analizu gasna hromatografija sa masenom spektrometrijom. Određeni su: količina ko-ekstrahovanih materija iz matriksa, hromatografske interference, uticaj matriksa na kvantifikaciju rezidua odabranih organohlorinih pesticida.

Rezultati: Količina ko-ekstrahovanih materija iz ispitanih matrica krompira, kruške, grožđa i šargarepe, iznosila je ispod 0.2%. Utvrđeno je postojanje određenih hromatografskih interferenci u ispitanim matricama, najjače izraženih u slučaju šargarepe. U pogledu efekta matriksa, dobijeni su sledeći rezultati: blagi efekti umanjenja ili uvećanja signala karakterišu preko 75% ciljnih organohlorinih pesticida u svim ispitanim matriksima, efekti srednje jačine 10-17% ciljnih jedinjenja, dok se snažni efekti uočavaju kod maksimalno 7% ciljnih jedinjenja, zavisno od matriksa.

Zaključak: QuEChERS metoda je ocenjena kao primerena za analizu rezidua organohlorinih pesticida primenom gasne hromatografije sa masenom spektrometrijom. Monitoring rezidua pesticida u namirnicama predstavlja važan aspekt u minimalizovanju potencijalnih rizika za ljudsko zdravlje.

Ključne reči: QuEChERS, pesticidi, GCMS.

EVALUATION OF QuEChERS METHOD FOR ORGANOCHLORINE PESTICIDE RESIDUES ANALYSIS IN FRUIT AND VEGETABLES – MATRIX EFFECT

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Introduction: Pesticides are widely used for the control of pests in agricultural practice. The major drawback of pesticide application is its toxicity, so their residues are issue of public concern and are regulated by legislation. Matrix effect can be an important problem in the analysis of pesticide residues in food commodities.

The Aim: Evaluation of efficiency of QuEChERS method for the extraction and purification of fruit and vegetable samples, from the aspect of chromatographic interferences and matrix effect during the analysis of organochlorine pesticide residues using gas chromatography-mass spectrometry.

Materials and methods: Samples used for study were organic fruits and vegetables. QuEChERS method was used for the preparation of the samples, and gas chromatography-mass spectrometry for the analysis. Following characteristics of the method were determined: quantity of co-extracted matters, chromatographic interferences, matrix effect on the quantitation of the organochloride pesticide residues.

Results: Co-extracted matters from the tested matrices (potato, pear, grape and carrot) were under 0.2%. The most severe chromatographic interferences were those found in carrot matrix. From the aspect of matrix effect, the results were following: small effects of signal diminishing or augmentation were characteristic for more than 75% of target organochlorine pesticides in all tested matrices, mild effects 10-17%, and strong effects for maximum 7% of target compounds, depending of the matrix.

Conclusion: QuEChERS method has been assessed as suitable for the analysis of organochlorine pesticide residues in foodstuffs by gas chromatography – mass spectrometry. Monitoring of pesticide residues in foodstuffs represents an important aspect of minimizing potential risks to human health.

Key words: QuEChERS, pesticides, GCMS

SKRINING REZIDUA AZOTNIH I ORGANOFOSFORNIH PESTICIDA U VOĆU I POVRĆU PRIMENOM GASNE HROMATOGRAFIJE SA MASENOM SPEKTROMETRIJOM

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Uvod: Organofosforne pesticide se rutinski primenjuju na usevima voća za kontrolu širokog spektra insekata. Njihova prekomerna upotreba i zloupotreba predstavljaju potencijalni rizik za ljudsko zdravlje, što je dovelo do monitoringa rezidua pesticida u namirnicama.

Cilj rada: Procena efikasnosti QuEChERS / GC-MS skrining metode za identifikaciju rezidua azotnih i organofosfornih pesticida, zasnovane na primeni softvera za dekonvoluciju spektara (DRS).

Materijal i metode: Kao uzorci za ispitivanje korišćeni su ekstrakti krompira, kruške, grožđa i šargarepe, pripremljeni QuEChERS metodom, i zatim fortifikovani smešom azotnih i organofosfornih pesticida. Fortifikovani ekstrakti su analizirani GC-MS skrining metodom, a pesticidi su identifikovani primenom DRS softvera. Uticaj koncentracije pesticida, kao i tipa matriksa na identifikacionu sposobnost metode ispitan je na osnovu promene vrednosti AMDIS podudaranja pesticida pri promeni koncentracionog nivoa, odnosno matriksa.

Rezultati: Sa povećanjem koncentracije pesticida raste i vrednost AMDIS podudaranja, odnosno jača identifikaciona moć metode. Na koncentracionom nivou od 25 µg/kg zastupljenost ciljnih pesticida sa vrednošću AMDIS podudaranja ³70 varira od 45 – 60% u zavisnosti od matriksa, a podizanjem koncentracije na 100 µg/kg zadato podudaranje dostiže ³90% ciljnih pesticida u svakom od ispitanih matriksa. Vrednosti limita identifikacije su ispod 25 µg/kg za ³55% ispitanih azotnih i organofosfornih pesticida u matriksima krompir i kruška, odnosno za ³45% pesticida u matriksima grožđe i šargarepe.

Zaključak: Identifikaciona sposobnost primenjene QuEChERS/GC-MS metode zavisi od koncentracionog nivoa pesticida i tipa matriksa. Uzimajući u obzir da je za veliki broj kombinacija pesticid-matriksa vrednost maksimalno dozvoljene koncentracije 10 µg/kg, jasna je potreba za osetljivijom analitičkom metodom za neke od ispitanih pesticida.

Ključne reči: QuEChERS, pesticidi, GCMS.

SCREENING OF NITROGEN AND ORGANOPHOSPHOROUS PESTICIDE RESIDUES IN FRUIT AND VEGETABLES BY GAS CHROMATOGRAPHY - MASS SPECTROMETRY

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Introduction: Organophosphates are mainly applied to fruit crops to control broad spectrum of insects. Their excessive use and abuse poses a potential risk to human health, which led to the pesticide residue monitoring of foodstuffs.

The Aim: Assessment of effectiveness of QuEChERS/GC-MS screening method for the identification of nitrogen and organophosphorus pesticide residues, based on the use of deconvolution reporting software (DRS).

Materials and Methods: Extracts of potato, pear, grape and carrot were prepared by QuEChERS method, fortified with the mixture of nitrogen and organophosphorus pesticides and analyzed by GC-MS screening method. Pesticides were identified using DRS software. Influence of pesticide concentration, as well as the matrix type effect on identification ability of the method, was studied based on changes in AMDIS matching values.

Results: The AMDIS matching value and the identification ability of the method increases with increase of the pesticide concentration. At a concentration level of 25 µg/kg, the percentage of analyzed pesticides with AMDIS matching value ³70 varies from 45 - 60%, depending on the matrix. Raising the concentration to 100 µg/kg, ³90% pesticides reach the requested matching. Values of limit of identification are below 25 µg/kg for ³55% of nitrogen and organophosphorus pesticides in potato and pear matrices, and ³45% in grape and carrot matrices.

Conclusion: Identification ability of applied QuEChERS/GC-MS method depends on pesticide concentration and type of matrix. Taking into consideration maximum allowable level of 10 µg/kg for many pesticide-matrix combinations, there is a need for more sensitive analytical method for a number of analysed pesticides.

Key words: QuEChERS, pesticides, GCMS.

ANALIZA HROMATOGRAFSKOG PONAŠANJA BAZNIH LEKOVA U HROMATOGRAFIJI HIDROFILNIH INTERAKCIJA PRIMENOM BOX – BEHNKEN – OVOG DIZAJNA

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Uvod: U radu je opisana primena metode hromatografije hidrofilnih interakcija (eng. – *Hydrophilic Interaction Liquid Chromatography* – HILIC) u analizi retencionog ponašanja baznih supstanci (feniramin, hlorfeniramin, klozapin, lamotrigin, tioridazin, sulpirid). HILIC je vrsta hromatografije normalnih faza u kojoj se na polarnim kolonama vrši razdvajanje supstanci uz upotrebu mobilne faze koja se sastoji iz smeše slabije polarnog rastvarača i 3 % – 30 % vode. Da bi se izvršila odgovarajuća procena hromatografskog ponašanja primenjen je Box – Behnkenov eksperimentalni dizajn.

Cilj rada: Izvršiti analizu retencionog ponašanja baznih supstanci u HILIC-u primenom Box – Behnkenovog dizajna.

Materijal i metode: Analiza je urađena na Waters Breeze sistemu, na koloni BETASIL Silica – 100 (100 mm × 4,6 mm, 5 µm veličine čestica), sa protokom mobilne faze 1 mL min⁻¹, temperaturom kolone 30°C i talasnom dužinom detekcije na 254 nm. Mobilna faza pripremana je mešanjem acetonitrila i vodenog rastvora amonijum-acetata, čiji je pH podešavan sirćetnom kiselinom. Eksperimenti su urađeni prema matrici eksperimenata definisanom Box – Behnken-ovim dizajnom.

Rezultati: U eksperimentima su varirana tri faktora: koncentracija acetonitrila u mobilnoj fazi, koncentracija amonijum-acetata u vodenju fazi i pH vodene faze. Analizom podataka dobijeni su kvadratni modeli koji povezuju uticaj ispitivanih faktora i faktorskih interakcija na retencione faktore. Svi modeli adekvatno opisuju sistem što je potvrđeno koeficijentima determinacije (0,94 – 0,96). Takođe, retenciono ponašanje ispitivanih supstanci prikazano je i grafičkim putem.

Zaključak: Zavisnost retencionog ponašanja ispitivanih supstanci u HILIC sistemu opisana je polinomima drugog reda i 3 – D dijagramima. Box – Behnkenov dizajn uspešno je primenjen u hromatografskoj analizi ispitivanih supstanci.

Ključne reči: retenciono ponašanje, hromatografija hidrofilnih interakcija, Box – Behnkenov dizajn, bazne supstance.

ANALYSIS OF CHROMATOGRAPHIC BEHAVIOR OF BASIC DRUGS IN HYDROFILIC INTERACTION CHROMATOGRAPHY USING BOX – BEHNKEN'S DESIGN

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Introduction: In this paper the analysis of retention behavior of basic substances (pheniramine, chlorpheniramine, clozapine, lamotrigine, thioridazine, sulpiride) in hydrophilic interaction chromatography (HILIC) is described. HILIC method is the type of normal phase liquid chromatography in which the separation is carried out on polar columns with mobile phases consisting of less polar solvent and 3 % – 30% of water. In order to evaluate the chromatographic behavior properly, Box – Behnken design was applied.

Aim: The analysis of retention behavior of basic substances in HILIC employing Box – Behnken design.

Materials and methods: The analysis was performed on Water Breeze system on BETASIL Silica – 100 column (100 mm × 4,6 mm, 5 µm particle size), flow rate was 1 mL min⁻¹, column temperature 30°C, detection wavelength 254 nm. Mobile phase is prepared by mixing acetonitrile and aqueous solution of ammonium acetate (pH adjusted with acetic acid). The experiments were carried out according to matrix defined by Box – Behnken design.

Results: In experiments three factors were varied: acetonitrile content in mobile phase, concentration of ammonium acetate in aqueous phase and pH of aqueous phase. Analyzing the data, quadratic models that show the influence of examined factors and factor interactions on retention factors were built. All the models describe the system adequately, which was confirmed with coefficients of determination (0.94 – 0.96). Retention behavior was also represented graphically.

Conclusion: The retention behavior of the analyzed substances in HILIC system is described with second – order polynomial equations and 3 – D graphs. Box – Behnken design is successfully applied in chromatographic analysis of investigated substance.

Key words: retention behavior, hydrophilic interaction chromatography, Box – Behnken design, basic substances

PRIMENA IC SPEKTROSKOPIJE U ISPITIVANJU APSORPCIONIH MAKSIMUMA JDINJENJA SA AROMATIČNOM KARBONILNOM GRUPOM

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Uvod: Kako je IC spektar odraz strukture molekula, to je on jedinstven i karakterističan za svako jedinjenje. U jedinjenjima koja sadrže karbonilnu grupu obično je najintenzivnija traka u oblasti valencioničkih vibracija i to između 1870-1540 cm^{-1} . Prik je intenzivan, oštar i prepoznatljiv, i na njegov položaj i IC spektru utiču u najvećoj meri samo supstituenti sa svojim induktivnim, rezonantnim i sternim efektom. Dipol-dipol interakcije su prisutne kod svih karbonilnih jedinjenja.

Cilj Rada: Ispitivanje uticaja rezonantnog i induktivnog efekta na položaj apsorpcionih maksimuma karbonilne grupe u različitim funkcionalnim grupama. Ispitivanje su funkcionalne grupe karbonskih kiselina i njihovih derivata (estara, amida, hlorida), aldehida i ketona. Dobiene vrednosti su poredene sa teorijskim σ vrednostima iz Hammetove jednačine kod aromatičnih karbonilnih jedinjenja.

Materijali i Metode: Na FT-IR spektrofotometru Nicolet iS 10 (Thermo Fisher scientific Inc., Madison, WI, SAD) ATR snimljeni su spektri benzaldehida, acetofenona, benzojeve kiseline, benzoilhlorida, etilbenzoata i njihovih derivata. Za statističku obradu podataka korišćen je Microsoft Office Excel.

Rezultati: Apсорpcioni maksimumi karbonilne grupe aldehida, ketona i karboksilnih kiselina kao osnovnih jedinjenja poredeni su sa apсорpcionim maksimumima mono- i disupstituisanih derivata. Dobijeni rezultati ukazuju na značajan uticaj induktivnog, rezonantnog i sternih efekata supstituenata. Statističkom obradom podataka dobijena je dobra korelacija između konstante supstituenta σ i apсорpcionog maksimuma karbonilne grupe.

Zaključak: Potvrđeno je da na položaj apсорpcionog maksimuma pored induktivnog i rezonantnog efekta supstituenata ispitivanih jedinjenja, veliki uticaj imaju i sterni efekti supstituenata.

KLjučne reči: IC spektroskopija, karbonilna grupa, induktivni efekat, rezonantni efekat, konstanta supstituenta.

POSTAVLJANJE METODE ČVRSTO-TEČNE EKSTRAKCIJE ZA IZOLOVANJE AMILORIDA I ATENOLOLA IZ URINA

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Uvod: Priprema uzoraka biološkog materijala jedan je od najvažnijih koraka u farmaceutskoj analizi kojim se otklanjaju nečistoće i interferirajuće endogene supstance i tako omogućava dobijanje pouzdanih rezultata prilikom određivanja. Zapremina analiziranog uzorka je takođe bitna, naročito ukoliko se analiti nalaze u malim koncentracijama.

Cilj rada: Postavljanje metode čvrsto-tečne ekstrakcije za izolovanje atenolola i amilorida iz urina uz adekvatno prečišćavanje uzorka.

Materijali i metode: Za čvrsto-tečnu ekstrakciju korišćeni su polimerni kertridži (HyperSep). Prinos ekstrakcije procenjen je tečnom hromatografijom na HPLC Thermo Scientific sistemu i koloni Econosil SI 250mm x 4.6mm, 5 mm koloni, uz mobilnu fazu ACN - 40 mmol $\text{CH}_3\text{COONH}_4$ pH4,5 podešen glac. sirćetnom kiselinom (75:25 V/V). Temperatura kolone bila je 30 °C, protok mobilne faze 1mlmin⁻¹, a $\lambda=220\text{nm}$. Konstruisane su kalibracione krive za atenolol i amilorid uz fenoterol kao interni standard. Rastvori su pripremljeni opterećivanjem urina analizitima.

Rezultati: Variranjem parametara koji utiču na čvrsto-tečnu ekstrakciju postavljeni su uslovi koji podrazumevaju: kondicioniranje kertridža sa 1ml metanola a zatim sa 4ml vode, nanošenje uzorka urina zapremine 1ml, ispiranje kertridža sa 1ml rastvora pufera $\text{CH}_3\text{COONH}_4$ pH4,5 i nakon toga sa 2ml vode. Maksimalno eluiranje analita postignuto je korišćenjem 2ml acetonitrila. Tečnom hromatografijom je na osnovu kalibracione krive određen prinos ekstrakcije od 101,4% za amilorid i 90,8% za atenolol.

Zaključak: Na osnovu dobijenog prinosa ekstrakcije može se zaključiti da je postavljena metoda čvrsto-tečne ekstrakcije pogodna za izolovanje atenolola i amilorida uz veoma značajno prečišćavanje uzorka i uklanjanje interferirajućih supstanci matriksa.

KLjučne reči: čvrsto-tečna ekstrakcija, urin, atenolol, amilorid, HPLC

IR SPECTROSCOPY APPLICATION IN ABSORPTION MAXIMA EXAMINATION OF AROMATIC COMPOUNDS WITH CARBONYL GROUP

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Introduction: As a reflection of molecular structure, IR spectrum is unique and characteristic of each compound. IR spectra of compounds which contain carbonyl group show the most intensive peak in region of the valent vibrations (1870-1540 cm^{-1}). The peak is intensive, sharp and remarkable. Its position in spectra depends for the most part on resonance, inductive and steric effects of the substituents. Dipole-dipole interactions are present in all carbonyl compounds.

The Aim: Examination of impact of resonance, inductive and steric effects of substituents on the position of absorption maxima of carbonyl groups in different functional groups. The functional groups of carboxylic acids and their derivatives (amides, esters and chlorides), aldehydes and ketones were examined. Obtained experimental values were compared with theoretical σ values calculated using Hammett equation.

Materials and Methods: Spectra of benzaldehyde, acetophenone, benzoic acid, benzoyl chloride, ethyl benzoate and their derivatives were recorded using the FT-IR spectrophotometer Nicolet iS 10 (Thermo Fisher scientific Inc., Madison, WI, USA) ATR. Microsoft Office Excel was used for statistical processing of data.

Results: Absorption maxima of carbonyl group of aldehydes, ketones and carboxylic acids as basic compounds were compared with absorption maxima of their mono- and disubstituted derivatives. The results indicate significant influence of inductive, resonance and steric effects of substituents. Statistical analysis showed a good correlation between substituent constant σ and absorption maximum of carbonyl group.

Conclusion: A great impact of steric as well as inductive and resonance effect on the position of absorption maxima was confirmed.

Key words: IR spectra, carbonyl group, inductive effect, resonance effect, substituent constant.

SETTING UP SOLID-PHASE EXTRACTION METHOD FOR THE ISOLATION OF AMILORIDE AND ATENOLOL FROM URINE SAMPLES

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Introduction: The preparation of biological samples is one of the most important steps to remove impurities and interfering endogenous substances and thus allows acquiring of the reliable data. Volume of the analyzed sample is also important, especially if the concentration of analytes is low.

The Aim: Setting up solid-phase extraction method for the adequate purification of urine sample containing atenolol and amiloride.

Materials and Methods: The procedure was conducted on polymer cartridges (HyperSep-DBS). Extraction recoveries were determined by liquid chromatography on Thermo Scientific system, Econosil SI 250mm x 4.6mm, 5mm column, with mobile phase ACN - 40 mmol $\text{CH}_3\text{COONH}_4$ adjusted at pH4.5 with glacial acetic acid (75:25 V/V). Column temperature was 30 °C, the flow rate 1mlmin⁻¹ and $\lambda=220\text{nm}$. Calibration curves were constructed for atenolol and amiloride with fenoterol as an internal standard. Solutions were prepared by spiking the urine with analytes.

Results: Parameters that might affect solid-phase extraction were varied. The most appropriate were: conditioning of the cartridge with 1ml of methanol and then with 4ml of water, application of 1ml of urine sample, washing with 1 ml of 40 mmol $\text{CH}_3\text{COONH}_4$ pH4.5 and then with 2ml of water. Maximum elution of analytes was achieved using 2ml of acetonitrile. Extraction recovery of 101,4% for amiloride and 90,8% for atenolol was determined by liquid chromatography based on the calibration curves.

Conclusion: Based on the extraction recoveries, proposed solid-phase extraction procedure is suitable for isolation of atenolol and amiloride with a significant sample purification and removal of interfering matrix substances.

Key words: solid-phase extraction, urine, atenolol, amiloride, HPLC

GEOMETRIJSKI TRANSFER GRADIJENTNE RP-HPLC METODE ZA IDENTIFIKACIJU NEČISTOĆA CEFUROKSIM AKSETILA

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Uvod: Gradijentno eluiranje kod metoda reverzno-fazne tečne hromatografije pod visokim pritiskom (RP-HPLC) koristi se za razdvajanje supstanci koje se razlikuju po polarnosti.

Cilj rada bio je da se izvrši transfer RP-HPLC metode s gradijentnim eluiranjem za identifikaciju nečistoća supstance cefuroksim aksetil na kolonu manjih dimenzija.

Materijali i metode: Hromatografska analiza izvršena je na Thermo Scientific Surveyor HPLC sistemu na kolonama: Hypersil BDS 250 mm ´ 4,6 mm, 5 µm i Hypersil BDS 100 mm ´ 4,6 mm, 3 µm. Odnos metanola i vodene faze (pH 4,5) u mobilnoj fazi menjao u skladu sa programom gradijenta. Separacije su vršene pri protoku mobilne faze 1,5 ml/min, na 30 °C i l=278 nm.

Rezultati: Primenjena su osnovna pravila geometrijskog transfera i odgovarajuće jednačine za korekciju hromatografskih uslova kako bi se HPLC *calculator* softverom program gradijent originalne metode korigovao, a brzina protoka mobilne faze i zapremina injektovanja prilagodili karakteristikama kolone na koju se vrši transfer. Osnovni zahtev koji mora biti ispunjen prilikom geometrijskog transfera je da relativna retenciona vremena ispitivanih nečistoća i faktor rezolucije između kritičnog para analiziranih supstanci ne smeju da se promene. Adekvatnost nove metode verifikovana je proverom pogodnosti sistema. Vreme trajanja analize, a time i potrošnja organskog rastvarača smanjena je 2,5 puta, dok se efikasnost razdvajanja povećala.

Zaključak: Zadovoljeni su svi zahtevi za geometrijski transfer metode, pa se ne mora vršiti revalidacija. Naime, faktor rezolucije između cefuroksima aksetila i njegovog Δ^3 izomera nije se promenio, kao ni relativna retenciona vremena svih analiziranih supstanci.

Ključne reči: Geometrijski transfer; RP-HPLC; Gradijentno eluiranje; Identifikacija nečistoća.

GEOMETRICAL TRANSFER OF GRADIENT RP-HPLC METHOD FOR THE IDENTIFICATION OF CEFUROXIME AXETIL IMPURITIES

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Introduction: High performance liquid chromatographic (RP-HPLC) methods in gradient elution mode are mainly used for the separation of substances with very different polarity.

Aim was to perform a geometrical transfer of the gradient RP-HPLC method used for the identification of cefuroxime axetil's impurities.

Materials and methods: Chromatographic analysis was performed on Thermo Scientific Surveyor HPLC system using: Hypersil BDS 250 mm ´ 4.6 mm, 5 µm and Hypersil BDS 100 mm ´ 4.6 mm, 3 µm. The content of methanol and water phase (pH 4.5) was varied according to the gradient program. The mobile phase flow rate was 1.5 ml/min, column temperature 30 °C and l=278 nm.

Results: Basic geometrical transfer rules, as well as suitable equations for the correction of chromatographic conditions were applied. HPLC *calculator* software was used to adjust the gradient program, mobile phase flow rate and injection volume of the original method to the characteristics of the column selected for transfer. During the geometrical transfer relative retention times of the analyzed substances as well as the resolution factor between the critical pair must remain unchanged. The adequacy of a new method was verified by system suitability test. The analysis time was shortened, organic solution consumption reduced 2.5 times while the separation efficiency increased.

Conclusions: All requirements for geometrical transfer of method were fulfilled, so the method revalidation is not requested. Namely, the resolution factor between cefuroxime axetil and its Δ^3 isomer and relative retention times of the analyzed impurities remained unchanged.

Key words: Geometrical method transfer; RP-HPLC; Gradient elution; Impurity identification.

FUNKCIJE HROMATOGRFSKOG ODGOVORA U REŠAVANJU OPTIMIZACIONIH PROBLEMA U TEČNOJ HROMATOGRAFIJI HIDROFILNIH INTERAKCIJA

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Uvod: Funkcije hromatografskog odgovora predstavljaju matematičko rešenje koje omogućava objektivnu procenu kvaliteta hromatograma i dopušta istovremenu optimizaciju više različitih hromatografskih ciljeva.

Cilj: Procena efikasnosti četiri različite funkcije hromatografskog odgovora na simuliranim hromatogramima i eksperimentalno dobijenim hromatogramima nakon analize beta agonista i blokatora tečnom hromatografijom hidrofilnih interakcija (HILIC – eng. *Hydrophilic Interaction Liquid Chromatography*).

Materijal i metode: Pet simuliranih hromatograma kreirano je u *Microsoft Excel* programu. Osamnaest eksperimentalno dobijenih hromatograma generisano je nakon analize pet beta agonista i blokatora pod različitim uslovima u HILIC sistemu (stacionarna faza: BETASIL Silica-100 (100 mm x 4.6 mm, 5 µm veličine čestica), mobilna faza: acetonitril: vodeni rastvor amonijum-acetata, čiji je pH podešen glacialnom sirćetnom kiselinom). Sastav mobilne faze variran je prema planu centralnog kompozicionog dizajna.

Rezultati: Četiri funkcije hromatografskog odgovora primenjene su u proceni simuliranih hromatograma. Analizirani su različiti separacioni parametri uključeni u funkcije i njihova sposobnost da istovremeno procenjuju kvalitet razdvajanja svih prisutnih pikova. Ispitani su pristupi proceni ukupne dužine trajanja hromatografske analize. Merena je sposobnost funkcija da postave adekvatan balans između procene kvaliteta razdvajanja i ukupne dužine trajanja analize. Funkcije su testirane na eksperimentalno dobijenim hromatogramima. Primećene su značajne razlike u vrednovanju kvaliteta hromatograma od strane različitih funkcija.

Zaključak: Pokazano je da funkcije hromatografskog odgovora predstavljaju pouzdan i objektivan pristup u optimizaciji razdvajanja supstanci u HILIC sistemu. Proučene su prednosti i mane različitih funkcija i definisane su mere opreza pri odabiru funkcije izbora za dati optimizacioni problem.

Ključne reči: funkcije hromatografskog odgovora, HILIC, beta agonist i blokatori

CHROMATOGRAPHIC RESPONSE FUNCTIONS IN SOLVING OPTIMIZATION PROBLEMS IN HYDROPHILIC INTERACTION LIQUID CHROMATOGRAPHY

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Introduction: Chromatographic response functions present mathematical solution which enables an objective quality assessment of chromatograms and allows simultaneous optimization of many different chromatographic aims.

Aim: Estimation of efficiency of four different chromatographic response functions using simulated chromatograms and experimentally obtained chromatograms in beta agonists and blockers analysis by liquid chromatography hydrophilic interaction (HILIC).

Materials and methods: Five simulated chromatograms were created in *Microsoft Excel* program. Eighteen experimentally obtained chromatograms were generated after the analysis of five beta blockers and agonists under different conditions in HILIC system (stationary phase: BETASIL Silica-100 (100 mm x 4.6 mm, 5 µm), mobile phase: acetonitrile: water solution of ammonium acetate, pH adjusted with glacial acetic acid). Mobile phase composition was varied according to the central composite design plan.

Results: Four chromatographic response functions were applied in the assessment of simulated chromatograms. The different separation parameters incorporated in the functions and their ability to estimate at the same time the quality of the separation of all presented peaks were analyzed. Approaches for assessment of the overall chromatographic analysis duration were tested. The functions ability to set an appropriate balance between assessment of quality of separation and overall duration of analysis were measured. Significant differences in the evaluation of the quality of chromatograms by different functions were noticed.

Conclusions: It was shown that the chromatographic response functions represent reliable and objective approach to optimize the separation of substances in HILIC system. The advantages and disadvantages of different functions were studied and precautions while choosing best function for a given optimization problem were defined.

Key words: chromatographic response function, HILIC, beta blockers and agonists

HEMOMETRIJSKI PRISTUP U ANALIZI RETENCIONOG PONAŠANJA BETA AGONISTA I BLOKATORA U TEČNOJ HROMATOGRAFIJI HIDROFILNIH INTERAKCIJA

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Uvod: Poslednjih godina tečna hromatografija hidrofilnih interakcija (HILIC – eng. *Hydrophilic Interaction Liquid Chromatography*) dobija značajno mesto među separacionim metodama zbog određenih prednosti koje je pokazala u poređenju sa normalno-faznom i reverzno-faznom tečnom hromatografijom.

Cilj rada: Analiza retencionog ponašanja pet beta blokatora i agonista u HILIC sistemu primenom centralnog kompozicionog dizajna i kreiranje modela koji predviđaju retenciono ponašanje.

Materijal i metode: Hromatografska analiza izvršena je na Waters Breeze sistemu uz razdvajanje na koloni BETASIL Silica-100 (100 mm x 4.6 mm, 5 µm veličine čestica). Mobilna faza pripremljena je mešanjem acetonitrila i vodenog rastvora amonijum-acetata, čiji je pH podešen glacialnom sirćetnom kiselinom. Protok mobilne faze bio je 1,0 mL min⁻¹, temperatura kolone 30 °C i talasna dužina detekcije 254 nm.

Rezultati: Promene retencionog ponašanja ispitivanih supstanci praćene su variranjem sadržaja acetonitrila u mobilnoj fazi (80 %– 90 %), pH vrednosti vodene faze (3,5 – 4,5) i molariteta amonijum acetata u vodenoj fazi (20 mM– 40 mM). Eksperimentalni plan formiran je prema šemi *rotatable* centralnog kompozicionog dizajna. Kreirani su kvadratni matematički modeli visoke statističke pouzdanosti koji predstavljaju zavisnost retencionih faktora pet beta blokatora i agonista od ispitivanih nezavisno promenljivih. Analizom kvadratnih modela zaključeno je da povećanje pH vrednosti dovodi do produžavanja, a povećanje molariteta pufera do skraćivanja retencionog faktora ispitivanih supstanci.

Zaključak: Dobijeni kvadratni modeli adekvatno su opisivali retenciono ponašanje ispitivanih supstanci u HILIC sistemu. Statističkom i grafičkom analizom identifikovani su faktori koji značajno utiču na posmatrani sistem.

Ključne reči: HILIC, retenciono modelovanje, beta agonisti i blokatori

CHEMOMETRICAL APPROACH IN ANALYSIS OF RETENTION BEHAVIOR OF BETA AGONISTS AND BLOCKERS IN HYDROPHILIC INTERACTION LIQUID CHROMATOGRAPHY

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Introduction: During the recent years, HILIC (*Hydrophilic Interaction Liquid Chromatography*) has become very significant separation technique due to its numerous advantages comparing to the normal phase and reversed phase liquid chromatography.

Aim: The analysis of retention behavior of five beta agonists and blockers in HILIC using central composite design and creation of retention prediction models.

Materials and Methods: Chromatographic analysis was performed on Waters Breeze system and separation on BETASIL Silica-100 (100 mm x 4.6 mm, 5 µm particle size) column. The mobile phase composition was acetonitrile: water phase (with ammonium acetate buffer, pH adjusted with glacial acetic acid). Flow rate of mobile phase was 1.0 mL min⁻¹, column temperature 30 °C and wavelength of detection was 254 nm.

Results: The retention behavior of tested substances was analyzed by varying content of acetonitrile in mobile phase (80% – 90%), pH of water phase (3.5 – 4.5) and concentration of ammonium acetate in water phase (20 mM– 40 mM). Experimental plan was formed according to *rotatable* central composite design. The mathematical models of high statistical confidence were designed presenting dependence of retention factors on investigated independent variables. The models analysis demonstrated that by increasing pH, retention factors increase, while by increasing buffer concentration, they decrease.

Conclusions: Obtained mathematical models adequately presented retention behavior of tested beta agonists and blockers in HILIC. Factors that significantly influence the system are identified through statistical and graphical analysis.

Key words: HILIC, retention modeling, beta agonists and blockers

EVALUACIJA ANTIOKSIDATIVNE AKTIVNOSTI EKSTRAKTA LISTA MASLINE POMOĆU COMET TESTA

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Uvod: Prema najnovijim saznanjima, oksidativni stres se povezuje sa brojnim hroničnim oboljenjima. Poznato je da ekstrakt lista masline (ELM) pokazuje protektivna svojstva i antioksidativnu aktivnost. Za evaluaciju oštećenja DNA molekula leukocita periferne krvi (LPK) izazvanih stresorom, koristi se comet test.

Cilj rada: Evaluacija antioksidativne aktivnosti različitih koncentracija ekstrakta lista masline na DNA oštećenjima, indukovanim adrenalinom kao stresorom na LPK.

Materijal i metode: Materijal za analizu je humana heparinizirana krv (LPK). U prvoj grupi uzoraka, izvršena je indukcija DNA oštećenja adrenalinom, nakon čega su dodavane tri različite koncentracije ELM u trajanju od 30min/37°C. Druga grupa uzoraka tretirana je prvo pomoću ELM (30min/37°C) nakon čega su indukovana DNA oštećenja adrenalinom. Pozitivna kontrola je tretirana samo adrenalinom, a negativna PBS-om. Uzorci se nanose na agarozni film na mikroskopskim pločicama, a nakon toga se ostave preko noći u lizirajućem rastvoru. Slede elektroforeza i bojenje uzoraka. Na osnovu količine DNA u repu komete, vrši se klasifikacija oštećenja.

Rezultati: Na fluorescentnom mikroskopu se jasno uočavaju različiti nivoi oštećenja DNA molekula. Tretiranje ELM-om pre i nakon indukcije DNK oštećenja adrenalinom, dovodi do statistički značajnog smanjenja DNA oštećenja.

Zaključak: Korišćenjem comet testa, dokazan je protektivan i antioksidativni efekat ELM. Dobijeni rezultati ukazuju na genoprotektivan efekat i povećanje antioksidativnog kapaciteta leukocita, indukcijom antioksidativnih enzimskih sistema u ćeliji.

Ključne reči: oksidativni stres, antioksidativna aktivnost, comet test, ELM

EVALUATION OF ANTIOXIDATIVE ACTIVITY OF OLIVE LEAF EXTRACT WITH THE HELP OF COMET TEST

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Introduction: According to the latest findings, oxidative stress is associated with many chronic diseases. It is known that olive leaf extract (DOLE) showed protective properties and antioxidant activity. For the evaluation of damage on DNA molecules of peripheral blood leukocytes (PBL) caused by the stressor, we use the comet test.

The Aim: Evaluation of antioxidant activity of different concentrations of DOLE on DNA damages, induced by adrenaline as a stressor on the PBL.

Materials and Methods: The material for the analysis is the human heparinized blood (PBL). In the first group of samples, DNA damages were induced with adrenaline, after which were added three different concentrations of DOLE for 30min/37 ° C. The second group of samples was treated first with DOLE (30min/37 ° C) and after the DNA damages were induced by epinephrine. The positive control was treated only with epinephrine, a negative only with PBS. Samples are applied on the agarose film on microscope plates, and then be left overnight in a lysing solution. Next phase is electrophoresis and colouring of samples. Classification of defects was based on the quantity of DNA in the comet's tail.

Results: Fluorescence microscopy clearly shows the different levels of damage on DNA molecules. Treatment with DOLE, before and after the induction of DNA damages with adrenaline, leading to statistically significant decrease of DNA damage.

Conclusion: During of using the comet test, protective antioxidant effect was demonstrated. The results indicate genoprotective effects and increase the antioxidant capacity of blood cells, with the help of induction of antioxidant enzyme systems in the cell.

Key words: oxidative stress, antioxidant activity, comet test, DOLE

ISPITIVANJE ANTIRADIKALSKE I ANTIHOLINESTERAZNE AKTIVNOSTI POSTDESTILACIONOG OSTATKA LISTA MATIČNJAKA (*Melissae folium*)

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Uvod: Matičnjak (*Melissa officinalis* L., Lamiaceae) ima veoma dugu tradiciju upotrebe u medicini, zahvaljujući prvenstveno prisustvu etarskog ulja. Međutim, današnja istraživanja se sve više bave terapijskim efektom različitih ekstrakata lista matičnjaka (*Melissae folium*) za koje je dokazano da ispoljavaju antioksidativnu i antiholinesteraznu delovanje, što je od velikog značaja za prevenciju i lečenje raznih bolesti.

Cilj: Cilj istraživanja je bio da se ispitaju i uporede antioksidativni i antiholinesterazni potencijali standardnog ekstrakta lista matičnjaka i dekokta koji ostaje nakon hidrodestilacije etarskog ulja.

Materijal i metode: U ekstraktima dobijenim metodom maceracije sa 45% etanolom (vreme maceracije 24h) i hidrodestilacije određena je količina suvog ostatka. Ukupni fenoli određeni su metodom Folin-Ciocalteu-a, a ukupni flavonoidi spektrofotometrijskom metodom kojom se prati formiranje flavonoid-metalo kompleksa. Antiradikalno delovanje ekstrakata praćeno je putem sposobnosti ispitivanih ekstrakata da izvrše neutralizaciju stabilnog DPPH radikala. Antiholinesterazni potencijal ekstrakata određivan je spektrofotometrijskom Ellman-ov metodom.

Rezultati: Prinos suvog ekstrakta (s.e.) u biljnom materijalu kretao se od 16,78 do 31,34%. Sadržaj ukupnih fenola je veći u standardnom ekstraktu (ST) i iznosi 38,8mg ekvivalenata galne kiseline (EGK)/g s.e., dok u postdestilacionom ostatku (PDO) je veći sadržaj ukupnih flavonoida i iznosi 26,56mg ekvivalenata kvercetina (EK)/g s.e. Oba ekstrakta ispoljavaju jaku antiradikalnu aktivnost. Inhibiciju acetilholin esteraze ispoljava samo ST ($IC_{50}=337,03 \mu\text{g/ml}$) dok PDO ne pokazuje značajniju inhibiciju.

Zaključak: Oba ispitivana ekstrakta lista matičnjaka ispoljavaju značajnu antioksidativnu aktivnost dok sa druge strane antiholinesteraznu aktivnost ispoljava samo standardni ekstrakt. Otpadni materijal nakon izolacije etarskog ulja lista matičnjaka može naći svoju primenu u farmaceutskoj i prehrambenoj industriji kao potencijalni izvor antioksidanasa. **Ključne reči:** *Melissa officinalis*, postdestilacioni ostatak, ukupni fenoli i flavonoidi, DPPH* radikal, inhibicija acetilholin esteraze

SCAVENGING AND ANTIHOLINESTERASE ACTIVITY OF POSTDISTILLATION WASTE MATERIAL OF LEMON BALM LEAF (*Melissae folium*)

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Introduction: Lemon Balm (*Melissa officinalis* L., Lamiaceae) has long tradition of use, mainly due to the presence of essential oil. However, current studies confirms an antioxidant and anticholinesterase potential of different lemon balm leaf extracts (*Melissae folium*), what is of great importance for prevention and treatment of various diseases.

The Aim: The aim of our study was to examine and compare the antioxidant and anticholinesterase potentials of standard lemon balm leaf extract and decoction, which remains after hydrodistillation of essential oil.

Materials and Methods: Extracts were made using a method of maceration with 45% ethanol (time of extraction was 24h) and hydrodistillation. Amount of dried residue was determined gravimetrically. Total phenolics were determined by Folin-Ciocalteu method and total flavonoids were quantified spectrophotometrically, according to the formation of flavonoid-methal complex. Radical scavenging capacity was assayed on DPPH. Anticholinesterase potential was determined by Ellman method.

Results: The amount of dry extract (d.e.) ranged from 16.78 do 31.34%. Concentration of total phenolics is higher in standardised extract (SE) (38.8mg gallic acid equivalents/g d.e.) than in postdistillation waste (PDW), but concentration of total flavonoids is higher in PDW (26.56mg quercetin equivalents/g d.e.). In DPPH-test both extracts exhibited very strong antioxidant activity. But only standardised extract expressed significant anticholinesterase inhibition ($IC_{50}=337.03 \mu\text{g/ml}$).

Conclusion: Both tested extracts exhibited very strong antioxidant activity on DPPH radical, yet significant anticholinesterase inhibition is achieved only by SE. PDW could be used in pharmaceutical and food industry as a potential source of antioxidants.

Key words: *Melissa officinalis*, postdistillation waste, total phenolics and flavonoid content, DPPH radical, acetylcholinesterase inhibition

ANTIOKSIDATIVNA AKTIVNOST I SADRŽAJ UKUPNIH FENOLA EKSTRAKATA CRVENE DETELINE

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Uvod: Crvena detelina (*Trifolium pratense* L., Fabaceae) sadrži jedinjenja fenolne strukture koja ispoljavaju antioksidativnu aktivnost. Antioksidativna aktivnost se sastoji u sprečavanju formiranja slobodnih radikala, hvatanju slobodnih radikala ili u ubrzavanju njihovog uklanjanja.

Cilj: Osnovni cilj rada je određivanje sadržaja ukupnih fenola i antioksidativnog potencijala kod pet sorti crvene deteline i u njenim različitim biljnim delovima.

Materijal i metode: Analizirano je pet sorti crvene deteline (posebno stabljika, list i cvet). Posle izvršene ekstrakcije spektrofotometrijski je određivan sadržaj ukupnih fenola Folin-Ciocalteu metodom i antioksidativna aktivnost ispitivanjem sposobnosti hvatanja slobodnih radikala sa DPPH (1,1-difenil-2-pikrilhidrazil) reagensom.

Rezultati: Sorta m21 je u proseku najbogatija ukupnim fenolnim jedinjenjima (29,71 mg GAE/g) i pokazuje najveću antioksidativnu aktivnost (IC_{50} iznosi 0,1512). Cvet sorte m28 ima najveći antioksidativni kapacitet (IC_{50} iznosi 0,0715) i najveći sadržaj ukupnih fenola (43,18 mg GAE/g), dok stabljika sorte m28 ima najmanji antioksidativni kapacitet (IC_{50} iznosi 0,5677) i najmanji sadržaj ukupnih fenola (9,58 mg GAE/g).

Zaključak: Posmatrajući biljne delove, najmanji sadržaj ukupnih fenola i najmanja antioksidativna aktivnost je utvrđena u stabljikama, dok su najveće vrednosti ukupnih fenola kao i antioksidantni potencijal određeni u cvetovima crvene deteline. Sorta m21 u proseku ima najveći sadržaj ukupnih fenola i najveći antioksidativni kapacitet.

Ključne reči: crvena detelina, antioksidativna aktivnost, fenolna jedinjenja

ANTIOXIDANT ACTIVITY AND TOTAL PHENOL CONTENT OF EXTRACTS OF RED CLOVER

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Introduction: Red clover (*Trifolium pratense* L., Fabaceae) contains phenolic compounds which display antioxidant activity. The antioxidant activity includes prevention of the formation of free radicals, free radical scavenging or acceleration of their removal.

Goal: The aim of this study was determination of total phenolic content and antioxidant potential in five varieties of red clover and its different plant parts.

Material and methods: Five varieties of red clover (stem, leaf and flower) were analyzed. After the extraction, total phenolic content was determined spectrophotometrically with Folin-Ciocalteu method and antioxidant activity by examining the radical scavenging capacity with DPPH (2,2-diphenyl -1-dipicrylhydrazyl) reagent.

Results: The m21 variety is on average the richest in total phenolic compounds (29.71 mg GAE/g) and it shows the highest antioxidant activity (IC_{50} is 0.1512). The flower of the m28 variety has the highest antioxidant capacity (IC_{50} is 0.0715) and the highest total phenolic content (43.18 mg GAE/g), while the stem of the m28 variety has the lowest antioxidant capacity (IC_{50} is 0.5677) and the lowest total phenolic content (9.58 mg GAE/g).

Conclusion: Observing different plant parts, the lowest total phenolic content and antioxidant activity were determined in stems, while the highest values for total phenolic compounds and antioxidant potential were found in flowers. The m21 variety has the highest total phenol content and the highest antioxidant capacity.

Key words: red clover, antioxidant activity, phenolic compounds

ANTIOKSIDATIVNI POTENCIJAL *VERBENAE OFFICINALIS* L. VERBENACEAE

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Uvod: *Verbena officinalis* je svoju primenu još od davnina našla u brojnim narodnim medicinama. Potvrđeno je da poseduje brojne pozitivne efekte na ljudski organizam i ima veliki značaj i potencijal za lečenje raznih patoloških stanja.

Cilj: Cilj istraživanja bio je da se ispita hemijski sastav infuza i vodeno-alkoholnog ekstrakta herbe *Verbena officinalis* pripremljenog po tipu tečnog ekstrakta. Ispitano je antiradikalno delovanje na DPPH radikal, OH radikal, kao i inhibitorno delovanje na proces lipidne peroksidacije.

Materijal i metode: Infuz je dobijen prelivanjem droge ključalom vodom u toku 30 minuta. Vodeno-alkoholni ekstrakt je pripremljen metodom hladne maceracije sa 25 % etanolom, u vremenskom periodu od 24 h. Ukupni fenoli određeni su metodom Folin-Ciocalteu-a, a ukupni flavonoidi spektrofotometrijskom metodom kojom se prati formiranje flavonoid-metalo kompleksa. Antioksidativno delovanje ispitivanih zoraka praćeno je putem tri testa: neutralizacijom stabilnog DPPH i hidroksil radikala, kao i inhibicijom procesa lipidne peroksidacije.

Rezultati: Ukupan sadržaj fenola u ispitivanim uzorcima iznosi 36,529 mgGAE/g.d.e. (za infuz) i 37,186 mgGAE/g.s.e. (za ekstrakt), dok je ukupan sadržaj flavonoida 28,68 µgKE/g.s.e. (za infuz) i 27,82 µgKE/g.s.e. (za ekstrakt). Značajna antioksidativna aktivnost utvrđena je DPPH-testom ($IC_{50}=3,56$ µg/mL za infuz, odnosno $IC_{50}=6,83$ µg/mL za ekstrakt). Testom inhibicije OH radikala dobijene su sledeće vrednosti IC_{50} : 60,31 µg/mL za infuz i 222,83 µg/mL za alkohlni ekstrakt. Merenjem intenziteta inhibicije procesa lipidne peroksidacije takođe je utvrđeno snažno antioksidativno delovanje ($IC_{50}=63,29$ µg/mL za infuz i $IC_{50}=79,57$ µg/mL za ekstrakt)

Zaključak: Na osnovu izvršenih testova, utvrđeno je antioksidativno delovanje ispitivanih uzoraka *Verbenae herba*, što se može bar delimično povezati sa značajnom količinom fenola i flavonoida.

Ključne reči: *Verbena officinalis*, ukupni fenoli, ukupni flavonoidi, DPPH radikal, OH radikal, lipidna peroksidacija.

ANTIOXIDANT ACTIVITY OF *VERBENA OFFICINALIS* L. VERBENACEAE

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Introduction: *Verbena officinalis* L. has a long tradition of use in folk medicine and has numerous positive effects on human health. It has a tremendous potential in healing various pathological states.

The Aim: The aim was to examine the chemical composition and scavenging activity of *Verbena officinalis* L. herb extracts on 2,2-diphenyl-1-picrylhydrazyl radical (DPPH), hydroxyl radical (OH), as well as inhibitory effect on the process of lipid peroxidation.

Material and methods: Infusion was prepared with 150 mL of boiling water (the mixture was cooled for 30 minutes before filtration). Extract was made using a method of cold maceration with 25% ethanol (time of extraction was 24h). Total phenolics were determined by the method of Folin-Ciocalteu and total flavonoids were quantified spectrophotometrically, according to the formation of flavonoid-methal complex. Antioxidant activity of tested extract was followed by three tests: neutralisation of stable DPPH radical, OH radical and inhibition of the process of lipid peroxidation.

Results: Total phenol content in tested samples was 36,529 mgGAE/g.d.e. (in infusion) and 37,186 mgGAE/g.d.e. (in extract), and total content of flavonoids was 28,68 µgQE/g.d.e. (in infusion) and 27,82 µgQE/g.d.e. (in extract). Significant antioxidant activity was determined by DPPH test ($IC_{50}=3,56$ µg/mL for infusion and $IC_{50}=6,83$ µg/mL for extract). Test of neutralisation of OH[•] also showed scavenging activity ($IC_{50}=60,31$ µg/mL (for infusion) and $IC_{50}=222,83$ µg/mL (for extract), as well as test of measuring the intensity of inhibition of the process of lipid peroxidation ($IC_{50}=63,29$ µg/mL for infusion and $IC_{50}=79,57$ µg/mL for extract).

Conclusion: A significant antioxidant activity of tested *Verbena officinalis* herb extracts has been found, which is associated with high levels of phenolics and flavonoids in its composition.

Key words: *Verbena officinalis*, total phenolics, total flavonoid content, DPPH test, OH test, lipid peroxidation.

KOMPARATIVNO ISPITIVANJA ANTIOKSIDANTNOG POTENCIJALA DVA PREDSTAVNIKA RODA *Hypericum* (*H.parforatum* L. i *H.barbatum* Jacq., Hypericaceae)

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Uvod: Pored kantariona (*Hypericum perforatum*, Hypericaceae) koji ima dugu tradiciju primene u medicine i farmaciji zbog svog antioksidantnog, antiinflamatornog, antiseptičkog, antidepressivnog i drugih farmakoloških delovanja, ispituju se i druge vrste roda *Hypericum* kao što je *Hypericum barbatum*.

Cilj: Cilj istraživanja je bio da se paralelnim ispitivanjima utvrdi sličnost hemijskog sastava i antiradikalnog delovanja na DPPH radikal ekstrakta vrsta *Hypericum perforatum* i *Hypericum barbatum*, kao i inhibitorno delovanje na proces oksidacije dezoksiriboze.

Materijal i metode: Ekstrakti su dobijeni metodom hladne maceracije sa 50% etanolom u vremenskom periodu od 24h. Ukupni fenoli određeni su metodom Folin-Ciocalteu-a, a ukupni flavonoidi spektrofotometrijskom metodom kojom se prati formiranje flavonoid-metalo kompleksa. Antioksidantni potencijal ispitivanih ekstrakta određen je praćenjem sposobnosti neutralizacije stabilnog DPPH radikala, kao i neutralizacijom procesa oksidacije dezoksiriboze.

Rezultati: Ukupan sadržaj fenola u ispitivanim ekstraktima iznosi 21,65 mgEGK/g.s.e. za ekstrakt vrste *Hypericum perforatum* (HP), a 32,69 mgEGK/g.s.e. za ekstrakt vrste *Hypericum barbatum* (HB). Ukupan sadržaj flavonoida u ispitivanim ekstraktima iznosi 26,33 mgEK/g.s.e. za HP, a 72,43 mgEK/g.s.e. za HB. Značajna antioksidativna aktivnost utvrđena je DPPH-testom ($IC_{50}=6,65$ µg/ml za HP, i $IC_{50}=18,4$ µg/ml za HB) i praćenjem neutralizacije hidroksil radikala ($IC_{50}=56,15$ µg/ml za ekstrakt vrste *H.perforatum*, i $IC_{50}=75,17$ µg/ml za ekstrakt vrste *H.barbatum*).

Zaključak: Na osnovu izvršenih testova, utvrđeno je značajno antioksidativno delovanje ispitivanih ekstrakta obe vrste, *Hypericum perforatum* i *Hypericum barbatum*. Nakon daljih ispitivanja, i vrsta HB, kao neoficinalna mogla bi potencijalno da nađe svoju primenu u okvirima farmaceutske industrije.

Ključne reči: *Hypericum perforatum*, *Hypericum barbatum*, ukupni fenoli, ukupni flavonoidi, DPPH test, hidroksil radikal.

COMPARATIVE ASSESSMENT OF ANTIOXIDANT POTENTIAL OF TWO GENUS *Hypericum* REPRESENTATIVES (*H. perforatum* L. i *H. barbatum* Jacq., Hypericaceae)

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Introduction: Besides *Hypericum perforatum*, Hypericaceae which has a long tradition of use in medicine and pharmacy because of its antioxidant, antiseptic, antiinflammatory, antidepressive and other pharmacological activities, other species of the genus *Hypericum* are examined, for example *Hypericum barbatum*.

The Aim: The aim of this research was to prove similarity of the chemical composition and scavenging activity on DPPH and OH radical between extracts *Hypericum perforatum* and *Hypericum barbatum*.

Material and methods: Extract was made using a method of cold maceration with 50% ethanol (time of extraction was 24h). Total phenolics were determined by the method of Folin-Ciocalteu and total flavonoids were quantified spectrophotometrically, according to the formation of flavonoid-methal complex. Antioxidant potential of tested extracts was determined by measuring the ability of neutralization of stable DPPH radical and by assessing the inhibition of deoxyribose oxidation.

Results: Total phenol content in tested extract *Hypericum perforatum* was 21.64 mgGAE/g.d.e. (HP), and 32.69mgGAE/g.d.e in tested extract *Hypericum barbatum*(HB). Total content of flavonoids in tested extracts was 26.33 µgQE/g.d.e. in HP, and 72.43µgQE/g.d.e. in HB. Significant antioxidant activity was determined by DPPH test ($IC_{50}=6.65$ µg/ml in HP and $IC_{50}=18.4$ µg/ml in HB) and by neutralisation of hydroxyl radical ($IC_{50}=56.15$ µg/ml in tested *H.perforatum* extract, i $IC_{50}=75.17$ µg/ml in tested *H.barbatum* extract).

Conclusion: On the basis of presented results, a significant antioxidant activities of both tested *Hypericum perforatum* and *Hypericum barbatum* extracts have been found. After detailed chemical characterisation, species HB, as non-official, could be used in pharmaceutical industry.

Key words: *Hypericum perforatum*, *Hypericum barbatum*, total phenolics, total flavonoid content, DPPH test, hydroxyl radical.

ODREĐIVANJE SADRŽAJA UKUPNIH FLAVONOIDA U EKSTRAKTIMA BILJNE VRSTE

Satureja kitaibelii Wierzb. ex Heuff.

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Uvod: Flavonoidi predstavljaju grupu biljnih polifenola, koji ispoljavaju antiinflamatorno, antimikrobno, antivirusno, antialergijsko, antimutageno, antiulkusno i vazodilatatorno dejstvo. *Satureja kitaibelii* Wierzb. ex Heuff. se smatra biljnom vrstom endemičnom za područje centralnog Balkanskog poluostrva, koja se u tradicionalnoj medicini od davnina koristi za lečenje dijareje, vrtoglavice, grčeva, bolova u mišićima, problema sa varenjem, fertiliteta, poremećaja menstrualnog ciklusa, respiratornih i infektivnih bolesti, u aromaterapiji, a u mediteranskoj kuhinji i kao začinska biljka.

Cilj istraživanja: Cilj ovog rada je određivanje sadržaja ukupnih flavonoida u etanolnom, metanolnom, vodenom ekstraktu i vodenj frakciji nakon izolovanja etarskog ulja biljne vrste *S. kitaibelii*.

Materijali i metode: Nadzemni delovi ispitivane biljne vrste sakupljani su na području Kamenice pored Niša početkom avgusta u fazi punog cvetanja. Sadržaj ukupnih flavonoida determinisan je spektrofotometrijski, metodom oficinalnoj po nemačkoj farmakopeji DAB 10.

Rezultati: Najveća količina flavonoida prisutna je u metanolnom ekstraktu (1.04%). U vodenj frakciji nakon izolovanja etarskog ulja količina flavonoida bila je nešto niža (0.98%), dok je najmanja količina utvrđena u vodenom (0.67%) i etanolnom ekstraktu (0.58%).

Zaključak: Na osnovu određenog ukupnog sadržaja flavonoida, može se zaključiti da se ekstrakti biljne vrste *S. kitaibelii*, kao izvor prirodnih antioksidanasa, mogu koristiti u izradi fitopreparata, stabilizaciji prehrambenih proizvoda, kao i u obliku suplemenata u ishrani.

Gljučne reči: *Satureja kitaibelii* Wierzb. ex Heuff., ekstrakti, flavonoidi

ODREĐIVANJE SADRŽAJA UKUPNIH FLAVONOIDA U EKSTRAKTIMA BILJNE VRSTE

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Uvod: Flavonoidi predstavljaju grupu biljnih polifenola, koji ispoljavaju antiinflamatorno, antimikrobno, antivirusno, antialergijsko, antimutageno, antiulkusno i vazodilatatorno dejstvo. *Satureja kitaibelii* Wierzb. ex Heuff. se smatra biljnom vrstom endemičnom za područje centralnog Balkanskog poluostrva, koja se u tradicionalnoj medicini od davnina koristi za lečenje dijareje, vrtoglavice, grčeva, bolova u mišićima, problema sa varenjem, fertiliteta, poremećaja menstrualnog ciklusa, respiratornih i infektivnih bolesti, u aromaterapiji, a u mediteranskoj kuhinji i kao začinska biljka.

Cilj istraživanja: Cilj ovog rada je određivanje sadržaja ukupnih flavonoida u etanolnom, metanolnom, vodenom ekstraktu i vodenj frakciji nakon izolovanja etarskog ulja biljne vrste *S. kitaibelii*.

Materijali i metode: Nadzemni delovi ispitivane biljne vrste sakupljani su na području Kamenice pored Niša početkom avgusta u fazi punog cvetanja. Sadržaj ukupnih flavonoida determinisan je spektrofotometrijski, metodom oficinalnoj po nemačkoj farmakopeji DAB 10.

Rezultati: Najveća količina flavonoida prisutna je u metanolnom ekstraktu (1.04%). U vodenj frakciji nakon izolovanja etarskog ulja količina flavonoida bila je nešto niža (0.98%), dok je najmanja količina utvrđena u vodenom (0.67%) i etanolnom ekstraktu (0.58%).

Zaključak: Na osnovu određenog ukupnog sadržaja flavonoida, može se zaključiti da se ekstrakti biljne vrste *S. kitaibelii*, kao izvor prirodnih antioksidanasa, mogu koristiti u izradi fitopreparata, stabilizaciji prehrambenih proizvoda, kao i u obliku suplemenata u ishrani.

Gljučne reči: *Satureja kitaibelii* Wierzb. ex Heuff., ekstrakti, flavonoidi

DETERMINATION OF TOTAL FLAVONOID CONTENT IN *Satureja kitaibelii* Wierzb. ex Heuff. EXTRACTS

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Introduction: Flavonoids are group of plant polyphenols which possess antiinflammatory, antimicrobial, antiviral, antiallergic, antimutagenic, antiulcer and vasodilatation activity. *Satureja kitaibelii* Wierzb. ex Heuff. is considered endemic plant species, distributed in the central part of the Balkan Peninsula, that is used in traditional medicine for ages to treat diarrhea, nausea, cramps, muscle pain, indigestion, fertility, menstrual disorders, respiratory and infectious diseases, in aromatherapy and in mediterranean kitchen as a culinary herb.

The Aim: To determinate total flavonoid content in ethanol, methanol, water extracts and water fraction after isolation of essential oil.

Materials and Methods: The aerial parts of the plant were collected in the region of Kamenica beside Niš in august, during the full flowering stage. Total flavonoid content was determinated spectrophotometrically by method officinal in German Pharmacopeia DAB 10.

Results: The highest total flavonoid content was determined in methanol extract (1.04%). In water fraction after isolation of essential oil, total flavonoid content was little lower (0.98%) while the lowest content was determined in water (0.67%) and ethanol extract (0.58%).

Conclusion: Based on determined total flavonoid content, it can be concluded that *S. kitaibelii* extracts, as a source of natural antioxidants, can be used in preparation of herbal remedies, stabilization of food products, and also as a dietary supplements.

Keywords: *Satureja kitaibelii* Wierzb. ex Heuff., extracts, flavonoids

DETERMINATION OF TOTAL FLAVONOID CONTENT IN *Satureja kitaibelii* Wierzb. ex Heuff. EXTRACTS

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Introduction: Flavonoids are group of plant polyphenols which possess antiinflammatory, antimicrobial, antiviral, antiallergic, antimutagenic, antiulcer and vasodilatation activity. *Satureja kitaibelii* Wierzb. ex Heuff. is considered endemic plant species, distributed in the central part of the Balkan Peninsula, that is used in traditional medicine for ages to treat diarrhea, nausea, cramps, muscle pain, indigestion, fertility, menstrual disorders, respiratory and infectious diseases, in aromatherapy and in mediterranean kitchen as a culinary herb.

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Keywords: *Satureja kitaibelii* Wierzb. ex Heuff., extracts, flavonoids

ANTIMIKROBNO DELOVANJE ETARSKOG ULJA SATUREJA MONTANA L. (LAMIACEAE)

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Uvod: Satureja montana L. je aromatični polužbun koji raste u mediteranskom i submediteranskom području. Vrste roda Satureja sadrže više od 0,5% etarskog ulja.

Cilj rada: Odrediti količinu, kvalitet i antimikrobno delovanje etarskog ulja dve podvrste Satureja montana subsp. montana i S. montana subsp. pisidica (Wettst.) Šilic.

Materijal i metode: Biljni materijal je prikupljen sa prirodnih staništa: S. montana spp. montana sa Prokletija i Kanjona Morače (Crna Gora) i S. montana spp. pisidica sa planine Galičica (Makedonija). Osušeni nadzemni izdanak podvrgnut je destilaciji vodenom parom u aparaturi po Clevenger-u. Komponente etarskog ulja su kvantifikovane GC/MS i GC/FID metodama, a MIC vrednosti su određene bujon mikrodilucionom metodom.

Rezultati: Količina etarskog ulja u istraženim taksonima je 0,6 – 1,1%. Dominantne komponente kod S. montana spp. montana su o-cimen (15,1%), kariofilen oksid (10,3%) i borneol (9,4%), a kod S. montana spp. pisidica timol (20,9 - 24,5%) i karvakrol (37,6%). Najbolju antibakterijsku i antifungalnu aktivnost pokazuje etarsko ulje S. montana spp. pisidica.

Zaključak: Naši rezultati pokazuju da ispitivana etarska ulja pokazuju izraženu antibakterijsku aktivnost, dok je antifungalna aktivnost nešto slabija. Ovakav efekat se može pripisati monoterpenskim komponentama etarskog ulja timolu, karvakrolu i o-cimenu. Analizirana etarska ulja pokazuju bolju aktivnost prema G(+) bakterijama (Staphylococcus aureus, Staphylococcus epidermidis, Micrococcus luteus, Bacillus subtilis), dok prema G(-) bakterijama (Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae) imaju nešto nižu aktivnost.

Ključne reči: Satureja montana spp. montana, S. montana spp. pisidica, etarsko ulje, antimikrobno dejstvo.

ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL OF SATUREJA MONTANA L. (LAMIACEAE)

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Introduction: Satureja montana L. is an aromatic semi-shrub that grows in the Mediterranean and sub-Mediterranean area. Species of the genus Satureja contain more than 0.5% of essential oils.

The Aim: To determine the quantity, quality and antimicrobial activity of essential oils of two subspecies of Satureja montana subsp. montana and S. montana subsp. pisidica (Wettst.) Šilic.

Material and methods: Plant material was collected from natural habitats of: S. montana spp. montana from Prokletije and Morača (Montenegro) and S. montana spp. pisidica from the mountain Galičica (Macedonia). Dried above-ground shoot was subjected to hydro distillation in Clevenger apparatus. Components of essential oils were quantified using GC/MS and GC/FID methods, while MIC were determined using broth microdilution method.

Results: The amount of essential oil in the studied taxons were 0.6 - 1.1%. Dominant components in S. montana spp. montana were o-cymene (15.1%), caryophyllene oxide (10.3%) and borneol (9.4%), while in S. montana spp. pisidica thymol (20.9 - 24.5%) and carvacrol (37.6%). The best antibacterial and antifungal activity of essential oil has shown S. montana spp. pisidica.

Conclusion: Our results show that the tested essential oils exhibited a strong antibacterial activity, while antifungal activity, was slightly weaker. This effect can be attributed to the monoterpene components of the essential oils thymol, carvacrol and o-cymene. Analyzed essential oils exhibit better activity against G (+) bacteria (Staphylococcus aureus, Staphylococcus epidermidis, Micrococcus luteus, Bacillus subtilis), whereas the G (-) bacteria (Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae) have a somewhat lower activity.

Key words: Satureja montana spp. montana, S. montana spp. pisidica, essential oil, antimicrobial effect.

ANTIMIKROBNO DELOVANJE EKSTRAKATA HERBE SATUREJA MONTANA L. (LAMIACEAE)

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Uvod: Satureja montana L. (Lamiaceae) je aromatični polužbun koji raste u mediteranskom i submediteranskom području. Dosadašnja ispitivanja ekstrakata pokazuju da ova vrsta ima antimikrobno delovanje i submediteranskom području.

Cilj rada: Odrediti kvalitativni, kvantitativni sastav i antimikrobno delovanje 70% metanolnog ekstrakta (V/V; 1:10) dve podvrste Satureja montana spp. montana i S. montana spp. pisidica (Wettst.) Šilic sa različitim lokaliteta.

Materijal i metode: Biljni materijal je prikupljen sa prirodnih staništa S. montana spp. montana sa Prokletija i Kanjona Morače (Crna Gora) i S. montana spp. pisidica sa planina Galičica i Koraba (Makedonija). Od osušenih i spršenih nadzemnih izdanaka, pripremljeni su metanolni ekstrakti. Identifikacija i kvantifikacija ispitivanih metanolnih ekstrakata izvršena je HPLC metodom, dok su MIC vrednosti određene bujon mikrodilucionom metodom.

Rezultati: Glavna komponenta analiziranih ekstrakata je rozmarinska kiselina, čiji je sadržaj u metanolnim ekstraktima sledeći: S. montana spp. montana, Prokletije (18,09%), S. montana spp. montana, Kanjon Morače (11,04%), S. montana spp. pisidica, Galičica (18,02%), S. montana spp. pisidica, Korab (14,86%). Ispitivani ekstrakti pokazuju značajnu antibakterijsku aktivnost, posebno ekstrakti S. montana spp. montana, Kanjon Morače i S. montana spp. pisidica, Galičica prema G(+) bakterijama (Staphylococcus epidermidis, Micrococcus luteus, Bacillus subtilis: MIC-37,5 µg/ml), dok prema G(-) bakterijama (Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae: MIC-75µg/ml) imaju nešto nižu aktivnost. Candida albicans je u istoj meri osetljiva na sve ispitivane ekstrakte (MIC-75µg/ml).

Zaključak: Na osnovu dobijenih rezultata može se zaključiti da ispitivani metanolni ekstrakti pokazuju izraženu antibakterijsku i antifungalnu aktivnost.

Ključne reči: Satureja montana spp. montana, Satureja montana spp. pisidica, metanolni ekstrakt, antimikrobno delovanje.

ANTIMICROBIAL ACTIVITY OF METHANOLIC EXTRACTS OF SATUREJA MONTANA L. (LAMIACEAE)

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Introduction: Satureja montana L. (Lamiaceae) is the aromatic semi-bushy that grows in the Mediterranean and sub-Mediterranean area. Recent studies indicate that extracts of this species have antimicrobial activity.

The Aim: To determine the quality, quantity and antimicrobial activity of 70% methanolic extract (V/V; 1:10) of two subspecies Satureja montana spp. montana and S. montana subsp. pisidica (Wettst.) Šilic from different localities.

Material and methods: Plant material was collected from natural habitats of S. montana spp. montana from Prokletije and Morača (Montenegro) and S. montana spp. pisidica from the mountains Galičica and Korab (Macedonia). Methanolic extracts were prepared from the dried and powdered aerial parts. Identification and quantification of the tested methanolic extracts were analysed by HPLC method, while MIC were determined using broth microdilution method.

Results: The main compound in analysed extracts was rosmarinic acid, which content in methanolic extracts were as follows: S. montana spp. montana, Prokletije (18.09%), S. montana spp. montana, Kanjon Morače (11.04%), S. montana spp. pisidica, Galičica (18.02%), S. montana spp. pisidica, Korab (14.86%). The tested extracts showed significant antibacterial activity, especially extracts of S. montana spp. montana, Kanjon Morače and S. montana spp. pisidica, Galičica analyzed against G(+) bacteria (Staphylococcus epidermidis, Micrococcus luteus, Bacillus subtilis: MIC-37,5µg/ml), whereas the G(-) bacteria (Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae: MIC-75µg/ml) have lower activity. Candida albicans is equally sensitive to all tested extracts (MIC-75µg/ml).

Conclusion: The obtained results may suggest that the methanolic extracts showed a strong antibacterial and antifungal activity.

Key words: Satureja montana spp. montana, Satureja montana spp. pisidica, methanolic extract, antimicrobial activity.

ISPITIVANJE MOGUĆNOSTI INDUSTRIJSKE EKSPLOATACIJE CVETA I SEMENA DVE VRSTE KESTENA (*AESCULUS HIPPOCASTANUM* I *AESCULUS X CARNEA*)

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Uvod: Seme kestena (*Aesculus hippocastanum*, Hippocastanaceae) predstavlja biološki izvor droge *Hippocastani semen*. Droga predstavlja izvor escina, triterpenskog saponozida, koji se koristi u terapiji vaskularnih poremećaja kao što su varikozne vene, hronična venska insuficijencija, hemoroidi. Osim ove biljne droge, escin je prisutan i u nekim drugim *Aesculus* vrstama, poput *Aesculus x carnea* koja je uobičajeno ukrasno drvo mnogih gradskih parkova.

Cilj rada: Cilj ovog rada je ispitivanje mogućnosti održive industrijske eksploatacije biljne sirovine dobijene od široko dostupnih parkovskih vrsta kestena, a koja se smatra otpadnim materijalom i jednim od izvora urbanog zagađenja.

Materijal i metode: Osušena semena i cvetovi dve vrste kestena - *Aesculus hippocastanum* i *Aesculus x carnea* su sakupljena u gradskom parku u Vršcu. Kotiledoni i semenjače datih uzoraka su razdvojeni i ispitivani posebno. Identifikacija escina tankoslojnom hromatografijom i njegovo spektrofotometrijsko određivanje u svim uzorcima izvršeno je prema propisu datom u DAB X. Sadržaj escina je takođe određen metodom TLC denzitometrije, gde je primenjen ekvivalentan postupak ekstrakcije iz biljnog materijala kako bi se obezbedilo poređenje osetljivosti ovih metoda. Sadržaj teških metala kadmijuma, olova i žive je određen atomskom apsorpcionom spektrofotometrijom u svim uzorcima i 60%-tnim etanolnim ekstraktima u cilju ispitivanja bezbednosti prilikom terapijske primene.

Rezultati: Spektrofotometrijskim određivanjem je pokazano da je sadržaj escina u ispitivanim uzorcima u granicama od 0.17-2.95%, a denzitometrijskim određivanjem 0.10-2.39%. Sadržaj teških metala odgovara zahtevima Ph.Eur.7.

Zaključak: Na osnovu dobijenih rezultata, spektrofotometrijsko određivanje je pokazalo veću osetljivost od denzitometrijskog određivanja. Obe ispitivane vrste kestena se mogu racionalno eksploatisati u industrijskoj proizvodnji.

Ključne reči: escin, tankoslojna hromatografija, spektrofotometrija, urbano zagađenje.

INVESTIGATIONS ON THE POSSIBILITY OF INDUSTRIAL EXPLOITATION OF FLOWERS AND SEEDS OF TWO HORSE CHESTNUT SPECIES (*AESCULUS HIPPOCASTANUM* AND *AESCULUS X CARNEA*)

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Introduction: Seed of the horse chestnut (*Aesculus hippocastanum*, Hippocastanaceae) represents the biological source of the herbal drug *Hippocastani semen*. Drug contains aescin, a triterpenoid saponoside, used in the treatment of vascular disorders. Apart from this herbal drug, aescin is present in other *Aesculus* species, such as *Aesculus x carnea* which is often raised in city parks.

The Aim: To estimate the possibility of sustainable industrial exploitation of plant material obtained from wide-spread park species of horse chestnut, which are considered as waste and one of the sources of urban pollution.

Materials and Methods: Dried seeds and flowers of two chestnut species – *Aesculus hippocastanum* and *Aesculus x carnea*, were collected in the city park of Vršac. Cotyledons and seedcoats of the given samples were examined separately. The identification of aescin in all samples was performed using thin-layer chromatography and its spectrophotometric determination was carried out according to DAB X. The content of aescin was also determined by TLC densitometry method, where the equivalent extraction procedure of the herbal material was applied in order to provide sensitivity comparison of these methods. The content of heavy metals cadmium, lead and mercury was determined by atomic absorption spectrophotometry in all samples and in 60% ethanol extracts in order to indicate their safety in therapeutic use.

Results: The content of aescin determined spectrophotometrically was in range of 0.17-2.95% and by densitometry 0.10-2.39%. Heavy metals concentrations correspond to the specifications of Ph.Eur.7.

Conclusion: Based on obtained results, spectrophotometric determination showed higher sensitivity than the densitometric determination. Both examined *Aesculus* species can be rationally exploited in industrial production.

Key words: aescin, thin-layer chromatography, spectrophotometry, urban pollution.

SADRŽAJ UKUPNIH ANTOCIJANA U SOKOVIMA PLODA CRNE RIBIZLE

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Uvod: Crna ribizla (*Ribes nigrum* L., *Grossulariaceae*) je biljna vrsta koja pripada bobičastom voću. Plod crne ribizle sadrži antocijane. Sadržaj antocijana u različitim biljnim varijetetima vrste *R. nigrum* varira u zavisnosti od klimatskih i pedoloških uslova, što uslovljava različit intenzitet njihove aktivnosti.

Cilj rada: Cilj našeg istraživanja je određivanje sadržaja ukupnih antocijana u sokovima dva varijeteta *Ribes nigrum* L.

Materijal i metode: Plodovi dva varijeteta crnih ribizli Ben Sarek i Triton sakupljani su tokom tri godine u fazi sazrevanja. Sok se priprema na tradicionalan način, ceđenjem odabranih, svežih plodova kroz gazu kojom se odstranjuje čvrsta materija. Ukupni sadržaj antocijana je određivan spektrofotometrijskim postupkom propisanim u Ph.Eur. 6.0 sa malim modifikacijama.

Rezultati: Rezultati dokazuju prisustvo značajne količine antocijana u sokovima varijeteta biljne vrste *Ribes nigrum* L. Kada uporedimo rezultate za oba varijeteta, nailazimo na nepravilnost u promeni sadržaja ukupnih antocijana tokom godina koju treba dalje ispitati. Varijacije u sadržaju ukupnih antocijana nastaju kao rezultat delovanja različitih klimatskih uslova i sadržaja mineralnih materija u vodi i zemljištu na kome se gaje biljne vrste.

Zaključak: Na osnovu sadržaja antocijana može se zaključiti da ispitivani varijeteti *Ribes nigrum* L. mogu imati značajnu ulogu u prevenciji i lečenju mnogih bolesti. Uniformnost u sadržaju antocijana doprineo bi lakšoj standardizaciji ekstrakata.

Ključne reči: *Ribes nigrum* L., sokovi, antocijani

TOTAL ANTHOCYANIN CONTENT IN THE JUICES OF BLACK CURRANT FRUIT

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Introduction: Black currant (*Ribes nigrum* L., *Grossulariaceae*) is a crop that belongs to berries. The fruit of black currant contains anthocyanins. The content of anthocyanins in different varieties of plant species *R. nigrum* L. depending on the climate and soil conditions which causes different intensity of their activities.

The Aim: The aim of our study was to determinate the total anthocyanins content in juices of two varieties *Ribes nigrum* L.

Materials and Methods: The fruit of two varieties of black currant Ben Sarek and Triton were collected during three years at the stage of maturation. Juice is prepared in the traditional way, by squeezing selected, fresh fruit through the gaze which removes solid matter. The total anthocyanins content was determined by the spectrophotometric procedure described in Ph. Eur 6.0 with small changes.

Results: The results demonstrate the presence of significant amount of anthocyanins in juices of varieties of plant species *Ribes nigrum* L. When we compare the results for the two varieties, we find an irregularity in the total anthocyanins content changes over the years, which should be further investigated. Variations in the content of total anthocyanins occur as the result of different climatic conditions and mineral content in water and soil.

Conclusion: Based on the content of anthocyanins may suggest that the varieties of *Ribes nigrum* L. could play an important role in the prevention and treatment of many diseases. Uniformity in the content of anthocyanins would contribute easier herbal extract standardization.

Key words: *Ribes nigrum* L., juices, anthocyanins

ODREĐIVANJE HLOGROGENSKE KISELINE U KOMERCIJALNIM UZORCIMA ČAJEVA

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Uvod: Čaj je jedan od najčešće korišćenih napitaka na svetu. U zavisnosti od načina prerade od iste biljke *Camellia sinensis* dobijaju se različite vrste čaja, kao što su npr. beli, zeleni, crni čaj. Potencijalno korisna delovanja čaja na ljudsko zdravlje se pripisuju njegovim fenolnim sastojcima, uključujući hlorogenske kiseline. Najzastupljenija hlorogenska kiselina u prirodi je 5-O-kafeoilkvinična kiselina (5-CQA). Paragvajski čaj, *Ilex paraguariensis* takođe predstavlja bogat izvor hlorogenske kiseline.

Cilj: Osnovni cilj ovog rada je određivanje sadržaja hlorogenske kiseline (5-O-kafeoilkvinične kiseline) u komercijalnim uzorcima čajeva različitih proizvođača.

Materijal i metode: Ekstrakcija aktivnih komponenta čajeva vršena je pripremom infuza, u kome je zatim određen sadržaj hlorogenske kiseline primenom visokoeфикаsne tečne hromatografije - High Pressure Liquid Chromatography (HPLC).

Rezultati: HPLC metoda za određivanje sadržaja hlorogenske kiseline u uzorcima čajeva je razvijena i validovana i pokazala je visoku tačnost, ponovljivost, selektivnost i robustnost. Sadržaj 5-CQA u belom čaju bio je 0,66 i 2,16 mg/100 ml, u crnom čaju u opsegu 0,33 – 6,11 mg/100 ml, u zelenom 7,37 i 16,02 mg/100 ml, dok je u Paragvajskom čaju iznosio 9,7 mg/100 ml.

Zaključak: Tokom ove studije utvrđeno je da sa porastom stepena oksidacije polifenolnih jedinjenja u čajevima vrste *Camellia sinensis* opada sadržaj hlorogenske kiseline. Visok sadržaj ove kiseline dobijen je i u Paragvajskom čaju. Vrednosti hlorogenske kiseline u pomenutim čajevima bi se mogle značajno povećati adekvatnim odabirom porekla i načinom prerade biljnog materijala.

Ključne reči: *Camellia sinensis*, hlorogenska kiselina, 5-O-kafeoilkvinična kiselina

DETERMINATION OF CHLOROGENIC ACID IN COMMERCIAL TEA SAMPLES

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Introduction: Tea is one of the most widely consumed beverages in the world. Depending on the manufacturing process different types of teas are gained from the same plant *Camellia sinensis*, such as white, green, black tea. Potential beneficial effects of tea on human health are attributed to its phenolic composition, including chlorogenic acid. The most abundant chlorogenic acid in nature is 5-O-caffeoylquinic acid (5-CQA). Paraguayan tea, *Ilex paraguariensis* is also a rich source of chlorogenic acid.

The Aim: The main objective of this paper is the determination of chlorogenic acid, particularly of 5-CQA in various commercial tea samples.

Material and methods: Tea infusions prepared for extraction of active ingredients were analysed by High Pressure Liquid Chromatography (HPLC) in order to determine their 5-CQA content.

Results: HPLC method for determination of chlorogenic acid in tea samples was developed and validated and it showed good accuracy, repeatability, selectivity and robustness. The content of 5-CQA in white tea samples was 0.66 and 2.16 mg/100 ml, in black tea in interval of 0.33–6.11 mg/100 ml, in green tea 7.37 and 16.02 mg/100 ml, whereas in Paraguayan tea the amount of this chlorogenic acid was 9.7 mg/100 ml.

Conclusion: In this study it was determined that the increase of oxidation level in teas made from *Camellia sinensis* leads to decreased amount of chlorogenic acid. Also, high amount of 5-CQA was obtained in Paraguayan tea. Greater amount of chlorogenic acid in the mentioned teas could be achieved by improved plant selection and production processes.

Keywords: *Camellia sinensis*, chlorogenic acid, 5-O-caffeoylquinic acid

ODREĐIVANJE SADRŽAJA HLOGROGENSKE KISELINE U KOMERCIJALNIM UZORCIMA KAFE

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Uvod: Kafa je jedan od najpopularnijih napitaka današnjice. Predstavlja piće gorkog ukusa, pripremljeno od prženih semenki biljke kafe (*Coffea sp., Rubiaceae*). Hemijski sastav semena kafe zavisi od načina obrade zelenog, tek ubranog zrna. Ovaj uticaj se posebno ogleda u zastupljenosti u vodi rastvorljivih jedinjenja kao što su šećeri, kofein, trigonelin i hlorogenska kiselina. Hlorogenska kiselina je fenolno jedinjenje koje je odgovorno za pigmentaciju i ukus kafe. Glavne klase hlorogenske kiseline koje se nalaze u prirodi su kafeoilkininske kiseline (CQA), dikafeoilkininske kiseline (diCQA) i ređe, feruolkininske kiseline (FQA). Svaka klasa ima najmanje tri izomera.

Cilj: Cilj ovog rada bio je da se razvije pouzdan metod određivanja sadržaja hlorogenske kiseline (5-O-kafeoilkininske kiseline) u uzorcima kafe primenom visokoeфикаsne tečne hromatografije (HPLC). Takođe, ispitan je i sadržaj 5-O-kafeoilkininske kiseline (5-CQA) u komercijalnim uzorcima kafe dostupnih u slobodnoj prodaji na teritoriji Republike Srbije.

Materijal i metode: Ispitivanje je rađeno na vodenim ekstraktima 10 komercijalnih uzoraka kafe. Identifikacija i kvantifikacija hlorogenske kiseline je vršena metodom visokoeфикаsne tečne hromatografije (HPLC).

Rezultati: HPLC metod za određivanje 5-CQA u uzorcima kafe je razvijen i validovan. Sadržaj hlorogenske kiseline u uzorcima je varirao od 0 do 36.196 mg/g kafe, tj. od 0 do 46.982 mg/100 ml napitka.

Zaključak: Upoređivanjem dobijenih rezultata utvrđeno je da sadržaj hlorogenske kiseline varira u zavisnosti od vrsta kafe, tehnološkog procesa obrade kafe i formulacije.

Najznačajniji faktor je formulacija jer se izborom pravog odnosa kafe i pomoćnih materija može postići optimalna količina hlorogenske kiseline koja se unosi u organizam pod uslovom da čovek konzumira kafu u adekvatnim količinama.

Ključne reči: hlorogenska kiselina, kafa, visokoeфикасна tečna hromatografija (HPLC)

DETERMINATION OF CHLOROGENIC ACID CONTENT IN COMMERCIAL COFFEE SAMPLES

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Introduction: Coffee is one of the most popular drinks in the world today. It is a bitter beverage prepared from roasted seeds of coffee plant (*Coffea sp., Rubiaceae*). Chemical composition of coffee seed depends on the method of processing green, just harvested seed. This influence is especially seen in the content of water soluble compounds such as sugars, caffeine, trigonelin and chlorogenic acid. Chlorogenic acid is a phenolic compound that is responsible for pigmentation and taste of coffee. The major classes of chlorogenic acids found in nature are caffeoylquinic acid (CQA), dicaffeoylquinic acid (diCQA) and less frequently, feruloylquinic acid (FQA). Each class has at least three isomers.

The Aim: The aim of this study was to develop reliable high-performance liquid chromatography (HPLC) method for determination of chlorogenic acid (5-O-caffeoylquinic acid) content in coffee samples. Also, the goal was to analyze 5-O-caffeoylquinic acid (5-CQA) content in commercial coffee samples present on the Serbian market.

Materials and methods: The survey was done in aqueous extracts of commercial samples of coffee. Identification and quantification of chlorogenic acid was performed with high-performance liquid chromatography method (HPLC).

Results: HPLC method for the determination of 5-CQA in coffee samples was developed and validated. The content of chlorogenic acid in the samples varies from 0 to 36.196 mg/g of coffee, or from 0 to 46.982 mg/100 ml of beverage.

Conclusion: Comparing the results showed that chlorogenic acid content varies depending on the type of coffee, coffee processing technology and formulation. The most important factor is formulation because the right choice of coffee and excipients can achieve the optimal amount of chlorogenic acid that will be inserted into the body, assuming that coffee is consumed in adequate amount.

Key words: chlorogenic acid, coffee, high-performance liquid chromatography (HPLC)

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Uvod: Predviđanje permeabilnosti lekova primenom računarskih metoda je od značaja u ranoj fazi dizajniranja i razvoja leka. Baze podataka eksperimentalnih vrednosti za permeabilnost (Papp, koeficijent permeabilnosti), koje se koriste za modeliranje permeabilnosti, najčešće se dobijaju primenom testova na CACO-2 ćelijama i PAMPA (engl. parallel artificial membrane permeability assay) testovima.

Cilj rada: Cilj ovog rada je uspostavljanje korelacije između permeabilnosti dobijenih CACO-2 i PAMPA metodama i analiza strukturnih karakteristika koje su od značaja za permeabilnost izmerenu dvema različitim metodama.

Materijal i metode: Kreiran je set lekova (n=16) za koje su permeabilnosti dobijene primenom PAMPA i CACO-2 metode. Uspostavljena je korelacija između permeabilnosti dobijene dvema različitim metodama. Korišćenjem CODESSA programa, izračunati su strukturni deskriptori i primenom heurističke metode odabrani najznačajniji deskriptori za permeabilnost dobijenu CACO-2 i PAMPA metodom.

Rezultati: Uspostavljena je korelacija između permeabilnosti dobijene CACO-2 i PAMPA testovima ($R^2=0,53$). Izračunati deskriptori grupisani su u pet grupa (konstitucioni, topološki, geometrijski, elektrostatički i kvantno-hemijski). Najznačajniji zajednički deskriptori za CACO-2 i PAMPA permeabilnost pripadaju grupi konstitucionih, topoloških i geometrijskih deskriptora. Razlike u deskriptorima koji su od značaja za CACO-2 i PAMPA permeabilnost uočene su u grupama elektrostatičkih i kvantno-hemijskih deskriptora.

Zaključak: Strukturne karakteristike lekova od značaja za permeabilnost izmerenu CACO-2 i PAMPA metodama se delimično razlikuju. Deskriptori koji, pored lipofilnosti, utiču na CACO-2 permeabilnost opisuju molekulske površine i mogućnost građenja vodoničnih veza, a deskriptori koji utiču na PAMPA permeabilnost uglavnom opisuju mogućnost građenja vodoničnih veza.

Ključne reči: Permeabilnost, računarsko predviđanje, CACO-2, PAMPA

COMPUTATIONAL PREDICTION OF DRUG PERMEABILITY: DIFFERENCES IN CACO-2 AND PAMPA DATA SETS

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Introduction: Computational prediction of drug permeability is important in early stages of drug design and development. Data bases of experimental permeability values (Papp, apparent permeability), which are used in permeability modeling, are mostly obtained by CACO-2 cells and PAMPA (parallel artificial membrane permeability assay) assays.

The Aim: The aim of this work was to establish correlation between permeability values obtained by CACO-2 and PAMPA assays and to analyze structural characteristics which are important for permeability values determined by these assays.

Materials and Methods: Sets of drug permeability values (n=16) obtained from CACO-2 and PAMPA assays were created. Correlation between permeabilities obtained by these assays was established. Structural descriptors were calculated using Codessa program and most significant descriptors for CACO-2 and PAMPA permeability values were selected using heuristic method.

Results: Linear correlation was established between permeability values determined by CACO-2 and PAMPA assays ($R^2=0,53$). Calculated descriptors were divided in five groups (constitutional, topological, geometrical, electrostatic and quantum-chemical). The most important mutual descriptors for CACO-2 and PAMPA permeability values belong to constitutional, topological and geometrical descriptors. The significant descriptors that differ for CACO-2 and PAMPA permeability values were observed among electrostatic and quantum-chemical descriptors.

Conclusion: Drug structural characteristics significant for permeability determined by CACO-2 and PAMPA assays are partially different. Descriptors which, besides lipophilicity, are significant for CACO-2 permeability describe molecular surface areas and hydrogen bonding capacity. On the other hand, the descriptors that are more significant for PAMPA permeability mostly describe hydrogen bonding capacity.

Keywords: Permeability, computational prediction, CACO-2, PAMPA

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Uvod: Enalapril pripada klasi ACE inhibitora, koji modulacijom aktivnosti sistema renin-angiotenzin-aldosteron regulišu zapreminu cirkulišuće tečnosti i vaskularni tonus. Koristi se u savremenoj terapiji hipertenzije i drugih vaskularnih poremećaja. Molekul enalapрила sadrži jedan kiseli centar (karboksilna grupa) i jedan bazni centar (sekundarna amino grupa). Poznavanje pK_a vrednosti enalapрила pruža podatke o stepenu jonizacije u rastvoru na različitim pH vrednostima, što je značajno za biofarmaceutski, farmakokinetički i analitički aspekt leka. Dozirani farmaceutski oblici sadrže enalapril u obliku soli sa maleinskom kiselinom.

Cilj: Ispitivanje uticaja površinski aktivnih supstanci na protolitičke ravnoteže enalapril-maleata u vodenoj sredini.

Materijal i metode: pK_a vrednosti enalapрила i maleinske kiseline određene su potenciometrijski na 25 °C, pri konstantnoj jonskoj sili rastvora (0.1 M NaCl), bez i u prisustvu surfaktanata: anjonskog natrijum-laurilsulfata (SDS), katjonskog cetiltrimetilamonijum-bromida (CTAB) i nejonskog 4-oktilfenolpolietoksilata (TX-100). Dobijeni rezultati analizirani su primenom kompjuterskog programa Hyperquad.

Rezultati: pK_a Vrednosti, određene u vodenoj sredini bez dodatka surfaktanata, iznosile su pK_{a1} 2,92 i pK_{a2} 5,63 za enalapril i pK_{a1} 2,27 i pK_{a2} 5,97 za maleinsku kiselinu. U prisustvu surfaktanata dobijene su sledeće razlike u pK_a vrednostima: (+0,22) – (+1,70) za pK_{a1} i (-0,39) – (+0,13) za pK_{a2} enalapрила; (+0,01) – (+0,14) za pK_{a1} i (-0,24) – (+0,15) za pK_{a2} maleinske kiseline. Na osnovu određenih konstanti konstruisani su dijagrami raspodele ravnotežnih oblika u funkciji pH.

Zaključci: Surfaktanti elektrostatičkim i nespecifičnim interakcijama utiču na protolitičke ravnoteže enalapрила i maleinske kiseline i dovode do promena pK_a vrednosti. Najveći uticaj ima SDS i to na disocijaciju karboksilne grupe enalapрила ($DpK_{a1}=+1,70$).

Ključne reči: Enalapril-maleat, pK_a vrednosti, micelarni rastvori

THE EFFECTS OF SURFACTANTS ON THE PROTOLYTIC EQUILIBRIA OF ENALAPRIL-MALEATE

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Introduction: Enalapril belongs to the class of ACE inhibitors, which modulate activity of the renin-angiotensin-aldosteron system affecting the blood volume and vascular tone. It is used in treatment of the hypertension and other cardiovascular diseases. Molecule contains acidic and basic center, carboxyl and secondary amino group. Knowledge of pK_a values of enalapril gives information about the extent of ionization in solution at different pH values. It is important for analytical, biopharmaceutical, pharmacokinetic applications. Dosage forms contains the maleate salt of enalapril.

The Aim: The investigation of the effects of surfactants on the protolytic equilibria of enalapril-maleate in aqueous solutions.

Materials and Methods: pK_a Values are determined potentiometrically at 25 °C, at ionic strength of 0.1 M NaCl in the absence and in the presence of surfactants: anionic (SDS), cationic (CTAB), nonionic (TX 100). The experimental data were analyzed using the HYPERQUAD computer program.

Results: pK_a Values determined in pure water without surfactants are pK_{a1} 2,91, pK_{a2} 5,41 for enalapril and pK_{a1} 2,33, pK_{a2} 6,03 for maleic acid. In the presence of surfactants were obtained following differences in pK_a values: (+0,22) – (+1,70) for pK_{a1} (-0,39) – (+0,13) for pK_{a2} of enalapril; (+0,01) – (+0,14) for pK_{a1} , (-0,24) – (+0,15) for pK_{a2} of maleic acid. Distribution diagrams as a function of pH are designed based on calculated values.

Conclusion: Surfactants affect the dissociation equilibria of enalapril-maleate with electrostatic and nonspecific interactions causing a change of pK_a values. CTAB shows the strongest influence, particularly on dissociation of carboxyl group of enalapril ($DpK_{a1}=+1,70$).

Keywords: Enalapril-maleate, pK_a , micelles

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Uvod: Ciklooksigenaza je enzim koji učestvuje u sintezi prostaglandina iz arahidonske kiseline. Prostaglandini predstavljaju medijatore koji dovode do pojave inflamacije. Lekovi nesteroidne strukture koji inhibiraju ciklooksigenazu nazivaju se nesteroidni antiinflamatorni lekovi (NSAIL). Derivati 3-hidroksi-3-aril-propionske kiseline imaju sličnu strukturu kao neki NSAIL, te se očekuje da imaju antiinflamatorno dejstvo.

Cilj rada: Cilj rada je optimizacija sinteze derivata 3-hidroksi-3-aril propionske kiseline.

Materijal i metode: Sinteza derivata 3-hidroksi-3-aril propionske kiseline obuhvatala je 2 reakcije. U prvoj reakciji je iz α -bromo-etanske kiseline i etil-vinil-etra sintetisan organometalni estar. Druga reakcija predstavljala je modifikovanu Reformatski reakciju, odnosno reakciju dobijenog organometalnog estra i 4-hlor-benzofenona. U prvom slučaju reakcija se odvijala u prisustvu Zn i THF-a na temperaturi 5-10°C, u drugom u prisustvu In i THF-a na temperaturi 65-69°C, a u trećem u prisustvu Zn i THF-a na temperaturi 65-69°C, nakon čega je izvršena kiselna hidroliza proizvoda. **Rezultati:** Prinos Reformatski reakcije u prvom slučaju (Zn, THF, 5-10°C) iznosi 6,70%, u drugom slučaju (In, THF, 65-69°C) iznosi 19,92%, a u trećem (Zn, THF, 65-69°C) iznosi 72,43%. Trajanje reakcije je 17 dana, 42 sata i 43 sata respektivno. Struktura dobijenih jedinjenja okarakterisana je LC/MS i IR spektroskopijom.

Zaključak: Na osnovu dobijenih rezultata zaključuje se da su optimalni uslovi za sintezu derivata 3-hidroksi-3-aril propionske kiseline korišćenje Zn i THF na temperaturi 65-69°C. Takođe se može zaključiti da promena temperature prilikom druge reakcije sinteze utiče na vreme trajanja sinteze i prinos. S obzirom na to da dobijena jedinjenja imaju strukturu sličnu određenim NSAIL, potrebno je ispitati njihovo antiinflamatorno dejstvo.

Ključne reči: Reformatski reakcija, 4-hlor-benzofenon, temperatura, trajanje sinteze

SYNTHESIS CONDITION OPTIMIZATION OF 3-HIDROXY 3-ARYL PROPIONIC ACID DERIVATIVES

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Introduction: Cyclooxygenase is an enzyme that takes part in synthesis of prostaglandins from arachidonic acid. Prostaglandins are mediators that lead to inflammation. Drugs of nonsteroidal structure that inhibit cyclooxygenase are called nonsteroidal anti-inflammatory drugs (NSAID). Derivates of 3-hydroxy-3-aryl-propionic acid have similar structure to some NSAID, therefore are expected to exhibit anti-inflammatory effect.

Aim: Aim is optimization of synthesis derivates of 3-hydroxy-3-aryl-propionic acid.

Material and methods: Synthesis of derivates 3-hydroxy-3-aryl-propionic acid includes 2 reactions. In first reaction α -bromo-ethanoic acid and ethyl-vinyl-ether form an ester. Second reaction is a modified Reformatski reaction, in other words reaction which gives ester and 4-chloro-benzophenone. In the first case the reaction is taking place in the presence of Zn and THF at a temperature of 5-10°C, in the second in the presence of In and THF at 65-69°C, in the third in presence of Zn and THF at 65-69°C, after it happens acid hydrolysis of the product.

Results: Yield of Reformatski reaction in the first case (Zn, THF, 5-10°C) is 6,70%, in the second (In, THF, 65-69°C) is 19,92%, and in the third (Zn, THF, 65-69°C) is 72,43%. Duration of reaction is 17 days, 42 hours and 43 hours in retrospect. The structure of the obtained compounds is by LC/MS and IR spectroscopy.

Conclusion: Based on the results, it is concluded that the optimal conditions for synthesis of a 3-hydroxy-3-aryl-propionic acid derivates is usage of Zn and THF at a temperature of 65-69°C. also it can be concluded that the change of temperature during the second reaction affects the duration of synthesis and yield.

Keywords: Reformatski reaction, 4-chloro-benzophenone, temperature, duration of synthesis.

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Uvod: Kortikosteroidi se koriste u terapiji mnogih oboljenja zbog njihovih imunosupresivnih i antiinflamatornih efekata. Aktivnost nastaje usled vezivanja za glukokortikoidne receptore (GR). Dugotrajnom primenom kortikosteroida u terapiji mogu nastati ozbiljni neželjeni efekti. Soft lekovi podležu predvidljivim biotransformacijama pri čemu nastaju neaktivni i netoksični metaboliti. Soft kortikosteroidi predstavljaju savremeni pristup u dizajnu bezbednijih kortikosteroida i predstavljaju derivate neaktivnog metabolita – kortijske kiseline. Docking simulacije predstavljaju modelovanje uklapanja liganada u receptore primenom računara.

Cilj: Dizajn novih soft kortikosteroida primenom docking simulacija.

Materijal i metode: Docking simulacije izvedene su na kristallografskoj strukturi kompleksa deksametazon-GR (1m2z.pdb). Strukture i 3D modeli deksametazona, kortijske kiseline i 15 novih soft kortikosteroida pripremljeni su primenom programa ChemOffice ultra 7.0. Za docking simulacije korišćen je program Autodock 4.2. u kojem je primenjen Lamarckian-ov genetski algoritam sa 100 ponavljanja za svaki kortikosteroid. Kortikosteroidi su uklapani u receptorsku šupljinu dimenzija 40x40x40 tačaka u mreži, koja je centrirana pomoću položaja deksametazona u kristallografskoj strukturi kompleksa. Pregled rezultata izveden je u programu Autodock Tools.

Rezultati: Energije veza ligand-receptor određene primenom docking simulacija bile su u opsegu od -8,23 do -12,59 kcal/mol. Na osnovu izračunatih energija kao najaktivniji soft kortikosteroidi izdvojili su se: (I) metilglicinil amid 3-okso-11b,17a-dihidroksiandrost-4-en-17-karboksilne kiseline (-12,59 kcal/mol) i (II) 3-hidroksibutil estar 3-okso-11b,17a-dihidroksi-androst-1,4-dien-17-karboksilne kiseline (-12,47 kcal/mol).

Zaključci: Od 15 predloženih struktura soft kortikosteroida izdvojene su dve sa najnižom vezivnom energijom, usled mogućnosti građenja dodatnih vodoničnih veza ((I) ASN564 i karbonilni kiseonik estarske grupe i (II) MET560 i sekundarna alkoholna grupa bočnog lanca (II)).

Ključne reči: dizajn lekova, soft kortikosteroidi, docking simulacije.

DESIGN OF SOFT CORTICOSTEROIDS USING DOCKING SIMULATIONS

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Introduction: Corticosteroids are used in the treatment of many diseases due to their immunosuppressive and anti-inflammatory effects. Corticosteroids exert their activity by binding to glucocorticoid receptor (GR). A long time treatment with corticosteroids may arise serious side effects. Soft drugs undergo predictable biotransformation to form non-toxic and inactive metabolites. Soft corticosteroids represent a modern approach in design of safer corticosteroids (derivatives of inactive metabolite – cortienic acid). Docking simulations represents in silico modeling of incorporation ligands into a receptor.

Objective: The design of new soft corticosteroids using docking simulations.

Materials and methods: Docking simulations were performed on the crystallographic structure of the complex dexamethasone-GR (1m2z.pdb). The structures and 3D models of dexamethasone, cortienic acid and 15 new soft corticosteroids were prepared using ChemOffice Ultra 7.0 software. 100 runs of Lamarckian genetic algorithm in AutoDock 4.2. software were performed in docking simulations for each corticosteroid. Corticosteroids are incorporated into 40x40x40 grid points receptor pocket, which is centered to the position of dexamethasone in crystallographic structure of the complex. AutoDock Tools was used for analysis of results.

Results: Binding energy of ligand-receptor calculated by the docking simulations were in the range from -8.23 to -12.59 kcal/mol. In accordance to calculated energies, the most active soft corticosteroids were identified: (I) metilglicinil amide of 3-oxo-11b,17a-dihydroxyandrost-4-en-17-carboxylic acid (-12.59 kcal/mol) and (II) 3 hydroxybutyl ester of 3-oxo-11b,17a-dihydroxy-androst-1,4-diene-17-carboxylic acid (-12.47 kcal/mol).

Conclusion: Two compounds with the lowest binding energy were selected from 15 proposed soft corticosteroid structures as a result of construction of building additional hydrogen bonds ((I) ASN564 and carbonyl oxygen ester groups, and (II) MET560 and secondary alcoholic group of the side chain (II)).

Keywords: drug design, soft corticosteroids, docking simulations.

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Uvod: Prirodni proizvodi su bogat izvor farmakološki važnih agenasa. Molekuli izolovani iz prirodnih izvora često predstavljaju prototipove, čijim se strukturnim modifikacijama dobijaju jedinjenja izvanrednih farmakoloških i terapijskih mogućnosti.

Terpenoidi i alkaloidi čine veliku grupu potencijalno aktivnih prirodnih proizvoda. Smatra se da je njihova biološka aktivnost u vezi sa prirodom i položajem funkcionalnih grupa. Hemijske i strukturne modifikacije prirodnih monoterpenoida mogu da rezultuju povećanjem biološke aktivnosti transformisanih molekula u odnosu na početno jedinjenje.

Cilj rada: Izolovanje piperina iz bibera. Hidroliza piperina do piperinske kiseline. Sinteza estarskih derivata geranil- i neril-piperata i ispitivanje antimikrobne aktivnosti dobijenih derivata disk-difuzionom metodom.

Materijal i metode: Izolovanje i sinteza sprovedeni su u skladu sa standardnim procedurama, a antimikrobna aktivnost sintetisanih jedinjenja ispitana je disk-difuzionom metodom na set od pet sojeva bakterija.

Rezultati: Sintetisana jedinjenja pokazala su slabo izraženo bakteriostatsko delovanje na svih pet sojeva primenjenih u *in-vivo* preliminarnom testu u koncentraciji od 10 mg/ml.

Zaključak: Na osnovu male razlike u delovanju sintetisanih supstanci pretpostavlja se da je mehanizam delovanja izomera geranil i neril-piperata na bakterije sličan.

Gljučne reči: piperinska kiselina, geranil-piperat, neril-piperat, antimikrobna aktivnost

SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF PIPERIC ACID DERIVATIVES

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Introduction: Natural products have been a rich source of agents of value to medicine. Many new natural compounds of diverse structures have been considered prototypes, leads or heads of series and their later structural modification has afforded compounds with pharmacological activity and extraordinary therapeutic possibilities. Terpenoids and alkaloids constitute an abundant and potent group of natural products. Their biological activity is believed to be related to the nature and the position of functional groups or substituents. Chemical modification of natural monoterpenoids to various derivatives has been reported to result in enhancement of biological activities when compared to parent (terpenoid) compounds.

The Aim: Isolation of piperine from black pepper. Hydrolysis of piperine to piperic acid. Synthesis of piperic acid esters geranyl and neryl piperate. Evaluation of antimicrobial activity.

Materials and methods: Isolation and synthesis were carried out following standard procedures. A disk diffusion method was used for the evaluation of the antimicrobial activity of synthesized compounds against a panel of microorganisms.

Results: Obtained compounds acted as weak bacteriostatic agents against five microorganisms currently involved. The applied concentration was 10 mg/ml.

Conclusion: Based on preliminary results, comparing only inhibition zones measured, it seems that there is no difference between geranyl and neryl piperate as antibacterial agents.

Key words: piperic acid, geranyl piperate, neryl piperate, antimicrobial activity

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Uvod: Morska riba predstavlja značajan izvor dugolančanih polinezasićenih masnih kiselina (PMK). Njavežnije masne kiseline omega-3 serije su eikozapentaenska (20:5 n-3, EPA) i dokozaheksaenska (22:6 n-3, DHA) masna kiselina. Za ove nutrijente se smatra da imaju protektivni efekat na kardiovaskularni i centralni nervni sistem.

Cilj rada: Kvalitativna i kvantitativna procena sadržaja masnih kiselina u uzorcima konzervisane morske ribe.

Materijal i metoda: U tri vrste konzervisane morske ribe (tuna, sardina i skuša) analiziran je sadržaj masnih kiselina nakon lipidne ekstrakcije. Masne kiseline su prevodene u isparljive metil-estre, a zatim su određivane metodom gasne hromatografije. Analizirano je ukupno 15 uzoraka konzervisane ribe domaćih i stranih proizvođača.

Rezultati: Analizom ukupnih lipida i sadržaja masnih kiselina u uzorcima konzervisane morske ribe, potvrđeno je da su sardina (2,3 g/100 g) i skuša (2,2 g/100 g) najbolji izvori dugolančanih PMK. Sadržaj PMK bio je veći u svim ispitivanim uzorcima od sadržaja nezasićenih i mononezasićenih masnih kiselina. Svi analizirani uzorci su imali značajno veći sadržaj DHA u odnosu na EPA. Najveći sadržaj EPA zabeležen je u sardini (0,36 g/100 g), a nešto niži u skuši (0,27 g/100 g) i tuni (0,21 g/100 g). Rezultati su pokazali da se sadržaj DHA u sardini, skuši i tuni nije značajno razlikovao (1,5 g, 1,3 g odnosno 1,2 g/100 g).

Zaključak: Zahvaljujući povoljnim zdravstvenim efektima koji se pripisuju omega-3 masnim kiselinama, konzervisane morske ribe mogu biti njihov značajan izvor u svakodnevnoj ishrani.

Gljučne reči: omega-3 masne kiseline, morske ribe.

CANNED SEAFISH AS DIETARY SOURCES OF OMEGA-3 FATTY ACID

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Introduction: Lipids of marine fish species are generally characterized by high levels of long-chain polyunsaturated fatty acids (LC-PUFAs). Among n-3 fatty acids, the most important are eicosapentaenoic (20:5 n-3, EPA) and docosahexaenoic (22:6 n-3, DHA) acids. These fatty acids are of great importance to humans for prevention of different diseases.

The aim: To analyze the fatty acid content of canned seafish.

Material and Methods: In three species of canned seafish (tuna, sardines and mackerel) the content and composition of fatty acids were analyzed. After lipid extraction, fatty acids were derivatized into volatile methyl-esters. Fatty acids were determined using capillary gas chromatography. Fifteen samples of canned seafish were selected from domestic and foreign commercial suppliers.

Results: Analyses of total lipid content in canned fish samples and their fatty acid composition revealed that sardines (2.3 g/100 g) and mackerel (2.2 g/100 g), were the best dietary sources of LC-PUFAs. PUFAs content were higher than those of unsaturated and monounsaturated fatty acids in all samples. All analyzed fish samples had significantly higher DHA than EPA content. The highest average EPA content per 100 g of canned fish was observed in samples of sardines (0.36 g) and slightly lower in the mackerel (0.27 g) and tuna (0.21 g). The results showed that the DHA content of sardines, mackerel and tuna were similar (1.5 g, 1.3 g and 1.2 g/100 g).

Conclusion: Canned seafish available on Serbian market can be useful source of LC-PUFAs in daily diet.

Keywords: omega-3 fatty acids, seawater fish.

PROCENA NUTRITIVNOG STATUSA STUDENATA FARMACIJE

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Uvod: Nutritivni status se definiše kao rezultat unosa, apsorpcije i iskorišćenja hranljivih materija, i tumači se na bazi odnosa između uhranjenosti i zdravstvenog statusa.

Cilj: Izvršiti procenu statusa uhranjenosti i usklađenosti načina ishrane studenata farmacije sa aktuelnim dijetarnim preporukama.

Materijal i metode: Istraživanjem su obuhvaćeni studenti završne godine Farmaceutskog fakulteta, Univerziteta u Beogradu tokom novembra 2011. godine. Od antropometrijskih parametara mereni su telesna masa i procenat masti u organizmu metodom bioelektrične impedance. Indeks telesne mase (ITM) je izračunat kao kg/m². Takođe, mereni su i obimi struka i kukova. Procena zastupljenosti pojedinih vrsta namirnica u ishrani izvršena je analizom trodnevnog dnevnika ishrane.

Rezultati: Ispitivanjem je obuhvaćeno 126 studenata (108 devojaka i 18 mladića), prosečne starosti 23,3±0,57 godina. Prosečni ITM je iznosio 21,3 ±2,55. Predgojaznost je utvrđena kod 4,6% devojaka i 22,2% muškaraca. Među devojka 15,7% je bilo pothranjeno. Analizom trodnevnog dnevnika ishrane utvrđeno je da 30,5% studenata ne konzumira ni jednu porciju voća tokom dana, dok je preporučeni unos od 2-4 porcije zabeležen samo kod 25,8 % studenata. Takođe, uočena je i relativno mala zastupljenost mleka i mlečnih proizvoda u ishrani: 19,5 % ne konzumira mleko i mlečne proizvode tokom dana, 44,3% unosi samo 1 porciju dnevno, a preporuke za unosom ove grupe namirnica zadovoljava samo 36,2 % studenata.

Zaključak: Među studentima farmacije uočeni su poremećaji statusa uhranjenosti kao i odstupanja unosa pojedinih grupa namirnica od aktuelnih dijetarnih preporuka.

Ključne reči: status uhranjenosti, ITM, dnevnik ishrane, dijetarni preporuke

ASSESSMENT OF NUTRITIONAL STATUS OF PHARMACY STUDENTS

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Introduction: Nutritional status is defined as a result of intake, absorption and utilization of nutrients, and interpreted on the basis of the relationship between nutrition and health status.

The aim: To evaluate nutritional status and dietary habits of pharmacy students.

Material and methods: The study included final year students of the Faculty of Pharmacy, University of Belgrade in November in 2011. Anthropometric measurements included body weight, body fat, waist and hip circumference and BMI (current measured weight in kg divided by height in m²). Dietary intake data was obtained using 3-day food records.

Results: The study included 126 students (108 girls and 18 boys), mean age 23.3 ± 0.57 years. Average BMI was 21.3 ± 2.55. Overweight was found in 4.6% of girls and 22.2% of men. About 15.7% of girls were underweight. By analyzing the 3-day food records, it was found that 30.5% of the students do not consume even one serving of fruit per day while the recommended intake of 2-4 servings was recorded only at 25.8% of students. Also, there is a relatively low proportion of milk and dairy products in the diet: 19.5% do not consume milk and dairy products per day, 44.3% take only one serving, and recommendations for the intake of these food groups meet only 36.2 % of students.

Conclusion: This study highlights the presence of the inadequate nutritional status and inadequate dietary intake of certain food groups among students of pharmacy.

Keywords: nutritional status, BMI, 3-day food records, dietary recommendations

RAZVOJ INDIKATORA KVALITETA FARMACEUTSKE ZDRAVSTVENE DELATNOSTI ZA BOLNIČKE APOTEKE – IZRADA UPITNIKA I VALIDACIJA

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Uvod: Kvalitativni i kvantitativni pokazatelji kvaliteta zdravstvene zaštite koriste se za praćenje i evaluaciju kvaliteta nege i lečenja pacijenata, kao i podrška aktivnostima zdravstvene zaštite. Indikatori kvaliteta farmaceutske zdravstvene delatnosti (FZD) u našoj regulativi dati su za primarni nivo, a nisu definisani za sekundarni i tercijerni nivo - bolničke apoteke.

Cilj rada: Razvoj indikatora kvaliteta za bolničke apoteke. Neposredni cilj je izrada i validacija upitnika-kontrolne liste za merenje i evaluaciju kvaliteta FZD u bolničkim apotekama.

Materijal i metode: Razvoj indikatora je deo Pilot projekta. U prvoj fazi je sprovedena pretraga dostupne literature na internetu (Medline, PubMed, KoBSON) koristeći ključne reči „quality indicators“, „hospital pharmacy“ i „process and outcomes“ u publikacijama objavljenim nakon 2005. godine. U drugoj fazi su postavljeni modeli indikatora kvaliteta, a u trećoj fazi formulisan je upitnik kroz diskusije u fokus grupi.

U toku je četvrta faza koja obuhvata merenje i evaluaciju indikatora u odabranom uzorku bolničkih apoteka: Klinički centar Srbije, Kliničko-bolnički centri (Bežanijska kosa, Zemun, Zvezdara), Institut za onkologiju, Institut za majku i dete i bolnička apoteka Vranje. Ovo predstavlja i validaciju upitnika-kontrolne liste.

Rezultati: Razvijena je set indikatora i alat (upitnik-kontrolna lista) za merenje kvaliteta FZD koja se obavlja u bolničkim apotekama. Upitnik i odabrani indikatori su procenjeni kao validni, relevantni i konzistentni.

Zaključak: Literaturni pregled je ukazao na najznačajnije indikatore kvaliteta FZD u bolničkim apotekama: broj konsultacija lekara sa farmaceutom pre neposredne primene lekova, procenat pogrešnih isporuka na odeljenje itd. Dizajniranim upitnikom su obuhvaćeni indikatori strukture, procesa i aktivnosti koje se obavljaju u bolničkim apotekama u Srbiji.

Ključne reči: indikatori kvaliteta, bolnička apoteka, upitnik

DEVELOPMENT OF THE SET OF QUALITY INDICATORS FOR HOSPITAL PHARMACIES – CREATION AND VALIDATION OF A QUESTIONNAIRE

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Introduction: Quality indicators (QI) are defined as measures based on standards of care that assess a particular health care process or outcome. Although QI for community pharmacies are given in our regulations, QI for hospital pharmacies are not defined.

The Aim: The aim of this study was to develop a set of QI for hospital pharmacies that are measurable and in line with pharmaceutical practice quality targets. The specific aim was to develop and validate a questionnaire for assessing the quality of pharmaceutical practice in hospital pharmacies.

Materials and Methods: Development of the set of QI was a part of a Pilot study. In the first phase of the study literature search was conducted in three databases (Pub Med, Medline, KoBSON) using the search terms “quality indicator”, “hospital pharmacy” and “process and outcomes” selecting articles published after 2005. In the second phase models of QI were set. During third phase questionnaire was developed through the focus group discussions. The fourth phase included QI measurement and evaluation based upon distributed questionnaire in selected sample of seven hospital pharmacies and validation of the questionnaire itself.

Results: The QI were set and the questionnaire as tool for assessing the quality of pharmaceutical practice in hospital pharmacies was developed. They were estimated as valid, consistent and relevant.

Conclusion: Literature search identified the most important QI such as: the number of consultations between physicians and pharmacists in charge before administration of drugs to patients, the percentage of incorrect deliveries to wards etc. Developed questionnaire included valid structure and process indicators for hospital pharmacies in Serbia.

Keywords: quality indicators, hospital pharmacy, questionnaire

ANALIZA KARAKTERISTIKA PORODILJA I POROĐAJA KOD TRUDNOĆA NASTALI IN-VITRO FERTILIZACIJOM I PRIRODNIIM PUTEM

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Uvod: In-vitro fertilizacija (IVF) je terapija kod opstrukcije Falopijevih tuba, neplodnosti muškaraca i perzistentne neplodnosti ukoliko su prethodne konvencionalne terapije bile neuspešne. Postoje oprečna mišljenja o tipu i načinu porođaja u zavisnosti od načina začeća.

Cilj rada: Ispitati karakteristike porodilja i porođaja u zavisnosti od načina začeća.

Materijal i metode: Istraživanje je sprovedeno na uzorku od 730 žena koje su se porodile na Ginekološko-akušerskoj klinici „Narodni front“ u Beogradu u julu 2011. godine. Posmatrane su dve grupe porodilja: porodilje kod kojih je trudnoća začeta in-vitro fertilizacijom (IVF, interventna grupa) i porodilje sa spontanim začećem (kontrolna grupa). Porodilje kontrolne grupe odabrane su nasumično iz baze tako da odgovaraju onim iz interventne grupe po broju i starosti. Izvršeno je poređenje demografskih karakteristika i karakteristika porođaja. Podaci su analizirani deskriptivnom analizom, t-testom, Mann-Whitney U-testom i chi-kvadrat testom.

Rezultati: Broj pacijenata u obe grupe iznosio je 40. Prosečna starost porodilja u interventnoj i kontrolnoj grupi iznosila je 36,33 (SD=4,96) i 35,35 (SD=4,78) godina. Statistički značajne razlike uočene su za paritet (prvi paritet je najčešće prisutan kod interventne, a drugi kod kontrolne grupe), broj porođene dece, tip porođaja, vreme izlaska posteljice i primenu epiduralne analgezije. Razlike nisu zapažene za varijable: bračno stanje, nedelja trudnoće kada je došlo do porođaja, dužina trajanja porođaja, nastanak hemoragije i ruptуре cerviksa.

Zaključak: Dve posmatrane grupe žena razlikovale su se u paritetu, broju dece, vremenu izlaska posteljice i tipu porođaja. IVF metoda nije imala uticaja na nedelju trudnoće kada je došlo do porođaja, trajanje porođaja i pojavu hemoragije.

Ključne reči: IVF, in-ivtro fertilizacija, trudnice, porođaji

ANALYSIS OF CHARACTERISTICS OF MOTHERS IN PREGNANCY AND CHILDBIRTH INCURRED IN-VITRO FERTILIZATION AND NATURAL WAY

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Introduction: In-vitro fertilization (IVF) is a treatment for fallopian tube obstruction, male infertility and persistent infertility in cases when previous conventional therapies were unsuccessful. There are opposing views on how the type of conception affects delivery.

The aim: To compare pregnancy and delivery characteristics of women who conceived through IVF and women who conceived naturally.

Materials and Methods: The study was conducted on a sample of 730 women who gave birth at GAK "Narodni front", Belgrade in July, 2011. Two groups with 40 patients each were examined: mothers with IVF pregnancy (intervention group) and mothers with natural pregnancy (control group). Mothers from the control group were randomly selected from a database to match the age of mothers in the intervention group. (The average age in the intervention and control groups was 36.33 (SD=4.96) and 35.35 (SD=4.78), respectively.) A comparison of demographic and delivery characteristics was made. The analysis included descriptive analysis, t-test, Mann-Whitney U-test, and chi-square test.

Results: Statistically significant differences were observed for parity (the intervention group pregnancies were most frequently of the first parity, and those in the control group of the second parity), number of delivered children, type of delivery, time of placenta release, and application of epidural analgesia. Differences weren't observed for marital status, weeks of pregnancy, duration of labor, occurrence of hemorrhage, and rupture of the cervix.

Conclusion: The two examined groups of women differed in parity, number of delivered children, time of placenta release, and type of delivery. The IVF method had no influence on weeks of pregnancy, duration of labor, and occurrence of hemorrhage.

Key words: IVF, in-vitro fertilization, pregnancy, births

KONSTRUKCIJA KONGENERIČNO SPECIFIČNOG MOLEKULSKOG DESKRIPTORA ZA ŽUČNE KISELINE

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Uvod: Žučne kiseline su jedna veoma važna grupa jedinjenja za medicinske nauke, pošto one imaju, pored njihovih bitnih fizioloških funkcija, veoma značajne medicinske primene. Jedna od funkcija koje mogu imati je da služe kao promotori za transport lekova kroz ćelijsku membranu, i zato je potrebno naći deskriptore koji mogu verno prikazati njihove osobine u zavisnosti od broja i položaja hidroksi ili okso grupa.

Cilj: Cilj rada je razvijanje topološkog molekuskog deskriptora (ND) za žučne kiseline koje su strukturni izomeri po steroidnom jezgru.

Materijal i metode: Novi deskriptor je računat u programu *Wolfram Mathematica*, konstruisan na osnovu produženog subgrafa kiselina.

Rezultati: Uočena je negativna korelacija između apsolutne vrednosti ND i broja stabilizovanih molekula vode u miceli.

Zaključak: Konstruisani deskriptor ND opisuje promenu hidrofobnosti u ispitivanom skupu žučnih kiselina, što se ogleda u korelaciji ND i kritične micelarne koncentracije.

Ključne reči: hidrofилnost, žučne kiseline, teorija grafa

CONSTRUCTING A CONGENERALLY SPECIFIC MOLECULAR DESCRIPTOR FOR BILE ACIDS

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Introduction: Bile acids are a very important compounds for medical sciences, because, in addition to their significant physiological functions, they have considerable medicinal applications. One of their applications is using them as promoters in the transport of drugs through cellular membranes, and therefore finding a descriptor that can faithfully show the dependence of their chemical properties and the number and positions of oxo- or hydroxi- groups in a molecule is important.

Goal: The aim of this study was finding a new topological molecular descriptor (ND) for structurally isomeric bile acids.

Material and methods: The ND was calculated in *Wolfram Mathematica* and was constructed using a subgraph of the bile acids.

Results: A negative correlation can be observed between the absolute values of ND and the number of stabilised water molecules in a micelle.

Conclusion: Because of the correlation between the new descriptor (ND) and the critical micelle concentration of bile acids used in the study, we can conclude that ND is an indicator of hydrophilicity.

Keywords: hydrophilicity, bile acids, graph theory

FAKTORI RIZIKA ZA INDUKCIJU POROĐAJA

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Uvod: Porodaj je potpuno istiskivanje ili izvlačenje ploda, posteljice, pupčanika i plodovih ovojaka. Poslednjih godina stopa indukovnog porođaja je u porastu.

Cilj rada: Utvrditi faktore značajno povezane sa indukcijom porođaja.

Materijal i metode: Podaci su sakupljeni za sve žene porođene tokom jula 2011 (ukupno 643 porodilje koje su rodile jedno dete). Nakon isključivanja žena porođenih planiranim carskim rezom, uzorak je činilo 538 žena. Kao izvor podataka korišćena je Knjiga porođaja Ginekološko-akušerske klinike „Narodni front“. Podaci su analizirani upotrebom logističke regresione analize. Rezultati su prikazivani u obliku Odds ratio (OR) vrednosti uz 95% interval pouzdanosti (CI). Verovatnoća od <0,05 smatrana je statistički značajnom.

Rezultati: Indukcija porođaja sprovedena je kod 447 žena (83,1%). Prosečna starost porodilja bila je 29,83±5,29. Veću verovatnoću za indukciju porođaja imale su žene koje su se porodile nakon 37. nedelje trudnoće (OR:4,12, 95%CI:2,22-7,81), ukoliko porođaj traje duže od četiri sata (OR:3,57, 95%CI:2,24-5,70) i prilikom primena epiduralne anestezije (OR:6,92, 95%CI:3,74-12,80). Žene sa indukcijom porođaja imaju manju verovatnoću za carski rez (OR:0,07, 95%CI:0,03-0,14), ali veću verovatnoću za rupturu cerviksa (OR:2,78, 95%CI:1,27-6,07) i izbacivanje placente nakon porođaja (OR:15,50, 95%CI:7,81-30,77). Bebe nakon indukovnog porođaja imaju veću verovatnoću za vrednost Apgar skora iznad 6 u 1. minutu (OR:5,21, 95%CI:1,78-15,23), i u 5. minutu (OR:10,16, 95%CI:1,83-56,36).

Zaključak: Nedelja porođaja, vreme trajanja porođaja i primena epiduralne anestezije mogu se smatrati faktorima rizika za indukciju porođaja. Indukcija porođaja smanjuje mogućnost za završetak vaginalnog porođaja carskim rezom i dovodi do boljih vrednosti Apgar skora bebe u odnosu na porođaj bez indukcije.

Ključne reči: porođaj, indukcija, faktori rizika

RISK FACTORS FOR LABOR INDUCTION

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Introduction: Labor is extraction of the fetus, placenta, umbilical cord and fetal membranes. Recently, the rate of induced labors increases.

The Aim: Identify factors significantly associated with labor induction.

Materials and Methods: Data were collected for women delivered during July 2011 (643 women with one newborn). After excluding women who had planned caesarean section, total of 538 women were studied. Data source was the Book of delivery, Clinic "Narodni front". Logistic regression was used to identify factors associated with labor induction, with odds ratio (OR) and 95% confidence interval (CI) as association measures.

Results: Labor induction was performed in 447 women (83.1%). Average maternal age was 29.83±5.29. Women were more likely to have labor induction if labor started after the 37th week of pregnancy (OR:4.12, 95% CI:2.22-7.81), if labor lasted longer than 4 hours (OR:3.57, 95% CI:2.24-5.70); and if epidural anesthesia was performed (OR:6.92, 95% CI:3.74-12.80). Women with labor induction have a lower probability of cesarean delivery (OR:0.07, 95% CI:0.03-0.14), but higher probability of rupture of cervix (OR:2.78, 95% CI:1.27-6.07) and extraction of placenta after birth (OR:15.50, 95% CI:7.81-30.77). Newborns after induced labor were more likely to gain Apgar score above 6 in the 1st minute (OR:5.21, 95% CI:1.78-15.23), and in the 5th minute (OR:10.16, 95% CI:1.83-56.36).

Conclusion: Time and duration of labor, and use of epidural anesthesia may be considered as risk factors for labor induction. Induction of labor reduces possibility for the completion of vaginal delivery with cesarean section and leads to better values in newborns' Apgar score compared with no induction.

Key words: delivery, induction, risk factors

FIZIČKO-HEMIJSKO ISPITIVANJE MEŠOVITIH MICELA SOLI ŽUČNIH KISELINA (Na-DEOKSIHOLATA I NJEGOVOG 12-OKSO DERIVATA) I TWEENA

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Uvod: Žučne kiseline su specijalna grupa anjonskih surfaktanata. Žučne kiseline su biplanarni molekuli koji sadrže dve funkcionalno različite površine, hidrofobnu konveksnu površinu i hidrofilnu konkavnu površinu steroidnog skeleta. Značajna osobina žučnih kiselina je sposobnost njihovih micelarnih rastvora da solubilizuju u vodi nerastvorne molekule. Takođe, neke od njih su promotori transporta određenih lekova kroz ćelijske membrane. Svojstva žučnih kiselina se mogu modifikovati formiranjem njihovih mešovityh micela sa površinski aktivnim materijama različityh agregacionih osobina.

Cilj: Cilj rada je bio da se odrede fizičko-hemijski parametri mešovityh micela izgrađenih od nejonskog surfaktanta Tweena i natrijum-deoksiholata ili natrijum-12-oksolitoholata.

Materijal i metode: Micelarno ponašanje ovih binarnih smeša je ispitivano konduktometrijskim merenjima. Clintova, Rubinghova i Motomurina teorija mešovityh binarnih sistema su korišćene za analizu dobijenih podataka.

Rezultati: Interakcioni parametar β je za sve ispitivane mešovite micelle imao negativnu vrednost. Ovo ukazuje na postojanje sinergizma između pojedinačnyh surfaktanata u mešovitym micelama. Uočeno je da mešovite micelle izgrađene iz natrijum-12-oksolitoholata i Tweena imaju negativnije vrednosti β parametra nego one izgrađene iz natrijum-deoksiholata i Tweena.

Zaključak: Određivanjem interakcionih parametara došli smo do podataka koji ukazuju na postojanje međumolekulskih vodoničnyh veza u svim ispitivanim binarnim sistemima. Između natrijum-12-oksolitoholata i Tweena postoje jače interakcije nego u slučaju natrijum-deoksiholata i Tweena.

Ključne reči: žučne kiseline, mešovite micelle, 12-oksolitoholat, deoksiholat, Tween 40.

PHYSICO-CHEMICAL PARAMETERS OF MIXED MICELLES BUILT OF BILE ACIDS (Na-DEOXYCHOLATE AND ITS 12-OXO DERIVATIVE) AND TWEEN

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Introduction: Bile acids are a special group of anionic surfactants. Bile acids are biplanar molecules, which have two functionally different areas, the hydrophobic convex area and the hydrophilic concave area of the steroid skeleton. An important characteristic of bile acids is the ability of their micellar solutions to solubilize water-insoluble molecules. Also, some of them are promoters of the transport of certain drugs through the cell membranes. Properties of bile acids can be modified by means of forming their mixed micelles with surface-active agents with different aggregation abilities.

Goal: The goal of this research was to determine the physicochemical parameters of mixed micelles built of nonionic surfactant Tween 40 and sodium deoxycholate or sodium 12-oxolithocholate.

Material and methods: The micellization behaviour of these binary mixtures was examined by conductivity measurements. Clint's, Rubingh's, and Motomura's theories for mixed binary systems were used to analyze the results.

Results: Interaction parameter β had negative values in all examined mixed micelles. This suggests synergism between the individual surfactants in the mixed micelles. It was found that mixed micelles built of sodium 12-oxolithocholate and Tween have more negative β values than those built of sodium deoxycholate and Tween.

Conclusion: The determined interaction parameters indicate the existence of intermolecular hydrogen bonds in all examined binary mixtures. Sodium 12-oxolithocholate generates stronger interactions with Tween than sodium deoxycholate.

Key words: bile acids, mixed micelle, 12-oxolithocholate, deoxycholate, Tween 40.

TURBIDIMETRIJSKO ODREĐIVANJE SULFATA U VODI

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Uvod: Sulfati prisutni u vodi talože se u obliku koloidne suspenzije barijum-sulfata. Turbidimetrija je metoda koja se koristi u analitičke svrhe za određivanje koncentracije čestica u koloidnim sistemima.

Cilj rada: Određivanje koncentracije sulfata u uzorcima vode turbidimetrijskom metodom.

Materijal i metode: Sadržaj sulfata određen je turbidimetrijskom metodom korišćenjem turbidimetra (model TB 1000, EUTECH – Holandija). Izmerene su vrednosti turbiditeta koloidnih rastvora barijum-sulfata. Koloidni rastvori dobijeni su dodavanjem barijum-hlorida, hloridne kiseline i želatina kao stabilizatora u standardne rastvore i uzorke vode.

Rezultati: Metodom kalibracione krive određen je opseg linearnosti za određivanje koncentracije sulfata u vodi od $2,0 \times 10^{-6}$ do $1,5 \times 10^{-5}$ mol L⁻¹. Dobijena je linearna regresiona jednačina $\tau = 3,701 + 2,902 \times 10^5 c$, ($R = 0,9995$). Izračunate su vrednosti granice detekcije (LOD = $1,25 \times 10^{-6}$ mol L⁻¹) i određivanja (LOQ = $3,40 \times 10^{-6}$ mol L⁻¹). Primenom ove metode određene su koncentracije sulfata u uzorcima pijaće, izvorske i rečne vode, sa različitih lokaliteta u Srbiji.

Zaključak: Rezultati su pokazali da je vrednost sadržaja sulfata u ispitanim uzorcima voda u očekivanom opsegu, od $2,0$ do $3,0 \times 10^{-6}$ mol L⁻¹, sa izuzetkom vode Severnog Banata koja pokazuje znatno nižu vrednost. Ova razlika u sadržaju sulfata može se objasniti prisustvom površinskih i/ili podzemnih voda, kao i različitim sastavom tla na lokacijama sa kojih su uzimani uzorci.

Ključne reči: Koloidni sistemi, sulfati, voda, turbidimetrija.

TURBIDIMETRIC DETERMINATION OF SULFATES IN WATER

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Introduction: The sulfates present in water, precipitate and form colloidal suspension of barium sulfate. Turbidimetry is the method which is often used to determine the concentration of colloidal particles in the solution.

The Aim: Turbidimetric determination of the sulfate concentration in water samples.

Material and Methods: The sulfate content is determined by turbidimetric method using turbidimeter (model TB 1000, EUTECH – The Netherlands). The values of turbidity of the barium sulfate colloidal solutions were measured. The colloidal solutions were prepared by adding barium chloride, hydrochloric acid and gelatin, as stabilizer into the standard solutions and water samples.

Results: Using the calibration curve method, the linear response was obtained in the sulfate concentration range from 2.0×10^{-6} to 1.5×10^{-5} mol L⁻¹. The corresponding linear regression equation was found to be: $\tau = 3.701 + 2.902 \times 10^5 c$, ($R = 0.9995$). The limits of detection (LOD = 1.25×10^{-6} mol L⁻¹) and quantification (LOQ = 3.40×10^{-6} mol L⁻¹) were evaluated. By applying this method, the sulfate concentration was obtained in the samples of drinking, spring and river waters, collected from different localities all over Serbia.

Conclusion: According to the obtained results, the sulfate content in water samples lie in the expected range from 2.0 to 3.0×10^{-6} mol L⁻¹, with one exception – North Banat water, showing significantly lower value. The difference in the sulfate content can be attributed to the different ratio of surface and ground waters, as well as the composition of the soil at the location where the samples were collected.

Key words: Colloidal system, sulfates, water, turbidimetry.

JON-HROMATOGRAFSKA ANALIZA DODATAKA ISHRANI

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Uvod: Jonska tečna hromatografija pod visokim pritiskom je vrlo osetljiva separaciona metoda, koja se koristi za razdvajanje jedinjenja u jonskom obliku, kao i onih koja se mogu jonizovati ili reagovati sa jonskim grupama. Koncentracioni opseg određivanja je reda veličine ppm. U ovom radu, analizirane su šumeće tablete i Ringerovi rastvori jer sadrže hidrosolubilne naelektrisane čestice.

Cilj: Analiza sastava pomenutih dodataka ishrani, određivanje prisutnih anjona u uzorcima i validacija jonske HPLC metode kao metode izbora u određivanju anjona.

Materijal i metode: Jonskom HPLC analizirani su sledeći uzorci: šumeće tablete (magnezijuma, kalcijuma i vitamina C) i Ringerovi rastvori. Uzorci za analizu su pripremljeni njihovim rastvaranjem u dejonizovanoj vodi, degaziranjem u supersoničnom kupatilu i naknadnim filtriranjem. Na osnovu različitih koeficijena raspodele, komponente uzorka izlaze različitim brzinom iz kolone i dobija se hromatogram (grafik zavisnosti signala detektora od vremena).

Rezultati: Ovom metodom uspešno su detektovani sledeći anjoni: F⁻, Cl⁻, Br⁻, NO₃⁻, PO₄²⁻ i SO₄²⁻ (anjoni za koje je kolona kalibrirana). Pored kvalitativne analize urađena je kvantitativna analiza anjona merenjem površine pikova.

Zaključci: Opisana priprema uzorka i dobijeni rezultati pokazuju da je jonska HPLC vrlo osetljiva metoda koja se može koristiti za kvalitativnu i kvantitativnu analizu ovakve vrste uzoraka.

Ključne reči: HPLC, dodaci ishrani, anjoni

ION-CHROMATOGRAPHIC ANALYSIS OF FOOD SUPPLEMENTS

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Introduction: Ion liquid chromatography is a highly sensitive method used for separating compounds in their ionic form, ones who can ionize, or the ones who can react with ionic groups. The extent is measured in ppm. Food supplements, effervescent tablets and Ringer's solutions contain water-soluble, charged particles which are suitable for subjecting to this kind of analysis.

The Aim: Analysis of food supplements, determination of the present anions in those samples and the validation of ionic HPLC as a method of first choice.

Materials and Methods: The samples used as analytical material: effervescent tablets (magnesium, calcium and vitamin C) and Ringer's solutions. Sample preparation consists of dissolution of the samples in deionized water, degasation in an ultrasonic bath and microfiltration. Sample components are coming out of the column at different times, depending on their different partition coefficients. As a result, a chromatogram is obtained, as a visual output of the chromatograph.

Results: The specified anions detected with this method are: F⁻, Cl⁻, Br⁻, NO₃⁻, PO₄²⁻ and SO₄²⁻ (anions for which the column is calibrated). Besides the qualitative analysis, a quantitative analysis has been done as a calculated surface below the correspondent peak.

Conclusion: The described preparation of samples as well as the results shows that the ionic HPLC method is a highly sensitive method and that it's convenient for analyzing this sort of samples.

Key words: HPLC, anions, food supplements

ODREĐIVANJE KRITIČNE MICELARNE KONCENTRACIJE HEKSADECILTRIMETILAMONIUM BROMIDA U VODENOM RASTVORU PROPILEN GLIKOLA

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Uvod: U radu su prikazani rezultati konduktometrijskog određivanja kritične micelarne koncentracije (CMC) katjonskog surfaktanta (heksadeciltrimetilamonijum bromida, CTAB) u vodenom rastvoru propilen glikola (PG) na različitim temperaturama.

Cilj: Cilj je bio ispitivanje micelizacije CTAB u vodenom rastvoru propilen glikola, odnosno određivanje CMC i stepena jonizacije (a) ovog surfaktanta.

Materijal i metode: Za pravljenje rastvora CTAB u 20% PG korišćena je dejonizovana voda ($r = 18 \text{ mW cm}$). Specifična provodljivost surfaktanta merena je konduktometrom HI8820N (Hanna instruments), na tri različite temperature koje su kontrolisane pomoću termostata) sa tačnošću $\pm 0.1^\circ\text{C}$.

Rezultati: CMC surfaktanta u 20% PG određene su iz infleksija krivih $k = f(c_{\text{CTAB}})$ dobijenih na različitim temperaturama (298.2 K, 306.2 K i 310.2 K). Tačke ispod i iznad infleksije krive $k = f(c_{\text{CTAB}})$ se fituju metodom najmanjih kvadrata i dobijaju dve jednačine oblika $k = A + Bc_{\text{CTAB}}$; rešavanjem ovih jednačina dobija se presečna tačka koja predstavlja CMC. Dobijene vrednosti CMC iznose 1.28 mmol L^{-1} (298.2 K), 1.48 mmol L^{-1} (306.2 K) i 1.54 mmol L^{-1} (310.2 K).

Stepen jonizacije micela, a, određuje se iz odnosa nagiba pravih dobijenih za koncentracije CTAB koje su iznad i ispod CMC. Dobijene vrednosti a su: 0.40 (298.2 K), 0.51 (306.2 K) i 0.60 (310.2 K).

Zaključci: Merenje specifične provodljivosti na različitim temperaturama omogućava jednostavno i brzo određivanje micelarnih osobina CTAB (CMC i a), kao i ispitivanje termodinamike micelizacije, što osim naučnog, ima i veliki praktični značaj.

Ključne reči: kritična micelarna koncentracija, surfaktant, provodljivost

OPTIMIZACIJA AdSDPV METODE ZA ELEKTROANALITIČKO ODREĐIVANJE CEFTRIAXONA

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Uvod: Cefalosporini su β -laktamski antibiotici. Indikovani su za lečenje različitih infekcija izazvanih Gram(+) i Gram(-) mikroorganizmima. Ispitivanja elektrohemijskog ponašanja cefalosporina (cefotaksima, ceftriaksiona i cefuroksim-aksetila) pokazala su da se cefalosporini lako adsorbuju na površini elektrode. Izražena adsorpcija cefalosporina bila je osnov za nalaženje optimalne metode za njihovo određivanje.

Cilj rada: Optimizacija adsorptivne "stripping" diferencijalno pulsne voltametriske metode (AdSDPV) za određivanje ceftriaksiona.

Materijal i metode: Za ispitivanje elektrohemijskog ponašanja izabranih cefalosporina korišćena je metoda ciklične voltametrije, a za elektroanalitičko određivanje ceftriaksiona primenjena je AdSDPV. Merenja su vršena Amel 433-A polarografom, u troelektrodnom sistemu sa stacionarnom živinom elektrodom kao radnom, Ag/AgCl i Pt kao referentnom i pomoćnom elektrodom. Britton-Robinsonov pufer korišćen je kao osnovni elektrolit.

Rezultati: Ispitivanjem zavisnosti intenziteta struje pika od brzine polarizacije utvrđeno je da su procesi elektrohemijske redukcije cefalosporina adsorpciono kontrolisani pri nižim brzinama polarizacije. Najizraženiju adsorpciju pokazao je ceftriakson, te je za određivanje ovog cefalosporina razvijena i validirana AdSDPV metoda.

Eksperimentalno su utvrđeni optimalno vreme ($t_{\text{acc}} = 100 \text{ s}$) i potencijal akumulacije ($E_{\text{acc}} = -200 \text{ mV}$). Dobijena koncentraciona zavisnost je ukazala na postojanje dva opsega linearnosti, od $2 \times 10^{-7} \text{ moldm}^{-3}$ do $1 \times 10^{-6} \text{ moldm}^{-3}$ i od $2 \times 10^{-6} \text{ moldm}^{-3}$ do $1 \times 10^{-5} \text{ moldm}^{-3}$. Druga koncentraciona oblast je korišćena za određivanje sadržaja ceftriaksiona u preparatu - Longacef injekcijama.

Zaključak: Na osnovu ispitanih adsorpcionih karakteristika navedenih cefalosporina predložena je i validirana AdSDPV metoda za određivanje ceftriaksiona u Britton-Robinsonovom puferu i u odgovarajućem farmaceutskom preparatu.

Ključne reči: Ceftriakson, cefotaksim, cefuroksim-aksetil, ciklična voltametrija, određivanje, AdSDPV

DETERMINATION OF CRITICAL MICELLAR CONCENTRATION OF HEXADECYLTRIMETHYLAMMONIUM BROMIDE IN AQUEOUS SOLUTION OF PROPYLENE GLYCOL

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Introduction: Determination of critical micellar concentration (CMC) of cationic surfactant (hexadecyltrimethyl ammonium bromide, CTAB) in aqueous solution of propylene glycol (PG) at different temperatures has been studied conductometrically.

The Aim: Examination of CTAB micelization in aqueous solution of propylene glycol, i.e. determination of CMC and degree of ionization (a) of this surfactant.

Material and Methods: For prepared solutions of CTAB in 20% PG, deionized water was used. Specific conductivity of surfactant was measured using a digital conductivity meter HI8820N (Hanna instruments), at three different temperature which are controlled by a thermostat with the accuracy $\pm 0.1^\circ\text{C}$.

Results: CMC of surfactant in 20% PG was determined from inflection in plots of conductivity, k, against total concentration of CTAB at different temperatures (298.2K, 306.2K and 310.2K). The data points above and below the inflection were fit (by least square method) to two equations of the form $k = A + Bc_{\text{CTAB}}$, and by the two equation solving, the point of intersection (CMC) was obtained. Thus, the obtained CMC are 1.28 mmol L^{-1} (298.2K), 1.48 mmol L^{-1} (306.2K) and 1.54 mmol L^{-1} (310.2K). The ionization degree of the micelle, a, was obtained as the ratio between slope of the postmicellar region to that of the premicellar region. The obtained values are 0.40 (298.2K), 0.51 (306.2K) and 0.60 (310.2K).

Conclusion: Measuring of specific conductivity at various temperatures enables the easy and fast determination of micellar properties of CTAB (CMC and a), as well as examination of the thermodynamic of micellization, that all, apart from scientific, have a great practical interest.

Key words: critical micellar concentration, surfactant, conductivity

OPTIMISATION OF AdSDPV METHOD FOR ELECTROANALYTICAL DETERMINATION OF CEFTRIAXONE

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Introduction: Cephalosporins are β -lactam antibiotics, indicated for the treatment of infections caused by Gram(+) and Gram(-) microorganisms. The investigation of electrochemical behavior of cephalosporins (cefotaxime, ceftriaxone and cefuroxime-axetil) showed that they readily adsorb onto the electrode surface. Adsorption was the basis for finding the optimal method for their determination.

The Aim: Optimization of Adsorptive Stripping Differential Pulse Voltammetric method (AdSDPV) for determination of ceftriaxone.

Materials and Methods: Electrochemical behavior of cephalosporins was investigated using cyclic voltammetry, and electroanalytical determination of ceftriaxone was done applying AdSDPV. Measurements were performed by Amel 433-A polarograph in three-electrode system with stationary mercury working electrode, Ag/AgCl and Pt as reference and auxiliary electrodes. Britton-Robinson buffer was used as supporting electrolyte.

Results: By examining the dependence of current intensity on the polarization rate it was found that the processes of electrochemical reduction of cephalosporins were adsorption controlled at low polarization rates. Ceftriaxone showed the most pronounced adsorption, so for the purpose of its determination the AdSDPV method was developed and validated. Experimental results yield the optimal accumulation time ($t_{\text{acc}} = 100 \text{ s}$) and potential ($E_{\text{acc}} = -200 \text{ mV}$). According to the obtained concentration dependence, two linear ranges are evident: the first one from $2 \times 10^{-7} \text{ moldm}^{-3}$ to $1 \times 10^{-6} \text{ moldm}^{-3}$ and the second one from $2 \times 10^{-6} \text{ moldm}^{-3}$ to $1 \times 10^{-5} \text{ moldm}^{-3}$. Using the second region, the ceftriaxone content in Longacef injections was determined.

Conclusion: According to the adsorption characteristics of the investigated cephalosporins AdSDPV method was proposed and validated for electroanalytical determination of ceftriaxone in Britton-Robinson buffer, as well as in pharmaceutical formulation

Key words: Ceftriaxone, cefotaxime, cefuroxime-axetil, cyclic voltammetry, determination, AdSDPV

TERMODINAMIKA MICELIZACIJE HEKSADECILTRIMETILAMONIUM BROMIDA U VODENOM RASTVORU PROPILEN GLIKOLA

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Uvod: U radu je ispitan uticaj temperature na kritičnu micelarnu koncentraciju (CMC) katjonskog surfaktanta (heksadeciltrimetilamonijum bromida, CTAB) u vodi i u vodenom rastvoru propilen glikola (PG). Razmatrajući proces micelizacije preko ravnotežnog modela, određeni su termodinamički parametri procesa micelizacije.

Cilj rada: Bio je određivanje različitih termodinamičkih veličina (Gibsove slobodne energije, DG_m , entalpije, DH_m , entropije, ΔS_m i tzv. energije transfera, DG_t) CTAB, kao i termodinamičko tumačenje procesa micelizacije.

Materijali i metode: Za pravljenje rastvora CTAB u 20 % propilen glikola korišćena je dejonizovana voda ($r = 18 \text{ mW cm}$). Specifična provodljivost surfaktanta merena je konduktometrom HI8820N (Hanna instruments), na različitim temperaturama (298.2 K, 306.2 K i 310.2 K) koje su kontrolisane pomoću termostata sa tačnošću $\pm 0.1 \text{ }^\circ\text{C}$. U cilju ispitivanja promene CMC sa temperaturom korstili smo ravnotežni model stvaranja micela.

Rezultati: Sa porastom temperature, vrednosti DG_m se menjaju od $-45.4 \text{ kJ mol}^{-1}$ do $-37.3 \text{ kJ mol}^{-1}$. Proces micelizacije je egzoterman u oba rastvarača (DH_m od $-204.2 \text{ kJ mol}^{-1}$ do $-7.46 \text{ kJ mol}^{-1}$). Vrednosti ΔS_m u vodi su pozitivne dok su u propilen glikolu negativne.

Zaključak: Proces micelizacije CTAB u 20% propilen glikolu je spontan ($DG_m < 0$). Entalpija i entropija micelizacije jako zavise od temperature; proces micelizacije pokazuje linearnu zavisnost između DH_m i ΔS_m . Na kraju, dobijene vrednosti za DG_t ukazuju na to da je uticaj PG na proces micelizacije pozitivan i da taj uticaj raste sa porastom temperature.

Ključne reči: termodinamički parametri, kritična micelarna koncentracija, surfaktant, provodljivost

TERMODYNAMIC OF MICELIZATION OF HEXADECYLTRIMETHYLAMMONIUM BROMIDE IN AQUEOUS SOLUTION OF PROPYLENE GLYCOL

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Introduction: We investigated effect of temperature on critical micellar concentration (CMC) of cationic surfactant hexadecyltrimethylammonium bromide (CTAB) in pure water and in aqueous solution of propylene glycol (PG). The equilibrium model of micelle formation has been applied to obtain the thermodynamic parameters of micellization.

The aim: Determination of various thermodynamic quantities (Gibbs free energy, DG_m , the enthalpy, DH_m , the entropy, ΔS_m and so-called free energy of transfer, DG_t), as well as elucidating thermodynamically the CTAB micellization process.

Material and methods: For preparing solutions of CTAB in 20 % propylene glycol, deionized water ($r = 18 \text{ m}\Omega\text{cm}$) was used. Specific conductivity of surfactant was measured using a digital conductivity meter HI8820N (Hanna instruments), at temperatures, 298.2 K, 306.2 K and 310.2 K which are controlled by a thermostat with the accuracy $\pm 0.1^\circ\text{C}$.

Results: With increasing temperature, the obtained values of DG_m are changed from $-45.4 \text{ kJ mol}^{-1}$ do $-37.3 \text{ kJ mol}^{-1}$. The micellization process is exothermic (DH_m od $-204.2 \text{ kJ mol}^{-1}$ do $-7.46 \text{ kJ mol}^{-1}$). Values of ΔS_m in aqueous solutions are positive while, in 20% propylene glycol, they are negative.

Conclusion: The micellization process of CTAB in 20% propylene glycol is spontaneous ($DG_m < 0$). Both, enthalpy and entropy of micellization are strongly dependent on temperature; the process of micellization exhibits a linear relation between DH_m i ΔS_m . The values of DG_t indicate that the effect of the propylene glycol on the micellization process is positive for all investigated temperatures.

Key words: thermodynamic parameters, critical micellar concentration, surfactant, conductivity

UTICAJ STRUKTURE ŽUČNIH KISELINA NA NJIHOVU SOLUBILIZACIONU MOĆ

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Uvod: Žučne kiseline su steroidna jedinjenja koja kao amfifilni molekuli imaju fiziološku ulogu u micelarnoj solubilizaciji lipida u toku varenja i regulaciji biosinteze – homeostaze holesterola a učestvuju i u velikom broju metaboličkih puteva. Osobine žučnih kiselina u velikoj meri određuje geometrija molekula 5 β -holanske kiseline na čijem skeletu se razlikuje konveksna β strana koja je nepolarna, i konkavna α površina koja je polarna. Žučne kiseline imaju sposobnost samoasocijacije u agregate koje nazivamo micelle.

Cilj rada: Cilj rada je ispitivanje hidrofobnosti unutrašnjeg domena micela žučnih kiselina solubilizacijom probnim molekulom, fenobarbitonom, koji ima tendenciju ulaska u hidrofobnu sredinu.

Materijal i metode: Rastvori soli ispitivanih žučnih kiselina pripremani su u različitim koncentracijama u odnosu na vrednost njihove kritične micelarne koncentracije. Po 2 mL od svakog rastvora odmereno je zajedno sa po 12 mg fenobarbitona. Nakon ravnomernog mešanja tokom 4h omogućena je solubilizacija. Koncentracija fenobarbitona je određivana visokoeфикасно tečnom hromatografijom prema validiranoj metodi.

Rezultati: Efekat solubilizacije opada sa porastom broja supstituisanih OH grupa sa okso grupama. Takođe najefektivnija žučna so u solubilizaciji fenobarbitona jeste natrijum deoksiholat čiji steroidni skelet je ujedno i najhidrofobniji. Fenilna grupa fenobarbitona se inkorporira u hidrofobni domen micelle. U ravni glavnih komponenti (metoda glavnih komponenti) se vidi da se žučne kiseline grupišu po okso grupama u steroidnom jezgru.

Zaključak: Povećanjem broja okso grupa opada hidrofobni domen micelle, pa samim tim i sposobnost primanja hidrofobnog gosta.

Ključne reči: žučne kiseline, fenobarbiton, hidrofobnost, micelle, solubilizacija

INFLUENCE OF BILE ACIDS' STRUCTURE ON THEIR SOLUBILISATION ABILITY

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Introduction: Bile acids are steroidal compounds with amphiphilic properties that have physiological role in micellar solubilisation of lipids during digestion, regulation of biosynthesis and homeostasis of cholesterol and in many other metabolic paths. Bile acids' properties are determined with the structure of 5 β cholanolic acid. Bile acids form aggregates known as micelles.

The Aim: The aim of the paper is to examine the hydrophobicity of the inner domain of bile acid micelle by solubilization of the probe molecule, phenobarbitone, which tends to enter the hydrophobic environment.

Materials and Methods: Solutions of bile acids are prepared in different concentrations according to the value of their critical micellar concentration. 2 mL of each solution is mixed with 12 mg of phenobarbitone. Solubilisation occurs during uniform mixing for 4 hours. Concentrations of phenobarbitone were determined using validated high pressure liquid chromatography method.

Results: The effect of solubilisation decreases with the increasing in the number of hydroxyl groups being substituted with oxo groups. The most effective bile salt in solubilization of phenobarbitone is sodium deoxycholate, whose steroid form is also the most hydrophobic one. Phenyl groups of the phenobarbitone get incorporated in the hydrophobic domains of micelles. In the plane of the principal components it is shown that the bile acids are grouped by the oxo groups in a steroid nucleus.

Conclusion: Increase in the number of oxo groups decreases the hydrophobic domain of micelles, and thus their ability to host a hydrophobic agent.

Key words: bile acids, phenobarbitone, hydrophobicity, micelles, solubilisation

UTICAJ RAZLIČITIH NEORGANSKIH SOLI NA SINERGIJAM PRI EKSTRAKCIJI PARACETAMOLA IZ VODENIH RASTVORA BINARNOM SMEŠOM DIETIL-ETAR/1-BUTANOL

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Uvod: Paracetamol (N-(4-hidroksifenil)-acetamid) je neopioidni analgetik i prilikom određivanja njegove koncentracije u plazmi koriste se različite metode u kojima se priprema uzorka često vrši metodom tečno-tečne ekstrakcije. Efikasnost ekstrakcije iz vodene faze organskim rastvaračima se može poboljšati dodatkom neke neorganske soli zbog efekta izoljavanja ili upotrebom smeše rastvarača zbog pojave sinergizma. Najveća efikasnost se postiže kombinovanjem ova dva efekta.

Cilj: Cilj ovog rada bio je ispitivanje uticaja neorganskih soli (NaCl, KCl, NH_4Cl i MgSO_4) na efekat sinergizma prilikom ekstrakcije paracetamola iz vodenih rastvora binarnom smešom dietil-etera i 1-butanola.

Materijal i metode: Ekstrakcija je vršena manuelno u levkovima za odvajanje. Spektrofotometrijski je merena vrednost apsorbancije vodene faze pre i posle ekstrakcije i na osnovu toga je vršeno izračunavanje deobenih koeficijenata i zatim koeficijenata sinergizma.

Rezultati: Određeni su deobeni koeficijenti za ekstrakciju paracetamola iz vodenih rastvora sa visokim sadržajem NaCl, KCl, NH_4Cl i MgSO_4 (2 mol dm^{-3}) korišćenjem binarne smeše dietil-etera i 1-butanola. Na osnovu vrednosti deobenih koeficijenata za smeše rastvarača i čiste rastvarače izračunate su vrednosti sinergističkih koeficijenata.

Zaključak: Za sve vodene rastvore soli korišćene u ovom radu uočen je sinergistički efekat u celokupnom opsegu sastava smeše organskih rastvarača. Sinergistički efekat je bio najizraženiji za rastvor MgSO_4 , potom slede rastvori NaCl i KCl. Najmanji sinergistički efekat je određen primenom rastvora NH_4Cl .

Ključne reči: paracetamol, ekstrakcija, efekat sinergizma

ISPITIVANJE ADSORPCIJE MOKRAĆNE KISELINE IZ VODENIH RASTVORA

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Uvod: Mokraćna kiselina je proizvod razgradnje nukleinskih kiselina i nukleoproteina. Povišena koncentracija mokraćne kiseline u organizmu može dovesti do pojave patoloških stanja poput gihta, bubrežnog kamenca, hipertenzije. Adsorpcija mokraćne kiseline na različitim prirodnim ili sintetičkim adsorbentima jedan je od načina prečišćavanja krvi i otpadnih voda prehrambene industrije.

Cilj rada: Ispitivana je priroda i intenzitet adsorpcije mokraćne kiseline iz vodenih rastvora. Korišćeni su aktivni uglj i aluminijum-oksidi, kao potencijalni adsorbenti za prečišćavanje sistema koji sadrže neželjene količine mokraćne kiseline.

Materijal i metode: Adsorpcija mokraćne kiseline iz vodenih rastvora vršena je na aluminijum-oksidu i aktivnom uglju kao adsorbentima. Koncentracije rastvora mokraćne kiseline pre i posle adsorpcije određivana je spektrofotometrijski, merenjem apsorbancena 286nm.

Rezultati: Dobijeni rezultati upoređivani su sa Freundlich-ovim i Langmuir-ovim modelom adsorpcije, koji se najčešće koriste za obradu ove vrste podataka. Korišćenjem računski dobijenih vrednosti Freundlich-ovih konstanti K_f i n i vrednosti korelacionih koeficijenata utvrđeno je u kojoj meri se adsorpcija odigrala po Freundlich-ovom modelu.

Zaključak: Utvrđeno je da se adsorpcija mokraćne kiseline na aktivnom uglju i aluminijum-oksidu ne može opisati adekvatno pomoću Langmuir-ovog modela. Određene su vrednosti konstanti K_f i n za Freundlich-ovu adsorpcionu izotermu, pri čemu se ove vrednosti ne nalaze u uobičajenom opsegu. Ovo ukazuje da je proces adsorpcije mokraćne kiseline na adsorbentima ispitivanim u ovom radu složene prirode i neophodna su dalja ispitivanja za utvrđivanje tačnog mehanizma adsorpcije.

Ključne reči: mokraćna kiselina, adsorpcija, Freundlich-ova i Langmuir-ova adsorpciona izoterma

INFLUENCE OF INORGANIC SALTS ON SYNERGISM EFFECT DURING PARACETAMOL EXTRACTION FROM WATER SOLUTION WITH BINARY MIXTURE OF DIETHYL-ETHER/1-BUTANOL

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Introduction: Paracetamol (N-(4-hydroxyphenyl)-acetamide) is a non-opioid analgesic. In determining its plasma concentration, different methods could be used in which sample preparation is often done by using liquid-liquid extraction. The extraction efficiency from the aqueous phase by organic solvents can be improved with the addition of some inorganic salts because of the salting effect or by using solvent mixtures due to the effect of synergism. Maximum efficiency is achieved by combining these two effects.

The Aim: The aim of this study was to examine the effect of inorganic salts (NaCl, KCl, NH_4Cl and MgSO_4) on synergistic effect during the extraction of paracetamol from aqueous phase by binary mixture of diethyl-ether/1-butanol.

Materials and Methods: Extraction was carried out manually in separatory funnels. The absorbances of aqueous phases were measured by spectrophotometer before and after extraction, and based on that, calculation of distribution ratio and synergistic ratio were done.

Results: Distribution ratios were determined for the extraction of paracetamol from aqueous solutions with high concentrations of NaCl, KCl, NH_4Cl and MgSO_4 (2 mol dm^{-3}) using binary mixtures of diethyl-ether/1-butanol. The values of synergistic ratios were calculated by using distribution ratio for solvent mixtures and pure solvents.

Conclusion: For all aqueous solutions of salts used in this study the synergistic effect observed in the whole composition range of organic solvents mixtures. The greatest synergistic effect was shown by the solution of MgSO_4 , followed by solutions of NaCl and KCl. The lowest synergistic effect was obtained using the solution of NH_4Cl .

Keywords: paracetamol, extraction, synergism effect

THE STUDY OF URIC ACID ADSORPTION FROM AQUEOUS SOLUTIONS

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Introduction: Uric acid is a product of nucleic acids and nucleoproteins catabolism. Concentrations higher than normal can cause several pathological states in human organism, such as gout, renal lithiasis, hypertension. Adsorption of uric acid onto various natural and synthetic adsorbents is one way of blood and food industry waste waters purification.

The Aim: In this study, the nature and intensity of uric acid adsorption in aqueous solutions was examined. Activated charcoal and aluminium oxide were used as potential adsorbents for purifying systems containing undesirable amounts of uric acid.

Materials and Methods: The adsorption was tested with activated charcoal and aluminium oxide as adsorbents. Concentrations of uric acid solutions before and after the adsorption were determined spectrophotometrically, through measuring their absorbance on 286 nm.

Results: Experimental results were compared with Freundlich and Langmuir adsorption model, which are mostly used to describe adsorption. Using the calculated values of Freundlich constants K_f and n and correlation coefficients, the degree to which this adsorption process followed the Freundlich model was determined.

Conclusion: It has been concluded that the adsorption of uric acid onto the surface of activated charcoal and aluminium oxide can not be adequately described by Langmuir model. Calculated values of Freundlich constants K_f and n were not in commonly known range. This indicates that the adsorption of uric acid onto the adsorbents used in this study is complex, so further studies are needed in order to determine the exact adsorption mechanism.

Key words: uric acid, adsorption, Freundlich and Langmuir adsorption isotherm

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Uvod: Paracetamol je sintetski nesteroidni analgetik, čija bioaktivnost u višim koncentracijama dovodi do poremećaja funkcije hepatoenzima. Zbog široke primene paracetamola, kao i prisustva osnovne supstance i njenih metabolita u otpadnim vodama, teži se razvijanju efikasnih metoda uklanjanja istih i time sprečavanja mogućih štetnih posledica njihovog unosa u organizam. To je, između ostalog, moguće postići primenom adsorpcije.

Cilj rada: Cilj rada bio je ispitivanje aktivnog uglja i aluminijum-oksida kao potencijalnih adsorbentata paracetamola iz vodenih rastvora, a u cilju dalje primene u praktične svrhe.

Materijal i metode: Vršena je adsorpcija paracetamola iz vodenih rastvora na aktivnom uglju i aluminijum-oksidu. Koncentracije rastvora pre i posle adsorpcije određivane su spektrofotometrijski, merenjem apsorbanca na talasnoj dužini od 244 nm.

Rezultati: Dobijeni rezultati upoređivani su sa Freundlich-ovim i Langmuir-ovim modelom adsorpcije, koji se najčešće koriste za obradu ove vrste podataka. Računski su dobijene vrednosti Freundlich-ovih konstanti K_f i n , kao i korelacionih koeficijenata, na osnovu čega je utvrđen stepen uspešnosti adsorpcije.

Zaključak: Obradom dobijenih rezultata došlo se do zaključka da adsorpcija paracetamola na aktivnom uglju i aluminijum-oksidu više odgovara Freundlich-ovom modelu, dok se Langmuir-ov model nije pokazao kao zadovoljavajući. Razlozi za takav zaključak su pretpostavljene interakcije molekula adsorbata i formiranje većeg broja slojeva adsorbata na površini adsorbenta. Ujedno, adsorpcija je intenzivnija na aktivnom uglju, što se može zaključiti na osnovu vrednosti koncentracija pre i posle adsorpcije.

Glavne reči: paracetamol, adsorpcija, Freundlich-ova i Langmuir-ova adsorpciona izoterma

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Uvod: Paracetamol (N-(4-hidroksifenil)-acetamid, acetaminofen) je neopioidni analgetik sa dominantim antipiretskim delovanjem, dok je antiinflamatorno i antiagregacijsko dejstvo slabo ili nikakvo. Prilikom primene smeše organskih rastvarača za tečno-tečnu ekstrakciju različitih jedinjenja iz vodenih rastvora, usled javljanja efekta sinergizma, efikasnost ekstrakcije se može povećati u značajnoj meri, naročito ukoliko se kombinuje sa efektom isoljavanja.

Cilj: Cilj ovog istraživanja bio je upoređivanje efekta sinergizma kod ekstrakcije paracetamola iz vodenih rastvora sa visokom koncentracijom natrijum hlorida, pomoću binarnih smeša dietil-etera/1-propanola, dietil-etera/2-propanola, dietil-etera/1-butanola, dietil-etera/2-butanola i dietil-etera/izo-butanola.

Materijal i metode: Ekstrakcija je vršena manuelno u levkovima za odvajanje. Spektrofotometrijski je merena vrednost apsorbanije vodene faze pre i posle ekstrakcije i na osnovu toga je vršeno izračunavanje deobenih koeficijenata i zatim koeficijenata sinergizma.

Rezultati: U ovom radu smo vršili određivanje koeficijenta sinergizma kod ekstrakcije paracetamola iz vodenog rastvora NaCl, uz primenu binarnih smeša nekih od uobičajenih organskih rastvarača. Dobijeni rezultati su pokazali da se efekat sinergizma javlja u svih pet ispitivanih slučajeva. Od svih binarnih smeša koje su ispitivane najizraženiji sinergistički efekat je pokazala smeša dietil-eter/2-propanol. Najefikasnija ekstrakcija postignuta je korišćenjem smeše dietil-etera/1-butanola, zatim slede smeše dietil-etera/1-propanola, dietil-etera/izo-butanola. Najmanju efikasnost pokazale su smeše dietil-etera/2-butanola i dietil-etera/2-propanola.

Zaključak: Dobijeni rezultati mogu biti, pre svega od značaja za poboljšanje osetljivosti analitičkih metoda određivanja paracetamola u kojima je ekstrakcija deo uobičajene procedure.

Glavne reči: paracetamol, ekstrakcija, efekat sinergizma

THE STUDY OF PARACETAMOL ADSORPTION FROM AQUEOUS SOLUTIONS

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Introduction: Paracetamol is a synthetic non-steroid, analgoantipyretic medicine. In cases of elevated bodily concentrations, it causes hepatic enzymes malfunctions. Due to its wide administration and the presence of the basic substance and its metabolites in waste waters, certain efforts have been made in order to develop efficient methods of removing those and thus preventing potential harmful consequences of their intake. These goals can be realized through applying adsorption.

The Aim: The aim of this study was to examine activated charcoal and aluminium oxide as potential paracetamol adsorbents from aqueous solutions, with the purpose of their further use in practice.

Materials and Methods: The adsorption was tested with activated charcoal and aluminium oxide as adsorbents. Paracetamol solutions' concentrations before and after the adsorption were determined spectrophotometrically, through measuring their absorbance on 244 nm.

Results: The results were compared with Freundlich and Langmuir adsorption model, the ones commonly used to describe adsorption. Values of Freundlich constants K_f and n and correlation coefficients were calculated, which served to determine success of the adsorption process.

Conclusion: When processed, the results showed that paracetamol adsorption onto the surface of activated charcoal and aluminium oxide suited Freundlich model better, while Langmuir model has not shown viable results. Reasons for such deduction were assumed adsorbate molecules interactions and multiple adsorbate layers on the surface of the adsorbents. Adsorption was more intensive onto the surface of activated charcoal, based on paracetamol concentrations before and after the adsorption.

Key words: paracetamol, adsorption, Freundlich and Langmuir adsorption isotherm

EXAMINATION OF SYNERGISM EFFECT IN PARACETAMOL EXTRACTION FROM WATER SOLUTIONS WITH DIFFERENT BINARY MIXTURE OF DIETHYL-ETHER/1-BUTANOL

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Introduction: Paracetamol (N-(4-hydroxyphenyl)-acetamide, acetaminophen) is a non-opioid analgesic with dominant antipyretic effect, while the anti-inflammatory and antiplatelet effects are low or unexpressed. When using mixtures of organic solvents for extraction of various compounds from aqueous solutions, due to synergism effects, extraction efficiency can increase significantly, especially if combined with the salting out effect.

The Aim: The aim of this study was to compare the effect of synergism in extraction of paracetamol from aqueous solutions with high concentrations of sodium chloride, using binary mixtures: diethyl-ether/1-propanol, diethyl-ether/2-propanol, diethyl-ether/1-butanol, diethyl-ether/2-butanol and diethyl-ether/iso-butanol.

Materials and Methods: Extraction was carried out manually in separatory funnels. The absorbances of aqueous phases were measured by spectrophotometer before and after extraction, and based on that, calculation of distribution ratio and synergistic ratio were done.

Results: In this study, we performed the determination of the synergistic ratio in paracetamol extraction from aqueous NaCl, by application of binary mixtures of some common organic solvents. The results showed that the synergism effect occurs in all five examined cases. Considering of all five binary mixtures that have been used, the greatest synergistic effect was expressed by diethyl-ether/2-propanol mixture. The most efficient extractions were achieved using a mixture of diethyl-ether/1-butanol, followed by mixtures of diethyl-ether/1-propanol, diethyl-ether/iso-butanol. The lowest efficiency was shown by mixtures of diethyl-ether/2-butanol and diethyl-ether/2-propanol.

Conclusion: The obtained results could be used, first of all, for improving sensitivity of analytical methods for paracetamol quantity determination in which the liquid-liquid extraction is a part of usual procedure.

Keywords: paracetamol, extraction, synergism effect

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Uvod: Pirogalol spada u jedinjenja koja se u farmaciji koriste kao antioksidansi. Zbog prisustva susednih hidroksilnih grupa, pokazuje izrazitu nestabilnost pod uticajem svetlosti i vazduha u vodenim rastvorima, pa je pogodan za ispitivanje procesa autooksidacije. Često se za ispitivanje procesa autooksidacije koristi UV-Vis spektrofotometrija čiji podaci se obrađuju nekom hemometrijskom metodom, kao što je MCR-ALS (multivariate curve resolution - alternating least squares).

Cilj: Vršeno je spektrofotometrijsko ispitivanje uticaja Cu^{2+} jona na autooksidaciju pirogalola u vodenima rastvorima uz pomoć MCR-ALS metode.

Materijal i metode: Pripremljeni su rastvori pirogalola sa i bez Cu^{2+} jona, a potom su spektrofotometrijski ispitivani u različitim vremenskim intervalima odvijanja procesa autooksidacije. Snimljeni spektri obrađeni su MCR-ALS metodom. Na osnovu toga su dobijeni spektri i profili koncentracija pojedinačnih komponenti koje su učestvovala u datim procesima.

Rezultati: Na osnovu dobijenih rezultata predložena je kinetika reakcije sa i bez prisustva Cu^{2+} jona, kao i mogući mehanizam odvijanja autooksidacije. Takođe su predložene strukture komponenti koje učestvuju u datim procesima.

Zaključak: Uočeno je da se kinetika procesa, kao i komponente koje učestvuju bitno razlikuju za reakcije koje se odvijaju bez prisustva Cu^{2+} jona i u njegovom prisustvu. Pri autooksidaciji bez prisustva Cu^{2+} jona najverovatnije dolazi do građenja purpurogalina koji se dalje transformiše u odgovarajući hinon. U prisustvu Cu^{2+} jona se u istom vremenskom intervalu gradi samo jedan karakterističan proizvod čija struktura nije definitivno utvrđena.

Ključne reči: pirogalol, autooksidacija, Cu^{2+} jon, spektrofotometrija, MCR-ALS

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Uvod: Paracetamol spada u grupu nesteroidnih analgetika i antipiretika, ali nema antiinflamatorna svojstva. Metabolizam paracetamola odvija se u jetri, glukuronidacijom i sulfokonjugacijom. Pod dejstvom reaktivnih kiseoničnih vrsta i Fe^{2+} jona, u jetri, može doći do transformacija paracetamola u reakcijama slobodno radikalskog tipa.

Cilj rada: U ovom radu vršeno je spektrofotometrijsko ispitivanje transformacije paracetamola pod dejstvom Fentonove reakcije i HPLC-DAD analiza proizvoda reakcije.

Materijali i metode: Za izazivanje reakcije je korišćen slabo bazni vodeni rastvor paracetamola, koncentracije $100 \mu\text{mol dm}^{-3}$, pH 7,4, vodonik peroksid, koncentracije 1 mmol dm^{-3} , i rastvor FeCl_2 koncentracije $0,05 \text{ mol dm}^{-3}$, kao katalizator. Za hromatografska ispitivanja proizvoda reakcije korišćen je tečni hromatografski sistem sa autosemplerom i „diode array“ detektorom.

Rezultati: Grafička metoda analiza snimljenih UV-Vis spektara tokom reakcije je vršena u intervalu talasnih dužina od 260 do 360 nm i pokazala je prisustvo dve apsorbujuće čestice. Hromatografskim ispitivanjem dokazano je da je 60 minuta od početka reakcije u sistemu prisutno samo jedno jedinjenje.

Zaključak: Analizom i obradom rezultata zaključeno je da u slabo baznim rastvorima paracetamola i vodonik peroksida, uz Fe^{2+} jon kao katalizator, dolazi do nastajanja polarnijeg jedinjenja, koje najverovatnije možemo da okarakterišemo kao dimer paracetamola.

Ključne reči: paracetamol, Fentonova reakcija, UV-Vis spektrofotometrija, HPLC

SPECTROPHOTOMETRIC STUDY OF THE INFLUENCE OF $\text{Cu}(\text{II})$ ION ON AUTOOXIDATION OF PYROGALLOL IN AQUEOUS SOLUTIONS

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Introduction: Pyrogallol belongs to the compounds which are used in pharmacy as antioxidants. Because of the presence of neighbouring hydroxyl groups, it shows significant instability under influence of light and air in aqueous solutions, and is useful for the examination of autooxidation. UV-Vis spectrophotometry is often used for examining the process of autooxidation after obtained data is processed via some chemometric method, like MCR-ALS (multivariate curve resolution - alternating least squares).

The Aim: The spectrophotometric study of the influence of Cu^{2+} ion on autooxidation of pyrogallol in aqueous solutions was performed by using MCR-ALS method.

Materials and Methods: The pyrogallol solutions with and without Cu^{2+} ion were prepared and spectrophotometrically examined in different time intervals of the process. The recorded spectra were processed via MCR-ALS method. According to that, spectra and profiles of concentrations of pure components of the processes were obtained.

Results: The kinetic of the reactions according to the gathered values was proposed, as well as the possible mechanism of the autooxidation. The structures of the components of the processes were also proposed.

Conclusion: It was noticed that the kinetic of the process, as well as the compounds which participate, differ significantly for the reactions with and without the presence of Cu^{2+} ion. During the autooxidation without the presence of Cu^{2+} ion, purpurogallin is most likely produced which transforms onward into adequate quinone. In the presence of Cu^{2+} ion only one specific product is produced which structure is not definitely determined.

Keywords: pyrogallol, autooxidation, Cu^{2+} ion, spectrophotometry, MCR-ALS

HPLC-DAD AND SPECTROPHOTOMETRIC ANALYSIS OF PARACETAMOL TRANSFORMATION UNDER THE INFLUENCE OF THE FENTON REACTION

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Introduction: Paracetamol belongs to the analgesic and antipyretic drugs, but has no anti-inflammatory properties. Paracetamol is metabolised in the liver, and primary metabolic pathways are glucuronidation and sulfate conjugation. Reactive oxygen species and Fe^{2+} ions may cause transformation of the paracetamol in the liver.

The Aim: In this research was performed spectrophotometric analysis of paracetamol transformation caused by the effect of Fenton reaction, and HPLC-DAD analysis of the resulting products.

Materials and Methods: For initiation of the reaction was used low base solution of paracetamol, concentration $100 \mu\text{mol dm}^{-3}$, pH 7,4, hydrogen peroxide, concentration 1 mmol dm^{-3} , and FeCl_2 solution, concentration $0,05 \text{ mol dm}^{-3}$, as catalyst. Chromatography examination of the products was performed in liquid chromatography system with autosampler and diode array detector.

Results: Graphical methods of analysis of gained UV-Vis spectra during the reaction was exerted in the 260 to 360 nm wavelength, and showed presence of two absorbing particles. Chromatography tests proved that 60 minutes from the beginning of the reaction only one compound was present in the system.

Conclusion: Processing the results, it was concluded that in low base solution of paracetamol and hydrogen peroxide, with Fe^{2+} ions as catalyst, comes to development of polar compound, that can be characterized as paracetamol dimer.

Key words: paracetamol, Fenton reaction, UV-Vis spectrophotometry, HPLC

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Uvod: Vitamin C pripada grubo hidrosolubilnih vitamina koji se ne sintetise u ljudskom organizmu zbog čega se mora unositi putem namirnica. Njegova uloga u organizmu je složena- ima antioksidativno dejstvo, predstavlja kofaktor mnogih enzima, smanjuje rizik za razvitak mnogih hroničnih bolesti. Sadržaj vitamina C u voćnim sokovima zavisi od mnogih faktora, pre svega od vrste i zrelosti voća, klimatskih uslova i izloženosti voća suncu, načina proizvodnje i pakovanja proizvoda. Postoji više metoda za procenu nivoa vitamina C u različitim uzorcima, a HPLC metoda je danas metoda izbora zbog njene jednostavnosti, selektivnosti i brzine.

Cilj rada: Cilj ovog istraživanja je određivanje sadržaja vitamina C u sokovima na našem tržištu, kako bi se obezbedio optimalan unos ovog vitamina i zadovoljile dnevne potrebe za njim.

Materijal i metode: Kvantifikacija askorbinske kiseline je izvođena na HPLC aparatu Agilent 1200 sa fotodiodom, automatskim semplerom i kompjuterom. Mobilna faze su bili 40 mM fosfatni pufer pH 2.5 i metanol.

Rezultati: Nakon izmerenih površina pikova uzoraka i formiranja standardne krive ($R^2=0,9999$), određena je koncentracija vitamina C u sokovima. Najveći sadržaj vitamina C je detektovan u 100% voćnom soku pomorandže (46,29 mg/100 ml soka), dok u soku od ananasa i jagode vitamin C bio ispod granice detekcije.

Zaključak: Na našem tržištu postoji širok spektar voćnih sokova i nektara, a brojne studije o sadržaju vitamina u sokovima daju dobru podlogu za izbor najadekvatnijih napitaka.

Ključne reči: vitamin C, voćni sokovi, voćni nektari

DETERMINATION OF VITAMIN C IN JUICES PRESENT IN SERBIAN MARKET

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Introduction: Vitamin C is hydrosoluble vitamin that can't be synthesized in human body; it must be taken through food. It has complex role in human body: has the antioxidant effect, is a cofactor of many enzymes, reduces risk for development of chronic diseases. The content of vitamin C in fruit juices depends on type and maturity of fruit, climatic conditions, exposure to sunlight, production methods and product packaging. There are several methods for estimating the level of vitamin C in different samples. HPLC method is method of choice because of its simplicity, selectivity and speed.

The aim: Objective of this research was to determine the content of vitamin C in soft drinks in market, in order to ensure the optimal intake of this vitamin and meet the daily requirements.

Material and Methods: Quantification of ascorbic acid was performed on Agilent 1200 HPLC apparatus with a photodiode, an automatic sampler and computer. Mobile phases were 40 mM phosphate buffer pH 2.5 and methanol.

Results: After peak areas of samples have been measured and standard curve formed ($R^2 = 0.9999$), concentration of vitamin C in juices was determined. The most abundant in vitamin C content was 100% orange juice (46,29 mg/100 ml), while in pineapple and strawberry juice content was below limit of detection.

Conclusion: There is wide range of fruit juices and nectars in our market. Numerous studies on vitamin content in juices provide a good foundation for the most appropriate choice of drinks.

Key words: vitamin C, fruit juices, fruit nectars





ANTIHIPERTENZIVNA TERAPIJA I KVALITET ŽIVOTA U PACIJENATA SA ARTERIJSKOM HIPERTENZIJOM I HRONIČNOM BUBREŽNOM INSUFICIJENCIJOM

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Uvod: Kvalitet života (QOL) pacijenata je veoma važan, jer cilj terapije nikako nije samo puko produženje života, i kao takav, u fokusu je istraživanja poslednjih godina.

Cilj rada: Cilj rada je da se sagleda da li kvalitet života pacijenata sa arterijskom hipertenzijom i hroničnom bubrežnom insuficijencijom više remeti starost, sama bolest, komorbiditeti, primenjen način lečenja ili neželjeni efekti lekova.

Materijal i metode: Urađena je studija preseka, kojom je obuhvaćeno 30 pacijenata sa arterijskom hipertenzijom i hroničnom bubrežnom insuficijencijom, korišćenjem dva upitnika: osnovnog (37 parametara) i za kvalitet života (EQ-5D).

Rezultati: Prosečan QOL bio je 75 na skali od 100 poena. QOL bio je statistički značajno niži u starijih pacijenata, kao i u osoba ženskog pola. Nije nađena statistički signifikantna razlika u QOL u vezi sa komorbiditetima. Jedino su pacijenti na terapiji beta blokatorima (od svih vrsta antihipertenziva) imali signifikantno niži QOL.

Zaključak: Naši rezultati ukazuju da do redukcije QOL više dovode starost, ženski pol, kao i primena beta blokatora, no komorbiditeti i primenjeni način lečenja (sa ili bez CAPD).

Ključne reči: arterijska hipertenzija, hronična bubrežna insuficijencija, antihipertenzivni lekovi, kvalitet života.

ANTIHYPERTENSIVE THERAPY AND QUALITY OF LIFE IN PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC RENAL FAILURE

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Introduction: Quality of life (QOL) of patients is very important, because the goal of therapy is not only extension of life, and as such, QOL is the focus of research in recent years.

The Aim: The aim of this study was to determine whether the quality of life of patients with arterial hypertension and chronic renal failure was more diminished by age, by the disease itself, by comorbidities, by treatment applied or by the side effects of drugs.

Materials and Methods: Cross sectional study was done, which included 30 patients with arterial hypertension and chronic renal failure, using two questionnaires: the basic (37 parameters) and the quality of life (EQ-5D).

Results: The average QOL was 75 on a scale of 100 points. QOL was significantly lower in older patients, as well as in females. There was no statistically significant difference in QOL related to comorbidity. Only patients treated with beta blockers (out of all types of antihypertensive drugs) had significantly lower QOL.

Conclusion: Our results indicate that the reduction of QOL is more due to age, female gender, as well as the use of beta blockers, than to comorbidities, and the applied treatment (with or without CAPD).

Key words: hypertension, chronic renal failure, antihypertensive drugs, the quality of life.

ADHERENCA PACIJENATA SA ARTERIJSKOM HIPERTENZIJOM

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Uvod: Stepen pacijentove saradnje ima ključnu ulogu u uspešnosti antihipertenzivne farmakoterapije. Neadherentnost predstavlja veliki zdravstveni i ekonomski problem u lečenju hipertenzije.

Cilj: Cilj rada je evaluacija stepena adherence kod pacijenata sa arterijskom hipertenzijom i utvrđivanje faktora rizika za neadherentnost.

Materijal i metode: Urađena je studija preseka, kojom je obuhvaćeno 35 pacijenata sa arterijskom hipertenzijom, lečenih u Internističkoj službi Doma zdravlja u Beloj Palanci. Pacijenti su podeljeni u dve grupe, zavisno od stepena adherence, utvrđenog na osnovu sprovedenog upitnika.

Rezultati: Nezadovoljavajući nivo adherence je zabeležen kod 22,85% hipertenzivnih pacijenata. Pacijenti starije životne dobi, sa dužim trajanjem hipertenzije i većim brojem lekova u terapiji su pokazali niži stepen adherence, sa većim brojem neželjenih efekata ($p<0,01$). Razlozi niskog stepena adherence su: zaboravnost (25%), nepridržavanje doznog režima (37,5%) i neredovni kontrolni pregledi (12,5%). Kod 25% ispitanika su utvrđena sva tri faktora.

Zaključak: Naša ispitivanja su pokazala bolju regulaciju krvnog pritiska kod adherentnih pacijenata. Utvrđivanje razloga neadherentnosti predstavlja osnovu za preduzimanje mera i intervencija za njeno poboljšanje u cilju kvalitetnijeg života bolesnika sa arterijskom hipertenzijom.

Ključne reči: adherence, arterijska hipertenzija, faktori neadherentnosti

ADHERENCE OF PATIENTS WITH ARTERIAL HYPERTENSION

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Introduction: The degree of patient cooperation plays a key role in the success of antihypertensive drug therapy. Non-adherence is the major health and economic problem in the treatment of hypertension.

Aim: To evaluate the degree of adherence in patients with hypertension and determine risk factors for non-adherence.

Material and methods: We performed a cross-sectional study, which involved 35 patients with hypertension, treated in the Health Service in Bela Palanka. Patients were divided in two groups, depending on the degree of adherence, defined on the basis of the questionnaires.

Results: Unsatisfactory level of adherence was noted in 22.85% of hypertensive patients. Elderly patients with longer duration of hypertension and larger number of drugs in the therapy showed a lower degree of adherence, with more side-effects ($p<0.01$). The reasons for low level adherence were: forgetfulness (25%), non-compliance with dosage regimen (37.5%) and non-regular check-ups (12.5%). All three factors occurred in 25% of patients involved in the study.

Conclusion: Our study showed better control of blood pressure in adherent patients. Determining the reasons for non-adherence represents the basics for taking actions and interventions to improve quality of life in patients with hypertension.

Keywords: adherence, hypertension, factors of non-adherence

SAMOMEDIKACIJA MEĐU STUDENTIMA UNIVERZITETA U NIŠU

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Uvod: U Srbiji zadnjih godina samomedikacija zauzima sve značajnije mesto u društvu i sistemu zdravstvene zaštite zahvaljujući sve većoj dostupnosti informacija o bolestima i njihovom lečenju i velikom broju registrovanih OTC preparata.

Cilj: Evaluacija samomedikacije među studentima Univerziteta u Nišu i određivanje potencijalnih faktora koji mogu da utiču na učestalost samomedikacije.

Materijal i metode: Istraživanje sprovedeno u formi studije preseka, korišćenjem anonimne ankete, namenjene studentima Univerziteta u Nišu. Ukupan broj obrađenih anketa iznosio je 279. Dobijeni rezultati su obrađeni statističkim programom SPSS 16.

Rezultati i diskusija: Od ukupnog broja ispitivanih studenata, 261 (93.55%) je potvrdilo postojanje samomedikacije kao oblika samonege. Samomedikacija je značajno više zastupljena kod žena u odnosu na muškarce (96,4% : 89,3%). Rezultati pokazuju da 30.47% ispitanika pokazuje visoku, 63.08% nisku sklonost ka samomedikaciji, dok svega 6,45% ispitanika nema iskustva sa samomedikacijom. Između studenata Medicinskog fakulteta i studenata ostalih fakulteta Univerziteta u Nišu utvrđena je sličnost u stepenu samomedikacije, dok je u nivou medicinskog znanja utvrđena statistički značajna razlika.

Zaključak: Na osnovu obrađenih podataka, uočeno je da je samomedikacija u visokom stepenu zastupljena kod studenata Univerziteta u Nišu. Utvrđen je značajan uticaj pola i izabranog fakulteta na odluku o samomedikaciji i izboru leka. Nivo medicinskog znanja je bitan faktor pravilne samomedikacije. Ovo istraživanje ukazuje na potrebu veće informisanosti studenata o prednostima i negativnim stranama samomedikacije.

Ključne reči: samomedikacija, nivo medicinskog znanja, studenti.

SELF-MEDICATION AMONG STUDENTS AT UNIVERSITY OF NIS

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Introduction: In recent years self-medication in Serbia takes plays a more prominent place in society and the health care system due to the increasing availability of information about diseases and their treatment, and a large number of registered OTC products.

The Aim: Evaluation level of self-medication among students of the University of Nis, and determining the potential factors that could affect self-medication and the proper use of OTC medicines.

Material and methods: This was cross-sectional, anonymous, questionnaire-based survey that included 279 students at different faculties at University in Nis. The results were analyzed by statistical program SPSS 16.

Results and discussion: Of the total number of students tested, 261 (93.55%) confirmed the presence of self medication as a form of self-care. Self-medication was significantly higher in females compared to males (96.4%: 89.3%). The results show that 30.47% of respondents showed a high, 63.08% low self-care orientation, while only 6.45% of the respondents have no experience with self-medication. Although, no significant predictors of self-medication did exist among the studied group, knowledge test showed a difference in the level of possession of medical knowledge among medical students and non-medical students.

Conclusion: Self-medication is very common among students of the University of Nis. This survey indicates the need for greater awareness of students about the benefits and negative aspects self-medication.

Key words: self-medication, medication knowledge, students.

SPECIFIČNOST UPOTREBE ANTIBIOTIKA I ANTIBIOTSKOG SAMOLEČENJA U STUDENTSKOJ POPULACIJI U BEOGRADU

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Uvod: Samolečenje antibiotičima je veoma česta i zabrinjavajuća pojava, pogotovo u zemljama u razvoju gde je ova vrsta lekova široko dostupna, čak i bez recepta.

Cilj: Cilj ovog rada je da proceni znanje i ponašanje studentske populacije u Beogradu u odnosu na samolečenje antibiotičima kao i upoređivanje učestalosti antibiotičkog samolečenja među studentima medicinskih i ne-medicinskih fakulteta.

Materijal i metode: Podaci su prikupljeni anketiranjem 220 slučajno izabranih studenata medicinskih i ne-medicinskih fakulteta. Upitnik je bio anoniman i sadržao je pitanja otvorenog i zatvorenog tipa. Značajnost razlike učestalosti antibiotičkog samolečenja je procenjen pomoću Hi kvadrat testa. Nivo značajnosti je 0,05 u svim slučajevima.

Rezultati: 91 % ispitanika je popunilo i vratilo upitnik. Prevalenca korišćenja antibiotika u prethodna 3 meseca je 17 % (n=17) kod studenata medicinskih i 31 % (n=31) kod studenata ne-medicinskih fakulteta. Respiratorni problemi su bili najčešća indikacija za samolečenje i to među obe grupe studenata 76% (n=13) i 81 % (n=25). Amoksisilin je bio najčešće korišćen antibiotik među obe grupe. Najučestaliji razlog za samolečenje među studentima medicine bilo je posedovanje medicinskog znanja i to kod 53 % (n=9) ispitanika, a među studentima ne-medicinskih fakulteta je prethodno iskustvo kod 48,4 % (n=15).

Zaključak: Rezultati pokazuju da postoji statistički značajna razlika u stopi upotrebe antibiotika bez recepta među studentima medicine i studentima ne-medicinskih fakulteta. Studenti ne-medicinskih fakulteta više pribegavaju antibiotičkom samolečenju što se može dovesti u vezu sa nedovoljnom informisanošću o antibiotičima, njihovom delovanju, neželjenim dejstvima i antibiotičkoj rezistenciji.

Ključne reči: antibiotički, samolečenje, studenti.

SPECIFICITY OF ANTIBIOTICS USE AND ANTIBIOTIC SELF-MEDICATION AMONG STUDENT POPULATION OF BELGRADE

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Introduction: Self-medication with antibiotics is concerning in the whole world, even more in developing countries, where this type of drugs are often available even without prescription.

The Aim: To assess knowledge and behavior towards self-medication with antibiotics among students population and compare frequency of antibiotics self-treatment among medical students and non-medical students.

Materials and Methods: Data were collected by interviewing 220 randomly selected students from medical and non-medical faculties in Belgrade. The questionnaire was anonymous and contained questions opened and closed types. Significant difference frequency of antibiotic self-medication was assessed using the Chi square test (p=0,05).

Results: 91 % of respondent filled out and returned the questionnaire. Prevalence of antibiotic use without prescription in the previous 3 months was 17 % (n=17) among medical students and 31 % (n=31) among non-medical students. Respiratory problems were the most frequent indication in both groups-76 % (n=13) and 81 % (n=25). Amoxicillin was the most commonly used antibiotic among both groups. The most frequent reason for self-medication among medical students was their knowledge 53 % (n=9) and prior experience was the most common reason among non-medical students 48,4 % (n=15).

Conclusion: The results show a statistically significant difference in use of antibiotics without prescription among medical and non-medical students. Non-medical students resort more antibiotics self-medication what can be attributed to the insufficient information about antibiotics, their treatment, adverse effects and antibiotic resistance.

Keywords: antibiotics, self-medication, students.

STAVOVI I INFORMISANOST STUDENATA MEDICINE U VEZI SA FARMAKOTERAPIJOM RETKIH BOLESTI U SRBIJI

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Uvod: Prema podacima iz zemalja EU, retkom bolešću smatramo onu koja se javlja učestalošću od 1/2000 ljudi u nekoj populaciji. Najveći broj ovih bolesti su hroničnog i progresivnog toka čija je najčešća posledica - trajni invaliditet. Oboleli od retkih bolesti suočavaju se sa brojnim problemima od kojih najčešće navode: nedovoljnu informisanost javnosti o ovim bolestima, nepostojanje odgovarajuće dijagnostike, nepostojanje registra obolelih u Srbiji, ali i brojne socijalne posledice.

Cilj rada: Ispitivanje stepena informisanosti, kao i stavova studenata medicine III i VI godine u odnosu na problematiku lečenja retkih bolesti u našoj sredini.

Materijal i metode: U studiji preseka anketirane su dve grupe studenata: poseban upitnik je popunilo 350 od 446 studenata III godine i 242 od 517 studenata VI godine.

Rezultati: Studenti VI godine ocenili su da su više informisani u vezi sa problematikom lečenja retkih bolesti nego student III godine. Obe grupe studenata navode obavezne predmete na fakultetu kao glavni izvor informacija. Ispitanici se slažu da su najveći problemi obolelih: visoke cene lekova, komplikovane procedure oko njihove nabavke i nedovoljna informisanost javnosti. Obe grupe studenata smatraju da je položaj obolelih u Srbiji prilično težak. Takođe, studenti, bez uzajamnih razlika, smatraju da je za poboljšanje dostupnosti lekova za retke bolesti najvažnije veće angažovanje države. Konačno, farmakoterapija retkih bolesti u našoj zemlji može se unaprediti: formiranjem Nacionalnog programa zbrinjavanja, registrovanjem većeg broja lekova i pojednostavljivanjem procedura nabavke lekova.

Zaključak: Potrebno je unaprediti informisanost studenata medicine na našem fakultetu po pitanju problematike farmakoterapije retkih bolesti.

Ključne reči: retke bolesti, stavovi, informisanost, lekovi.

AWARENESS AND ATTITUDES OF MEDICAL STUDENTS IN CONNECTION WITH PHARMACOTHERAPY OF RARE DISEASES IN SERBIA

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Introduction: According to the EU, a rare disease, consider one that occurs incidence of 1/2000 people in a population. People with rare disease face many problems of which most often cited: lack of public awareness about these diseases, lack of proper diagnosis, absence of a register of patients in Serbia, but also its social consequences.

The Aim: We aimed to assess knowledge and attitudes of 3rd and 6th year medical students towards the issue of treatment of rare diseases in our community.

Material and methods: In this cross-section study, two samples of students were questioned: a self-completed questionnaire was delivered to 350 out of 446 students of the 3rd year and 242 out of 517 students of the 6th year.

Results: Sixth year students estimated that they were more informed on the bioethical issue analyzed than the 3rd year students. Both groups indicated core curriculum subjects as the main source of information on the rare diseases. Our participants agreed that the most important problems are the following: high prices of drugs, complicated procedures of drug provision, and lack of public information. Students find that greater involvement of state is needed for improving the availability of drugs for diseases. In order to improve pharmacotherapy of rare diseases in our country, participants suggested the establishment of the National Plan for Rare Diseases and simplified procedures for drug provision.

Conclusion: It is necessary to improve knowledge and attitudes of our medical students towards pharma cotherapy of rare diseases.

Keywords: rare diseases, attitudes, knowledge.

LIPODISTROFIJA POVEZANA SA PRIMENOM VISOKOAKTIVNE ANTIRETROVIRUSNE TERAPIJE KOD PACIJENATA SA HIV INFEKCIJOM

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Uvod: Visoko-aktivna antiretrovirusna terapija (*highly-active antiretroviral therapy*, HAART) podrazumeva kombinaciju lekova iz grupe inhibitora proteaza (PI), nukleozidnih inhibitora reverzne transkriptaze (NIRT) ili nenukleozidnih inhibitora reverzne transkriptaze (NNIRT). Pored svojih prednosti, HAART može dovesti do pojave lipodistrofije kod pacijenata sa HIV-infekcijom. Lipodistrofiju karakteriše visceralno nagomilavanje masnog tkiva u omentumu, mezenterijumu, retroperitoneumu i karlici i gubitkom masnog tkiva ekstremiteta i lica.

Cilj: Cilj istraživanja je da kod pacijenata sa HIV-infekcijom lečenih HAART-om odredimo učestalost lipodistrofije.

Materijal i metode: Retrospektivnom studijom su obuhvaćeni pacijenti sa HIV-om, koji su u periodu od 01.10.2001 do 01.11.2010. započeli terapiju, lečeni u Centru za HIV/AIDS Instituta za infektivne i tropske bolesti u Beogradu. Univarijantnom i multivarijantnom logističkom regresionom analizom je određivan relativni rizik (RR) za pojavu lipodistrofije, dok je za procenu rizika za pojavu lipodistrofije tokom vremena korišćena Kaplan-Meirova analiza.

Rezultati: Od 840 pacijenata, lipodistrofiju je imalo 580 (69.1%) pacijenata. Lekovi iz grupe NIRT 19.3 puta povećavaju RR za pojavu lipodistrofije (RR 19.5; 95%IP 7.8-48.1; p=0.001), dok PI imaju RR od 2.1 (RR 2.1; 95%IP 1.2-3.3; p=0.001), a NNIRT RR od 5.9 (RR 5.9; 95%IP 3.7-9.6; p=0.001). Verovatnoća da će se lipodistrofija razviti posle 12.5 godina lečenja je 100%. Kada su pacijenti svrstani prema NIRT koje su uzimali, oni lečeni stavudinom bili su u 15.3 puta većem RR da razviju lipodistrofiju, dok su pacijenti lečeni lamivudinom imali su najmanji RR za pojavu LD.

Zaključak: Postaje jasnije da koncept HAART terapije nije podesan za dugotrajnu primenu, jer dovodi do razvoja lipodistrofije.

Ključne reči: HIV, HAART, lipodistrofija.

LIPODISTROPHY INDUCED BY HIGHLY ANTIRETROVIRAL THERAPY IN HIV INFECTED PATIENTS

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Introduction: Highly active antiretroviral therapy (HAART) contains combination of different antiretroviral drugs, such as protease inhibitors (PIs), nucleoside reverse transcriptase inhibitors (NRTIs) and nonnucleoside reverse transcriptase inhibitors (NNRTIs). HAART may develop lipodistropy characterised by visceral accumulation of the adipose tissue in the omentum, mesenterium, retroperitoneum, pelvis and/or loss of adipose tissue of extremities and face.

The Aim: The goal of this study is to determine frequency of developing lipodistropy in HIV-infected patients treated with HAART.

Material and Methods: Retrospective studies consider patients with HIV, started HAART therapy between 1.10.2001-1.11.2010 at the Institute of Infectious and Tropical Diseases, Belgrade. Relative risk (RR) for developing lipodistropy was determined by univariate and stepwise multivariate logistic regression analysis, while for risk assessment of lipodistropy over time was used Kaplan-Meier analysis.

Results: In 580 (69.2%) patients out of 840 lipodistropy was recorded, NIRTs increase the RR for developing lipodistropy (RR 19.5; 95%IP 7.8-48.1; p=0.001), as well as PIs (RR 2.1; 95%IP 1.2-3.3; p=0.001) and NNIRTs (RR 5.9; 95%IP 3.7-9.6; p=0.001). The risk assessment for developing lipodistropy odd of LD further developing in the next 12.5 years of therapy was 100%. Identifying patients by NIRT regimen, those who were treated with stavudine had 15.3 times higher risk for developing lipodistropy. In contrast lamivudine has no impact on developing lipodistropy.

Conclusion: It is becoming more clear that modern concept of HAART therapy isn't adequate for a long-term treatment, as lipodistropy could appear as a side effect of HAART.

Key Words: HAART, HIV, lipodistropy.

STAVOVI I INFORMISANOST LEKARA I PACIJENATA O NEŽELJENIM REAKCIJAMA NA LEKOVE

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Uvod: Procena rizika od neželjenih reakcija na lekove je važan faktor u sistemu praćenja bezbednosti lekova.

Cilj: Ispitivanje znanja i stavova odabranog uzorka lekara i pacijenata u odnosu na rizik od primene lekova.

Materijal i metode: U studiji preseka anketirani su lekari zaposleni u Zavodu za zaštitu zdravlja studenata u Beogradu, kao i pacijenti koji se ambulantno leče u ovoj ustanovi tokom jedne nedelje. Uпитnik su popunili 20 od 22 lekara (91%) i 250 od 260 pacijenata (96%).

Rezultati: Prema očekivanju, lekari i farmakološki edukovani pacijenti (studenti medicinske grupacije koji su pohađali Farmakologiju) smatrali su da su bolje informisani o neželjenim reakcijama na lekove (NRL) od ostalih ispitanika ($P < 0,01$). Svi ispitanici smatrali su da je rizik od NRL za lekove koji se propisuju na recept nizak, a da je samomedikacija veoma rizična. Lekari su najrizičnijim smatrali antikoagulanse (medijana 7,5, skala 1-10; interkvartilni opseg 3,75-8), a pacijenti antidepressive, anksiolitike i hipnotike (medijana 8, svi). Bezbednost lekova visoko je rangirana od strane svih ispitanika kao motiv za izbor terapije (medijana 8-10, svi).

Zaključak: Potrebno je poboljšati informisanost lekara i pacijenata o neželjenim reakcijama na lekove, a posebno omogućiti zdravstvenim radnicima stalni kontakt sa službama za prijavljivanje neželjenih reakcija.

Ključne reči: bezbednost lekova, stavovi lekara i pacijenata, svest o riziku od neželjenih reakcija na lekove

ATTITUDES AND KNOWLEDGE OF MEDICAL DOCTORS AND PATIENTS REGARDING DRUG SAFETY RISK

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Introduction: The assessment of the adverse drug reactions (ADRs) risk is important factor in drug safety monitoring system.

Aim: To assess the knowledge and attitudes of medical doctors and patients regarding drug safety risk.

Material and Methods: In this cross-section study, samples of medical doctors (MDs) and patients from the Belgrade Student Medical Center were questioned on ADRs: a self-completed questionnaire was delivered to 22 out of 20 MDs, and 250 out of 260 patients (91% and 96%, respectively).

Results: As expected, medical doctors and pharmacologically educated patients (medical students who attended Pharmacology course) are considered to be better informed about ADRs than other participants ($P < 0.01$). Prescription drugs were ranked as less dangerous than self-medication by all participants. Anticoagulants were considered the most dangerous drugs by MDs (median 7.5, scale 1-10, interquartile range 3.75 to 8), and antidepressants, anxiolytics and hypnotics by patients (median 8, all). Information about drug safety significantly influenced the choice of therapy by both MDs and patients (median 8-10, all).

Conclusion: It is necessary to improve the awareness of doctors and patients about adverse drug reactions, and to establish ongoing contact between health workers and agencies for reporting adverse reactions.

Keywords: adverse drug reactions, attitudes safety of drugs, attitudes of doctors and patients, awareness of the risk of adverse drug reactions

INFORMISANOST STUDENATA MEDICINE O VRSTAMA I NAČINU PRIMENE KONTRACEPCIJE SA POSEBNIM OSVRTOM NA POZNAVANJE UPOTREBE ORALNIH KONTRACETIVA

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Uvod. Kontracepcija podrazumeva mere za sprečavanje neželjene trudnoće. Hormonska kontracepcija je vid zaštite gde se koristi kombinacija polnih hormona. Ovaj metod je veoma efikasan i jedan od najsigurnijih. Problem koji se tiče oralne kontracepcije (ORK) predstavlja slaba informisanost ljudi o načinu upotrebe, kao i neželjenim efektima.

Cilj. Cilj rada bio je da se ispita informisanost studenata četvrte godine o načinu korišćenja ORK, kao i da se ispita njihovi stavovi, verovanja i zablude vezane za kontraceptivne metode.

Materijal i Metode. Istraživanje je sprovedeno na Medicinskom fakultetu u Beogradu. Prikupljanje podataka je izvršeno putem validiranog upitnika. Anketirani su slučajno odabrani studenti četvrte godine, koji su nastavu iz farmakologije slušali na prethodnoj godini studija. Ukupno je anketirano 150 studenata, i to 100 ženskog i 50 muškog pola.

Rezultati. Oko polovine ispitanih studenata redovno koristi zaštitu, povremeno 15.33%, dok je ne koristi 34%.

Rezultatima je pokazano da zaštitu koriste češće oni koji poznaju barem jedan njen vid, a da samo 9.34% ne poznaje ni jednu vrstu niti je koristi. Kod oba pola najzastupljeniji je mehanički vid zaštite, dok se žene odlučuju i za oralnu kontracepciju.

Zaključak. Znanje anketiranih studenata je solidno, ali i dalje nedovoljno. S obzirom da oni predstavljaju osobe koje bi trebalo da prenose znanje o značaju zaštite na opštu populaciju, potrebno je da se njihova informisanost poboljša.

Ključne reči. Oralna kontracepcija, studija, informisanost i znanje o kontracepciji, studenti medicine.

MEDICAL STUDENTS AWARENESS ABOUT CATEGORIES AND THE USE OF CONTRACEPTION WITH SPECIAL REVIEW ON KNOWLEDGE HOW TO USE ORAL CONTRACEPTIVES

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Introduction. Contraception involves a set of measures to prevent unwanted pregnancy. Hormonal contraception is a form of protection where a combination of sex hormones is used. This method is very efficient and one of the safest. The problem concerning oral contraceptives is low awareness about the use and their adverse effects.

The aim. The aim of this study was to examine the level of fourth year students about the usage of oral contraceptives, and to examine the attitudes, beliefs and misconceptions regarding protection.

Materials and Methods. The study was conducted at the Medical Faculty University of Belgrade. Data collection was performed using a validated questionnaire. All of those polled were randomly selected from the fourth year, who attended pharmacology lectures in a previous academic year. A total of 150 students were included in study, 100 females and 50 males.

Results. About half of surveyed students regularly use protection, 15.33% use occasionally, while 34% doesn't use any. Obtained results show that contraceptives are used more frequently by those who knew at least one of its kinds, and that only 9.34% doesn't know any type of protection nor uses one. The most frequent protection method in both sexes is mechanical, while women opt for oral contraception, as well.

Conclusion. Knowledge of surveyed students was solid, but still insufficient. Since they are people who are supposed to convey knowledge about the importance of oral contraception to general population, it is necessary to improve their knowledge.

Key words. Oral contraception, survey, awareness and knowledge about contraception, medical students.

NEŽELJENA DEJSTVA UZROKOVANA GLIKOKORTIKOIDIMA KOD DECE OBOLELE OD AKUTNE LIMFOBLASTNE LEUKEMIJE

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Uvod: Terapija konsolidacije akutne limfoblastne leukemije (ALL), obuhvata primenu visokih doza glikokortikoida (prednizona i deksametazona), koji zbog svog suprimirajućeg delovanja na limfocite, značajno povećavaju uspeh terapije.

Cilj: Cilj rada je utvrđivanje podnošenja visokih doza prednizona i deksametazona kod dece obolele od ALL, kao i strukturu i intenzitet neželjenih reakcija koje su se javile.

Materijal i metode: U prospektivnom ispitivanju, analizirane su istorije bolesti dece obolele od ALL koja su primljena na lečenje na Klinici za hematologiju, od decembra 2010. godine do jula 2011. godine. Ispitivanje je obuhvatilo 5 pacijenata, uzrasta od 2 do 9 godina.

Rezultati: Hiperglikemija se javila kod 4 pacijenta lečenih prednizonom i svih 5 pacijenata lečenih deksametazonom. U jednom slučaju za regulisanje glikemije je primenjen insulin. Hipertenzija se javila kod 3 pacijenta lečenih prednizonom i 2 pacijenta lečenih deksametazonom. Kod 2 pacijenta je bilo neophodno primeniti antihipertenzive za regulisanje krvnog pritiska. Hipokalijemija i hipokalcijemija su bile izraženije posle primene prednizona u odnosu na deksametazon. Terapija deksametazonom je izazvala povećanje nivoa aspartat i alanin aminotransferaze, dok je primena prednizona izazvala samo povišenje nivoa aspartat aminotransferaze. Deksametazon je izazvao depresivno ponašanje, a potom agitiranost kod dva pacijenta.

Zaključak: Neželjena delovanja deksametazona i prednizona, primenjenih u visokim dozama kod dece obolele od ALL su poznata i očekivana. Zabeležene neželjene reakcije su se najčešće povlačile spontano, po prestanku primene lekova ili posle kratkotrajne terapije nastalih neželjenih delovanja.

Ključne reči: prednizon, deksametazon, ALL, neželjena delovanja, deca

SIDE EFFECTS CAUSED WITH GLUCOCORTICOIDES IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Introduction: Consolidation therapy of acute lymphoblastic leukemia (ALL) includes the use of high doses of glucocorticoids (prednisone and dexamethasone), whose adverse effects may affect the quality of life of treated patients.

Aim: The aim of the study was to determine tolerability of high doses of prednisone and dexamethasone in children with ALL and the structure and the intensity of adverse effects, occurred following these medicines.

Material and methods: In a prospective study, histories of disease of the children with ALL treated on the Clinic of Hematology, since December 2010. until July 2011., were analyzed. This study includes 5 patients, aged from 2 to 9 years.

Results: Hyperglycemia appeared in 4 patients treated with prednisone and in all patients treated with dexamethasone. In 1 case for the treatment of hyperglycaemia, insulin was used. Hypertension appeared in 3 patients treated with prednisone and in 2 patients treated with dexamethasone. In two cases, antihypertensives were needed for regulation of blood pressure. Hypopotassemia and hypocalcaemia were significantly more expressed after the use of prednisone in comparison to dexamethasone. The dexamethasone's treatment increased the activity of both, alanine and aspartate aminotransferase in serum, while prednisone increased the activity of aspartate aminotransferase only. In two patients, the treatment with dexamethasone caused depressive behavior, followed by agitation.

Conclusion: Dexamethasone and prednisone, administered in high doses in children with ALL were not followed by serious, life-threatening adverse effects. Adverse reaction that have occurred were known and often disappeared spontaneously after glucocorticoides therapy.

Key words: prednisone, dexamethasone, ALL, adverse effects, children

UPOTREBA ACE INHIBITORA U SRBIJI U 2009. I 2010. GODINI

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Uvod: Kardiovaskularne bolesti predstavljaju najčešći uzrok morbiditeta i mortaliteta u svetu. Zbog toga je razumljivo što su lekovi za lečenje kardiovaskularnih oboljenja najviše korišćena grupa lekova, a ACE inhibitori zauzimaju značajan udeo potrošnje.

Cilj rada: Cilj rada bio je da se analizira potrošnja ACE inhibitora u Srbiji u 2009. i 2010. godini sa farmakoterapijskog i farmakoeonomskog aspekta, kao i da se potrošnja ovih lekova uporedi sa Norveškom.

Materijal i metode: Podaci o upotrebi ACE inhibitora u Srbiji za 2009. i 2010. godinu dobijeni su od Agencije za lekove i medicinska sredstva Srbije.

Rezultati: U Srbiji je upotreba lekova u terapiji hipertenzije koji su svrstani u pet grupa (diuretici, β -blokatori, ACE inhibitori, blokatore kalcijumskih kanala i antagonisti receptora angiotenzina) bila neujednačena, pri čemu je potrošnja ACE inhibitora bila dominantna. Nasuprot ovoj slici u Norveškoj je potrošnja lekova u terapiji hipertenzije bila prilično ujednačena. Tokom obe posmatrane godine u Srbiji značajan udeo u potrošnji ACE inhibitora činili su skuplji preparati kao što su fosinopril, cilazapril i kvinapril, međutim u Norveškoj ovi preparati nisu uopšte korišćeni. Da je u Srbiji kao u Norveškoj potrošnja fosinopрила bila svedena na minimum i da je pacijentima umesto njega bio ponuđen enalapril ušteda u Srbiji u 2009. godini samo na ovom preparatu iznosila bi oko 7.800.000,00 €.

Zaključak: Analizirajući potrošnju ACE inhibitora u Srbiji u 2009. i 2010. godini, uočavamo da su ACE inhibitori i njihove fiksne kombinacije sa diureticima najviše korišćeni lekovi u lečenju kardiovaskularnih oboljenja. Farmakoeonomske analize pokazuju da bi se značajna finansijska sredstva uštedela da je potrošnja ACE inhibitora u Srbiji bila kao u Norveškoj.

Ključne reči: farmakoepidemiologija, definisana dnevna doza, kardiovaskularni sistem

USE OF ACE INHIBITORS IN SERBIA IN 2009 AND 2010

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Introduction: Cardiovascular diseases are the most frequent cause of morbidity and mortality in the world. That explains why medications for the treatment of cardiovascular diseases are the most used group of drugs, and ACE inhibitors take a large part in the consumption.

The Aim: The aim of this study was to analyze the consumption of ACE inhibitors in Serbia during 2009 and 2010 from pharmacotherapeutic and pharmacoeconomic aspects, and comparing the consumption in our country with the consumption in Norway.

Material and methods: The data about the use of ACE inhibitors in Serbia in 2009 and 2010 were taken from the Agency for Drugs and Medical Devices of the Republic of Serbia.

Results: In Serbia, the use of drugs in the treatment of hypertension who are divided into five groups (diuretics, β -blockers, ACE inhibitors, calcium channel blockers and angiotensin-II receptor blockers) was very uneven, where the consumption of ACE inhibitors was dominant. Opposed to this condition, the consumption of the antihypertensive drugs was very balanced in Norway. During both analyzed years significant part of consumption of ACE inhibitors was taken by more expensive drugs in Serbia, as fosinopril, cilazapril and quinapril, though they have not been used in Norway at all. If the consumption of fosinopril in Serbia was reduced to a minimum as in Norway, and if the patients were offered enalapril instead, the savings in Serbia in 2009 would have been around 7.800.000,00 € only from this product.

Conclusion: While analysing the consumption of ACE inhibitors in Serbia in 2009 and 2010 year we realise that ACE inhibitors and their fixed combination with diuretics are the most used drugs for treating cardiovascular diseases. Pharmacoeconomic analyses show that large financial resources would be saved if the consumption of ACE inhibitors in Serbia were more similar to the one in Norway.

Keywords: pharmacoepidemiology, defined daily dose, the cardiovascular system

PRAĆENJE NEŽELJENIH DELOVANJA METOTREKSATA KOD DECE OBOLELE OD AKUTNE LIMFOBLASTNE LEUKEMIJE

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Uvod: Terapija akutne limfoblastne leukemije kod dece, prema ALL IC-BMF 2002 protokolu, obuhvata primenu metotreksata, 6-merkaptopurina i lek za detoksikaciju – kalcijum folinat. Danas se 80% dece sa ovim oboljenjem izleči, međutim rezistencija na primenjenu terapiju i njeni toksični efekti i dalje predstavljaju ozbiljan klinički problem.

Cilj: Cilj rada bio je praćenje podnošenja metotreksata primenjenog u ciklusima tokom trajanja protokola i uloga folne kiseline u sprečavanju težih neželjenih delovanja.

Materijal i metode: Neželjena delovanja su praćena po modifikovanom obrascu za praćenje akutne toksičnosti terapije. Istraživanjem su obuhvaćena deca standardnog i intermedijarnog rizika koja su u periodu od jula 2010. do februara 2012. godine zbog terapije konsolidacije bila hospitalizovana na Institutu za zdravstvenu zaštitu dece i omladine Vojvodine u Novom Sadu.

Rezultati: Najčešće neželjeno delovanje koje se javilo kod 10 pacijenata uključenih u istraživanje je depresija kostne srži. Metotreksat je izazvao trombocitopeniju kod 6 pacijenata, ali se 24 časa posle primene folne kiseline broj trombocita vraćao u okvire normalnih vrednosti. Leukopenija je bila prisutna kod svih 10 pacijenata, a broj leukocita je uravnotežen 14 dana posle primene folne kiseline. Tokom ispitivanja utvrđena su manje učestala neželjena delovanja: povećanje aktivnosti transaminaza u serumu, stanje febrilnosti, bronhopneumonija, dijareja sa blagim grčevima i hiperkalcemija.

Zaključak: Primena kalcijum folinata, sprečila je pojavu težih neželjenih delovanja srednje visokih doza metotreksata. Zabeležena neželjena delovanja su bila blagoga do umerenog intenziteta, reverzibilna i nisu značajnije remetila kvalitet lečenih pacijenata.

Ključne reči: akutna limfoblastna leukemija (ALL), metotreksat (MTX).

MONITORING OF SIDE EFFECTS OF METHOTREXATE IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Introduction: The treatment of acute lymphoblastic leukemia in children according to the protocol ALL IC BMF-2002, includes the application of methotrexate and 6-mercaptopurine and drug detoxification - calcium folinate. 80% of children with this disease is cured, but resistance to the therapy and its toxic effects remain as serious clinical problem.

Aim: Monitoring of methotrexate applied in cycles during the protocol and the role of folic acid in preventing serious adverse effects.

Material and methods: Side effects were followed by a modified form of monitoring of acute toxicity of therapy. The research included children with standard or intermediate risk that during the period from July 2010. to February 2011. due to consolidation therapy were hospitalized at the Institute for Health Protection of Children and Youth of Vojvodina in Novi Sad.

Results: The most frequent side effect in ten patients involved in research is bone marrow depression. Methotrexate has caused thrombocytopenia in 6 patients, but 24 hours after the use of folic acid, platelet count returned to normal value. Leukopenia was present in all 10 patients, a leukocyte count is balanced 14 days after treatment with folic acid. Less frequent side effects: an increase serum transaminase activities, the state of fever, bronchopneumonia, diarrhea and hypercalcemia.

Conclusion: Application of calcium folinate prevented the occurrence of serious adverse effects of high doses of methotrexate. Observed adverse effects were mild to moderate intensity, reversible and did not significantly disturb the quality of treated patients.

Key words: acute lymphoblastic leukemia (ALL), methotrexate (MTX).

UPOTREBA LEKOVA U TERAPIJI POREMEĆAJA FUNKCIJE ŠTITNE ŽLEZDE U TRUDNOĆI

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Uvod: U poslednje vreme utvrđeno je da zagađenje životne sredine značajno utiče na funkciju štitne žlezde. Od zagađujućih supstanci kao rezultat konfliktnih situacija na području Zapadnog Balkana, značajno mesto zauzimaju polihlorovani bifenili koji kod životinja i ljudi smanjuju nivo tiroksina, kao i osiromašeni uranijum koji deluje imunomodulatorno.

Cilj: Cilj rada bio je da se odredi trend upotrebe lekova u terapiji hipotireoidizma i hipertireoidizma tokom trudnoće na teritoriji grada Novog Sada anketiranjem porodilja na Zavodu za perinatologiju, Odeljenju za puerperijum, Klinike za Ginekologiju i akušerstvo Kliničkog centra Vojvodine, u periodu od 1988. godine do 2011. godine.

Materijal i metode: Tokom jednogodišnjeg perioda anketirane su sve porodilje hospitalizovane na Zavodu za perinatologiju, Odeljenju za puerperijum, Klinike za Ginekologiju i akušerstvo Kliničkog centra Vojvodine 2011. godine, o bolestima štitne žlezde, kao i o tome koji lek i koliko dugo uzimaju u terapiji poremećaja funkcije štitne žlezde. Učestalost upotrebe lekova kod poremećaja funkcije štitne žlezde tokom trudnoće upoređivana je sa ranijim ispitivanjima sprovedenim 1988., 1999. i 2007. godine na teritoriji Novog Sada.

Rezultati: Tokom 1988. i 1999. godine nijedna trudnica nije evidentirana sa poremećajem funkcije štitne žlezde, 2007. godine evidentirane su 4 trudnice, a 2011. godine bilo je 18 trudnica sa poremećajem funkcije štitne žlezde od čega čak 14 sa dijagnozom hipotireoze i to u najvećem broju slučajeva kao autoimuni Hashimoto tireoiditis.

Zaključak: Rezultati našeg rada ukazuju na neophodnost sprovođenja detaljnije analize povezanosti, učestalosti poremećaja funkcije štitne žlezde i uticaja zagađivača životne sredine.

Ključne reči: hipotireoza, levotiroksin, farmakoepidemiologija, trudnoća, zagađenje životne sredine

UTILIZATION OF DRUGS FOR THE TREATMENT OF THYROID DYSFUNCTION IN PREGNANCY

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Introduction: Recently it has been confirmed that the pollution of our environment significantly influences the function of thyroid gland. As a result of conflict situations in the West Balkans there are significant polluting substances such as polychlorinated biphenyls, which lower the level of thyroxine in animals and people. Also, depleted uranium like polychlorinated biphenyls modify the immune system.

The Aim: The objective of this research was to determine the trend of utilization of drugs in the treatment of thyroid dysfunction during pregnancy on the city of Novi Sad territory by surveying women who just gave birth in Institute of perinatologist, Department of puerperium, Clinic of Gynecology and Obstetrics, Clinical Centre of Vojvodina, in period from 1988 to 2011.

Materials and methods: During one month period all women who just gave birth and were hospitalized were surveyed about hypothyroidism diseases as well as what medicine they took and how long were they taking it in therapy. The survey took place in Institute of perinatologist, Department of puerperium, Clinic of Gynecology and Obstetrics, Clinical Centre of Vojvodina. Frequency of utilization of drugs in the treatment of thyroid dysfunction during pregnancy was compared with earlier surveys and research conducted in 1988, 1999 and 2007 on the territory of Novi Sad.

Results: In 1988 and 1999 not a single pregnant woman was recorded with thyroid dysfunction. However in 2007 four women were recorded with thyroid dysfunction and in 2011 there were 18 of them. Fourteen out of 18 were with hypothyroidism and in most cases it was diagnosed as autoimmune Hashimoto thyroiditis.

Conclusion: The results of our research indicate that it is necessary to conduct more detailed analyses the relationship between the frequency of the thyroid gland dysfunction and the influence of environmental pollution.

Key words: hypothyroidism, levothyroxine, pharmacoepidemiology, pregnancy, environmental pollution

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Uvod : Svaka zemlja je u obavezi da organizuje sistem praćenja bezbednosti lekova u prometu, koji bi omogućio identifikovanje neželjenih dejstava i njihovu evaluaciju. U današnje vreme, kada su ljudi skloni samomedikaciji, raste značaj prijavljivanja neželjenih reakcija lekova od strane farmaceuta, jer su oni ti koji izdaju lek i kojima se pacijent prvo obrati.

Cilj : Cilj ovog rada je da se aktivnim prikupljanjem podataka o neočekivanim i neželjenim dejstvima lekova, direktnim kontaktom sa farmaceutima i pacijentima, poboljša sistem farmakovigilance u našoj sredini.

Materijal i metode : Podaci o neželjenim dejstvima lekova prikupljeni su u apotekama u Sremskoj Mitrovici. Ukupno 10 apoteka je kontaktirano u istraživanju, od toga 8 privatnih i 2 državne. U periodu od 15.11.2011-15.12.2011. godine farmaceuti su beležili slučajeve neželjenih reakcija na lekove u apotekama. U periodu od 15.12.2011-10.02.2012. godine u 4 apoteke farmaceuti su dodatno informisali pacijente o neželjenim i neočekivanim reakcijama na lekove.

Rezultati : U prvih mesec dana, iz svih apoteka koje su bile uključene u istraživanje, prikupljeno je 6 slučajeva neželjenih reakcija na lek. Nakon toga, kada su u 4 apoteke pacijenti bili dodatno informisani o značaju prijavljivanja neželjenih reakcija na lekove, u periodu od 2 meseca je prikupljeno 28 slučajeva.

Zaključak : Direktnom komunikacijom sa farmaceutima se značajno popravila sistem prijavljivanja neželjenih i neočekivanih reakcija na lekove.

Кључне речи : Neželjena dejstva, farmaceuti, prijava.

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Увод: Поштовање прописаног режима примене лекова је често мање од оптималног, нарочито код хроничних обољења каква је и хронична опструктивна болест плућа-ХОБП. Упркос напорима Глобалне иницијативе за хроничну опструктивну болест плућа (ГОЛД), да обезбеди што боље терапијске смернице, придржавање прописаној терапији је лоше.

Циљ истраживања: Основни циљеви овог истраживања били су да се испита медикаментна комплијанса код оболелих од ХОБП, и да се анализира разлика у степену придржавања прописаној пулмолошкој терапији у односу на поједине варијабле.

Материјал и методе: У студији пресека спроведеној у периоду од маја до августа 2011. у Центру за плућне болести Клиничког центра Крагујевац било је укључено 154 пацијента са ХОБП, са различитом тежином болести. Комплијанса је процењивана на основу упитника о комплијанси- Morisky scale.

Резултати: Од 154 пацијента који су учествовали у истраживању, њих 98 (63,6%) се показало добрим комплајерима, а 56 (36,4%) лошим. Степен образовања се показао као значајан фактор придржавања терапији ($p=0.021$). Корелациона анализа је показала да: што је број придружених болести већи, то је пацијент лошији комплајер ($r=0.315^{**}$, $p=0.000$); што је већи број прописаних пулмолошких лекова то је комплијанса лошија ($r=0.199^{*}$, $p=0.013$); укупан број лекова прописаних пацијенту је у корелацији са вредношћу скора комплијансе ($r=0.212^{**}$, $p=0.008$); и да је вредност спирометријског параметра FVC (%) у значајној корелацији са комплијансом пацијената ($r=0.219^{*}$, $p=0.036$).

Закључак: С обзиром да је ХОБП хронична болест, а комплијанса пацијената лоша требало би спровести више едукативних програма како би пацијенти били боље упознати са природом своје болести, са значајом редовне и правилне примене лекова. С обзиром да су у питању углавном инхалаторни лекови требало би више пажње обратити на технику примене лека и стално пацијентима понављати инструкције на њима «блиском језику», увести помоћне методе и уређаје за комплијансу, као што су подсетници за дозу, кутије за пилуле.

Кључне речи: комплијанса, ХОБП, пулмолошка терапија.

REPORTING AND COLLECTING OF SIDE EFFECTS OF DRUGS BY PHARMACISTS

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Introduction: Every country has an obligation to organize a system of monitoring drug safety in traffic, which should enable identification of side effects and their evaluation. Nowadays, when more and more people tend to self-medicate, the importance of reporting side effects by pharmacists is increasing, because they are the ones who prescribe the drug and where the patient is first addressed.

The Aim : The aim of this study was to improve the system of pharmacovigilance in our country by active collecting of data on unexpected and side effects of drugs, in direct contact with patients and pharmacist

Materials and Methods: Data on side effects of drugs were collected in pharmacies in Sremska Mitrovica. 10 pharmacies participated in the research, of which 8 were private and 2 state. In the period from 15.11.2011-15.12.2011. pharmacists were collecting cases of adverse reactions to medicines. From 15.12.2011-10.02.2012. in four pharmacies pharmacists further informed patients about side and unexpected reactions to medicines.

Results: In the first month, from the pharmacies that were included in the study, has been collected 6 cases of side effects of drugs. After that, when in the four pharmacies the patients were further informed about the importance of reporting adverse reactions to medicines, within 2 months, 28 cases were collected.

Conclusion: Direct communication with pharmacists can significantly improve the system of reporting side and unexpected reactions to medicines.

Key words: Side effects, pharmacists, report.

MEDICATION COMPLIANCE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

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Background: Compliance with prescribed medication regimes is often less than optimal, especially in chronic diseases such as the Chronic obstructive pulmonary disease- COPD. Despite the efforts of the Global Initiative for Chronic Obstructive Lung Disease (GOLD), to provide a better therapeutic guidelines, adherence to prescribed therapy is bad.

The aim of the research: The main objectives of this study were to examine the medication compliance in patients with COPD, and to analyze the differences in the degree of adherence to prescribed pulmonary therapy in relation to certain variables.

Material and methods: In a study conducted between May and August 2010. at the Center for Pulmonary Diseases, Clinical Center Kragujevac, 154 patients with COPD were included, with varying severity of the disease. Compliance was assessed on the basis of the questionnaire-Morisky adherence scale.

Results: Of 154 patients who participated in the study, 98 of them (63.6%) showed good compliance, and 56 (36.4%) poor. The level of education has been proved to be a significant factor in adherence to therapy ($p=0.021$).

Correlation analysis showed that: the higher the number of comorbidities, the patient had worse compliance ($r=0.315^{**}$, $p=0.000$), the higher the number of prescribed pulmonary medication, the compliance was worse ($r=0.199^{*}$, $p=0.013$); total number of drugs prescribed to the patient is correlated with the value of compliance ($r=0.212^{**}$, $p=0.008$), and that the value of spirometric parameters FVC (%) is significantly correlated with patient compliance ($r=0.219^{*}$, $p=0.036$).

Conclusion: Considering that COPD is a chronic disease, and patients have poor compliance, more training programs should conduct so that patients would be better informed about the nature of illness, the importance of regular and proper use of medicines. Given that these are generally inhaled drugs more attention should be paid to the technique of administration and constantly repeating instructions to the patients in "language they can understand", and also to introduce auxiliary methods and devices for compliance, such as reminders for dose, pill boxes ..

Keywords: compliance, COPD, pulmonary therapy.

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Увод: Астма је хронична, инфламаторна болест дисајних путева која ограничава физичко, емоционално и социјално стање пацијената. Квалитет живота је нов показатељ праћења тока болести.

Циљ: Циљ истраживања је да покаже да ли астма утиче на смањење квалитета живота код пацијената. Показаће и који су фактори ризика који доприносе лошијем квалитету живота и у којој мери квалитет живота корелира са параметрима плућне функције и степеном тежине астме. Испитаће се и да ли постоји разлика у квалитету живота асматицара у односу на терапију.

Материјал и метод: У студији је учествовало 70 оболелих пацијената који се лече на одељењу за плућне болести, Клиничког центра у Крагујевцу. За мерење квалитета живота коришћен је специфични упитник за болест астме, The asthma quality life questionnaire. Сви пацијенти давали су и одговоре на питања везана за демографске податке, податке из анамнезе, као и о тренутној терапији коју користе. Свим пацијентима спирометријским тестом испитана је плућна функција.

Резултат: Добијени скор квалитета живота је 4,21. Највеће ограничење постојало је у области изложености стимулансима спољашњег окружења, а најмање на емоционалном статусу пацијената. Доказано је да старији пацијенти, пацијенти који користе више лекова, пацијенти који су имали већи број хоспитализација, већи број погоршања и придружене болести имају и лошији квалитет живота. Историја пушења и трајање болести није утицало на квалитет живота. Сви параметри плућне функције су корелирали са квалитетом живота, осим Tiffno-овог индекса.

Закључак: Студијом смо показали да астма умањује све аспекте квалитета живота. Доказали смо да параметри плућне функције корелирају са квалитетом живота. Показали смо и које су то карактеристике болесника или болести које утичу на квалитет живота.

Кључне речи: астма, квалитет живота, AQLQ упитник.

QUALITY OF LIFE IN PATIENTS WITH ASTHMA

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Background: Asthma is a chronic, inflammatory disease of the airways that restricts the physical, emotional and social well-being. Quality of life is a new indicator for monitoring the disease.

Aim: The aim of this research was to show whether asthma affects the reduction of quality of life. Also it shows which risk factors contribute to poorer quality of life, to what extent the quality of life correlates with lung function parameters and degree of severity of asthma, but also examines whether there is a difference in the quality of life in relation to therapy.

Materials and Methods: The study comprised 70 patients who are treated at the Department of Pulmonary Diseases. For the measurement of quality of life questionnaire was used for a specific disease of asthma, the Asthma Quality of Life Questionnaire. All patients gave answers to questions related to demographic data, data from medical history and the current therapy. All patients tested for spirometric tests and lung function.

Result: Score obtained by the quality of life was 4.21. The biggest limitation existed in the area of exposure to external environmental stimuli, while the least affected by asthma in patients' emotional status. It has been shown that older patients, patients who use multiple drugs, patients who have had more hospitalizations, more worsening of the disease and associated disorders have a poorer quality of life. History of smoking and duration of illness did not affect the quality of life. All lung function parameters were correlated with the quality of life, except Tiffneau's index.

Conclusion: The study we have shown that asthma is reduced all aspects of quality of life. We have shown that lung function parameters correlated with the quality of life. We have shown and what are the characteristics of the patients or diseases that affect the quality of life.

Key words: asthma, quality of life, AQLQ questionnaire.

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Увод: **Грип** или **инфлуенца** је веома заразна болест, која се најчешће карактерише кратком инкубацијом, тешким поремећајима општег стања (температура, главобоља, грозница, бол у мишићима и зглобовима, губитак апетита и општа слабост тела) уз слабије изражене поремећаје горњих **респираторних путева** (суви кашаљ, зачепљен нос).

Материјал и метод: Испитана је 343 становника града Крагујевца методом случајног избора који су одговорили на питања формулисана упитником. 148 (43,15%) испитаника (60,14% женског пола и 39,86% мушког пола, старости од 11 до 67 година) потврдило је да су имали симптоме грипа у претходних месец дана. Они су одговорили на питања која се тичу лекова које су користили (назив лека, фармаколошки активне супстанце и број милиграма, прописана доза). Одговорили су и у којој мери су им лекови помогли, да ли им је лек прописао лекар, препоручио фармацеут или су лек узели по сопственом нахођењу.

Резултати: Сумирањем резултата утврђено је да је највећи број испитаника (62,16%) узимао лекове из групе антипиретика (парацетамол -48,65% испитаника, аспирин- 13,51%). 13,51% испитаника је користило неки антибиотик (из групе пеницилина- 9,46%, из групе цефалоспорина- 4,05%). Од преосталих испитаника, 4,73% пацијената се изјаснило да су користили лекове из групе антитусика, а 6,08% лек из групе аналгетика. 14,9% није користило ниједан лек. Интересантан је податак да је чак 56,76% пацијената узимало лек по сопственом нахођењу, за 33,1% пацијената је лек прописао лекар, а преосталих 10,14% је лек узело по препоруци фармацеута.

Закључак: Велики број становника града Крагујевца лекове узима по сопственом нахођењу, што је забрињавајући податак с обзиром да антипиретици не би требало да се примењују ако је температура испод 39°C јер чак и наизглед безазлени лек као парацетамол оптерећује ензимске системе у јетри, док превентивно узимање антибиотика доводи до могућности настанка резистенције и уништења природне бактеријске флоре човека.

Кључне речи: грип, лекови, Крагујевац.

PHARMACOLOGICAL TREATMENT OF INFLUENZA IN KRAGUJEVAC

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Introduction: Flu or influenza is a highly contagious disease that is usually characterized by a short incubation, severe general symptoms (fever, headache, muscles and joint pain, loss of appetite and general weakness of the body) with a less pronounced disorders of the upper respiratory tract (dry cough, stuffy nose). **Aim:** The aim of this study is to determine which drugs the inhabitants of Kragujevac use to treat influenza

Materials and methods: The study included 343 inhabitants of Kragujevac who were chosen by the method of random selection. They answered the questionnaire. 148 (43,15%) respondents (60.14% female and 39.86% male, aged 11 to 67 years) confirmed that they had flu symptoms in the last month. They responded to questionnaire about the drugs they used (the name of the drug, pharmacologically active substance and the number of milligrams, the prescribed dose). They responded about the extent to which drugs help them. They also answered if their doctor has prescribed the drug, or it was a pharmacist or they took the drug by themselves.

Results Summarizing the results showed that the majority of respondents (62.16%) received treatment from a group of antipyretics (paracetamol -48.65%, aspirin-13.51%). 13.51% of respondents used an antibiotic (the penicillin group -9.46% , cephalosporin group-4.05%). 14.9% did not use any drug, while 4.73% used some antitussive, and 6.08% analgesic. An interesting fact is that even 56.76% of patients took a drug in its sole discretion, 33.1% of patients were prescribed the medicine by the doctor, 10.14% took a drug recommended by pharmacists.

Conclusions: A large population of Kragujevac takes the medication by themselves, which is worrying given that the antipyretics should not be applied if the temperature is below 39 °C because even seemingly harmless drug like paracetamol burdens in the liver enzyme systems, and preventive use of antibiotics leads to the possibility of resistance and destruction of human natural bacterial flora.

Keywords: influenza, drugs, Kragujevac.

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Uvod: Protamin-sulfat je polikationski amin koji se u klinici koristi kod predoziranja heparinom. Za PS je nađeno da ima endotel-zavisni relaksantni efekat na izolovane renalne arterije. Postoji više mehanizama koji mogu biti uključeni u relaksaciju glatkih mišića arterija preko različitih vrsta receptora i signalnih procesa. Ti mehanizmi mogu uključivati K⁺ kanale, Ca²⁺ kanale, ili nekoliko drugih procesa posredovanih receptorima.

Cilj: Cilj rada bio je da se utvrdi relaksantno djelovanje protamin sulfata (PS) na izolovane mezenterične arterije pacova, uloga endotela u ovom procesu, kao i mogućnost antagonizovanja njegovog efekta glibenklamidom i metilenskim plavilom.

Materijal i metode: U istraživanju smo koristili isječke mezenteričnih arterija izolovanih od pacova tipa Wister. Ispitivane mezenterične arterije smo podijelili na grupe sa i bez endotela. Koristili smo glibenklamid i metilensko plavilo da bismo utvrdili ulogu K_{ATP} kanala i cGMP puta kod PS-indukovane relaksacije na izolovane krvne sudove.

Rezultati: Utvrdili smo da je relaksantno djelovanje PS izraženije kod arterija sa endotelom. Takođe glibenklamid je potencirao efekat PS na arterije sa i bez endotela. To ukazuje da glibenklamid može potencirati efekat visokih koncentracija PS (200 – 600 µg/ml). Za razliku od glibenklamida, metilensko plavilo moduliralo je relaksantno djelovanje PS.

Zaključci: Naši rezultati ukazuju da PS prouzrokuje koncentracijski zavisnu relaksaciju izolovanih mezenteričnih arterija pacova. Vaskularni endotel ima važnu ulogu kako u hipertenziji tako i u mehanizmima preko kojih PS ispoljava svoje dejstvo. Inhibicija K_{ATP} kanala glibenklamidom može potencirati efekat PS. Naši rezultati također ukazuju da se relaksantni efekat PS odvija jednim dijelom i preko cGMP puta.

Ključne riječi: Protamin-sulfat, mezenterična arterija, endotel.

DETERMINATING THE ROLE OF PROTAMINE SULFATE ON RELAXATION OF THE ISOLATED MESENTERIC ARTERY OF RATS

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Introduction: Protamine-sulfate is a polycationic amine used clinically to reverse heparin overdose. PS has been found to have an endothelium-dependent relaxing effect on isolated renal arteries. There are several possible mechanisms that could cause this relaxation.

The aim: The aim was to study the relaxing effect of PS on the isolated mesenteric arteries of rats and determine the role of endothelium in these reactions, as well as the role of glibenclamide and methylene blue in antagonizing the effect of PS.

Materials and methods: We used mesenteric arteries isolated from normotensive Wistar rats. The arteries were separated into two groups, with and without endotel. We used glibenclamide and methylene-blue in order to analyze the contribution of K_{ATP} channels and cGMP pathway to the PS-induced inhibition of isolated rats blood vessels.

Results: We found that relaxation effect of PS was more expressed on the arteries with than without endothelium. Also glibenclamide potentiate the relaxant effect of PS on arteries with and without endothelium. That suggests that glibenclamide can potentiate the effect of higher concentrations of PS (200 – 600 µg/ml). In addition methylene-blue modulated the relaxant effect of PS.

Conclusions: Our results show concentration dependent relaxation of isolated mesenteric arteries of rats caused by PS. Vascular endothelium has a significant role in hypertension and also play a role in mechanism of action of PS. Inhibition of KATP channels with glibenclamide may potentiate relaxant effect of PS. Our results also indicate that relaxant effect of PS partially express via cGMP pathway.

Keywords: Protamine-sulfate, mesenteric artery, endotel.

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Uvod: Bradikinin pripada grupi kinina, endogenih vazoaktivnih polipeptida, koji svoja dejstva ispoljavaju i u regulaciji krvnog pritiska, dovodeći do vazodilatacije i hipotenzije. Takođe je pokazano i njihovo vazokonstriktorno dejstvo.

Cilj: Cilj ovog rada je bio ispitati dejstvo bradikinin na izolovanoj femoralnoj arteriji pacova i utvrditi da li integritet endotela, produkti ciklooksigenaze, voltažni Ca²⁺ kanali i Na⁺/K⁺-ATPaza imaju ulogu u vaskularnom odgovoru na ispitivani kinin.

Materijal i metode: Krvni sudovi su izolovani iz mužjaka soja Wistar pacova, gde je endotel bio mehanički uklanjan na pojedinim preparatima. Preparati su potom uranjeni u kupatilo za izolovane organe ispunjeno Krebs-Ringer-bikarbonatnim rastvorom. Koncentracijski-zavisni efekat bradikinin na krvne sudove dobijen je kumulativnim postupkom dodavanjem njegovih rastućih koncentracija na prstenastim segmentima ekvilibriranim na nivou bazalnog tonusa.

Rezultati: Bradikinin je prouzrokovao koncentracijski-zavisnu kontrakciju, koja je bila redukovana nakon uklanjanja endotela. Indometacin (inhibitor ciklooksigenaze), OKY-046 (blokator sintetaze tromboksana A₂) i nifedipin (inhibitor L-tipa voltažnih Ca²⁺ kanala) su doveli do snažne inhibicije kontraktinog odgovora krvnog suda prema bradikininu. Uabain (blokator Na⁺/K⁺-ATPaze) je uzrokovao redukciju vaskularnog odgovora prema bradikininu samo u srednjem opsegu primenjenih koncentracija.

Zaključak: Bradikinin izaziva koncentracijski- i endotel-zavisnu kontrakciju femoralne arterije pacova. Primarni medijator ovog dejstva predstavlja tromboksana A₂. Otvaranje L-tipa voltažnih Ca²⁺ kanala i aktivacija Na⁺/K⁺-ATPaze takođe sudeluju u ispitivanom efektu.

Ključne reči: bradikinin, femoralna arterija, endotel, tromboksana

PHARMACOLOGICAL ANALYSIS OF BRADYKININ EFFECTS ON ISOLATED RAT FEMORAL ARTERY

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Introduction: Bradykinin belongs to the class of peptides known as kinins, which, among other things, regulates blood pressure by inducing vasodilatation and hypotension. Their vasoconstrictor effect has also been noted.

The Aim: The aims of this study were to examine the effects of bradykinin in isolated rat femoral artery and also to determine whether intact endothelium, cyclooxygenase products, Ca²⁺ channels and Na⁺/K⁺-ATPase have a significant role in bradykinin-induced response.

Materials and Methods: The femoral arteries were isolated from male Wistar rats, and then mounted as a ring preparations in Krebs-Ringer bicarbonate solution. Some femoral rings had their endothelium mechanically removed. Cumulative concentration-contraction curves for bradykinin were obtained for ring segments previously equilibrated at basal tone.

Results: Bradykinin produced concentration-dependent contraction, which was reduced after denudation of endothelium. Indomethacin (cyclooxygenase inhibitor), OKY-046 (thromboxane A₂-synthase inhibitor) and nifedipine (voltage-gated L-type Ca²⁺ channel blocker) strongly inhibited bradykinin-produced contraction response. Ouabain (inhibitor of Na⁺/K⁺-ATPase) reduced vascular response to bradykinin only in the middle range of applied concentrations.

Conclusion: Bradykinin produces concentration- and endothelium-dependent contraction of rat femoral artery. The primary mediator of this action was thromboxane A₂. Voltage-gated L-type Ca²⁺ channel opening and Na⁺/K⁺-ATPase activation also had a contributing role.

Key Words: bradykinin, femoral artery, endothelium, thromboxane

VALIDACIJA TESTA PREPOZNAVANJA NOVOG OBJEKTA

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Uvod: Test prepoznavanja novog objekta (TPNO) se bazira na spontanom istraživačkom ponašanju pacova prilikom prezentovanja novog objekta i koristi se za ispitivanje efekata lekova na memorijske procese.

Cilj: Validacija TPNO.

Materijal i metode: U eksperimentima je korišćena kutija dimenzija 65x45x45 cm, i dva para objekata sličnih dimenzija (polulopta i piramida) međusobno udaljenih oko 30 cm. U prvom eksperimentu (validacija objekata), ispitivali smo afinitete pacova prema različitim objektima, bez prethodnog tretmana, u dve faze: habituacija (bez objekata, 10 min, dan 1) i familijarizacija (dva ista/različita objekta, 5 min, dan 2). Drugi eksperiment (validacija procedure) se sastojao od tri faze: habituacije (10 min, dan 1), familijarizacije (dva ista objekta, 5 min, dan 2) i test faze (dva različita objekta - poznat i novi, 3 min, 1 sat nakon familijarizacije). Četiri grupe pacova Wistar soja (n=6-7 po grupi), 30 min pre familijarizacije, primile su i.p. fiziološki rastvor ili skopolamin u tri različite doze (0.1, 0.3 i 1 mg/kg).

Rezultati: U prvom delu validacije nije bilo statistički značajnih razlika u vremenima istraživanja istih/različitih objekata. Analiza rezultata validacije procedure Studentovim t-testom, pokazala je da je kontrolna grupa pacova provela statistički značajno više vremena u istraživanju novog objekta ($t(5)=-4.354$, $p=0.007$), što je potvrđeno i diskriminacionim odnosom ($Tn-Tp/Tn+Tp$, Tn -vreme istraživanja novog, a Tp -vreme istraživanja poznatog objekta) ($t(5)=5.132$, $p=0.004$). Kod grupa koje su primile skopolamin nisu uočene ovakve statističke značajnosti.

Zaključci: Rezultati pokazuju da smo, koristeći jednostavnu proceduru, izvršili uspešnu validaciju TPNO, ali i potvrđuju da bi ovaj test trebalo rutinski koristiti prilikom ispitivanja prokognitivnih lekova, kao što su inverzni agonisti α_5 GABA_A receptora.

Ključne reči: test prepoznavanja novog objekta, memorija, skopolamin.

VALIDATION OF NOVEL OBJECT RECOGNITION TEST

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Introduction: The novel object recognition test (NORT) is based on the spontaneous exploration behavior of rats, when exposed to a novel object and is used to evaluate the effects of drugs on the memory processes.

The Aim: Validation of NORT.

Materials and Methods: The apparatus consisted of the box (65x45x45 cm) and two pairs of objects with similar dimensions (hemisphere and pyramid), at a distance of 30 cm. In the first experiment (validation of objects), we examined the affinities of rats for two different objects, without previous treatment, in two phases: habituation (no objects, 10 min, day one) and familiarization (two identical/different objects, 5 min, day two). The second experiment (validation of procedure) comprised three phases: habituation (10 min, day one), familiarization (two identical objects, 5 min, day two) and testing (two different objects - familiar and novel, 3 min, 1 hour after familiarization). Four groups of Wistar rats (n=6-7 per group), 30 min before the familiarization received i.p. saline or scopolamine (0.1, 0.3 and 1 mg/kg).

Results: In the first experiment there were no statistically significant differences in the time spent exploring the same/different objects. The analysis of the second experiment using Student's t-test revealed that the control group spent significantly more time in investigating the novel object ($t(5)=-4.354$, $p=0.007$); a finding substantiated by the discrimination index ($Tn-Tf/Tn+Tf$, Tn -exploration of novel object, Tf -exploration of familiar object) ($t(5)=5.132$, $p=0.004$). In scopolamine-treated groups this effect was not observed.

Conclusion: The results show we have performed a successful validation of NORT using a relatively simple procedure; they also corroborate that this test should be routinely used in the screening of procognitive drugs, exemplified by inverse agonists of α_5 GABA_A receptors.

Keywords: novel object recognition test, memory, scopolamine.

ULOGA α_1 PODJEDINICE GABA_A RECEPTORA U POVEĆANOJ OSETLJIVOSTI NA KONVULZIJE NAKON OBUSTAVE DIAZEPAMA KOD PACOVA

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Uvod: Dugotrajna primena benzoaodiazepina može dovesti do fizičke zavisnosti koja se manifestuje sindromom obustave.

Cilj rada: U ovom radu, procenjena je uloga α_1 podjedinice GABA_A receptora u povećanoj osetljivosti na konvulzije izazvane pentilentetrazolom, nakon obustave diazepam kod pacova.

Materijal i metode: Wistar pacovi (n=71) su randomizovano raspoređeni u devet grupa (2 mg/kg diazepam, 5 mg/kg diazepam + β CcT i kontrolna grupa) i ponavljano su tretirani tokom 14, 21 i 28 dana. Na dan testiranja, 24 h od poslednje primene tretmana aplikovan je PTZ intravenskom infuzijom u repnu venu. Konvulzivni prag je meren kao doza PTZ-a potrebna da izazove tonus na prvi trzaj.

Rezultati: Analiza varijanse je pokazala značajan efekat tretmana posle 21 i 28 dana ponavljane primene ($F(2,23)=12,730$; $p<0.001$ odnosno $F(2,18)=9,190$; $p=0.002$). Post hoc testom je pokazano značajno smanjenje konvulzivnog praga nakon obustave tretmana (diazepam i diazepam + β CcT) posle 21 dan ($p=0.005$ odnosno $p<0.001$, u poređenju sa kontrolnom grupom). Obustava tretmana posle 28 dana rezultovala je značajnim smanjenjem konvulzivnog praga samo u grupi tretiranoj diazepamom ($p=0.001$, u poređenju sa kontrolnom grupom).

Zaključak: Ova studija ukazuje da GABA_A receptori koji sadrže α_1 podjedinicu mogu uticati na razvoj zavisnosti diazepam nakon 4 sedmice ponavljane primene, ali ne i nakon 3 sedmice ponavljane primene.

Ključne reči: α_1 podjedinica GABA_A receptora, pentilentetrazolski test, obustava diazepam, konvulzivni prag.

THE ROLE OF α_1 -CONTAINING GABA_A RECEPTORS IN INCREASED SEIZURE SUSCEPTIBILITY AFTER DIAZEPAM DISCONTINUATION IN RATS

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Introduction: Long-term treatment with benzodiazepines can lead to physical dependence, manifested as emergence of withdrawal syndrome.

The Aim: In the present study we investigated the role of α_1 -containing GABA_A receptors in increased seizure susceptibility, induced by pentylenetetrazole (PTZ), after diazepam discontinuation.

Materials and Methods: Wistar rats (n = 71) were randomly distributed in the nine treatment groups (2 mg/kg diazepam, 2 mg/kg diazepam + 5 mg/kg β CcT, and solvent group) and were protractedly treated during 14, 21 and 28 days. On the testing day, 24 h after the last administration of treatment, a butterfly infusion needle was inserted into the tail vein and PTZ was given by i.v. infusion. Seizure threshold was measured as the dose of PTZ required to give rise to the first clonic twitch.

Results: The analysis of variance showed significant effect of treatment after 21 and 28 days of protracted administration ($F(2,23)=12,730$; $p<0.001$ and $F(2,18)=9,190$; $p=0.002$, respectively). Post hoc SNK test revealed a significant decrease in the PTZ threshold after discontinuation of diazepam treatment and diazepam+ β CcT treatment after 21 days ($p=0.005$, $p<0.001$, compared to solvent group). Discontinuation of treatment after 28 days resulted in a significant decrease in the PTZ threshold only in the group protractedly treated with diazepam ($p=0.001$ compared to solvent group).

Conclusion: The present study suggested that α_1 -containing GABA_A receptors may influence the dependence liability of diazepam, as evidenced by seizure susceptibility, after four, but not three weeks of repeated dosing.

Keywords: α_1 -containing GABA_A receptors, pentilentetrazole test, diazepam discontinuation, seizure threshold.

UTICAJ METIZERGIDA NA ANTINOCICEPTIVNO DEJSTVO LEVETIRACETAMA U OROFACIJALNOM FORMALINSKOM TESTU U PACOVA

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Uvod: Prethodno je pokazano da antiepileptik levetiracetam ispoljava antinociceptivno dejstvo u orofacijalnom formalinskom testu (OFT), modelu trigeminalnog bola, u pacova. Poremećaj serotoninergičkih puteva u moždanom stablu i trigeminalnom nervu stoji u osnovi nastanka migrene, a serotoninški receptori (5-HT₁ i 5-HT₂) su ciljna mesta dejstva lekova koji se koriste u terapiji napada i profilaksi migrene.

Cilj: Da bismo utvrdili da li su serotoninški receptori uključeni u antinociceptivno dejstvo levitracetama u modelu trigeminalne nocicepcije, ispitali smo uticaj metizergida (neselektivnog antagoniste serotoninških 5-HT₁ i 5-HT₂ receptora) na ovo dejstvo levitracetama.

Materijal i metode: Bolna preosetljivost orofacijalnog regiona u mužjaka pacova roda Wistar (180–220 g) izazivana je supkutanim injekcijom formalina (1,5%; 100 µl/pacovu). Mereno je vreme koje pacov provede u nociceptivnom ponašanju - trljanju perinazalne oblasti ipsilateralnom prednjom i/ili zadnjom šapom. Levitracetam (25 mg/kg, p.o.) sam, ili u kombinaciji sa metizergidom (1 i 3 mg/kg, i.p.) ili odgovarajući vehikulum (kod kontrolne grupe) davani su 60 minuta pre formalina.

Rezultati: Levitracetam (25 mg/kg, p.o.) je ispoljio antinociceptivno dejstvo u OFT u pacova (p<0,05; Mann-Whitney U-test). Metizergid (1 i 3 mg/kg, i.p.) je dozno-zavisno redukovao antinocicepciju izazvanu levitracetatom (25 mg/kg, p.o.) (p<0,05; Mann-Whitney U-test).

Zaključak: Ovaj rezultat ukazuje da su u antinociceptivno dejstvo levitracetama u modelu trigeminalnog bola u pacova verovatno uključeni serotoninški (5-HT₁ i/ili 5-HT₂) receptori. Dalje istraživanje sa selektivnim serotoninškim antagonistima je potrebno da se utvrdi koji tip/podtip 5-HT receptora učestvuje u ovom dejstvu levitracetama.

KLjučne reči: levitracetam, metizergid, orofacijalni formalinski test, trigeminalna nocicepcija

THE INFLUENCE OF METHYSERGIDE ON ANTINOCICEPTIVE EFFECT OF LEVETIRACETAM IN OROFACIAL FORMALIN TEST IN RATS

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Introduction: Previously it was shown that antiepileptic drug levitracetam exerts antinociceptive effect in orofacial formalin test (OFT), a model of trigeminal pain, in rats. Disruption of serotonergic pathways in brainstem and trigeminal nerve is involved in pathogenesis of migraine, and serotonin receptors (5-HT₁ and 5-HT₂) are targets for drugs used in treatment of migraine attacks and in prophylaxis.

The Aim: To determine whether the serotonin receptors are involved in antinociceptive effect of levitracetam in model of trigeminal nociception, we examined the effect of methysergide (a non-selective antagonist of serotonin 5-HT₁ and 5-HT₂ receptors) on this effect of levitracetam.

Materials and methods: Painful hypersensitivity of orofacial region in male Wistar rats (180–220 g) was caused by subcutaneous injection of formalin (1,5%; 100 µl/rat). The time that rat spent in nociceptive behavior - rubbing of perinasal area with ipsilateral anterior and/or hind paw was measured. Levitracetam (25 mg/kg, p.o.) alone or in combination with methysergide (1 and 3 mg/kg, i.p.) or corresponding vehicle (in the control group) were given 60 minutes before formalin.

Results: Levitracetam (25 mg/kg, p.o.) exerted antinociceptive effect in rat OFT (p<0,05; Mann-Whitney U-test). Methysergide (1 and 3 mg/kg, i.p.) dose-dependently reduced the antinociception caused by levitracetam (25 mg/kg, p.o.) (p<0,05; Mann-Whitney U-test).

Conclusion: This result indicates that antinociceptive effect of levitracetam in a rat model of trigeminal pain probably involves serotonin (5-HT₁ and/or 5-HT₂) receptors. Further research with selective serotonin antagonists is needed to determine which type/subtype of 5-HT receptors is involved in this action of levitracetam.

Keywords: levitracetam, methysergide, orofacial formalin test, trigeminal nociception

RELAKSACIJA ARTERIJSKOG GRAFTA PROUZROKOVANA NIKORANDILOM

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Uvod: Nikorandil je vazodilatator koji se primenjuje u terapiji angine pektoris. U mehanizam vazorelaksacije izazvane nikorandilom, uključeni su ATP senzitivni kalijumovih (K_{ATP}) kanali, ali i Ca²⁺-zavisni K⁺ (K_{Ca}) kanali.

Cilj: Cilj našeg istraživanja bio je da se ispita vazorelaksantni efekat nikorandila, otvarača kalijumovih kanala, na izolovanoj humanoj unutrašnjoj torakalnoj arteriji (ITA), kao i da se definišu uloge različitih podtipova K⁺ kanala u vazorelaksaciji indukovanoj nikorandilom.

Materijal i metode: Neiskorišćeni segmenti ITA-e su uzimani od pacijenata u toku bajpas operacije i ispitivani u kupatilu za izolovane organe. Preparati ITA-e su pre-kontrahovani fenilefrinom (10 µM), a zatim su kumulativno dodavane rastuće koncentracije nikorandila. Endotel je uklanjan mehaničkim putem.

Rezultati: Nikorandil (0.001 µM – 300 µM) je koncentracijski-zavisno relaksirao preparate ITA-e pre-kontrahovane fenilefrinom. Glibenklamid (10 µM), visoko selektivni blokator K_{ATP} kanala, kao i iberiotoxin (100nM), visoko selektivni blokator velikih Ca²⁺ zavisnih K⁺ (BK_{Ca}) kanala, delimično su antagonizovali relaksaciju ITA-e izazvanu nikorandilom. Suprotno tome, neselektivni blokator voltažno-zavisnih K⁺ (K_v) kanala, 4-aminopiridin (4-AP, 0.5mM), kao i margatoksin, potentni inhibitor K_{v1.3} kanala, nisu antagonizovali relaksaciju ITA-e izazvanu nikorandilom.

Zaključci: Naši rezultati su pokazali da nikorandil prouzrokuje snažnu endotel-nezavisnu relaksaciju ITA-e. Izgleda da su u mehanizam ove relaksacije uključeni K_{ATP} i BK_{Ca} kanali, koji su smešteni u glatkoj muskulaturi ITA-e.

KLjučne reči: nikorandil, vazorelaksacija, K⁺ kanali, humana unutrašnja torakalna arterija

RELAXATION OF ARTERIAL GRAFT INDUCED BY NICORANDIL

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Introduction: The drug nicorandil is a vasodilator approved for treatment of angina. In addition to its well-known effect on the opening of ATP-sensitive K⁺ (K_{ATP}) channels, nicorandil-induced vasorelaxation also involves the opening of Ca²⁺-activated K⁺ (K_{Ca}) channels.

The Aim: The aim of this study was to investigate the effects of nicorandil, K⁺ channel opener, on the isolated human internal mammary artery (HIMA) and to define the contribution of different K⁺ channel subtypes in nicorandil action on this blood vessel.

Materials and Methods: The HIMA segments were collected from male patients suffering from coronary artery disease who were undergoing coronary artery bypass surgery and studied in organ bath. HIMA rings were pre-contracted with phenylephrine (10 mM). Endothelium was removed mechanically.

Results: Our results show that nicorandil (0.001 µM – 300 µM) induced a concentration-dependent relaxation of HIMA rings pre-contracted by phenylephrine. Glibenclamide (10 µM), a selective K_{ATP} channels inhibitor, as well as iberiotoxin (100 nM), a most selective blocker of large-conductance K_{Ca} (BK_{Ca}) channels, partly antagonized relaxation of HIMA induced by nicorandil. In contrast, a non-selective blocker of voltage-gated K⁺ (K_v) channels, 4-aminopyridine (4 AP, 0.5 mM), as well as margatoksin (10 mM), a potent inhibitor of K_{v1.3} channels, did not abolish the nicorandil-induced relaxation of HIMA.

Conclusions: Our results showed that nicorandil induced strong endothelium-independent relaxation of HIMA. It seems that K_{ATP} and BK_{Ca} channels located in the smooth muscle of HIMA mediated relaxation induced by nicorandil.

Key words: nicorandil, vasorelaxation, K⁺ channels, human internal mammary artery

UTICAJ PWZ-029 NA PONAŠANJE PACOVA U MORISOVOM VODENOM LAVIRINTU

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Uvod: Pozitivni modulatori GABA-ergičke neurotransmisije, poput benzodiazepina, primenjeni na ljudima i životinjama dovode do anterogradne amnezije, dok supstance koje deluju kao negativni modulatori na nivou GABA_A receptora predstavljaju potencijalne promnestičke lekove. PWZ-029, kao negativni modulator GABA_A receptora koji sadrže α_5 podjedinicu, pokazao je u prethodnim istraživanjima da poboljšava učenje pacova u testu pasivnog izbegavanja.

Cilj rada: Ispitati uticaj PWZ-029 na prostorno učenje zdravih pacova u Morisovom vodenom lavirintu u tri različita protokola.

Materijal i metode: Dvadeset minuta nakon intraperitonealne primene tretmana (inertni vehikulum ili PWZ-029 u rasponu doza od 0,2 do 30 mg/kg), mužjaci pacova Wistar soja (6-8 u grupi) pušteni su u Morisov vodeni lavirint, odnosno bazen dijametara 2 m. Životinje su kroz niz uzastopnih pokušaja tokom jednog (protokoli referentne i radne memorije) ili više dana (protokol referentne memorije) učile da nađu platformu potopljenu 2 cm ispod površine vode. Parametri učenja su automatski praćeni pomoću kamere, a za analizu podataka je korišćena jednofaktorska ili dvofaktorska ANOVA.

Rezultati: Nije bilo značajne razlike između pacova koji su primali PWZ-029 ili vehikulum u parametrima latencije nalaska platforme, praćene u jednodnevnom i petodnevnom eksperimentalnom protokolu za procenu referentne memorije ($F(3,24) = 0.8237, p=0.494$; odnosno $F(3,24) = 0.7334, p=0.542$), niti razlike u latenciji između prvog i drugog pokušaja praćenju u testu radne memorije ($F_{(4,24)} = 0.956, p=0.441$).

Zaključak: PWZ-029 primenjen na normalnim pacova, bez kognitivnih oštećenja, ne dovodi do značajnog poboljšanja memorije u Morisovom vodenom lavirintu.

KLjučne reči: PWZ-029, vodeni lavirint, prostorna memorija

THE INFLUENCE OF PWZ-029 ON RATS' PERFORMANCE IN MORRIS WATER MAZE

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Introduction: Drugs that act as positive modulators at GABA_A receptors may cause anterograde amnesia when applied on human and animals. On the other hand, negative modulators of GABA_A receptors might have promnestic activity. PWZ-029 is a negative modulator of GABA_A receptors that contain α_5 subunit. In previous research, PWZ-029 improved learning in passive avoidance task in rats.

The Aim: The purpose of the study was to examine the influence of PWZ-029 on spatial learning of healthy rats in Morris water maze, using three different protocols.

Materials and Methods: Twenty minutes after intraperitoneally application of treatments (vehikulum or PWZ-029 in dose range 0.2-30 mg/kg), male Wistar rats (6-8 per group) were released in Morris water maze. Depending on the protocol applied, rats had multiple swimming trials during one or five days, where they learned to find invisible platform submerged 2 cm below the water surface. Behaviour in the water maze was tracked with digital camera and parameters related to learning were analyzed using one-way or two-way ANOVA.

Results: When the referent memory was assessed, there were no significant differences in latency to platform between rats treated PWZ-029 and rats treated with solvent, neither in one-day nor in five-day protocol ($F(3,24) = 0.8237, p=0.494$; $F(3,24) = 0.7334, p=0.542$, respectively). When the working memory was assessed, the difference in saving time between above mention groups was not significant ($F_{(4,24)} = 0.956, p=0.441$).

Conclusion: In the absence of cognitive impairment, application of PWZ-029 does not improve spatial learning of rats in Morris water maze.

Key words: PWZ-029, water maze, spatial memory

ANTIDEPRESIVNI POTENCIJAL ČAJA OD KOMBUHE I KANTARIONA U OKVIRU POJEDINIHI FARMAKODINAMSKIH TESTOVA

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Uvod: Kombuha predstavlja tradicionalni napitak napravljen fermentisanjem određenog čaja u simbiotskoj kulturi gljivica i bakterija. Tokom poslednje dve decenije rađena su istraživanja na laboratorijskim životinjama, gde je utvrđeno da kombuha ima širok dijapazon povoljnih efekata po zdravlje. Kantarion je višegodišnja biljka čija se droga koristi kao preparat za lečenje blagih do umerenih depresija. Za sada nema publikovanih istraživanja na temu antidepresivnog efekta čaja od kombuhe.

Cilj: Ispitivanje antidepresivnog efekta (ADE) čaja od kombuhe, koji je dobijen fermentacijom kombuhe u čaju od kantariona.

Materijal i metode: Ispitivanje je izvedeno na polno zrelih belim laboratorijskim miševima, soja Swiss Albino, oba pola. Testom prinudnog plivanja (FST) i testom suspenzije o repu (TST) praćen je antidepresivni efekat čaja od kombuhe naspram dejstva čaja od kantariona i antidepresivnih lekova, imipramina i fluoksetina.

Rezultati: U okviru FST, čaj od kombuhe je pokazao ADE kod ženki miševa, dok je kombinacija ovog čaja i imipramina pokazala ADE i kod mužjaka i kod ženki. TST je pokazao ADE čaja od kombuhe kod ženki miševa, dok je kombinacija čaja od kombuhe i fluoksetina imala ADE i kod mužjaka i kod ženki.

Zaključak: Napitak kombuhe spravljajući u čaju od kantariona i dalje poseduje antidepresivni potencijal karakterističan za čaj od kantariona. Ovaj napitak konzumiran sa antidepresivnim lekovima – imipraminom i fluoksetinom, ne umanjuje njihovu farmakološku efikasnost, već naprotiv, u nekim situacijama je i povećava, pokazujući sinergističko dejstvo. Osetljivost prema ovom dejstvu je naročito izražena kod jedinki ženskog pola.

KLjučne reči: kombuha, kantarion, TST, FST, antidepresivni efekat

ANTIDEPRESSIVE POTENTIAL OF KOMBUCHA AND ST. JOHN'S WORT TEA UNDER CERTAIN PHARMACODYNAMIC TESTS

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Introduction: Kombucha is traditional beverage, which is produced by fermentation of tea in symbiotic culture of fungi and bacteria. In last two decades researchers determined that Kombucha has various benefits on health. St. John's Wort is a perennial weed plant which is used as an herbal drug for the treatment of mild to moderate depression. There are no published studies that investigated antidepressant effect (ADE) of Kombucha.

The Aim: Determining antidepressant effect of Kombucha tea that was produced by fermentation of St. John's Wort tea in Kombucha culture.

Materials and methods: Experiments were conducted on Swiss albino mice of both sexes. Antidepressant effect of Kombucha tea versus effects of St. John's Wort tea and antidepressant drugs, imipramine and fluoxetine, were tested by the forced swimming test (FST) and the tail suspension test (TST).

Results: ADE of Kombucha during FST was shown at female mice, but combination of Kombucha and imipramine showed ADE on both, female and male mice. During TST, Kombucha showed ADE at female mice, but in combination with fluoxetine, ADE was shown at both sexes.

Conclusion: Kombucha tea that was made by fermentation of St. John's Wort tea didn't change or reduce antidepressant effect of the tea. In combination with imipramine, or fluoxetine, Kombucha didn't reduce their effect and in some cases it was increased, especially at female mice.

Key words: Kombucha, St. John's Wort, antidepressant effect, TST, FST

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Uvod: Rezultati savremenih istraživanja su pokazali da preparati gljive *Coprinus comatus* poseduju sledeće korisne efekte: poboljšavaju sekreciju insulina iz beta ćelija pankreasa, pospešuju metabolizam glukoze i lipida, popravljaju ćelijsku osetljivost na insulin. Posmatrajući učestalost obojevanja od dijabetesa melitusa, Vojvodina predstavlja regiju u Srbiji sa najvećom učestalošću.

Cilj: Imajući u vidu da metabolički sindrom predstavlja jedan od vodećih medicinskih problema današnjice, sproveli smo istraživanje kako bismo uvideli moguće pozitivne efekte *C. comatus* na poremećaje koji čine ovaj sindrom.

Materijal i metode: Eksperiment je izveden na albino Wistar pacovima oba pola, starijim od 3 meseca koji su nasumično podeljeni u ogleadne i kontrolnu grupu, sa po 6 pacova. Ogleadne grupe životinja su tretirane vodenom suspenzijom komercijalnog preparata gljive *C. comatus* tokom 7 dana u dozi od 1,67 g/kg. Hipoglikemijska aktivnost je procenjena nakon izazivanja hiperglikemije davanjem anhidrirane glukoze, adrenalina i aloksana, dok je hepatoprotektivno dejstvo procenjavano nakon primene ugljen-tetrahlorida. Hipolipemijska aktivnost je određivana merenjem koncentracija lipida u krvi, odnosno računanjem indeksa ateroskleroze.

Rezultati: Pri procenjanju delovanja *C. comatus-a* na telesnu masu nije uočena statistički značajna razlika u odnosu na kontrolu. Kod indukcije hiperglikemije aloksanom, tretman gljivom je uspeo da statistički značajno smanji vrednosti glukoze u krvi životinja (13,98 ± 6,45; 23,14 ± 6,42). Posmatranjem dejstva na lipidni status životinja uočeno je povišenje vrednosti HDL lipoproteina kod životinja tretiranih samo *C. comatus-om* ali bez statističke značajnosti. Na kraju gljiva nije u potpunosti uspela da zaštiti jetru od akutnog oštećenja izazvanog sa CCl4.

Zaključak: Na osnovu rezultata istraživanja smo zaključili da tretman gljivom *C. comatus* ispoljava pozitivna farmakološka delovanja na ogleadnim životinjama.

Ključne reči: aloksanom indukovana hiperglikemija, ugljen tetrahlid, *Coprinus comatus*

PHARMACOLOGICAL PROPERTIES OF WATER SUSPENSION OF COMMERCIAL PRODUCTS MUSHROOM COPRINUS COMATUS

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Introduction: Contemporary research results have been showed that mushroom preparations of *Coprinus comatus* have positive pharmacotherapy effects: enhancement of insulin secretion from pancreatic beta cells, promotion of glucose and lipid metabolism, improvement of cellular sensitivity to insulin. By observing the incidence of diseases such as diabetes mellitus in Serbia, the most frequent incidence is in the region of Vojvodina.

The Aim: Bearing in mind that metabolic syndrome is one of the leading medical problems of today, we have conducted research to examine possible positive effects of *C. comatus* on disorders that follow the metabolic syndrome.

Materials and methods: The experiment was performed on albino Wistar rats of both sexes, older than 3 months who were randomly divided into experimental and control groups, each with 6 rats. The experimental groups of animals were treated with an aqueous suspension of commercial preparation of mushroom *C. comatus* for 7 days with dose of 1,67 g/kg. Antidiabetic activity was assessed after induced hyperglycaemia by giving anhydrous glucose, adrenaline and aloxan, while the hepatoprotective effects were evaluated after administration of carbon tetrachloride. Hypolipidemic activity was determined by measuring the concentration of lipids in the blood and by calculating the index of atherosclerosis.

Results: After assessing the effects of *C. comatus* on body weight, there was no statistically significant difference compared to control. In the aloxan-induced hyperglycaemia rats, treatment with the mushroom preparation significantly reduced the value of glucose in the blood of animals (13.98 ± 6.45; 23.14 ± 6.42). By observing the effects on the lipid status of animals, increase of HDL lipoproteins in animals treated only with *C. comatus* was shown, but with no statistical significance. At the end it was shown that mushroom is not fully able to protect the liver from acute damage induced with CCl4.

Conclusions: On the basis of these results we can conclude that treatment with the mushroom *C. comatus* shows positive pharmacological effects on experimental animals.

Key words: aloxan-induced hyperglycaemia, carbon tetrachloride, *Coprinus comatus*

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Uvod: Diabetes mellitus predstavlja bolest od koje boluje više od 250 miliona ljudi širom sveta. Zbog potrebe za što prirodnijim i delotvornijim lekom istraživanja su usmerena na pronalaženje izvora bioaktivnih ksenobiotika čije dejstvo će biti najefikasnije u lečenju dijabetesa. Istraživanja vršena na gljivama roda *Ganoderma* ukazuju na pozitivne rezultate iako za sada ne postoji dovoljan broj publikacija o njihovom antidijabetskom delovanju.

Cilj: Cilj istraživanja je bio da se utvrdi postojanje antidijabetskog efekta etanolnih i vodenih ekstrakata gljiva *Ganoderma pfeifferi* i *Ganoderma resinaceum* kod pacova koji su oralno opterećeni glukozom i tretirani aloksanom.

Materijal i metode: U eksperimentu su korišćeni vodeni i etanolni ekstrakti gljiva *G. pfeifferi* i *G. resinaceum*. Kao eksperimentalne životinje koristili smo *Rattus norvegicus* soj Wistar. Životinje su podeljene u 5 eksperimentalnih grupa sa po 6 životinja. Jedna gupa je služila kao kontrola i dobijala je fiziološki rastvor tokom 5 dana. Preostale 4 grupe pacova su dobijale 3% etanolni i 3% vodeni ekstrakt navedenih gljiva tokom 5 dana, a zatim su bile podvrgnute testu oralnog opterećenja glukozom (OGTT) i tretiranju aloksanom. Antidijabetski efekat ekstrakata gljiva procenjavali je merenjem vrednosti glikemije u pomenutim testovima.

Rezultati: Kod testa oralnog opterećenja glukozom nije zabeležen antihyperglikemijski efekat etanolnih i vodenih ekstrakata *G. pfeifferi* i *G. resinaceum*. Prilikom oštećivanja pankreasa aloksanom, statistički značajan efekat ustanovljen je kod primene etanolnog i vodenog ekstrakta *G. resinaceum*.

Zaključak: Na osnovu dobijenih rezultata može se zaključiti da ekstrakti gljive *G. resinaceum* imaju određen antidijabetski odnosno antihyperglikemijski potencijal kod pacova.

Ključne reči: *Ganoderma pfeifferi*, *Ganoderma resinaceum*, OGTT, aloksan.

THE INFLUENCE OF GANODERMA PFEIFFERI AND GANODERMA RESINACEUM FUNGI EXTRACTS ON GLUCOSE LEVELS IN RATS

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Introduction: Diabetes mellitus is a disease that afflicts more than 250 million people all over the world. Because of the need for a more natural and more efficient cure, studies have been aimed to find a source of bioactive xenobiotics that are most efficient in treating the disease. Studies conducted on *Ganoderma* fungi showed positive results, even though, so far there is not enough publications to substantiate their anti-diabetic properties.

The Aim: The aim of this research has been to determine the anti-diabetic effects of ethanol and water extracts of *G. pfeifferi* and *G. resinaceum* using oral glucose tolerance test and aloxan treatment in rats.

Materials and methods: *G. pfeifferi* and *G. resinaceum* water and ethanol extracts have been used in this test. *Rattus norvegicus* strain Wistar have been used as test subjects. Animals have been divided into 5 experimental groups with 6 six animals in each group. Control group has been given physiological solution for five consecutive days. The other four groups have been given 3% ethanol and 3% water extracts of the aforementioned fungi and afterwards subjected to oral glucose tolerance test and treated with aloxan. The anti-diabetic effect was estimated by measuring blood glucose levels in mentioned tests.

Results: *G. pfeifferi* and *G. resinaceum* ethanol and water extracts did not show any hypoglycemic effect in oral glucose tolerance test. Both ethanol and water extracts of the mushroom *G. resinaceum* showed antihyperglycemic effects in animals treated with aloxan.

Conclusion: Based on the given results, we can presume that *G. resinaceum* ethanol and water extracts have certain antidiabetic/antihyperglycemic effect in rats.

Key words: *Ganoderma pfeifferi*, *Ganoderma resinaceum*, OGTT (oral glucose tolerance test), aloxan.

UGLJEN MONOKSID U KRVI NEPUŠAČA SA TERITORIJE BEOGRADA

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Uvod: Ugljenmonoksid, kao gas koji nastaje pri svakom nepotpunom sagorevanju, može biti uzročnik profesionalnih trovanja, ali i značajan uzročnik trovanja opšte populacije naročito pri požarima, usled rada motora sa unutrašnjim sagroevanjem, pušenju itd.

Cilj: Određivanje ugljenmonoksida u krvi nepušača sa teritorije Beograda.

Materijali i metode: Uzorci krvi su metodom slučajnog uzorka sakupljeni u jutarnjim časovima kod 68 nepušača, dobrovoljca. Po 1 ml krvi je pripremljen u vialama koje su potom hermetički zatvorene. Kao agensi za oslobađanje CO iz HbCO korišćen je 1% rastvor 1 mol/l H₂SO₄ i 1,5% saponin. Sadržaj CO određivan je gasnom hromatografijom sa TCD detektorom pod sledećim uslovima: temperatura detektora i pečnice 200°C, odnosno 40°C; pritisak kolone 6,4 bar; gas nosač helijum pri protoku od 4,3 ml/min; retenciono vreme za CO je 6,3 minuta. Rezultati su obrađeni primenom neparametarskog Man-Whitney testa.

Rezultati: Sadržaj HbCO u krvi nepušača sa teritorije Beograda kreće se do 9,85% (M₀=0,48%). Kod osoba koje žive u centru sadržaj HbCO iznosi 0,26%-9,85% (M₁=1,06%), dok su za osobe koje žive na periferiji dobijene statistički niže vrednosti koje se kreću od 0,00 do 1,33% (M₂=0,53%). Opsezi sadržaja HbCO za osobe ženskog pola kao i medijane se nisu značajno razlikovale u odnosu na sadržaj HbCO kod osoba muškog pola.

Zaključak: Dobijeni rezultati ukazuju da je sadržaj HbCO kod osoba koje žive u centru Beograda veći nego u osoba koje žive na periferiji što se može objasniti većim zagađenjem ovim gasom prvenstveno kao posledice povećanog saobraćaja.

Glavne reči: Ugljenmonoksid, krv, gasna hromatografija, nepušači

CARBON MONOXIDE LEVELS IN BLOOD OF NON-SMOKERS FROM BELGRADE

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Introduction: Carbon monoxide as a gas that is product of incomplete combustion may cause not only professional intoxication, but can also cause toxic effects of general population especially as a result of fires, internal combustion engines, smoking etc.

Aim: The aim of the study was to determine the CO blood levels of non-smokers from Belgrade.

Materials and methods: Blood samples were collected from 68 non-smoker volunteers in early morning hours. 1 ml of each blood sample was prepared in hermetically sealed vials and mixture of 1 mol/l H₂SO₄ and 1.5% saponin was used as CO releasing agent. The CO levels were determined by gas chromatography with TCD under following conditions: temperature of detector and oven 200°C and 40°C, respectively; column pressure 6.4 bar; carrier gas helium at flow rate of 4.3 ml/min; retention time for CO 6.3 minutes. Nonparametric Mann-Whitney test was used in statistical calculations.

Results: The levels of HbCO in non-smokers blood reach 9.85% (median value 0.48%). In persons living in the centre of Belgrade HbCO content vary from 0.26% to 9.85% (median value 1.06%), while statistically lower values were determined for persons living in suburban areas (0.00 to 1.33% with median value 0.53%). No significant differences were observed between HbCO levels obtained for females and males.

Conclusion: These results indicate that HbCO content is higher in residents living in the centre of the city than in once living in suburb which can be explained by more profound pollution with this gas due to more intensive traffic.

Key Words: Carbon monoxide, blood, gas chromatography, non-smokers

UTICAJ SMEŠE DEKABROMOVANOG DIFENILETRA I KADMIJUMA NA OKSIDATIVNI STRES

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Uvod: Dekabromovani difeniletar (BDE209) i kadmijum (Cd) se nalaze u životnoj sredini, hrani i posledično u životinjskim i tkivima čoveka najvećim delom kao posledica antropogene aktivnosti. BDE209 i Cd najznačajnije toksične efekte ispoljavaju na jetru, bubrege, pluća, nervni sistem, rast i razvoj itd. Međutim, mehanizmi toksičnosti ovih supstanci još uvek nisu u potpunosti ispitani, niti postoje saznanja o mehanizmima njihovih *in vivo* interakcija.

Cilj: Cilj ovog rada je bio ispitivanje uticaja smeše dekaBDE i Cd na parametre oksidativnog stresa.

Materijal i metode: mužjaci *Wistar* pacova, 200-240 g, su putem oralne sonde primili doze BDE209 (1000, 2000 i 4000 BDE209/kg t.m./dan) i/ili Cd (2,5, 7,5 i 15 mg/kg t.m./dan), tokom 28 dana. U homogenatima jetre, bubrege, slezine i mozga ispitivan je sadržaj parametara oksidativnog stresa: malondialdehida (MDA), tiolnih grupa (SH) i aktivnost superoksiddismutaze (SOD), primenom spektrofotometrijskih metoda.

Rezultati: BDE209 ne dovodi do statistički značajnih promena parametara. Srednja i visoka doza Cd sa 2000 ili 4000 mg BDE209/kg t.m./dan dovode do značajnog smanjenja aktivnosti SOD u jetri u odnosu na Cd. Iste doze Cd u kombinaciji sa svim primenjenim dozama BDE209 dovode do povećanja sadržaja SH grupa u mozgu u odnosu na sam BDE209.

Zaključci: Različite doze BDE209 umanjuju efekat Cd na integritet lipida membrana. Smanjenje sadržaja tiolnih grupa u jetri moguće ukazuje da BDE209 smanjuje produkciju metalotioneina indukovanu Cd. Može se smatrati da oksidativni stres posreduje u toksičnosti smeše Cd i BDE209, ali je za detaljnija objašnjenja mehanizma potrebno sprovesti dalja ispitivanja.

Glavne reči: dekabromovani difeniletar, kadmijum, smeše, oksidativni stres, pacov.

INFLUENCE OF DEKABROMINATED DIPHENYLETHER AND CADMIUM MIXTURE ON OXIDATIVE STRESS

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Introduction: Decabrominated diphenylether (BDE209) and cadmium (Cd) are chemicals present in environment, food and consequently in animal and human tissues, mostly as a result of anthropogenic activities. Target organs for BDE209 and Cd are liver, kidneys, lungs, nervous system growth and development, while toxicity mechanisms of mixture and/or single compounds are still under examination. However, toxicity mechanisms of these compounds are not fully examined, nor is there data on mechanisms of their *in vivo* interactions.

The Aim: In this study we examined the influence of BDE209 and Cd mixture on oxidative stress parameters.

Materials and Methods: Male *Wistar* rats, 200-240 g, were by gavage exposed to BDE209 (1000, 2000 or 4000 BDE209/kg bw/day) and/or Cd (2.5, 7.5 and 15 mg/kg bw/day), for 28 days. In the homogenates of liver, kidney, spleen and brain were measured oxidative stress parameters: malondialdehyde (MDA), thiol groups (SH) and superoxide dismutase (SOD) (spectrophotometrically).

Results: BDE209 does not significantly influence parameters. Medium and high doses of Cd with 2000 or 4000 mg BDE209/kg b.w./day cause significant decrease in liver SOD comparing to Cd. The same doses of Cd given along with BDE209 induce increase SH groups in brain in relation to BDE209.

Conclusion: Different doses of BDE209 reduce the effect of Cd in terms of membranes destruction. Decrease in SH groups could indicate that BDE209 decreases in metallothionein induced by Cd. It could be assumed that oxidative stress mediates in toxicity of Cd and BDE209 mixture, however further experiments would be necessary to reveal exact toxicity mechanisms.

Keywords: decabrominated diphenylether, cadmium, mixture, oxidative stress, rat.

UTICAJ KADMIJUMA/KADMIJUMA I MAGNEZIJUMA NA NIVO GLUTATIONA U BUBREZIMA PACOVA

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Uvod: Kadmijum spada u najznačajnije metalne otrove koji svoje toksično dejstvo ispoljava prvenstveno na bubrege. Jedan od mehanizama njegove toksičnosti je i indukcija oksidativnog stresa kao rezultat dejstva na parametre antioksidativne zaštite. Iako terapija trovanja Cd nije rešena, dosadašnji literaturni podaci ukazuju na značajnu ulogu magnezijuma u prevenciji trovanja Cd.

Cilj: Proceniti dejstvo Cd na glutatation, kao parametar oksidativnog stresa, kao i protektivni efekat Mg na isti parametar u bubregu.

Materijal i metode: Studija je rađena na 40 pacova podeljenih u grupe tretirane sledećim dozama Cd i Mg: grupa 1-oralno 30 mg Cd /kg t.m.; grupa 2-intraperitonealno 1,5mg Cd/kg t.m.; grupa 3-oralno 30 mg Cd/kg t.m.+50 mg Mg/kg t.m. jedan sat pre davanja Cd; grupa 4-intraperitonealno 1,5mg Cd/kg t.m.+3 mg Mg/kg t.m. deset minuta pre davanja Cd. Pacovi su žrtvovani nakon 24 h i uzeti su uzorci bubrega. Nakon izvršene homogenizacije uzorka, određivan je sadržaj glutatationa metodom po Ellman-u. Rezultati su statistički obrađeni primenom jednofaktorskog ANOVA testa praćenog Tukey post hoc testom.

Rezultati: U obe grupe tretirane Cd uočeno je sniženje sadržaja glutatationa u odnosu na kontrolnu grupu ($P < 0,01$). U grupi koja je oralno tretirana Mg i Cd, primena Mg je sprečila pad nivoa glutatationa te je dobijena vrednost bila u nivoima kontrolne grupe. Intraperitonealna primena Mg pak, nije izazvala promenu nivoa sadržaja glutatationa u odnosu na grupu koja je primala samo Cd.

Zaključak: Protektivni efekat magnezijuma na sadržaj glutatationa u uslovima trovanja kadmijumom potvrđen je pri njegovoj oralnoj, ali ne i intraperitonealnoj primeni.

Gljučne reči: Kadmijum, magnezijum, glutatation, bubreg, pacov

INFLUENCE OF CADMIUM/CADMIUM AND MAGNESIUM ON GLUTATHIONE LEVELS IN THE KIDNEYS OF RATS

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Introduction: Cadmium (Cd) is one of the most important toxic metals manifesting its toxic effect primarily on kidneys. One of the mechanisms of Cd toxicity is the induction of oxidative stress as the result of its effects on parameters of antioxidant defense. Although treatment of Cd poisoning has not been resolved yet, literature data indicate the important role of magnesium (Mg) in preventing Cd poisoning.

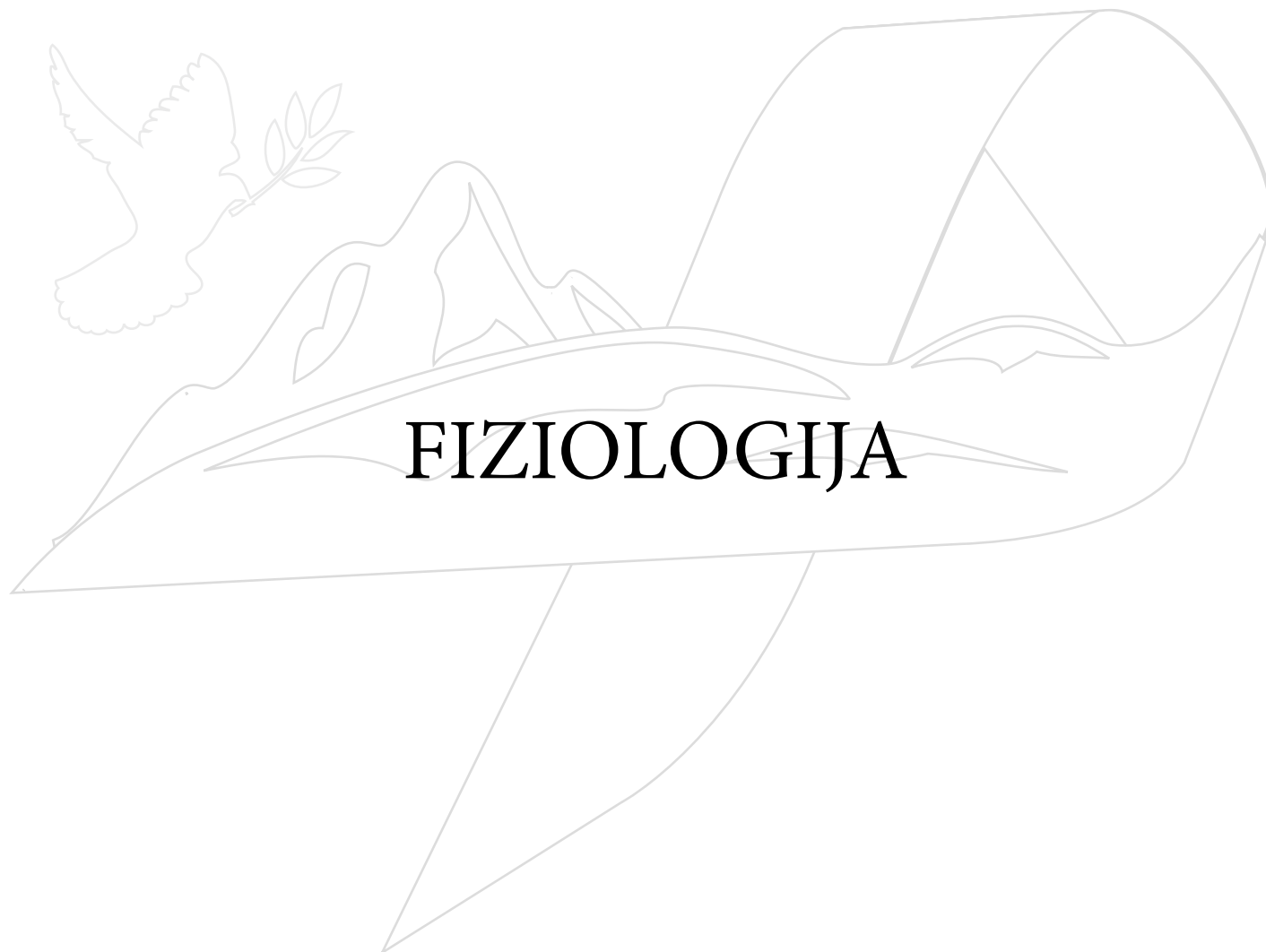
The Aim: Evaluate the effect of Cd on glutathione levels and the protective effect of Mg on this parameter of antioxidant defense.

Materials and Methods: The study was conducted on 40 rats divided into: control, group 1-orally treated with 30 mg Cd/kg bw, group 2-intraperitoneally treated with 1.5 mg Cd/kg bw, group 3-orally treated with 30 mg Cd/kg bw+50mg Mg/kg bw one hour before Cd, group 4-intraperitoneally treated with 1.5 mg Cd/kg bw+3mg Mg/kg bw 10 minutes before Cd. Rats were sacrificed after 24h and kidneys were collected, homogenized and glutathione content was determined using Ellman method. The results were statistically analyzed using ANOVA test followed by Tukey test.

Results: In both Cd-treated groups decrease in glutathione content was observed when compared to the controls ($P < 0,01$). Magnesium pretreatment prevented decrease of glutathione, keeping it in the range of controls. On the other hand, intraperitoneal Mg application caused no changes in the glutathione level if compared to the group receiving only Cd.

Conclusion: The protective effect of magnesium on the glutathione in conditions of cadmium intoxication was confirmed after its oral, but not intraperitoneal application.

Key words: cadmium, magnesium, glutathione, rat, kidney



FIZIOLOGIJA

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Uvod: Brojni podaci iz literature pokazuju da endogeno oslobođeni NO učestvuje u patogenezi velikog broja digestivnih oboljenja. NO posreduje u neadrenergičkoj i neholognergičkoj relaksaciji glatke muskulature većine regiona gastrointestinalnog trakta.

Cilj rada: Utvrditi efekte L-arginina i L-NAME na longitudinalnu i cirkularnu muskulaturu ileuma i terminalnog ileuma zamorca.

Materijal i metode: Eksperimenti su izvedeni na ileumu i terminalnom ileumu zamorca muškog pola, telesne težine 350 do 450 grama. Kontrakcije su registrovane pomoću izometrijskog transdjusera na Bekmanovom pisaču.

Rezultati: L-NAME i L-arginin nisu ispoljili značajne efekte na sponatnu motornu aktivnost ileuma i terminalnog ileuma. Relaksacija longitudinalnog i cirkularnog mišićnog sloja je izazvana električnom stimulacijom. L-NAME inhibira relaksaciju izazvanu električnom poljnom stimulacijom. U prisustvu L-arginina efekti L-NAME na električnu poljnu stimulaciju su bili inhibirani. Kada su preparati prekontrahovani sa karbaholom (10^{-6} M) i holecistokininom (10^{-6}) nije došlo do relaksacije u toku poljne stimulacije.

Zaključak: Zaključeno je da NANC nervi igraju važnu ulogu u inhibiciji glatke muskulature ileuma i terminalnog ileuma zamorca i da je NO uključen kao medijator.

Ključne reči: NO, neadrenergička neholognergička inhibicija, motilitet, ileum.

THE ROLE OF NO IN THE CONTRACTILITY OF GUINEA-PIG ILEUM AND TERMINAL ILEUM

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Introduction: Numerous reports in the literature have suggested that endogenous NO may participate in the ethiopathogenesis of digestive tract diseases. Nitric oxide (NO) has been shown to mediate nonadrenergic nonholinergic (NANC) relaxation in gastrointestinal smooth muscle cells.

The Aim: To investigate the effects of L-arginine and L-NAME on longitudinal and circular muscle strips of the guinea-pig ileum and terminal ileum.

Materials and Methods: Experiments were performed on ileum and terminal ileum of male guinea-pigs weighting 350-450 g. Contractions were registered using isometric transducer on Backman printer.

Results: L-NAME and L-arginine did not show effects on spontaneously motor activity of the ileum and the terminal ileum. L-NAME reversed the relaxation induced by electrical field stimulation. In the presence of L-arginine, effects of L-NAME on electrical field stimulation were inhibited. When the preparations were precontracted by carbachol (10^{-6}) and cholecystokinin (10^{-6}) there were no relaxation during electrical field stimulation.

Conclusion: We concluded that NANC nerves play an important role for inhibition of smooth muscle of the guinea pig ileum and terminal ileum, and that NO is involved as a neurotransmitter.

Key words: NO, nonadrenergic noncholinergic inhibition, motility, ileum.

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Uvod: Hemisfera je reč koja označava polovinu sfere u ovom slučaju mozga. Obično je leva dominantna, a desna u manji broj ljudi mada i u sadejstvu omogućavaju niz funkcija tela.

Cilj rada: bio je da se ispita uticaj stepena dominacije moždane hemisfere navrednosti latence i amplitude P300. U istraživanje je uključeno 60 ispitanika, starosti od 45 do 56 godina.

Materijal i metode: Bioelektrična aktivnost mozga registrovana je pomoću srebro-hlorid elektroda koje su postavljane na centralnoj liniji skalpa, frontalno (Fz) i centralno (Cz) prema standardnom "10-20 međunarodnom sistemu". Zadobijanje P300 KEP korišćena je "oddball" paradigmasa 80% neciljnih i 20% ciljnih stimulusa. Kao stimulus korišćeni su čisti tonovi visine 1000 i 2000 Hz, jačine 90dB.

Rezultat: Ispitanici su detektovali pojavljivanje ciljnih tonova visine 2000 Hz i za najkraće vreme pritisnuli dugme na specijalnoj ručici prvo desnom rukom (prva registracija), a zatim levom rukom (druga registracija).

Zaključak: Analizom rezultata latence i amplitude P300 u grupi ispitanika sa izraženim stepenom lateralizovanosti zapaženo je da postojistatišćikiznačajnarazlikakada je korišćena dominantna u odnosu na nedominatnu ruku kako u vrednostima latenci P300 ($p < 0.01$), tako i u vrednostima amplituda P300 ($p < 0.05$).

Ključne reči : mozak, P300, asimetrija, hemisfera.

FUNCIONAL ASYMMETRY OF THE BRAIN AND EVENT RELATED POTENTIALS

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Introduction: Hemisphere is half of the brain. The left most dominant, with a small number of the people and right. Together provide a range of functions of the body.

The aim: of this study was to assess influence of the *hemispheric dominance to the values of latency and amplitude of P300 component of cognitive potentials*. The study included 60 right-handed subjects whose age was between 45 and 56 years

Materials and Methods: Bioelectric brain activity was recorded using argentum chloride (AgCl) electrodes that were placed at *central line of the scalp (over Fz and Cz regions) according to the international 10-20 standard*. P300 was generated using "oddball" paradigm with randomized stimuli: A frequent 1000 Hz tone with an occurrence of 80 % and a 2000 Hz tone (target) with a 20 % occurrence. Subjects were instructed to recognize target stimuli of 2000Hz frequency and press the button as fast as they can.

Results: The measurement is done with the right hand (first recording) and left hand (second recording).

Conclusion: In the group with high degree of lateralization latencies of P300 were significantly lower ($p < 0.01$) and amplitudes of P300 were significantly higher ($p < 0.05$) when dominant hand was used.

Keywords: brain, P300, functional asymmetry.

ELEKTROENCEFALOGRAFSKE MANIFESTACIJE HEPATIČNE ENCEFALOPATIJE IZAZVANE THIOACETAMIDOM KOD PACOVA

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Uvod: Hepatična encefalopatija (HE) je posledica insuficijencije jetre i eksperimentalno može biti izazvana thioacetamidom.

Cilj: Cilj rada je bio da se ispita efekat thioacetamida na EEG aktivnost pacova obrađenu spektralnom analizom.

Materijal i metode: Mužjaci pacova Wistar soja su podeljeni u sledeće grupe: 1. kontrolna, tretirana fiziološkim rastvorom i 2. grupe tretirane thioacetamidom: TAA₆₀₀ (600 mg/kg) i TAA₉₀₀ (900 mg/kg). Doza thioacetamida (300 mg/kg) je administrirana tokom 2 (TAA₆₀₀) ili 3 uzastopna dana (TAA₉₀₀). EEG zapis je analiziran svakih 30 minuta u periodu 22.5-23.5 h nakon primene poslednje doze thioacetamida.

Rezultati: Srednja spektralna snaga je u odnosu na kontrolu bila značajno viša u TAA₆₀₀ grupi 23.5 h nakon primene poslednje doze thioacetamida ($p<0.01$) i značajno niža u TAA₉₀₀ grupi u svim vremenskim intervalima ($p<0.01$). Apsolutna spektralna snaga je bila značajna veća u TAA₆₀₀ grupi u odnosu na kontrolnu grupu u delta opsegu u svim intervalima ($p<0.01$) i u beta, alfa i teta opsegu 23.5 h nakon tretmana ($p<0.01$). U TAA₉₀₀ grupi apsolutne spektralne snage alfa, teta i delta talasa su bile smanjene u odnosu na kontrolu u svim intervalima. Relativna spektralna snaga delta talasa je bila značajno viša ($p<0.01$), a teta talasa značajno niža u TAA₉₀₀ grupi u odnosu na kontrolu ($p<0.01$).

Zaključak: TAA u dozi od 900 mg/kg izaziva povećanje zastupljenosti delta talasa i smanjenje zastupljenosti teta talasa uz smanjenje napona u EEG-u koje odgovaraju teškoj HE kod ljudi. Ova doza thioacetamida može se koristiti kao pogodan model uznapredovalih stadijuma HE.

Ključne reči: hepatična encefalopatija, thioacetamid, EEG, pacovi

ELECTROENCEPHALOGRAPHIC MANIFESTATIONS OF THIOACETAMIDE-INDUCED HEPATIC ENCEPHALOPATHY IN RATS

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Introduction: Hepatic encephalopathy (HE) appears as a result of liver failure and may be induced experimentally by thioacetamide.

The Aim: The aim of our study was to investigate the effect of thioacetamide on EEG activity, determined by spectral analysis, in rats.

Materials and methods: Male Wistar rats were divided into following groups: 1. control, saline-treated; 2. thioacetamide-treated groups: TAA₆₀₀ (600 mg/kg) and TAA₉₀₀ (900 mg/kg). Daily dose of thioacetamide (300 mg/kg) was administered during 2 (TAA₆₀₀) or 3 subsequent days (TAA₉₀₀). EEG was analyzed every 30 minutes in the period of 22.5-23.5 h after administration of the last dose of thioacetamide.

Results: Mean power density in comparison with control group was significantly higher in TAA₆₀₀ 23.5 h after treatment ($p<0.01$) and significantly lower in TAA₉₀₀ at all intervals ($p<0.01$). Absolute power was significantly higher in TAA₆₀₀ vs. control in delta band ($p<0.01$) at all intervals and in beta, alpha and theta bands 23.5 h after treatment ($p<0.01$). In TAA₉₀₀ group absolute alpha, theta and beta power were decreased vs. control at all time intervals. Relative delta power was significantly higher while relative theta power was lower in TAA₉₀₀ vs. control ($p<0.01$).

Conclusion: Thioacetamide in a dose of 900 mg/kg induces an increase in delta band and a decrease in theta band representation followed by a decrease in EEG voltage, that correspond to severe HE in humans. This dose of thioacetamide may be used as a suitable model of advanced stages of HE.

Key words: hepatic encephalopathy, thioacetamide, EEG, rats

UTICAJ ETANOLNOG EKSTRAKTA LISTA *Erica arborea* NA KONTRAKTILNOST IZOLOVANOG ILEUMA PACOVA

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Uvod: Veliki vres (*Erica arborea*) je biljna vrsta koja se u tradicionalnoj medicini koristi kao diuretik, adstringent i za lečenje urinarnih infekcija.

Cilj rada: Cilj ovog rada je proučavanje efekata etanolnog ekstrakta *E. arborea* na spontane i kontrakcije ileuma pacova indukovane acetilholinom.

Materijal i metode: Korišćeni su pacovi Wistar soja, telesne mase 250-300 g. Iseći ileuma su postavljeni u kupatilo za izolovane organe ispunjeno Tirodovim rastvorom, koji je aerisan smesom 5% ugljen dioksida i kiseonika i zagrevan do temperature od 37°C. U prvoj eksperimentalnoj seriji registrovan je uticaj vodenog ekstrakta *E. arborea* na spontane kontrakcije ileuma pacova. U drugoj eksperimentalnoj seriji kontrakcije ileuma su stimulisane acetilholinom, a zatim su efekti acetilholina registrovani u prisustvu etanolnog ekstrakta *E. arborea*.

Rezultati: Rezultati pokazuju da je primenom ekstrakta *E. arborea*, koncentracije 1 mg/ml statistički značajno ($p<0.01$) umanjn tonus spontanih kontrakcija ileuma za $27.42\pm 3.15\%$ ($p<0.01$). Ekstrakt *E. arborea* (koncentracije 1 mg/ml) je statistički značajno inhibisao kontrakcije ileuma pacova indukovane acetilholinom za $33.58\pm 4.75\%$ ($p<0.01$).

Zaključak: Dobijeni rezultati pokazuju da je vodeni ekstrakt *E. arborea* inhibisao spontane i acetilholinom indukovane kontrakcije ileuma pacova.

Ključne reči: *Erica arborea*; Ekstrakt; Acetilholin; Ileum; Pacov

THE EFFECT OF ETHANOLIC EXTRACT OF *Erica arborea* LEAF ON ISOLATED RAT ILEUM CONTRACTIONS

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Introduction: *Erica arborea* is used in the traditional herbal medicine as a diuretic, adstringens and to treat infections of the urinary tract.

The aim: To examine the effect of ethanolic extract of *E. arborea* on spontaneous and acetylcholine induced contractions on isolated rat ileum.

Material and methods: In this study were used Wistar albino rats (250–300g). The ileum portions were isolated out and cleaned off mesenteries. Preparations 2 cm long were mounted in 20 ml tissue baths containing Tyrode's solution maintained at 37°C and aerated with a mixture of 5% carbon dioxide in oxygen. In the first part of experiments, a contractile response to the ethanolic extract of *E. arborea* was recorded. In the second part, increasing concentrations of acetylcholine were added to the organ bath for a full concentration response curve and then concentration response curves were obtained after addition of the extract of *E. arborea*.

Results: Our results showed that ethanolic extract of *E. arborea* significantly in dose dependent manner decreased tonus spontaneous contractions of isolated rat ileum ($27.42\pm 3.15\%$; $p<0.01$). Ethanolic extract of *E. arborea* significantly reduced the acetylcholine induced contraction ($33.58\pm 4.75\%$; $p<0.01$).

Conclusion: It can be concluded that the ethanolic extract of *E. arborea* exert antispasmodic activity on rat ileum.

Key words: *Erica arborea*; Extract, Acetylcholine, Ileum, Rat

ODGOVOR HIPOTALAMUS-HIPOFIZA-NADBUBREG OSOVINE NA TEST FIZIČKOG OPTEREĆENJA KOD FIZIČKI AKTIVNIH I NEAKTIVNIH ISPITANIKA

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Uvod: Savremena naučna istraživanja sve više analiziraju fizičku aktivnost iz ugla dobrog modela stresa. U toku stresa dolazi do pojačanog lučenja ACTH iz hipofize, a posledično i kortizola iz kore nadbubrežne žlezde.

Cilj rada: Cilj ovog rada je bio da se ispita da li posle testa fizičkog opterećenja postoje razlike u odgovoru hipotalamus-hipofiza-nadbreg osovine kod fizički aktivnih i neaktivnih ispitanika.

Materijal i metode: U ovom istraživanju učestvovalo je 10 vrhunskih sportista i 10 fizički neaktivnih ispitanika. Svi su bili podvrgnuti testu fizičkog opterećenja na tredmilu. Ispitanicima je uzimana krv u mirovanju, na kraju testa i u 30. minutu oporavka iz koje je određen nivo ACTH i kortizola metodom ELISA testa.

Rezultati: Na kraju testa i u 30. minutu oporavka nivo kortizola bio je statistički značajno veći kod fizički neaktivnih u odnosu na fizički aktivne ispitanike ($p < 0.05$). Nivo kortizola kod fizički neaktivnih bio je statistički značajno veći na kraju testa ($p < 0.05$) kao i u 30. minutu oporavka ($p < 0.05$) u odnosu na početak testa.

Zaključci: Ovim radom smo pokazali da kontinuirano izlaganje fizičkoj aktivnosti dovodi do određenih adaptacija organizma na ovu vrstu stresa. Za razliku od nivoa ACTH koji se nije razlikovao između ispitivanih grupa, nivo kortizola bio je značajno veći u kontrolnoj grupi u odnosu na fizički aktivne ispitanike na kraju testa i u 30. minutu oporavka. Takođe, nivo kortizola u kontrolnoj grupi bio je statistički značajno veći na kraju testa kao i u 30. minutu oporavka u odnosu na početak testa.

Glavne reči: stres, fizička aktivnost, ACTH, kortizol.

DEBLJINA INTIMOMEDIJALNOG KOMPLEKSA KAROTIDNIH ARTERIJA KOD ASIMOTOMATSKIH ISPITANIKA STUDENATA MEDICINSKOG FAKULTETA

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Uvod: Ateroskleroza, u svojim ranijim fazama razvoja može biti reverzibilna, ako se redukuje uticaj određenih, potencijalno modifikujućih, faktora rizika za aterogenezu kao što su pušenje duvana, povećana tjelesna masa i abnormalna gojaznost. Na ovaj način može da se odgodi kliničko ispoljavanje ateroskleroze, ili da se smanji njihov intenzitet. Buduci da je ateroskleroza dominantni mehanizam starenja krvnih sudova, njen se intenzitet danas označava kao vaskularna starost i može da se procjenjuje mjerenjem debljine intimomedijskog kompleksa, najcesce na karotidnim arterijama. Istraživanja pokazuju da se vrijednosti ovog parametra razlikuju među nacijama.

Cilj istraživanja: Utvrditi debljinu intimomedijskog kompleksa karotidnih arterija kod mladih asimptomatskih ispitanika

Materijal i metode: Uzorak čini 36 studenata Medicinskog fakulteta Foca, oba pola starosti 20-22 godine. Debljina intimomedijskog kompleksa karotidnih arterija, određivana je korištenjem Color dopler ultrazvuka, sondom od 9Hz

Rezultati: Debljina intimomedijskog kompleksa karotidnih arterija kod nasih ispitanika iznosi $0,608 \pm 0,093$ mm

Zaključak: Debljina intimomedijskog kompleksa kao mjera vaskularne starosti određuje se ehosonografski broz, jednostavno i neinvazivno I potrebno je pratiti je, te time vršiti monitoring intenziteta aterogeneze na populacionom nivou, kao i na nivou pojedinca posebno ako postoje faktori rizika.

Glavne reči: ateroskleroza, debljina zida krvnog suda, vaskularna starost, studenti.

ANSWER HYPOTHALAMIC-PITUITARY-ADRENAL AXIS ON ERGOSPIROMETRIC TEST IN PHYSICALLY ACTIVE AND INACTIVE PARTICIPANS

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Introduction: Scientific researches increasingly analyse physical activity from the point of good stress model. During stress period secretion of ACTH being increased from pituitary gland as well as cortisol from adrenal cortex.

The Aim: To investigate whether after physical exercise there are different responses in relation hypothalamic-pituitary-adrenal axis to physically active and inactive participants.

Materials and Methods: Study included 10 elite athletes and 10 physically inactive participants. They were subjected exercise test on treadmill. Blood samples were taken during the rest, at the end of test and in 30. minutes of the recovery. Levels of ACTH and cortisol were determined by ELISA test.

Results: Level of cortisol was significantly higher in physically inactive participants compared to physically active subjects at the end of test and in 30. minutes of recovery ($p < 0.05$). Level of cortisol in physically inactive participants was significantly higher at the end of test ($p < 0.05$) and in 30. minutes of recovery ($p < 0.05$) compared to the beginning of test.

Conclusion: We have shown that continuous exposure to physically activity leads to certain adaptation of the organism in this type of stress. In contrast to ACTH levels, which did not differ between the groups, cortisol levels were significantly higher in control group than in physically active participants at the end of test and in 30. minutes of recovery. Cortisol levels in control group was significantly higher at the end of test and in 30. minutes of recovery compared to beginning of test.

Keywords: stress, physical activity, ACTH, cortisol.

THICKNESS INTIMOMEDIAL COMPLEX KAROTIDNIH ARTERY ASIMOTOMATSKIH RESPONDENTS MEDICAL STUDENTS

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Background: Atherosclerosis, in its earlier stages of development may be reversible if it reduces the influence of certain potentially modifying, risk factors for atherogenesis, such as smoking, increased body weight and abnormal obesity. This way you can postpone the clinical manifestation of atherosclerosis, or to reduce their intensity. Since atherosclerosis is the dominant mechanism of aging of blood vessels, its intensity still stands as a vascular and age can be estimated by measuring the thickness intimomedijskih kompleksa, usually in the carotid arteries. Studies show that the values of this parameter differ among nations.

The Aim: To determine the thickness of the carotid arteries intimomedijskih kompleksa in young asymptomatic subjects

Methods: The sample comprised 36 students of the Medical Faculty Foca, of both sexes aged 20-22 years. The thickness of the carotid arteries intimomedijskih kompleksa was measured by using Color Doppler ultrasound probe 9Hz

Results: The thickness of the carotid arteries intimomedijskih kompleksa in our patients was 0.608 ± 0.093 mm

Conclusion: Obesity intimomedijskih kompleksa as a measure of vascular age is determined ehosono fast, simple and noninvasive, it is necessary to follow it, and thereby monitor the intensity of atherogenesis in the population level, as I At the individual level especially if there are risk factors

Keywords: atherosclerosis, blood vessel wall thickness, vascular age, students.

DNEVNO - NOĆNI RITAM STUDENATA

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Uvod: Spavanje je za čoveka mnogo više od odmora. To je proces neophodan za telesnu i duhovnu regeneraciju organizma. Planiranje dnevnih aktivnosti, u zavisnosti od neurofiziološke hronotipologije, jedan je od koraka koji bi trebalo učiniti ka kvalitetnijem, uspešnijem i zdravijem životu.

Cilj rada: Cilj istraživanja je bio da se odredi koliko studenti Univerziteta u Novom Sadu spavaju, a koliko misle da bi trebalo; koliko su zadovoljni kvalitetom spavanja, kao i u kojoj meri nedovoljno spavanje utiče na efikasnost u njihovim svakodnevnim obavezama. Određivan je hronotip kojem studenti pripadaju (jutarnjem, večernjem ili indiferentnom).

Materijal i metode: Istraživanjem je obuhvaćeno 100 studenata Univerziteta u Novom Sadu- 50 devojaka i 50 mladića, uzrasta od 20 do 23 godine (prosečne starosti 21.1 godina). Svi ispitanici su dobrovoljno testirani primenom specijalno načinjenih upitnika (dva upitnika).

Rezultati: Studenti, u najvećem procentu, pripadaju indiferentnom hronotipu. Studentkinje spavaju duže od studenata i više vremena provode u krevetu. Studenti su nezadovoljniji vremenom spavanja od studentkinja. Optimalno vreme za rešavanje zadataka uz maksimalni psihički angažman je od 9 do 11 časova pre podne.

Zaključci: Studenti, u najvećem procentu, pripadaju indiferentnom hronotipu. Najveći broj studenata su optimalno psihički aktivni od 9 do 11 časova pre podne, te bi ovaj podatak trebalo iskoristiti pri planiranju testova- ispita. Studenti su zadovoljni kvalitetom spavanja.

Ključne reči: hronotipologija, studenti, spavanje.

DAY - NIGHT RHYTHM OF STUDENTS

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Introduction: Sleeping is for the men much more than a rest. This process is essential for physical and spiritual regeneration of the organism. Planning daily activities, depending on neurophysiological chronotipology, is one of the steps which should be taken towards the more successful, healthier, high quality life.

The aim: The aim of this study was to determine how many students of the University of Novi Sad sleeps, and how many feel they should be; how are they satisfied with the quality of sleep, and in what degree the lack of sleep affects efficiency of their daily duties.

Materials and methods: The study involved 100 students from the University of Novi Sad- 50 girls and 50 boys, ages 20 to 23 years (median age 21,1 years). The individuals were voluntarily tested using a specially made questionnaires (two).

Results: Students belong to the largest percentage of indifferent chronotype. Female students sleeps more than their colleagues and spend more time in bed. Boys were more dissatisfied with the sleeping than girls. The optimum time convenient for mental and heavy physical work is from 9 to 11 AM.

Conclusions: Students belong to the largest percentage of indifferent chronotype. The optimum time convenient for mental and heavy physical work is from 9 to 11 AM, and this fact should be use for planning tests. The students are satisfied with the quality of sleep.

Key words: chronotipology, students, sleeping.

MODULACIJA EPILEPTOGENE AKTIVNOSTI HOMOCISTEINA FIZIČKOM AKTIVNOŠĆU NA TREDMILU

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Uvod: Aerobno fizičko vežbanje ima brojne povoljne efekte na mentalno zdravlje i somatsku izdržljivost, dok je efekat vežbanja na epilepsiju, hroničnu neurološku bolest, kontroverzan. Homocistein, ubikvitarna amino kiselina, je uvršćena na listu potencijalnih ekscitatornih neurotransmitera.

Cilj: Ispitati efekte aerobnog fizičkog vežbanja na tredmilu kod pacova kojima je intraperitonealnom administracijom homocisteina izazvana epileptogena aktivnost.

Materijal i metode: Wistar albino pacovi su učeni da trče na traci tredmila koja se kretala brzinom 5-10 m/min (10 min u toku 3 dana). Nakon adaptacije životinje su nasumično raspoređene u treniranu i sedentarnu grupu. Životinje iz trenirane grupe su nastavile da trče pri brzini trake od 20 m/min sledećih 30 dana, pola sata dnevno. Sedentarna grupa je provodila vreme u tredmilu pri brzini kretanja trake od 0 m/min sledećih 30 dana, takođe pola sata dnevno. Zadnjeg dana eksperimenta (31. dan) svim životinjama je administriran D, L homocistein tiolakton u dozi od 8 mmol/kg, i.p. Incidencija, intenzitet, latentni period i broj konvulzivnih epizoda po pacovu opserviran je tokom narednih 90 min.

Rezultati: Nakon administracije homocisteina trenirana grupa je imale statistički značajno produžen latentni period do prvog konvulzivnog napada, kao i statistički značajno manji broj konvulzivnih epizoda po pacovu u odnosu na sedentarnu grupu životinja. Međutim, nije dobijena statistički značajna razlika između grupa za incidenciju i intenzitet konvulzivne epizode.

Zaključak: Hronično aerobno fizičko vežbanje na tredmilu smanjuje osetljivost adultnih pacova na epileptogenu aktivnost izazvanu administracijom homocisteina.

Ključne reči: aerobno fizičko vežbanje, tredmil, homocistein, konvulzije, pacov.

MODULATION OF EPILEPTOGENIC ACTIVITY OF HOMOCYSTEINE BY PHYSICAL EXERCISE ON TREADMILL

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Introduction: Aerobic physical exercise has many benefits for mental and physical condition, but its implications for epilepsy, one of the most common and chronic neurologic disorder worldwide, are still controversial. Homocysteine is ubiquitous amino acid and a potential excitatory neurotransmitter.

The Aim: To determine effects of treadmill aerobic exercise training on epileptogenic activity of homocysteine in rats.

Materials and Methods: Wistar albino rats were familiarized with treadmill by teaching them to run 10 min daily, 3 consecutive days, at a belt speed of 5-10 m/min. After adaptation animals were randomly divided into trained and sedentary (control) groups (n = 8 for each). Animals from trained group continued to run 30 min daily, 30 consecutive days, at a belt speed of 20 m/min. Thirty-first day of the start of training all animals were administrated homocysteine (D, L homocysteine thiolactone, 8 mmol/kg, i.p.). Convulsive behavior (incidence, severity, seizure latency and number of seizure episodes per rat) was observed during the next 90 min.

Results: After homocysteine administration the animals that were included in chronic aerobic exercise training program had a significantly prolonged seizure latency and significantly reduced number of seizure episodes per rat compared with the sedentary group. However, there was no statistically significant difference between these groups in incidence and seizure severity.

Conclusion: Chronic treadmill aerobic exercise training reduces the susceptibility of adult rats to epileptogenic activity of homocysteine.

Key words: aerobic physical exercise, treadmill, homocysteine, seizure, rat.

EFEKTI HOMOCISTEIN TIOLAKTONA NA ANKSIOZNOST PACOVA

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Uvod: O povezanosti anksioznosti sa homocisteinom i njegovim reaktivnim tioestrom (homocistein tiolaktonom), koji je faktor rizika za brojna oboljenja, kliničke studije pokazuju oprečne rezultate.

Cilj rada: Ispitati efekte akutne administracije homocistein tiolaktona na lokomotornu aktivnost i ponašanje povezano sa anksioznošću kod pacova upotrebom testa otvorenog polja.

Materijal i metode: Životinje su pojedinačno testirane u otvorenom polju nakon 30 minuta od intraperitonealne administracije 0,9% NaCl (kontrolna grupa) ili homocistein tiolaktona 1,3 mmol/kg (eksperimentalna grupa). Pomoću automatizovanog sistema za monitoring ponašanja registrovani su pređeni put i vreme ambulatornog kretanja; broj propinjanja na zadnje ekstremitete, kao i vreme koje životinja provede u centru polja. Odnos pređenog puta u perifernim zonama polja i ukupnog pređenog puta tokom ambulatornog kretanja predstavljao je indeks tigmotaksije (%).

Rezultati: Akutna administracija homocistein tiolaktona dovela je do skraćenja pređenog puta i vremena ambulatornog kretanja u otvorenom polju, smanjila je broj propinjanja na zadnje ekstremitete i vreme provedeno u centru otvorenog polja, a povećala indeks tigmotaksije u poređenju sa kontrolnom životinjama.

Zaključak: Akutna aplikacija homocistein tiolaktona kod pacova delovala je proanksiogeno.

Ključne reči: homocistein tiolakton, anksioznost, test otvorenog polja, pacovi

EFFECTS OF HOMOCYSTEINE THIOACTONE ON ANXIETY IN RATS

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Introduction: Clinical studies showed contradictory results on relationship between anxiety and homocysteine level, which is, together with its reactive thioester homocysteine thiolactone, risk factor for numerous disorders.

The Aim: To determine the effects of acute homocysteine thiolactone administration on locomotor activity and anxiety – related behavior using open field test in rats.

Materials and Methods: Wistar albino rats were individually tested in open field 30 min after 0.9% NaCl (control group) or homocysteine thiolactone (1.3 mmol/kg, experimental group) intraperitoneal administration. Distance and time of ambulatory movements; number of rearings and time spent in the center of the field were recorded using automatized system for rat behavior monitoring. Index of thigmotaxis (%) was calculated as ratio between distance of ambulation in periphery and total distance of ambulation.

Results: Acute homocysteine thiolactone administration decreased distance and time of ambulatory movements in the open field, as well as number of rearings and time spent in the field center, while it increased index of thigmotaxis.

Conclusion: Results of this study indicate proanxiogenic effects of acute homocysteine thiolactone administration in rats.

Key words: homocysteine thiolactone, anxiety behavior, open field test, rats

EFEKTI D,L- HOMOCISTEIN TIOLAKTONA NA SPONTANI MOTILITET IZOLOVANOG DUODENUMA PACOVA I NITRERGIČKU NEUROTRANSMISIJU

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Uvod: Brojna ispitivanja su pokazala da postoji povezanost između povećane koncentracije homocisteina sa nastankom vaskularnih, neurodegenerativnih oboljenja. Homocistein je potencijalni ekscitatorni neurotransmiter na nivou krvnih sudova, CNS-u, a u nivou gastrointestinalnog trakta dovodi do poremećaja motiliteta.

Cilj rada: Ispitati efekte D,L- homocistein tiolaktona na spontani motilitet duodenuma pacova i nitregeričku neurotransmisiju.

Materijal i metode: Eksperimenti su izvedeni na izolovanom duodenumu Wistar albino pacova muškog pola, telesne težine 250-300g. Mehanička aktivnost duodenalnih segmenata pod mirovnom tenzijom od 1g je merena pomoću izometrijskog transdjusera povezanog sa Sensor Medics Dynograph Recorder R511A pisačem. Nakon 1h adaptacionog perioda registrovana je spontana aktivnost segmenta duodenuma u toku perioda od 30 min, nakon čega su ispitivani efekti D,L-homocistein tiolaktona.

Rezultati: D,L-homocistein tiolakton u koncentraciji 10µmol/L dovodi do trenutnog porasta tonusa, amplitude i frekvence spontanih pokreta izolovanog duodenuma pacova. Ovaj efekat se održava i postaje maksimalan nakon 30-o minutne inkubacije. L-NAME (10µmol) dovodi do porasta mirovnog tonusa, amplitude i frekvence spontanih kontrakcija longitudinalne muskulature izloženih segmenata duodenuma. Efekat nastaje odmah nakon aplikacije i traje 5 minuta. Inkubacija u 10 µmol L-arginina, efekte L-NAME značajno redukuje, ali u potpunosti ne blokira. Inkubacija u 10 µmola D,L-homocistein tiolaktona pokazuje manji porast mirovnog tonusa, amplitude i frekvence spontanih kontrakcija longitudinalne muskulature izolovanih segmenata duodenuma u odnosu na kontrolnu grupu.

Zaključak: D,L-homocistein tiolakton povećava tonus, amplitudu i frekvencu spontanih pokreta izolovanog duodenuma pacova i smanjuje nitregeričku aktivnost.

Ključne reči: homocistein, nitregerička neurotransmisija, motilitet, izolovani duodenum, pacov.

EFFECTS OF D,L-HOMOCYSTEIN THIOACTONE ON SPONTANEOUS MOTILITY OF ISOLATED RAT DUODENUM AND NITRERGIC NEUROTRANSMISSION

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Introduction: Numerous studies have shown that there is a correlation between increased homocysteine concentrations with the development of vascular, neurodegenerative diseases. Homocysteine is a potent excitatory neurotransmitter in the blood vessels, the CNS, and in gastrointestinal tract causes motility disorders.

The Aim: To examine the effects of D, L-homocysteine thiolactone on the spontaneous motility of rat duodenum and nitregeric neurotransmission.

Materials and Methods: Experiments were performed on isolated rat duodenum male albino Wistar, body weight 250-300g. The mechanical activity of duodenal segments under the basale tension of 1g was measured using isometric transducers connected to the Sensor Medics Dynograph Recorder R511A printer. After 1 hour adaptation period spontaneous activity was recorded during the period of 30 min, after that effects of D, L-homocysteine thiolactone were examined.

Results: D, L-homocysteine thiolactone concentration of 10 µmol/L leads to immediate increase in tone, amplitude and frequency of spontaneous movements of isolated rat duodenum. L-NAME (10 µmol) leads to an increase in basale tone, amplitude and frequency of spontaneous contractions of longitudinal muscle of isolated segments of the duodenum. Incubation in 10 µmol L-arginine, the effects of L-NAME significantly reduced, but does not completely blocked. Incubation in 10 µmol D,L-homocysteine thiolactone shows a smaller increase in basale tone, amplitude and frequency of spontaneous contractions of longitudinal muscle of isolated segments of the duodenum than in the control group.

Conclusion: D,L-homocistein tiolakton increases tone, amplitude and frequency of spontaneous contractions of isolated rat duodenum and decreases nitregeric activity.

Key words: homocysteine, nitregeric neurotransmission, motility, isolated duodenum, rat.

EFEKTI VIBROAKUSTIČKI-INDUKOVANIH MIKROVIBRACIJA NA ARTERIJSKI KRVNI PRITISAK I PARAMETRE OKSIDATIVNOG STRESA KOD PACOVA

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Uvod: Vibroakustika je naučna oblast koja koristi sposobnost zvuka (infrazvuk, ultrazvuk, buka, muzika) da indukuje vibracije, koje kao i zvuk, mogu imati štetna ili korisna dejstva.

Cilj: Ispitati akutne efekte vibroakustički-indukovanih mikrovibracija na arterijski krvni pritisak i parametre oksidativnog stresa u krvi pacova.

Materijal i metode: Eksperimenti su izvedeni na pacovima, mužjacima, soja Vistar, podeljenim u kontrolnu i eksperimentalnu grupu (6 pacova u svakoj grupi). U ovom istraživanju korišćene su vibroakustički-indukovane mikrovibracije (ukupno vreme 60 minuta, 4 različita režima, trajanje svakog režima 10 minuta sa pauzama između pojedinačnih režima od 5 minuta, opseg frekvencija 30Hz-18000Hz, opseg amplituda mikrotalasa 2,8 μ m-12,3 μ m) za procenu njihovih efekata na vrednost arterijskog krvnog pritiska i parametre oksidativnog stresa (indeks lipidne peroksidacije-TBARS, superoksidna dismutaza, katalaza, glutation) kod pacova.

Rezultati: Rezultati su pokazali da akutna primena vibroakustički-indukovanih mikrovibracija kod pacova in vivo, pri najnižim frekvencijama i amplitudama, smanjuje sistolni arterijski pritisak i pokazuje tendenciju ka smanjenju dijasistolnog arterijskog pritiska. Osim toga, rezultati su pokazali značajne razlike u vrednostima enzima katalaze, dok u odnosu na druge analizirane parametre oksidativnog stresa značajne razlike nisu pokazane, iako je postojao jasan trend promena posle tretmana.

Zaključak: Akutna primena vibroakustički-indukovanih mikrovibracija smanjuje sistolni pritisak, ne utiče na vrednost dijasistolnog pritiska, ali pokazuje tendenciju ka smanjenju, povećava aktivnost enzima katalaze i ne utiče na aktivnost drugih parametara oksidativnog stresa, ali pokazuje tendenciju ka smanjenju.

KLjučne reči: Vibroakustički-indukovane mikrovibracije, krvni pritisak, oksidativni stres

EVALUACIJA PACIJENATA SA PRVOM KONVULZIVNOM KRIZOM SVESTI

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Uvod: Konvulzivna kriza svesti predstavlja jedan od osnovnih simptoma kojim mozak reaguje kada je nadražen ili oštećen različitim noksama.

Cilj: Cilj rada je bio da se utvrdi korelacija između prve konvulzivne krize svesti sa nalazom na EEG-u, CT ili MR endokranijuma.

Materijal i metode: U radu je uključeno 42 pacijena, koji su se hospitalizovali zbog prve konvulzivne krize svesti na odeljenju za neurologiju ZC Kosovska Mitrovića u toku 2010. godine. Svim pacijentima je urađen kompletan neurološki pregledi, standardno EEG snimanje, EEG snimanje nakon deprivacije spavanja, CT ili MR endokranijuma. U istraživanju su uključeni ispitanici sa normalnim neurološkim nalazom.

Rezultati: Ukupan broj hospitalizovanih pacijenata na odeljenju za neurologiju, ZC Kosovska Mitrovića u toku 2010. godine je iznosio 42. Analizirajući EEG nalaz kod tih pacijenata došlo se do sledećih podataka: normalan nalaz je bio zastupljen kod 47,6% pacijenata, promene na EEG su viđene kod 52,4% pacijenata od tog broja 14,3 je imalo nespecifične iritativne promene, a specifična epileptiformna pražnjenja su registrovana kod 38,1% hospitalizovanih pacijenata. Na osnovu elektroencefalografskog nalaza, nalaza na CT ili MR endokranijuma završna dijagnoza epilepsije je postavljena kod 35,7% pacijenata, od tog broja strukturne promene na CT ili MR endokranijuma je imalo 26,6%. **Zaključak:** Uzimajući u obzir sve navedeno potrebno je kako kod pacijenata sa normalnim nalazom tako i kod onih kod kojih su viđene promene na EEG-u, CT ili MR potrebna su dalja ispitivanja ne samo za potpuniju dijagnostiku već i za praćenje terapijskog efekta jer slične pojave mogu da se vide kod mnogih oboljenja i poremećaja.

KLjučne reči: konvulzivna kriza, EEG, epilepsija.

THE EFFECTS OF VIBROACOUSTICALLY-INDUCED MICROVIBRATIONS ON ARTERIAL BLOOD PRESSURE AND PARAMETERS OF OXIDATIVE STRESS IN RATS

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Introduction: There has been substantial amount of research investigating vibratory sensitivity in subjects including infrasound, ultrasound, noise, music. However, vibrations in the audible range have been used to help bring patients back to mental, physical and emotional balance in many cultures.

The Aim: To investigate the acute effects of vibroacoustically-induced microvibrations on arterial blood pressure and parameters of oxidative stress in rats blood.

Materials and Methods: The experiments were performed on Wistar male rats, divided in control and experimental group (6 animals in every group). In this research we used vibroacoustically-induced microvibrations (total time 60 minutes, 4 different regimens, duration of every regimen 10 minutes with stabilization time between separated regimens 5 minutes, frequency range 30Hz-18000Hz, amplitude range of microwaves 2.8 μ m-12.3 μ m) to evaluate their influence on arterial blood pressure as well as on certain parameters of oxidative stress (index of lipid peroxidation-TBARS, superoxide dismutase, catalase, glutathione) in rats.

Results: The obtained results clearly show beneficial effects of applied low-frequency vibroacoustically-induced microvibrations on decrease of systolic blood pressure and tendency to decrease diastolic blood pressure. In addition, the results showed significant increase of enzyme catalase value, while other parameters of oxidative stress were not significantly changed, although there were clear tendency of changes after treatment.

Conclusion: The acute application of vibroacoustically-induced microvibrations decreases systolic blood pressure, has no effects on diastolic pressure, but shows tendency to reducing, increase enzyme catalase value and has no effects on other parameters of oxidative stress, but shows tendency of changing.

Key words: Vibroacoustic-induced microvibrations, arterial pressure, oxidative stress

EVALUATION OF THE PATIENTS WITH FIRST CONVULSIVE CONSCIOUSNESS CRISIS

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Introduction: Convulsive consciousness crisis represents one of the basic symptoms where brain reacts when it is stimulated or damaged with different noxes.

Aim: The aim of this work was to determine correlation between first convulsive consciousness crisis and records got by EEG, CT or MR endocranium.

Material and methods: 42 patients who were hospitalized on Neurology department in Kosovska Mitrovića because of first convulsive consciousness crisis were included in this work during 2010. All patients had full neurological examination, EEG recordings which is a standard procedure, EEG recordings after sleeping deprivation, CT or MR endocranium. This research included patients with normal neurological status.

Results: Number of patients hospitalized on Neurology Department in Kosovska Mitrovića during 2010 was 42. After analysing patients' EEG records we had come to following data: 47.6% of patients had normal neurological status, 52.4% of patients had changes on EEG records (out of this 14.3% of patients had nonspecific iritative changes while 38.1% of patients had specific epileptic activity). On the basis of EEG records, CT or MR endocranium 35.7% of patients had final epilepsy diagnosis where 26.6% of patients had structural changes on CT or MR endocranium.

Conclusion: Taking into consideration all these, it is necessary to apply some further examinations not only to get more complete diagnostics but for following therapy effect as well in both patients (with normal neurological status and those with changes on EEG, CT or MR) because some similar symptoms can be found in many other diseases and disorders.

Key words: consciousness crisis, EEG, epilepsy.

MORFOMETRIJSKE KARAKTERISTIKE GONADOTROPNIH ČELIJA ADENOHIPOFIZE NORMALNO UHRANJENIH I GOJAZNIH PACOVA POSLE CENTRALNE PRIMENE GRELINA

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Uvod: Energetska homeostaza predstavlja balans između unosa i potrošnje energije. Svako narušavanje energetskog balansa predstavlja stanje organizma gde dolazi do promena u hipotalamo-hipofizno-gonadnoj osovini. Jedan od važnih centralnih faktora u kontroli energetske homeostaze je grelin.

Cilj rada: Ispitivanje uticaja intracerebroventrikularne (ICV) primene grelina na reproduktivnu osovину normalno uhranjenih (NF) i gojaznih (HF) pacova određivanjem morfometrijskih karakteristika gonadotropnih ćelija adenohipofize.

Materijal i metode: Različito uhranjeni, 8 nedelja stari mužjaci Wistar pacova ($n=32$) koji su ICV tretirani grelinom ($1\mu\text{g}$ grelina/ $5\mu\text{L}$ PBS, $n=16$) ili solventom ($5\mu\text{L}$ PBS, $n=16$) tokom 5 uzastopnih dana, bili su tokom tretmana na *ad libitum* režimu ishrane. Životinje su žrtvovane 1h nakon poslednje aplikacije kada su im ekstrahovane hipofize, izvršeno imunohistohemijsko bojenje LH i FSH ćelija i određeni morfometrijski parametri.

Rezultati: U svim ispitivanim grupama tretiranim grelinom konstatovano je značajno ($p<0.05$) povećanje unosa hrane i telesne mase u odnosu na odgovarajuće kontrole. Centralni tretman grelinom nije značajno promenio ($p>0.05$) apsolutne i relativne mase hipofize ni u jednoj od ispitivanih grupa u odnosu na odgovarajuće kontrole. Isti tretman izazvao je smanjenje broja LH ćelija, smanjene veličine FSH ćelija i tamniji intenzitet bojenja oba tipa ćelija. Centralna aplikacija grelina dovela je do značajnog ($p<0.05$) smanjenja volumenske gustine (Vvc) LH ćelija u NF grupi životinja, kao i pada vrednosti volumena ćelija (Vc) i značajno povećanja vrednosti volumena jedara (Vn) FSH ćelija u NF i HF grupi pacova.

Zaključak: Centralna primena grelina negativno utiče na hipotalamo-hipofizno-gonadnu osovину, delujući inhibitorno na morfološke i stereološke karakteristike gonadotropnih ćelija adenohipofize.

Ključne reči: grelin, ICV, FSH, LH

MORPHOMETRIC FEATURES OF PITUITARY GONADOTROPIC CELLS IN NORMAL FED AND HI-FED RATS AFTER CENTRAL GHRELIN APPLICATION

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Introduction: Energy homeostasis represents balance between energy intake and expenditure. Every disorder in energy homeostasis leads to changes in hypothalamo-pituitary-gonadal axis. One of the crucial factors regulating energy homeostasis is ghrelin.

The Aim: Examination of intracerebroventricular (ICV) ghrelin application on reproductive axis in normal fed (NF) and hi-fed (HF) rats by determination of morphometric features of pituitary gonadotropic cells.

Materials and Methods: Eight weeks old male Wistar rats ($n=32$) that were on different nutritional states, had been treated every 24h with ICV ghrelin ($1\mu\text{g}$ ghrelin/ $5\mu\text{L}$ PBS, $n=16$) or solvent ($5\mu\text{L}$ PBS, $n=16$) during 5 days. Animals were on *ad libitum* feeding regimen during experiment, and were sacrificed 1h after last ICV application when pituitaries were extracted, LH and FSH immunohistochemical features were analyzed and morphometric features were obtained.

Results: Body mass and food intake were significantly increased ($p<0.05$) in all examined groups after ghrelin treatment. Central ghrelin administration did not significantly change ($p>0.05$) absolute and relative pituitary weights compared to corresponding controls. Same treatment caused decrease in LH cells number and decrease in FSH cells size, also causing darker staining intensity of both cell types. Central ghrelin application significantly decreased ($p<0.05$) volume density (Vvc) of LH cells in NF group. Same treatment caused significantly decreased cell volumes (Vc) and significantly increased nuclear volume (Vn) of FSH cells in both NF and HF group of animals.

Conclusion: Central ghrelin application negatively effects hypothalamo-pituitary-gonadal axis acting inhibitory on morphological and stereological characteristics of gonadotropic pituitary cells.

Key words: ghrelin, ICV, FSH, LH

KLINIČKI ZNAČAJ DEFINISANE LATERALIZOVANOSTI GORNJIH EKSTREMITETA KOD DECE

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Uvod: Lateralizovanost predstavlja spoljnu manifestaciju integrativne aktivnosti moždane kore u smislu dominacije jedne hemisfere, odnosno funkcionalna prevaga jednog od parnih organa.

Cilj: Nedefinisana ili nedosledna upotreba jedne ruke kao dominantne počiva na različitim oblicima neurološke disfunkcije.

Materijal i metode: Istraživanjem je obuhvaćeno 80 dece uzrasta 5 do 7 godina koji su podeljeni u tri grupe: 20 dece je sa mono ili polisimptomatskim tikovima, 20 lako mentalno retardirane dece i 40 zdrave dece. Procena gestualne i upotrebne lateralizovanosti ruku kod dece vršena je probama po Bojaninu.

Rezultati: Istraživanja pokazuju da je slabo izražena dominacija moždanih hemisfera kod lako mentalno retardirane dece prisutna u 90 % slučajeva, kod dece sa tikovima 80 % slučajeva, dok je kod zdrave dece bila zastupljena u 65% slučajeva.

Zaključak: Kod dece sa specifičnim neurološkim problemima zapažamo nedefinisano upotrebnu lateralizovanost gornjih ekstremiteta.

Ključne reči: mozak, lateralizovanost, ruka.

THE CLINICAL SIGNIFICANCE OF DEFINED HANDEDNESS OF UPPER LIMBS WITH CHILDREN

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Introduction: Handedness represents external manifestation of integrative cortex activity, in terms of, one hemisphere domination, or in other words a functional overbalance of one of paired organs.

The Aim: Undefined or inconsistent usage of only one hand as dominant, is based on different forms of neurological dysfunction.

Materials and Methods: The research included eighty children, age five to seven, who were split into three groups. Twenty of children had mono or polysymptomatic tics. Other twenty were mildly mentally retarded, and forty more healthy children. The estimation of gestural and utilization handedness with children, was done according to Bojanin's tests.

The result: of the research showed that with mildly mentally retarded children the brain hemispheres domination was poorly expressive in 90% cases, then with children who had tics in 80% cases, while with healthy children the brain hemispheres domination was represented in 65% cases.

Conclusion: Children with specific neurological problems showed undefined handedness usage of upper limbs.

Key words: brain, handedness, hand.

EFEKTI HIPERBARIČNE OKSIGENACIJE NA OPORAVAK PACOVA POSLE SUKCIONE ABLACIJE SENZO-MOTORNOG KORTEKSA

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Uvod: Hiperbarična oksigenacija (HBO) predstavlja terapijsku proceduru u kojoj pacijent pod pritiskom višim od atmosferskog udiše 100% molekulski kiseonik.

Cilj: Cilj ove studije je da utvrdi da li primena HBO može poboljšati oporavak pacova posle sukciione ablacije desnog senzo-motornog korteksa.

Materijal i metode: Eksperimentalni model je imao sledeće grupe: kontrolne životinje(K), kontrolne + HBO(KHBO), šam kontrola(Š), šam kontrola + HBO (ŠHBO), operisana grupa kojoj je sukcionom ablacijom uklonjen desnoi senzomotorni korteks (L), operisana + HBO (LHBO). HBO protokol: pritisak od 2.5 atmosfere, 60 minuta, jedamput dnevno, tokom 10 dana. Test prelaska brvna i test merjenja snage stiska su korišćeni za procenu oporavka motornih funkcija. Količina malondialdehida (MDA), aktivnost superoksida dizmutaze(SOD) i glutation peroksidaze(GPX) su mereni u uzorcima povređenog hemikorteksa.

Rezultati: LHBO grupa je postigla statistički značajno bolje rezultate na testu prelaska brvna u odnosu na L grupu. Oporavak mišićne snage pogođene šape je bio značajno veći posle HBO tretmana. HBO je izrazito povećao aktivnost GPX u povređenom korteksu u odnosu na sve ostale grup. Posle povrede, nivo aktivnosti SOD je dramatično smanjen u uzorcima kortikalnog tkiva grupe L dok je u grupi LHBO bio skoro na nivou kontrolne grupe. Os svih ispitivanih grupa, najviši nivo MDA je nađen u L grupi dok je kod LHBO bio smanjen.

Zaključci: Naši nalazi ukazuju da HBO smanjuje lipidnu peroksidaciju i intenzivira antioksidativnu aktivnost GPX i SOD nakon eksperimentalne kortikalne povrede. Stabilizacija oksidativnog statusa stvara pogodnije uslove za oporavak lokomotornih funkcija kod pacova.

Ključne reči: traumatska povreda mozga, lokomotorna oštećenja, hiperbarična oksigenacija, oksidativni stres.

EFFECTS OF HYPERBARIC OXYGEN TREATMENT ON RECOVERY OF RATS AFTER SUCTION ABLATION OF SENSORY-MOTOR CORTEX

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Introduction: Hyperbaric oxygenation (HBO) is therapeutic modality where patient breathes 100% oxygen under the pressure of more than one atmosphere.

The Aim: To investigate whether (HBO) can improve the recovery in rats after suction ablation of the sensorimotor cortex.

Materials and Methods: Experimental paradigm implies the following groups: Control animals(C), Control + HBO(CHBO), Sham controls(S), Sham control + HBO(SHBO), Lesion group(L), right sensorimotor cortex was removed by suction, Lesion + HBO(LHBO). Hyperbaric protocol: pressure applied 2.5 atmospheres absolute, for 60 minutes, once a day for 10 days. Beam walking test and grip strength meter were used to evaluate recovery of motor functions. Malondialdehyde(MDA) content, activity of superoxide dismutase(SOD) and glutathione peroxidase(GPX) sampled from injured hemicortex were measured.

Results: LHBO group have achieved statistically superior scores in beam walking test compared to the L group and more pronounced the recovery of the muscle strength of affected hindpaw. HBO increased GPX activity in the injured cortex compared to all other groups. L group level of SOD activity was dramatically lowered in the cortical tissue sample, while in LHBO it was almost at control levels. The highest level of MDA was found in the cortical tissue samples from L group, while in LHBO it was reduced.

Conclusion: Our data indicate that HBO therapy inhibits the lipid peroxidation and intensify the antioxidant activities of GPX and SOD after experimental brain injury. Thus, stabilisation of oxidative status contributes to the recovery of locomotor performances in rats.

Keywords: traumatic brain injury, locomotor impairments, hyperbaric oxygen, oxidative stress

EFEKTI DELTA PEPTIDA SPAVANJA NA BIHEVIJORALNE MANIFESTACIJE KONVULZIVNIH NAPADA IZAZVANIH LINDANOM KOD PACOVA

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Uvod: Lindan (gama – heksahlorciklohekan) je u upotrebi kao pesticid i skabid i izaziva konvulzivne napade blokirajući GABA_A receptor. Delta peptid spavanja (DSIP) je endogeni neuropeptid prisutan u različitim regionima mozga, u mleku, crevima i dr.

Cilj: Utvrditi da li DSIP ima efekte na konvulzivne manifestacije izazvane lindanom kod pacova.

Materijal i metode: Odrasli mužjaci Wistar pacova intraperitonealno su tretirani lindanom (8 mg/kg). Tokom narednih pola sata opservirani su bihevioralni parametri konvulzivnih napada (incidenca, latenca i intezitet napada). Intenzitet je procenivan koristeći deskriptivnu skalu sa gradusima od 0 do 4. DSIP (1 mg/kg, i.p.) ili dimetilsulfoksid (DMSO, 0,5 ml/kg, kontrolna grupa) injicirani su 30 min pre administracije lindana.

Rezultati: Grupa životinja pretirana DSIP-om pokazivala je konvulzivne napade izazvane lindanom koji su značajno izmenjeni u odnosu na grupu kojoj nije administriran DSIP (redukcija intenziteta i produženje trajanja lateno perioda). Nisu zapaženi statistički značajni efekti na incidencu napada i letalitet izazvan lindanom.

Zaključak: Ovi rezultati pokazuju da bi DSIP trebalo razmotriti kao adjuvantnu komponentu antiepileptičnog tretmana lindanom izazvanih napada kod pacova.

Ključne reči: DSIP, lindan, epilepsija, bihevior, pacovi

EFFECTS OF DELTA SLEEP INDUCING PEPTIDE ON BEHAVIORAL MANIFESTATIONS OF CONVULSIONS INDUCED BY LINDANE IN RATS

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Introduction: Lindan (gamma-hexachlorcyclohexane) is used as pesticide and scabicide, but it also induces convulsions, by blocking GABA_A receptor. Delta sleep-inducing peptide (DSIP) is an endogenous peptide, which is constantly present in several different brain regions.

The Aim: To determine the effects of DSIP on behavioral manifestations of convulsions induced by lindane in rats.

Material and Methods: Lindane (8 mg/kg) was given to the adult male rats intraperitoneally (i.p.). During the following 30 minutes, behavioral characteristics of convulsions were observed (incidence, latency and intensity). A descriptive scale with grades from 0 to 4 was used to estimate the intensity of the attacks. DSIP (1 mg/kg, i.p.) or dimethylsulfoxide (DMSO, 0.5 ml/kg, control group) were injected 30 minutes before lindane.

Results: DSIP significantly reduced the intensity, and prolonged the latency of convulsions induced by lindane. However, DSIP did not produce statistically significant effect to the incidence and lethality of these attacks.

Conclusion: These results showed that DSIP should be considered as an adjuvant component of antiepileptic treatment.

Key words: DSIP, lindane, epilepsy, behavior, rats

UTICAJ AMINOGLAVANIDINA NA KONVULZIJE IZAZVANE HOMOCISTEINOM KOD PACOVA

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Uvod: Azot monoksid (NO) pripada porodici gasnih transmitera i pokazuje pro/antikonvulzivne osobine u zavisnosti od modela epilepsije. Selektivni inhibitor inducibilne NO sintaze (iNOS) je aminogvanidin koji smanjuje nivo NO. Hiperhomocisteinemija je faktor rizika za mnoge neurološke bolesti, kao i za epilepsiju.

Cilj rada: je bio da se utvrdi uticaj aminogvanidina na konvulzivne manifestacije indukovane homocisteinom kod odraslih pacova.

Materijal i metode: Pacovi soja *Wistar albino* su tretirani aminogvanidinom (100 mg/kg) 30 minuta pre administracije homocisteina (D,L homocistein tiolaktom, subkonvulzivna doza, 5,5 mmol/kg). Opservirali smo sledeće karakteristike konvulzivnih napada: incidencu, latentni period, broj konvulzivnih epizoda po pacovu i njihov intenzitet (skala od 0 do 4).

Rezultati: Sistemskom administracijom aminogvanidina pre homocisteina došlo je do povećanja incidence, broja konvulzivnih epizoda po pacovu i intenziteta konvulzija dok je smanjen latentni period.

Zaključak: Na osnovu rezultata ovog rada može se zaključiti da aminogvanidin, selektivni inhibitor iNOS, potencira konvulzivne napade izazvane homocisteinom kod pacova.

Ključne reči: konvulzije, aminogvanidin, homocistein, iNOS, pacovi

THE EFFECTS OF AMINOGLAVANIDINE ON HOMOCYSTE - INDUCED CONVULSIONS IN RATS

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Introduction: Nitric oxide (NO) belongs to the family of gaseous transmitters and shows pro/anticonvulsant properties depending of the experimental model of epilepsy. Aminoguanidine is selective inhibitor of inducible NO synthase (iNOS) and he reduces the level of NO. Hyperhomocysteinemia is a risk factor for many neurological diseases, and epilepsy too.

The aim: of this study was to determine the effect of aminoguanidine on homocysteine-induced convulsions in adult rats.

Material and Methods: Wistar albino rats were treated with aminoguanidine (100 mg/kg) 30 min before administration of homocysteine (D, L homocysteine thiolacton, in subconvulsive dose, 5.5 mmol/kg). We observed the following characteristics of convulsions: incidence, latency, the number of convulsive episodes per rats and their intensity (scale from 0 to 4).

Results: Systemic administration of aminoguanidine 30 minutes before administration of homocysteine was increased incidence, the number of convulsive episodes per rat and intensity of seizures, while latency was decreased.

Conclusion: The results of this study can point that aminoguanidine, a selective inhibitor of iNOS, potentiate seizures induced by homocysteine in rats.

Keywords: convulsions, aminoguanidine, homocysteine, iNOS, rats

EFEKTI VIBROAKUSTIČKIH MIKROVIBRACIJA NA FREKVENCIJU, RITAM I STRUKTURU SRCA PACOVA

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Uvod: Površina tela homeoterma konstantno proizvodi vibracije. U prošlosti su sprovedena mnoga istraživanja na temu mikrovibracija, i opisala amplitudu mikrovibracija kao osetljiv parametar mišićne tenzije i telesne aktivnosti. Kasnija istraživanja su frekvenciju mikrovibracija navela kao varijablu od centralnog značaja za njihove efekte na organizam.

Cilj istraživanja: bio je da ispitamo efekte vibroakustičkih mikrovibracija na frekvenciju, ritam i strukturu srca pacova u fiziološkim uslovima.

Materijal i metode: koristili smo aparat koji proizvodi mikrovibracije, VITAFON-T određene frekvencije i amplitude, i u skladu sa tim opsegom izabrali četiri režima rada u kojima smo ispitivali efekte mikrovibracija na EKG karakteristike i strukturu zida srca pacova.

Rezultati: utvrdili smo da nakon primene mikrovibracija (u trajanju od 10-60 minuta) nije došlo do statistički značajnih promena u broju otkucaja, vrednosti amplitude su statistički značajno povećane posle 10, 20 i 30 minuta a visoko statistički značajno povećane posle 60 minuta. Na preparatu zida srca nema promena u odnosu na normalnu strukturu.

Zaključak: akutna primena vibroakustičkih mikrovibracija kod pacova in vivo ne utiče značajno na frekvenciju i ritam srčanog rada, povećava amplitudu P talasa u drugom standardnom EKG odvodu za 25-32 % i ne dovodi do promena u strukturi zida srca pacova.

Ključne reči: mikrovibracije, frekvencija, ritam, struktura, srce

THE EFFECTS OF VIBROACUSTIC MICRO VIBRATIONS TO THE FREQUENCY, RHYTHM AND STRUCTURE OF THE RAT HEART

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Introduction: Body surface of homeoterma produces constant vibration. In the past, many studies have been conducted on the topic of micro vibrations, and the amplitude of micro vibrations was described as a sensitive marker of muscle tension and body activity. Subsequent studies have indicated the frequency of micro vibrations as a variable of central importance for their effects on the body.

Aim: was to examine the effects of vibroacoustic micro vibrations to the frequency, rhythm and structure of rat heart in physiological conditions.

Material and Methods: We used an apparatus which produces micro vibrations, T-VITAFON of specific frequency and amplitude, in accordance with the scope of these were chosen four modes in which we examined the effects of micro vibrations on the characteristics of the ECG and wall structure of rat heart.

Results: We found that after application of micro vibrations (lasting 10-60 minutes) there was no statistically significant changes in heart rate, amplitude values were significantly increased after 10, 20 and 30 minutes and highly statistically significantly increased after 60 minutes. The preparation of the wall of the heart does not change compared to the normal structure.

Conclusion: Acute application of vibroacoustic micro vibrations in rats in vivo did not significantly affect the frequency and rhythm of the heart, increases the amplitude of P wave in second standard ECG drain for 25-32% and does not lead to changes in the structure of the wall of rat heart.

Key words: micro vibrations, frequency, rhythm, structure, heart

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Увод: Подаци о ефектима паладијума на кардиоваскуларни систем и оксидативни стрес код пацова су ограничени.

Циљ рада: Упоредивање токсичности неорганских и органских једињења паладијума на изоловано срце пацова и њихове ефекте на оксидативни стрес.

Материјал и методе: Срца су ретроградно перфундована по Лангендорфовой техници са константним перфузионим притиском (70 cmH₂O). Након убацивања сензора у леву комору, параметри срчане функције: дП/дт мах, СЛВП, ДЛВП, МБП и ХР, су континуирано регистровани. Параметри оксидативног стреса (ТБАРС, НО, О₂- и Х₂O₂) су детерминисани спектрофотометријски. Након контролне серије експеримената уследила је перфузију растућим концентрацијама следећих раствора: ТЕА, ТЕАА, ПдЦл₂, и Пд комплекс на сваких 30 минута (30, 60, 90, 120 минута).

Резултати: Испитивана једињења нису изазвала значајан ефекат на дП/дт мах. Није било значајног утицаја ни на СЛВП од стране ТЕАА, ТЕА, ПдЦл₂ или Пд комплекс. ДЛВП је био значајно смањен применом ТЕАА и ПдЦл₂, док ТЕА и Пд комплекс није показао значајан ефекат. МБП је био значајно смањен само под утицајем ПдЦл₂, док ТЕАА, ТЕА и Пд комплекс нису показали значајан ефекат. Срчана фреквенција је била значајно смањена применом свих испитиваних једињења ПдЦл₂ ТЕАА, ТЕА и Пд комплекс. Пд комплекс је индуковао пад вредности ТБАРС, док остала једињења нису показала значајан ефекат на параметре оксидативног стреса. Закључак: ПдЦл₂ је изазвао депресију контрактилности изолованог срца, и успоравањем срчане фреквенције. Пд комплекс може имати и антиоксидативна својства.

Кључне речи: паладијум – изоловано срце пацова – оксидативни стрес.

EFFECTS OF PALLADIUM COMPOUNDS ON THE ISOLATED RAT HEART

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Introduction: There are limited data about effects of palladium on cardiovascular system and oxidative stress in rats. **The Aim:** To compare toxicity of inorganic and organic palladium compounds on the isolated rat heart and their effects on oxidative stress.

Materials and Methods: The hearts were retrogradely perfused according to the Langendorff technique at constant perfusion pressure (70 cmH₂O). After the insertion of sensor in the left ventricle, the parameters of heart function: dP/dt max, SLVP, DLVP, MBP and HR, were continuously registered. Oxidative stress parameters (NO, TBARS, O₂ and H₂O₂) were determined spectrophotometrically. The experiments were performed during control conditions, and in presence of perfusion with increasing concentration of following: TEA, TEAA, PdCl₂, and trans-[PdCl₂(TEA)₂] complex started every 30 minutes (30, 60, 90, 120 minute).

Results dP/dt max was not affected significantly by either TEAA, TEA, PdCl₂ or Pd complex. SLVP was, also, not affected significantly by either TEAA, TEA, PdCl₂, or Pd complex. DLVP was significantly decreased by both TEAA and PdCl₂, while TEA and Pd complex did not show significant effect. MBP was significantly decreased only by PdCl₂, while TEAA, TEA and Pd complex did not show significant effect. HR was significantly decreased by all compounds- PdCl₂, TEAA, TEA and Pd complex. Pd complex also induced decrease of TBARS levels, while other compounds does not affect significantly on oxidative stress parameters.

Conclusion: PdCl₂ induced clear depression of the isolated rat heart contractility, but may have antioxidant potential.

Key words: palladium - isolated rat heart - oxidative stress.

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Увод: У фази опоравка срчане фреквенције, непосредно након излагања интензивним физичким активностима, долази до брзог смањења фреквенције срчане контракције, и даље стабилизације срчаног ритма. Иницијално, брзо смањење учесталости контракција миокарда је подстакнуто реактивацијом вазусне инервације срца (parasimpatička реактивација).

Циљ: Циљ нашег испитивања био је испитати полне разлике у parasimpatičkoj реактивацији након supra-maksimalnog opterećenja.

Материјал и методе: Полне разлике у parasimpatičkoj реактивацији након tridesetosekundnog „Wingate“ testa су испитане код 16 мушких и 15 женских sedenternih испитаника. Параметри употребљени за квантификацију parasimpatičke реактивације након физичког напора су опоравак срчане фреквенције (HRR) и варијабилност срчане фреквенције (HRV). Оporавак срчане фреквенције се може охарактерисати помоћу три показатеља. Први представља апсолутну разлику између вредности срчане фреквенције измерене непосредно након opterećenja, и вредности срчане фреквенције измерене након 60 секунди од завршетка вежбе (HRR₆₀). Други је израчунат помоћу semi-logaritamske regresione tehnike (T30). Трећи индекс HRR-a смо одредили као vremensku konstantu nagiba eksponencijalne krive koja се добија „fitovanjem“ peto-minutnog опоравка срчане фреквенције.

Резултати: Оporавак срчане фреквенције након opterećenja је брži код испитаника мушког пола, procenjujući prema parametrima HRR₆₀ и T30. Istovremeno, vremenska konstanta eksponencijalne krive (T) се не разликује између полова.

Закључак: Описане промене kardiovaskularne homeostaze, indukovane supra-maksimalnim opterećenjem, dovele су do nepotpune obnove vagnusnog tonusa. Оporавак срчане фреквенције и parasimpatička реактивација су биле израженије код мушких испитаника, u poređenju sa ženskim.

Кључне рећи: parasimpatička реактивација, опоравак срчане фреквенције, supra-maksimalno opterećenje

GENDER DIFFERENCES IN PARASYMPATHETIC REACTIVATION FOLLOWING SUPRAMAXIMAL ANAEROBIC EXERCISE

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Introduction: Sudden changes in cardiac autonomic regulation occur, at the period that follows strenuous exercise, that may alter cardiovascular homeostasis. The initial rapid decrease of heart rate after exercise cessation is mainly due to prompt restoration of vagal tone.

The Aim: The purpose of this study was to investigate the gender differences in parasymphathetic reactivation from supramaximal exercise.

Materials and methods: Gender differences in parasymphathetic reactivation from a 30-s Wingate anaerobic test were investigated in 16 male and 15 female volunteers. To quantify parasymphathetic reactivation after exercise, indices such as HR recovery (HRR) and heart rate variability (HRV) have been used. Heart rate recovery was assessed as the difference between the peak exercise heart rate (HR) and the HR recorded following 60 seconds of recovery (HRR₆₀). Time constant of the first 30 s post-exercise HR (T30) was determined as a negative reciprocal of the slope of the regression line. Another time constant decay (T) was obtained by fitting the 5 minute post-exercise HRR into a first-order exponential curve.

Results: Post exercise heart rate recovery was faster in male participants, demonstrated through HRR₆₀ and T30, but the time constant of the exponential heart rate decay (T) did not differ between the two genders.

Conclusion: In conclusion the immediate HRR and parasymphathetic reactivation was affected by gender and was augmented in male participants.

Key words: parasymphathetic reactivation, heart rate recovery, Wingate anaerobic test

PROCENA DINAMOMETRIJSKIH PARAMETARA KOD ŽENA RAZLIČITOG NIVOA FIZIČKE AKTIVNOSTI

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Uvod: Skeletni mišići, kao skup većeg broja mišićnih vlakana, mogu da razviju različitu snagu u zavisnosti od potrebe, a snaga je direktno srazmerna poprečnom preseku mišića. Bavljenje sportom utiče na telesnu kompoziciju u smislu povećanja mišićne mase a samim tim i snage mišića koja se može dinamiometrijski proceniti.

Cilj: Procena vrednosti dinamiometrijskih parametara više mišićnih grupa gornjih i donjih ekstremiteta kod žena različitog nivoa fizičke aktivnosti, kao i utvrđivanje značajnosti razlika u vrednostima izmerenih parametara.

Materijal i metode: Istraživanjem je obuhvaćeno 30 ispitanica podeljenih u dve grupe. Prvu grupu je činilo 15 sportistkinja, atletičarki iz klubova "Vojvodina" i "Crvena Zvezda", dok je drugu grupu predstavljalo 15 nesportistkinja, studentkinja medicine koje se nisu aktivno bavile sportom poslednjih šest meseci, niti rekreativno upražnjavale sportske aktivnosti. Svim ispitanicama su izmereni osnovni antropometrijski parametri (telesna masa i visina), kao i dinamiometrijski parametri (mišićna snaga, odnosno maksimalno savladano opterećenje, mišićni rad i brzina mišićne kontrakcije).

Rezultati: Poređenjem mišićne snage između žena koje su fizički aktivne i studentkinja kao grupe neaktivnih žena, utvrđene su statistički značajne razlike u vrednostima svih dinamiometrijskih parametara kako mišićnih grupa gornjih, tako i donjih ekstremiteta.

Zaključak: Dobijene razlike u vrednostima između dve grupe ispitanica mogu se objasniti specifičnim zahtevima sporta, odnosno uticajem kontinuirane, individualno dozirane fizičke aktivnosti tipa treninga na povećanje mišićne mase, kao i snage mišića.

Ključne reči: dinamiometrija, mišićna snaga, fizička aktivnost.

ASSESSMENT OF DYNAMOMETRIC PARAMETERS IN WOMEN OF DIFFERENT LEVEL OF PHYSICAL ACTIVITY

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Introduction: Skeletal muscles, as set a larger number of muscle fibers, can develop power directly proportional to the cross section area of muscle. Physical activity affects body composition by increasing muscle mass and therefore muscle strength and power, which can be measured using dynamometric method.

The Aim: Evaluation of dynamometric parameters of multiple muscle groups of upper and lower extremities in women with different levels of physical activity, and assessment of significance of differences in values of measured parameters.

Materials and methods: The study included 30 subjects divided into two groups. The first group consisted of 15 female athletes from clubs "Vojvodina" and "Crvena Zvezda", while the second group included 15 non-athletes, medical students who are not actively engaged in sports for the last six months, or practicing recreational sports activities. Basic anthropometric parameters (body weight and body height) were measured in all subjects, as well as dynamometric parameters (muscle strength, power, work and velocity of muscle contraction).

Results: Comparing dynamometric parameters between women who are physically active and inactive female students, statistically significant differences in values of all measured parameters (muscle groups of the upper and lower extremities) were recorded.

Conclusion: Differences in values between two groups of subjects can be explained by the specific requirements of sport, and continuing influence of programmed, individually dosed physical activity (training) resulting in increase in muscle mass and muscle strength.

Key words: Dynamometry, Muscular strength, Physical activity.

PROCENA ANTROPOMETRIJSKIH KARAKTERISTIKA I MASNE MASE KOD SPORTISTKINJA I NESPORTISTKINJA

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Uvod: Procena telesnog sastava, posebno veličine masne mase, ima veliki značaj u kliničkoj praksi, u proceni zdravstvenih rizika vezanih za njeno povećanje i smanjenje. Fizička aktivnost doprinosi promenama u telesnoj kompoziciji u pravcu smanjenja masne i povećanja mišićne mase, što se može proceniti različitim metodama.

Cilj: Procena antropometrijskih karakteristika i veličina masne mase kod mladih žena različitog nivoa fizičke aktivnosti.

Materijal i metode: U istraživanju je učestvovalo 30 ispitanica podeljenih u dve grupe. Prvu grupu je činilo 15 nesportistkinja (studentkinja medicine), koje se nisu aktivno bavile sportom poslednjih šest meseci, niti rekreativno upražnjavale određene sportske aktivnosti, dok je drugu grupu činilo 15 sportistkinja (atletičarki). Kod svih ispitanica mereni su: telesna visina, telesna masa, indeks telesne mase, određivana je telesna kompozicija metodom bioelektrične impedance, debljina kožnih nabora i telesni obimi.

Rezultati: Rezultati dobijeni merenjem indeksa telesne mase nisu pokazali statistički značajnu razliku između sportistkinja i nesportistkinja. Metodom bioelektrične impedance izmerene su statistički značajno niže vrednosti masne mase u grupi atletičarki. Debljina kožnih nabora viša je kod studentkinja medicine uz statistički značajno više rezultate grudnog, abdominalnog, nabora iznad tricepsa, natkolenice i potkolenice. Merenje telesnih obima je pokazalo statistički značajnu razliku jedino kod obima grudni u korist sportistkinja.

Zaključak: Postoje razlike u veličini masne mase i debljine kožnih nabora između ispitivanih grupa koje se mogu objasniti različitim nivoom fizičke aktivnosti. Indeks telesne mase nije pouzdan pokazatelj telesne kompozicije, jer ne diferencira masnu od mišićno koštane mase.

Ključne reči: antropometrija, telesna kompozicija, fizička aktivnost, masno tkivo

EVALUATION OF ANTHROPOMETRIC PARAMETERS AND FAT MASS OF SPORTSMEN AND NONSPORTSMEN

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Introduction: Assessment of body composition, especially size of fat mass, has great importance in clinical practice in assessment of health risks related to its increase and decrease. Physical activity contributes to changes in body composition decreasing fat and increasing muscle mass, which can be estimated by different methods.

The Aim: Assessment of anthropometric characteristics and total fat mass in young women with different levels of physical activity.

Material and methods: Study included 30 subjects divided into two groups. First group consisted of 15 non-athletes (female medical students) who didn't practice sports for last six months, or recreational sports activities, while second group included 15 female athletes. All subjects have been measured height, weight, body mass index, skinfold thickness, body circumferences and body composition that was analysed using bioelectrical impedance method.

Results: Results obtained by measuring body mass index showed no statistically significant difference between athletes and non-athletes. Bioelectrical impedance method measured significantly lower values of fat mass in athletes. Skinfold thickness was higher in medical students with significantly higher scores of thoracic, abdominal, folds over the triceps, thigh and lower leg. Measurement of body circumferences showed statistically significant difference only in scope of breast favoring athletes.

Conclusion: There are differences in size of fat mass and skinfold thickness between two groups, that can be explained by different levels of physical activity. Body mass index is not reliable indicator of body composition, because it doesn't differentiate fat from musculoskeletal mass.

Key words: Anthropometry, body composition, physical activity, body fat mass

UTICAJ DIJABETES MELITUSA TIP 2 NA KVALITET ŽIVOTA I ANKSIJNOST KOD ŽENA STARIJE DOBI

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Uvod: Dijabetes melitus tip 2 (DM) predstavlja bolest koju možemo definisati kao stanje hronične hiperglikemije nastale kao posledica apsolutnog ili relativnog nedostatka insulina, koja dovodi do poremećaja metabolizma ugljenih hidrata, masti i belančevina. Sa sobom nosi veliki rizik od razvoja komplikacija, što može bitno uticati na kvalitet života obolelog. Prema Svetskoj zdravstvenoj organizaciji kvalitet života se definiše kao bolesnikova percepcija o uticaju bolesti i odgovarajuće terapije na njegovu fizičku i radnu sposobnost, psihološko stanje, socijalnu komunikaciju i somatsko zdravlje. Anksioznost, stanje koje se karakteriše osećanjem nelagodnosti, nemira i napetosti udruženo sa osećanjem moguće opasnosti i pretnje jedan je od najčešćih neuropsiholoških komorbiditeta ove bolesti.

Cilj: Cilj ove studije bio je da se uporedi kvalitet života i stepen anksioznosti obolelih od DM sa kontrolnom grupom zdravih ispitanika.

Materijal i metode: Studija je koncipirana kao anamnestička studija koja je obuhvatila 80 žena uzrasta 45-65 godina, od kojih je bilo 40 sa klinički dijagnostikovanim dijabetes melitusom tip 2, koje se leče na Klinici za endokrine bolesti Kliničkog centra Vojvodine, kao i 40 zdravih žena, koje su predstavljale kontrolnu grupu. Korišćeni su upitnici, *Short Form 36 (SF-36)* upitnik za procenu kvaliteta života ispitanika i *State-Trait Anxiety inventory (STAI)* upitnici, koji omogućavaju procenu nivoa anksioznosti kod istih. Dobljeni rezultati ove dve grupe su upoređeni i statistički obradjeni.

Rezultati: Dobljeni rezultati ukazuju da postoji statistički značajna razlika u kvalitetu života obolelih od ove bolesti u poređenju sa kvalitetom života kontrolne grupe, pri čemu ispitanici sa DM postižu više vrednosti na svim ispitanim varijablama (fizičko funkcionisanje, bol, opšte zdravlje, vitalnost, socijalno funkcionisanje, emocije, mentalno zdravlje, aktivnosti). Prema upitnicima o samoproceni utvrđeno je da su nivoi anksioznosti znatno viši kod obolelih od DM u poređenju s kontrolnom grupom I to u oba testa: za merenje anksioznosti u datom trenutku I generalnog nivoa anksioznosti.

Zaključak: Dijabetes melitus tip 2 ima negativan uticaj na kvalitet života, i oboleli od njega pate od visokog stepena anksioznosti u odnosu na kontrolnu grupu.

KLjučne reči: Dijabetes melitus tip 2, kvalitet života, anksioznost.

THE INFLUENCE OF TYPE 2 DIABETES MELLITUS ON QUALITY OF LIFE AND ANXIETY LEVEL IN OLDER WOMEN

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Introduction: Type 2 diabetes mellitus (DM) is a disease that we can define as a state of chronic hyperglycemia which occurs because absolute or relative insufficiency of insulin, which leads to the disorder of carbohydrate, lipid and protein metabolism. By itself it carries a great risk of complications, which can infect the quality of life. According to the World Health Organization the quality of life is defined as a patient's perception of the influence of the disease and appropriate therapy to his physical and work ability, psychological state, social communication and somatic health. Anxiety, state that is characterized as a feeling of discomfort, unease and tension with the feeling of possible danger and threat, is one of the most often neuropsychological comorbidity of this disease.

The Aim: The aim of this research was to compare quality of life patients which have DM with the people without acute and chronic disease, as to determine the level of anxiety in this patient.

Material and Methods: The study is designed as a case study which includes 80 women ages 45-65, 40 had clinical diagnosed DM which is treated on the clinic for endocrinology disease, Clinical center of Vojvodina, as 40 healthy women which represented the control group. Questionnaires that were used are *Short Form 36 (SF-36)* questionnaire that assesses the quality of life of patients and *State-Trait Anxiety inventory (STAI)* questionnaires which allow us to evaluate the level of anxiety. The results from these two groups were compared and statistically processed.

Results: The results say that there is a statistically important difference in the quality of life between the patients and the control group, where patients have higher values in every tested variables (physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, mental health). According to the questionnaires about self-evaluation the level of anxiety is greatly higher in patients than in the control group, this is the same in both tests: anxiety state and anxiety trait.

Conclusion: Diabetes mellitus type 2 has a negative influence on the quality of life, and patients suffering from it have a high level of anxiety.

Key words: Type 2 diabetes mellitus, quality of life, anxiety.

UTICAJ SIMPATEKTOMIJE NA VEGETATIVNI NERVENI SISTEM KOD OSOBA SA HIPERHIDROZOM

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Uvod: Prekomerno znojenje ili hiperhidroza je suvišno znojenje koje prevazilazi potrebe normalne termoregulacije ili termohomeostaze organizma. Terapija ovog stanja predstavlja presecanje simpatičkih vlakana ili uništavanje simpatičkih ganglija. Shodno ovim činjenicama pojavila se i ideja o kvantitativnom određivanju aktivnosti vegetativnog nervnog sistema osoba sa hiperhidrozom pre i nakon simpatetomije. Kvantitativni marker procene stanja vegetativnog nervnog sistema se bazira na varijabilnosti srčane frekvencije (Heart Rate Variability, HRV).

Cilj: Cilj ovog rada je kvantitativno određivanje aktivnosti vegetativnog nervnog sistema osoba sa hiperhidrozom pre i nakon simpatetomije.

Materijal i metode: Ispitivanjem je obuhvaćeno 18 ispitanika muškog pola i 22 ispitanika ženskog pola. Merenja varijabilnosti srčane frekvencije sprovedena su u dva navrata, dan pre operacije i mesec dana nakon operacije.

Rezultati: Postoje statistički značajne polne razlike vezane za vremenske parametre i pre i nakon simpatetomije. Frekvencijski parametri HRV-a se nisu statistički značajno razlikovali između ispitanika muškog i ženskog pola. Uticaj simpatetomije na parametre HRV je bio statistički značajan u grupi ispitanika ženskog pola. Povećanje vremenskih parametara HRV, logaritma snage visokog spektra (lnHF), kao i njegove normirane vrednosti (HFn) ukazuju na povišenje tonusa parasimpatikusa, dok normirana vrednost snage spektra niske frekvencije (Lfn) nakon operacije ukazuje na pad simpatičkog tonusa. Kod muškaraca ni vremenski ni frekvencijski parametri nisu pokazali statistički značajne promene nakon operacije.

Zaključci: Postoje polne razlike u vremenskim parametrima HRV-a i pre i nakon operacije. Simpatetomija je značajno uticala na kvantitativne markere HRV-a u grupi ispitanika ženskog pola, u smislu povišenja parasimpatičkog tonusa, a sniženja simpatičkog tonusa nakon operacije.

KLjučne reči: HRV metoda, simpatetomija, hiperhidroza

INFLUENCE OF SYMPATHECTOMY ON AUTONOMIC NERVOUS SYSTEM IN PATIENTS WITH HYPERHIDROSIS

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Introduction: Hyperhidrosis is excessive sweating that exceeds the needs of normal thermoregulation. Interruption of the sympathetic chain by thoracoscopic sympathectomy is an effective treatment for essential hyperhidrosis. Considering these facts, it is reasonable to postulate that sympathectomy affects the autonomic nervous system. The quantitative marker of autonomic function is based on the heart rate variability (HRV).

The Aim: The aim of this study was to quantify the activity of the autonomic nervous system in patients with primary hyperhidrosis before and after sympathectomy. **Materials and Methods:** In this study 22 female and 18 male subjects were included. Measures of Heart Rate Variability were collected one day before and one month after the surgery.

Results: There are significant gender differences regarding the time domain markers before and after sympathectomy. No gender differences were detected analyzing frequency domain variables. The influence of sympathectomy on HRV variables was statistically significant in the group of female participants. The increase of time domain variables and high frequency spectral ranges (lnHF and HFn) represent increased parasympathetic tone, while the low frequency band (Lfn) after the surgery showed decreased sympathetic tone. No change was detected comparing time and frequency domain variables before and after sympathectomy in group of the male participants.

Conclusion: There are sex differences in time domain markers of HRV both before and after surgery. Sympathectomy has significantly influenced the quantitative markers of HRV in a group of female subjects, in terms of increase parasympathetic tone and decrease sympathetic tone after surgery.

Key words: HRV, sympathectomy, hyperhidrosis

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Uvod: Uspeh u sportu zavisi od pet stvari. Od taktike, tehnike, motivacije, aerobnog i anaerobnog kapaciteta. Nivo anaerobnog kapaciteta se lako može odrediti pomoću Wingate testa.

Cilj rada: Da se odredi anaerobni kapacitet kod sportista koji se bave različitim sportskim disciplinama.

Materijal i metode: Za istraživanje je korišćen Wingate anaerobni test, a merenja su sprovedena na 128 sportista (29 košarkaša, 27 odbojkaša, 17 rvača, 21 veslača i 34 fudbalera).

Rezultati: Najveće vrednosti maksimalne snage (peak power, PP), parametara Wingate testa, zabeleženi su kod košarkaša (1018.07±142.61 W), odbojkaša (1122.81±137.51 W) i rvača (1024.41±151.85 W). Najniže vrednosti dobijene su kod fudbaler (844.50±139.05 W) i veslača (901.10±126.41 W).

Zaključak: Rad ukazuje na značajne razlike u anaerobnom kapacitetu između sportista različitih sportskih disciplina. Rezultati istraživanja su značajni trenerima, mogu im pomoći u izradi efikasnog plana treninga i tako dovesti do poboljšanja sportskih rezultata.

KLjučne reči: Wingate test, anaerobni kapacitet, maksimalna snaga

THE ANAEROB CAPACITY IN DIFFERENT SPORT DISCIPLINES

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Introduction: Success in sport depends on five things: tactic, technique, motivation and aerob and anaerob capacity. We can measure anaerob capacity with Wingate test.

The Aim: Was to investigate the values of anaerobic energetic capacity in different sport disciplines.

Materials and Methods: Wingate anaerobic tests were conducted on 128 elite athletes (29 basketball players, 27 volleyball players, 17 wrestlers, 21 rowers and 34 football players). Peak power (PP), was measured as a marker of anaerobic capacity.

Results: The highest values of peak power were measured in basketball players (1018.07±142.61 W), in volleyball players (1122.81±137.51 W) and in wrestlers (1024.41±151.85 W). The lowest value of peak power was registered in rowers (901.10±126.41 W) and in football players (844.50±139.05W).

Conclusion: We found a significant difference in the anaerobic capacity of athletes of various sport disciplines. Coaches or other sport experts in the field, in the future, could find these markers useful to follow and improve the athletes performance.

Key words: Wingate test, Anaerob capacity, Peak power

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Uvod: Latentni period zduženog akcionog potencijala (CAP) predstavlja vrijeme od primjene elektricne draži do pojave CAP dok latentni period pika predstavlja vrijeme od primjene elektricne draži pa do pojave pika CAP.

Cilj rada: Cilj ovog rada je bio da se utvrdi uticaj visoko-molarnog rastvora lidokain-hlorida na provodljivost nervnih vlakana.

Materijal i metode: U našem eksperimentu, ispitivan je odgovor 20 žabljih išijadičnih nerava, podijeljenih u kontrolnu i eksperimentalnu grupu (10 nerava u svakoj grupi). Nervi su nakon preparacije inkubirani u Ringerovom rastvoru (2,0 mmol/l rastvor kalcijuma) 2 sata, nakon čega su po prvi put izmjerene vrijednosti latentnih perioda. Zatim su nervi kontrolne grupe inkubirani u Ringerovom rastvoru, a nervi eksperimentalne grupe u 100,0 mmol/l rastvoru lidokaina tokom 15 minuta. Nakon toga, nervi su isprani i ponovo inkubirani u Ringerovom rastvoru. Mjerenja amplitude CAP-a su vršena nakon 30, 60, 120 i 180 minuta tokom perioda oporavka. CAP je indukovan pomoću stimulatora, pojedinačnim električnim stimulusom, a amplituda je mjerena pomoću digitalnog osciloskopa. Podaci su prikupljeni i obrađeni pomoću statističkog kompjuterskog programa GraphPadPrism 5.0.

Rezultati: Nakon 30 minuta oporavka odgovora nerava iz eksperimentalne grupe nije bilo. Razlike dužina oba latentna perioda između grupa ispitivanih nerava su bile statistički značajne na 60, 120, 180 minuta oporavka. (p<0.01).

Zaključak: Postoje latentni periodi predstavljalju vrijeme provođenja brzih i sporih nervnih vlakana pri koncentraciji od 100,0 mmol/l lidokain-hlorida imamo ireverzibilno usporjenje provodnje kako sporih tako i brzih vlakana.

KLjučne riječi: lidokain, CAP, amplitude.

EFFECTS OF HIGH CONCENTRATIONS OF LIDOCAINE HLORIDE ON THE RECOVERY OF THE COMPOUND ACTION POTENTIAL LATENCY PERIODS

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Introduction: The onset latency period of the compound action potential (CAP) represents the time between the stimulus artifact and the CAP onset while the peak latency period is the one between the stimulus artifact and the CAP peak.

Objective: The aim was to examine the recovery of nerve fibers conductivity after application of high concentrations of lidocaine.

Method: In the study, 20 frog sciatic nerves, divided into two groups (10 nerves in each group), were examined. Nerves were incubated in Ringer solution (2,0 mmol/l calcium solution) for 2 hours and control measurements of latency periods were taken. Then, nerves were incubated for 15 minutes in: Control group: Ringer solution; Experimental group: 100,0 mmol/l lidocaine solution. After that, nerves were washed and incubated in Ringer solution. Measurements of CAP were done after 30, 60, 120 and 180 minutes. CAP was induced by stimulator with single electrical stimulus and latency periods were measured using digital oscilloscope. Data were collected and analysed using the statistical computer programme GraphPadPrism 5.0.

Results: After 30 minutes, both latency periods of all nerves in the experimental group were completely blocked. The difference in mean values of both latency periods between the groups was statistically significant at 60, 120 and 180 minutes of the recovery period (p<0.01).

Conclusion: Since the latency periods represent the nerve impulse conduction time along fast and slower conducting fibers, conductivity along the corresponding fibers was irreversibly reduced during 180 minutes after the application of 100,0 mmol/l lidocaine.

Keywords: Lidocaine, CAP, latency periods.

ZNAČAJ IZOLOVANOG PRODUŽENOG QTc INTERVALA KOD FIZIČKI AKTIVNIH ISPITANIKA

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Uvod: Fiziološka adaptacija na fizičku aktivnost, poznata kao sportsko srce odlikuje se i elektrofiziološkim promenama. Međutim, u naučnoj javnosti vodi se polemika oko toga koliko produžen QTc interval je fiziološki a koliko je to siva zona koja može ukazivati na neke patološke promene kod sportista.

Cilj: Cilj ovog rada bio je da se utvrde, opišu i uporede karakteristike EKG zapisa kod fizički aktivnih i neaktivnih ispitanika kao i da se utvrdi da li je u populaciji fizički aktivnih ispitanika vrednost QTc intervala produžena.

Materijal i metode: U studiji je učestvovalo 35 fizički aktivnih ispitanika (28.36 ± 4.67 godina) i 30 fizički neaktivnih ispitanika (27.62 ± 2.52 godina). Svim ispitanicima urađeni su 12-kanalni elektrokardiogrami.

Rezultati: Kod 27 (76.0%) ispitanika iz grupe fizički aktivnih prisutna je sinusna bradikardija, dok se u grupi fizički neaktivnih, sinusna bradikardija nalazi kod jednog ispitanika (3.3%). QTc intervala je značajno produženo kod fizički aktivnih ispitanika ($p < 0.05$). Prema Sokolow-Lyon voltaznom kriterijumu za hipertrofiju leve komore (LVH), dva (6%) ispitanika iz grupe fizički aktivnih ima znake LVH, dok to nije slučaj ni sa jednim ispitanikom iz grupe fizički neaktivnih ($p < 0.05$). Minimalna inverzija T talasa (< 0.2 mV) u više od dva odvođa prisutna je kod 8 (23%) ispitanika iz grupe fizički aktivnih, dok ni jedan fizički neaktivan ispitanik nije imao inverziju T talasa ($p < 0.01$).

Zaključci: Promene u EKG fizički aktivnih ispitanika su različite u odnosu na fizički neaktivne. Fizički aktivni ispitanici imali su značajno produžen QTc interval u odnosu na fizički neaktivne ispitanike.

Glavne reči: fizički aktivni ispitanici, EKG, QTc interval.

PROMENE BALANSA KALIJUMA U PACIJENATA SA ARTERIJSKOM HIPERTENZIJOM

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Uvod: Kalijum predstavlja glavni regulator tonusa glatkih mišića u zidu krvnog suda, važan je za održanje tonusa krvnih sudova, a poseduje i direktno vazodilatatorno dejstvo na krvne sudove.

Cilj rada: Cilj rada bio je da se ispita uticaj dijeta sa različitim nivom kalijuma na vrednosti krvnog pritiska.

Materijal i metode: Ispitivanjem je obuhvaćeno 126 ispitanika, od kojih je 20 činilo kontrolnu grupu zdravih a 106 eksperimentalnu (kliničku) grupu, koju su činili novotkriveni pacijenti sa arterijskom hipertenzijom. Pacijenti eksperimentalne grupe podeljeni su u dve podgrupe, na osnovu dnevnog unosa kalijuma.

Rezultati: Uočena je statistički značajna razlika između vrednosti sistolnog krvnog pritiska kontrolne grupe i prve podgrupe kliničke grupe ($p < 0.001$), a statistički značajna razlika nije uočena između vrednosti sistolnog krvnog pritiska prve eksperimentalne podgrupe pre i posle tretmana. Takođe nije postojala statistički značajna razlika između vrednosti dijastolnog krvnog pritiska unutar prve podgrupe kliničke grupe i kontrolne grupe, ali je zabeležena statistički značajna razlika između vrednosti dijastolnog pritiska kontrolne i eksperimentalne grupe pre i nakon tretmana ($p < 0.001$). Zabeležena je statistički značajna razlika u vrednostima sistolnog i dijastolnog krvnog pritiska između kontrolne i druge podgrupe kliničke grupe ($p < 0.001$), kao i unutar druge kliničke podgrupe 30 i 90 dana nakon tretmana ($p < 0.01$, $p < 0.05$).

Zaključak: Dijeta bogata kalijumom ima direktan efekat na redukciju krvnog pritiska. Redukcija krvnog pritiska je direktno zavisna od veličine dnevnog unosa kalijuma hranom i dužine tretmana.

Glavne reči: kalijum, dijastolni krvni pritisak, sistolni krvni pritisak, tretman

THE IMPORTANCE OF EXTENDED ISOLATED QTc INTERVAL IN ATHLETES

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Introduction: adaptation on physical activity, known as athlete's heart is characterized by electrophysiological changes. However, there are controversies about how a prolonged QTc interval is a physiological as much as a gray area that may indicate a pathological condition in athletes.

The Aim: In order to evaluate this finding, we compare electrocardiographic changes of trained and untrained subjects.

Materials and Methods: A total number of 35 trained (mean (SD) age 28.36 (4.67) years) and 30 (mean (SD) age 27.62 (2.52) years) untrained male subjects participated in this study. Electrocardiograms (ECGs) were recorded for each subject.

Results: Trained subjects had a significantly higher prevalence of sinus bradycardia (76.0% vs 3.3%; $p < 0.01$) than untrained ($p < 0.05$). The QTc interval was statistically more prolonged in trained than untrained. The Sokolow-Lyon voltage criterion for left ventricular hypertrophy (LVH) was more common in trained individuals (6% vs 0% $p < 0.05$) compared with untrained. Minor T wave inversion (less than 0.2 mV) in more than two leads was absent in untrained and present in 8 (23%) trained subjects ($p < 0.01$).

Conclusion: ECG changes in trained subjects are dissimilar to those in untrained subjects. Physically active subjects had significantly prolonged QTc interval compared to physically inactive subjects.

Keywords: trained; ECG; QTc interval.

CHANGES OF POTASSIUM BALANCE IN PATIENTS WITH ARTERIAL HYPERTENSION

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Introduction: Potassium represents main regulator of vascular tonus, and it also has direct vasodilatory effect.

The Aim: The Aim of this paper was to examine the influence of diet with different levels of potassium intake on the values of blood pressure.

Material and methods: 126 subjects were included in the study, and among them 20 belong to the control group of healthy volunteers, while 106 belong to the experimental (control) group, which consists of newly diagnosed patients with hypertension. Patients of the experimental group were divided into two subgroups, according to the daily intake of potassium.

Results: Statistically significant difference between the systolic pressure of the first clinical subgroup and control group was observed ($p < 0.001$), while statistically significant difference between the values of systolic blood pressure in clinical group pre and after treatment. Statistically significant difference between diastolic blood pressure was also observed between experimental and control group ($p < 0.001$). Statistically significant differences between the values of systolic and diastolic blood pressure between control and second subgroup of clinical group were observed ($p < 0.001$), as well between second clinical group, 30 and 90 days after the treatment.

Conclusion: Diet high in potassium has a direct effect on blood pressure reduction. Reduction of blood pressure is directly dependent on daily potassium intake and the lasting of the treatment.

Key words: potassium, diastolic blood pressure, systolic blood pressure, treatment

METABOLIČKI ODGOVOR NA TEST FIZIČKOG OPTEREĆENJA KOD FIZIČKI AKTIVNIH I NEAKTIVNIH ISPITANIKA

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Uvod: Masno tkivo obezbeđuje supstance neophodne za mišićnu kontrakciju. Glavni izvor oksidacije slobodnih masnih kiselina (FFAs) tokom vežbanja su trigliceridi smešteni u masnom tkivu i u mišićnim vlaknima. Pri vežbanju jakog intenziteta energija se dobija iz glukoze i mišićnog glikogena.

Cilj rada: Cilj ovog rada bio je da se ispita da li se posle testa fizičkog opterećenja postoje razlike u metaboličkom odgovoru kod fizički aktivnih i neaktivnih ispitanika.

Materijal i metode: Ovim istraživanjem obuhvaćeno je 10 vrhunskih sportista, vaterpolista i 10 fizički neaktivnih ispitanika muškog pola. Ispitanici su bili podvrgnuti testu fizičkog opterećenja na tredmilu. Svim ispitanicima je uzimana krv u mirovanju, na kraju testa i u 30. minutu oporavka, iz koje je određivan nivo glukoze i FFAs.

Rezultati: Nivo glukoze kod fizički neaktivnih bio je statistički značajno veći na kraju testa ($p < 0.01$) kao i u 30. minutu oporavka ($p < 0.05$) u odnosu na početak testa. Nivo FFAs u mirovanju bio je statistički značajno veći kod fizički aktivnih u odnosu na fizički neaktivne ispitanike ($p < 0.05$). Nivo FFAs kod fizički aktivnih ispitanika bio je statistički značajno niži na kraju testa ($p < 0.01$) kao i u 30. minutu oporavka ($p < 0.05$) u odnosu na početak testa.

Zaključak: Rezultati ovih istraživanja pokazuju da je višegodišnji specifični trenazni proces doveo do fizioloških promena metabolizma vaterpolista. Ovo istraživanje ukazuje da se kod vrhunskih sportista pri akutnoj fizičkoj aktivnosti energija neophodna za kontrakciju mišića dobija oksidacijom FFAs, dok se kod fizički neaktivnih ispitanika energija prvenstveno dobija iz rezervi glukoze u organizmu.

Ključne reči: fizička aktivnost, glikemija, FFAs

METABOLIC ANSWER ON ERGOSPIROMETRIC TEST IN PREVIOUSLY HIGHLY TRAINED SUBJECTS AND PHYSICALLY INACTIVE SUBJECTS

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Introduction: Fat is an important substrate for muscle contraction. Triglycerides are considered to be the main source of free fatty acids (FFAs) oxidised during exercise. At strenuous exercise energy must be obtained from muscle glycogen and plasma glucose.

The Aim: To investigate if there is a difference between metabolism of athletes and physically inactive subjects after physical exercise test on the treadmill.

Materials and Methods: This study included 10 athletes and 10 physically inactive subjects. All the participants were subjected physical exercise test on the treadmill. Blood samples were taken from all participants during the rest, at the end of the test and in the 30. minutes of the recovery. Serum concentrations of glucose and FFAs were determined from those samples.

Results: The level of glucose in physical inactive subjects was significantly higher at the end of the test ($p < 0.01$) and in 30. minutes of recovery ($p < 0.05$) compared to the beginning of the test. The level of FFAs in athletes was significantly higher compared to physically inactive subjects in 30. minutes of recovery ($p < 0.05$). The level of FFAs in athletes was significantly lower at the end of the test ($p < 0.01$) and in 30. minutes of recovery ($p < 0.05$) compared to the beginning of the test.

Conclusion: Results of this investigation showed that in highly endurance trained subjects metabolism was physiological changed. This work shows that energy necessary for contraction in athletes obtained from FFAs oxidised, while energy necessary for contraction in physical inactive subjects obtained from glucose.

Keywords: physical activity, glucose, FFAs

POVREDE ŠAKE I RUČNOG ZGLOBA U KIKBOKSU

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Uvod: Kikboks je zapadnjački sport – jedinstven odgovor velikom broju istočnjačkih borilačkih veština u kom prevladavaju kontuzije, distorzije, luksacije.

Cilj: Ispitivanje uticaja telesnih osobina sportiste i procesa treniranja na pojavu i distribuciju povreda šake i ručnog zgloba u kikboks.

Materijal i metode: Retrospektivno ispitivanje je obuhvatilo 193 kikboksera uzrasta od 11 do 56 godina, iz Vojvodine i reprezentacije Srbije, metodom slučajnog odabira u toku 2011. godine. Uzorak su činili ispitanici oba pola, 155 muškog i 38 ženskog pola. Ispitivanje se sastojalo od popunjavanja upitnika, uvida u medicinsku dokumentaciju povređenih i RTG snimaka. Praćeni su visina i masa tela, broj sati treniranja (3 h, 5 h, 7,5 h i više od 7,5 h), broj mečeva, broj i težina povrede šake i način lečenja. Ispitivan je i način lečenja (bandažiranjem, elastičnim zavojem ili gazom, kremama, hladnim oblogom, stavljanjem longete ili gipsa, posetom kineziterapeuta, posetom nadriplekaru) i ko je lečio povrede (sam, sportski lekar, ortoped, fizijatar, neurohirurg, nadriplekar). Ispitanici su podeljeni u dve grupe: grupu A su činili sportisti koji treniraju manje od 5 godina, a grupu B oni koji treniraju 5 ili više godina.

Rezultati: Na povređivanje šake i ručnog zgloba u kikboksera utiču kako telesna visina i težina, tako i trajanje treniranja i ukupna dužina treniranja. Broj povreda kod muškaraca najviše zavisi od broja mečeva, od dužine treniranja i godina života. Kod žena statistički značajan uticaj imaju samo godine života i broj sati provedenih u treniranju. Najučestalije povrede u obe polne grupe kikboksera su povrede koje sami leče. 20 muškaraca (30,3%) bilo je primorano da se zbog preloma, ili iščašenja kostiju šake obrati ortopedu nakon čega je lečeno gipsom. Skoro petina muških, njih 13 (19,7%) kao i dve devojke (18,2%) nakon ovog lečenja obavljala je produženu rehabilitaciju pod nadzorom fizioterapeuta. I pored svih raspoloživih načina lečenja 7 sportista (9,1%) pomoć je potražilo kod nadriplekara.

Zaključak: Faktori koji utiču na nastanak povreda su dužina bavljenja sportom i godine života. Takmičari koji više od 7 časova nedeljno provedu trenirajući skloniji su povredama, kod žena su povrede češće ukoliko treniraju manje od 3 ili više od 7 sati nedeljno. Veći broj takmičarskih mečeva predstavlja faktor rizika za veći broj povreda. Masa tela i visna tela imaju značaj u nastanku povreda. Teži i viši takmičari se češće povređuju od nižih i lakših i ova razlika je statistički značajna $p < 0,01$. Neadekvatno lečenje dovodi do češće pojave ponovnog povređivanja i kasnijih komplikacija u lečenju.

Ključne reči: kikboks, šaka, povređivanje

INJURIES OF THE HAND AND WRIST IN KICKBOXING

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Introduction: Kickboxing is a Western sport – the unique answer to a great number of martial arts that come from the East in which the most dominant injuries are contusions, distortions and luxations

The Aim: Investigation of the effect of body condition of athletes and the training process on the occurrence and distribution of hand injuries and wrist in kickboxing

Materials and Methods: Retrospective research included 193 professional athletes in total: kick boxers from Vojvodina Province and boxers from the national team of Serbia, chosen at random. The research included both sexes 155 subjects were male and 38 female. The test consisted of filling out a questionnaire, insight in the medical documentation of the injured and RTG. We followed the body weight and height, number of hours of training (3h, 5h, 7.5h and more than 7.5h), the number of matches, the number and severity of hand injuries and treatment. We studied the mode of treatment (bandages, elastic bandage or gauze, creams, cold compress, placing splints or plaster, visit to kinesiology therapist and pseudodoctor) and who treated the injuries (sports doctor, orthopedist, physiatrist, neurosurgeon, pseudodoctor). Subjects were divided into two groups: Group A consisted of athletes who train less than 5 years and group B those who train 5 or more years.

Results: On the injury of wrist and hand in kickboxer affect both height and weight, and duration of training and the overall length of training. The number of injuries in men depends on the number of matches, the length of training and years of life. In women, statistically significant effect only with the age and number of hours spent in training. The most frequent injuries in both gender groups kick boxers are often treated by themselves. 20 men (30.3%) were forced due to fractures of the bone or luxation of the hand to turn to orthopedist and then were treated with plaster. Almost a fifth of men, 13 (19.7%) and two girls (18.2%) after this treatment, went to extended rehabilitation under the supervision of a physiotherapist. In spite of all available modes of treatment 7 athletes (9.1%) sought help of pseudodoctor.

Conclusion: Factors affecting the occurrence of injuries in sports are the length and age. Competitors who spent more than 7 hours per week in training tend to injuries, injuries in women are often when they train less than 3 hours or more than 7 hours per week. A number of competitive matches is a risk factor for multiple injuries. Body weight and body height have significance in the occurrence of injuries. Heavier and senior athletes are more likely to hurt their hands than the lower and lighter, and this difference was statistically significant $p < 0.01$. Inadequate treatment leads to an increased incidence of re-injury and subsequent complications in treatment.

Keywords: kickboxing, hand, injuries

PROMENE NIVOA KORTIZOLA I TESTOSTERONA NAKON INTENZIVNOG PSIHO-FIZIČKOG STRESA

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Uvod: Intenzivno fizičko vežbanje utiče na promene nivoa anaboličkih i kataboličkih hormona testosterona (T) i kortizola (C). Sa druge strane utakmica predstavlja ne samo fizički već i značajan psihički stres za sportiste, te može za posledicu imati drugačiji obrazac promene nivoa hormona u odnosu na uobičajeno fizičko vežbanje.

Cilj rada: Cilj ovog rada bio je da se prate promene nivoa C i T ragbista tokom i nakon utakmice i utvrdi da li se odnos njihovih koncentracija u serumu menja, a ukoliko promene postoje, da se utvrdi koji period oporavka je neophodan da bi se uspostavila ravnoteža ovih hormona.

Materijal i metode: Aktivnim sportistima ragbi kluba uzorci krvi su uzimani dan pred utakmicu, na dan utakmice kao i prvog, trećeg i šestog dana nakon utakmice. Nivoi hormona određeni su korišćenjem ELISA metode a izračunat je i količnik njihovih koncentracija za svakog ispitanika (T/C količnik).

Rezultati: Nivo kortizola bio je povećan na dan utakmice u odnosu na dan posle utakmice i tek šestog dana oporavka koncentracija C nije se statistički značajno razlikovala u odnosu na bazalni nivo. Nivo testosterona bio je značajno povećan na dan utakmice kao i trećeg dana nakon utakmice a šestog dana nakon utakmice nije bilo razlike u odnosu na bazalne vrednosti. T/C količnik je bio značajno povećan nakon utakmice i ravnoteža ovih hormona uspostavljena je šestog dana oporavka.

Zaključak: Značajno povišen nivo T/C količnika nakon utakmice verovatno je potreban da bi se uspostavila homeostaza narušena intenzivnim psihičkim i fizičkim naporom koji predstavlja ragbi utakmica.

Ključne reči: testosteron, kortizol, stres.

CHANGES IN LEVEL OF CORTISOL AND TESTOSTERONE AFTER INTENSE PSYCHOLOGICAL AND PHYSICAL STRESS

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Introduction: Intensive physical exercise influences the levels of anabolic and catabolic hormones testosterone (T) and cortisol (C). On the other hand, match represents not only physical but also a significant psychological stress for athletes and can result in a different pattern of changes in hormone levels compared to common physical exercise.

Objective: The objective of this study was to examine changes in blood levels of C and T rugby players during and after the game, and to determine whether the T/C ratio changes, and if so, to find out which recovery period is necessary to establish balance of these hormones.

Material and methods: Blood samples from rugby players were taken the day before, on the competition day, and on first, third and sixth day after the game. Hormone levels were determined using ELISA method and the ratio of their concentrations for each subject (T/C ratio) was calculated.

Results: The level of cortisol was increased on the match day compared to the day after the game and only the sixth day of recovery the concentration of C was not significantly different compared to baseline. Testosterone level was significantly increased on match day and third day after the game but on the sixth day of recovery, there was no difference compared to baseline values. T/C ratio was significantly increased after the game and the balance of these hormones has been established on the sixth day of recovery.

Conclusion: Significantly elevated T/C ratio after the game is probably required to establish homeostasis disturbed by intensive mental and physical effort that represents the rugby match.

Key words: testosterone, cortisol, stress

ANTROPOMETRIJSKI I LIPIDNI PARAMETRI KOD FIZIČKIH AKTIVNIH I SEDENTARNIH OSOBA

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Uvod: Umerena fizička aktivnost smatra se vrlo efektnom metodom za podizanje opštih fizičkih sposobnosti i ostvarivanje vrhunskih rezultata u sportu, dok istovremeno doprinosi kvalitetu zdravlja osobama koje se bave sedentarnim zanimanjima. Fizičko opterećenje ima izvanredan uticaj na zdravlje čoveka jer prvenstveno olakšava regulaciju nivoa holesterola u krvi i usporava razvoj ateroskleroze.

Cilj istraživanja: da se odredi indeks telesne mase i lipidni profil fizički aktivnih i sedentarnih osoba.

Metod. Ispitivanje je obuhvatilo 50 zdravih muškaraca podeljenih u dve grupe. Prvu grupu činile su netrenirane osobe, studenti pete godine medicine starosti 23 ± 1.6 godina. Drugu grupu ispitanika sačinjavalo je 35 aktivnih sportista (24 ± 1.9). Obe ispitivane grupe bile su uravnotežene prema svim bitnim obeležjima (pol, starost, navike). Ispitivani su sledeći parametri indeks telesne mase (ITM), ukupni holesterol, lipoproteini velike gustine (HDL), lipoproteini male gustine (LDL), trigliceridi i indeks ateroskleroze.

Rezultati. Ne postoji značajna razlika u indeksu telesne mase između ispitivanih grupa ali veći broj sedentarnih osoba ima prekomernu telesnu masu. Fizički aktivne osobe imaju značajno veći nivo HDL-holesterola ($p < 0.05$). Osobe koje su fizički neaktivne imaju veću koncentraciju triglicerida i ukupnog holesterola u serumu nego testirani sportisti ($p < 0.05$). Ne postoji značajna razlika u indeksu ateroskleroze kod ispitivanih grupa.

Zaključak. Fizičko opterećenje umerenog intenziteta ima značajnu ulogu u regulaciji lipidnog profila i protektivni efekat na razvoj ateroskleroze.

Ključne reči: fizička aktivnost, indeks telesne mase, lipidi.

ANTROPOMETRIC AND LIPID PARAMETERS IN PHYSICALLY ACTIVE AND SEDENTARY INDIVIDUALS

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Introduction. Moderate physical activities are considered to be a very effective method for improving the general physical abilities as well as achieving considerable results in sport at the same time contributing to a better health quality in individuals who perform sedentary jobs.

The Aim: to establish the BMI and the lipid profile in physically active and sedentary individuals.

Methods. 50 healthy male individuals belonging to two different groups were subjects of examination in this research. The first group consisted of individuals who haven't done any sport training, they were 5-th year medicine students aged 23 ± 1.6 year. The other group consisted of 35 active sportsmen aged 24 ± 1.9 . The following parameters were examined: BMI, total cholesterol, lipoproteins with high density, lipoproteins with low density, triglycerides and the index of atherosclerosis.

Results. There isn't a significant difference in the BMI in individuals belonging to different groups but yet more of the overweight belong to the sedentary group. Physically active individuals have significantly higher level of HDL cholesterol ($p < 0.05$). Individuals who are not physically active have higher concentration of triglycerides and total cholesterol in the serum than the examined sportsmen ($p < 0.05$). There isn't a significant difference in the atherosclerosis index between the examined groups.

Conclusion. Performing physical activities of moderate intensity plays an important role in the lipid profile regulation and prevents from atherosclerosis.

Key words: physical activity, BMI, lipids

FIZIOLOŠKA ADAPTACIJA RESPIRATORNIH PARAMETARA NA FIZIČKU AKTIVNOST KOD VRHUNSKI TRENIRANIH SPORTISTA

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Uvod: Usled specifične fizičke aktivnosti kojoj podležu sportisti mogu se videti adaptacijske promene na svim organskim sistemima.

Cilj: Cilj rada bio je da ispita specifičnost razlike respiratornih parametara usled adaptacije na fizičku aktivnost kod vrhunski treniranih sportista u odnosu na fizički neaktivne ispitanike.

Materijal i metode: Ovim istraživanjem obuhvaćeno je 14 vrhunskih sportista, vaterpolista i 14 ispitanika muškog pola, koji se ne bave kontinuirano fizičkom aktivnošću. Svim ispitanicima urađena je dinamska spirometrija i određeni su: vitalni kapacitet pluća (VC), forsirani vitalni kapacitet (FVC) i forsirani ekspirijumski volumen u prvoj sekundi (FEV1), najveći (vršni) ekspirijumski protok (PEF), kao i procenat svih parametara u odnosu na predviđene vrednosti.

Rezultati: Nivoi VC, FVC i FEV1 bili su statistički značajno veći u grupi fizički aktivnih ispitanika u odnosu na fizički neaktivnu grupu ($p < 0.01$ za VC, $p < 0.05$ za FVC i FEV1). Vitalni kapacitet izražen u procentima se statistički razlikovao u ispitivanim grupama ($p < 0.05$), dok se pokazalo da iako su vrednosti forsiranog vitalnog kapaciteta i forsiranog ekspirijumskog volumena u prvoj sekundi izraženim u procentima (FCV i FEV1) veće kod grupe fizički neaktivnih ispitanika, ta razlika nije statistički značajna ($p > 0.05$). Najveći (vršni) ekspirijumski protok bio je veći kod fizički aktivnih ispitanika u odnosu na fizički neaktivne ali ta razlika nije statistički značajna ($p > 0.05$).

Zaključci: Rezultati ovog istraživanja pokazuju da je višegodišnji specifični trenajni proces doveo do fizioloških adaptivnih promena respiratornog sistema fizički aktivnih ispitanika (vaterpolista) u poređenju sa fizički neaktivnim ispitanicima.

Ključne reči: fizička aktivnost, respiratorni parametri.

PHYSIOLOGICAL ADAPTATION OF RESPIRATORY PARAMETERS OF PHYSICAL ACTIVITY IN TOP TRAINED MALE ATHLETES

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Introduction: Due to specific physical activities which are subject to the athletes can see the adaptive changes in all organ systems.

The Aim: The objective was to examine the specific differences of respiratory parameters due to physical activity in highly trained athletes compared to physically inactive subjects.

Materials and Methods: This study involved 14 elite athletes, water polo players and 14 male subjects who are not engaged in ongoing physical activity. All subjects underwent dynamic spirometry and measured respiratory parameters are: vital lung capacity (VC), forced vital capacity (FVC) and forced expiratory volume in first second (FEV1), peak expiratory flow (PEF), and the predicted percentage of all parameters.

Results: The levels of VC, FVC and FEV1 were significantly higher in physically active subjects compared to physically inactive ($p < 0.01$ for VC, $p < 0.05$ for FVC and FEV1). Vital capacity, expressed in percentages was statistically different in the two groups ($p < 0.05$), while it showed that although the values of forced vital capacity and forced expiratory volume in first second expressed as a percentage (FCV and FEV1) were higher in the group of physically inactive participants, that difference was not statistically significant ($p > 0.05$). The peak expiratory flow was higher in physically active subjects compared to physically inactive, but this difference was not statistically significant ($p > 0.05$).

Conclusion: These results show that a multi-year specific training process led to physiological adaptive changes of the respiratory system in physically active subjects, compared with physically inactive.

Keywords: physical activity, respiratory parameters

UTICAJ GRELINA NA STRUKTURU TIMUSA PERIPUBERTALNIH I ADULTNIH PACOVA

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Uvod: Timus je primarni limfoidni organ koji obezbeđuje mikrosredinu za razvoj T-limfocita neophodnih za razvoj imunog odgovora. Na funkciju timusa značajno utiče nivo polnih hormona, kao i starenje tokom kojega organ značajno atrofiruje, što se ogleda u redukciji zapremine funkcionalnog limfoidnog tkiva i povećanju zapremine masnog tkiva. Celijske imunskog sistema eksprimiraju oreksigeni hormon grelin i malobrojni podaci ukazuju da on može posredovati u aktivaciji T limfocita.

Cilj rada: Cilj rada bio je da se utvrdi da li centralna aplikacija grelina može uticati na strukturu i volumen timusa pacova različite starosti.

Materijal i Metode: Korišćeni su pacovi Wistar nesrodničkog soja, muškog pola, starosti 5 nedelja i 2 meseca. Tokom 5 dana životinje su dobijale intracerebroventrikularno grelin ($1\mu\text{g}/\text{dan}$), dok su kontrolne životinje odgovarajućeg uzrasta dobijale fiziološki rastvor ($5\mu\text{l}/\text{dan}$) istim postupkom. Nakon tretmana, pacovi su žrtvovani, izolovan je i izmeren timus, a na histološkim preparatima stereološkom analizom, metodom brojanja pogodaka, određivane su relativna i apsolutna zapremina timusnih odeljaka (kore, medule i vezivnog-adipoznog tkiva).

Rezultati: Kod dva meseca starih kontrolnih životinja pokazana je statistički značajna atrofija timusa (redukcija ukupne mase timusa kao i volumena timusnog korteksa) u odnosu na pet nedelja stare kontrole. Tretman grelinom doveo je do povećanja apsolutne mase timusa, kao i zapremine timusnog korteksa kod pacova obe starosne dobi.

Zaključak: Centralna aplikacija grelina odlaže atrofiju timusa dva meseca starih Wistar pacova, tako da nema razlike u masi timusa i zapremini korteksa dva meseca starih tretiranih životinja i pet nedelja starih kontrolnih životinja. Rezultati ukazuju na stimulatívno delovanje grelina na strukturu, a verovatno i na funkciju, timusa.

Ključne reči: struktura timusa, grelin

GHRELIN INFLUENCES THYMIC STRUCTURE IN PERIPUBERTAL AND ADULT RATS

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Introduction: Thymus is the primary lymphoid organ that provides microenvironment for development of T-lymphocytes required for establishing efficient immune response. Its functions depend on gonadal hormone levels and age. Ageing induces significant thymic atrophy accompanied by reduction of volume of true lymphoid tissue and increase in volume of adipose tissue. Orexigenic hormone ghrelin is expressed by immune cells and scarce data indicate that it might regulate T cell activation.

The Aim: The aim of this study was to establish if intracerebroventricular application of ghrelin might influence thymic volume and structure.

Materials and Methods: Male Wistar rats, 5 weeks and 2 months old were used in this experiment. Experimental groups were treated intracerebroventricularly with $1\mu\text{g}$ of ghrelin during 5 days, while the control groups received $5\mu\text{l}$ of saline in the same way. Following the treatment, animals were sacrificed, their thymi were isolated, weighed, fixed and processed for stereological analysis. Point counting method was applied for measuring the relative and absolute volumes of thymic compartments (cortex, medulla and interlobular connective/adipose tissue).

Results: In control two-month-old animals significant thymic atrophy was showed (reduced absolute thymic weight and reduced volume of thymic cortex) compared to five-week-old controls. Ghrelin treatment increased absolute thymic weight and volume of thymic cortex in rats of both ages.

Conclusion: Intracerebroventricular application of ghrelin postpones thymic atrophy in two-month-old Wistar rats, and there was no statistically significant difference in thymic weight and volume of thymic cortex in treated animals of this age compared to five-weeks-old control animals. These results point to a stimulatory influence of ghrelin on thymic size, and probably the function.

Key words: thymic structure, ghrelin

UTICAJ KAMFORA NA VIJABILNOST I OKSIDATIVNI STRES TIMOCITA PACOVA

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Uvod: Kamfor ($C_{10}H_{16}O$) predstavlja biciklični monoterpen, koji se nalazi široko distribuiran u biljkama. Iako su dobro poznata njegova antivirusna, antibiotska i analgetička dejstva, njegov uticaj na ćelije imunog sistema i dalje je nepoznat.

Cilj rada: U našoj studiji pokušali smo da utvrdimo kakav uticaj poseduje kamfor na ćelije imunog sistema, kao i potencijalne mehanizme uključene u ovaj proces.

Materijal i metode: Eksperimenti su izvođeni na pacovima Wistar soja, izolovani timociti su tretirani rastućim koncentracijama kamfora (0.1, 1, 10 $\mu\text{g}/\text{bazenu}$) tokom 24h. Nakon isteka kultivacionog perioda određivana je vijabilnost timocita, promena ukupne intracelularne količine ROS-a i promena MMP.

Rezultati: Rezultati dobijeni u našoj studiji pokazuju da aplikacija kamfora ne dovodi do statistički značajne citotoksičnosti kao i da dovodi do porasta ćelijske vijabilnosti. Inkubacija timocita sa kamforom dovela je do značajnog povećanja produkcije intracelularnog ROS-a, u svim testiranim koncentracijama, kao i do poremećaja MMP-a.

Zaključak: Kamfor nije izazvao značajnu toksičnost timocita pacova, već su visoke koncentracije kamfora povećale vijabilnost timocita, ukazujući na njegov stimulatívni efekat na ćelije imunog sistema. Indukcija oksidativnog stresa, kao i poremećaj mitohondrijalnog membranskog potencijala, ne predstavljaju dominantan mehanizam citotoksičnog dejstva na ćelije imunog sistema.

Ključne reči: Kamfor, vijabilnost, oksidativni stres, timociti pacova.

MODEL TALASNOG OBLIKA PROMENE PRITISKA U VELIKIM ARTERIJAMA GORNJEG EKSTREMITETA KOD LJUDI

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Uvod: Modeliranje protoka ima direktne implikacije za bolje biofizičko razumevanje arterijske hemodinamike.

Cilj rada: Cilj rada je bio da razvijemo model arterijskog protoka i rekonstruisanog modela pritiska baziranog na jednodimenzionoj linearnoj teoriji u frekventnom domenu za talase koji se proširu u elastičnim sudovima, kao i da uporedimo karakteristike talasnog oblika promene pritiska u velikim arterijama gornjeg ekstremiteta.

Materijal i metode: Korišćenjem infracrvenog senzora obavili smo istovremeno merenje protoka na brahijalnoj i radijalnoj arteriji kod mladih, sredovečnih i starijih ispitanika.

Rezultati: Na osnovu podataka za koeficijent refleksije, terminalni otpor i dimenzije arterije, određenih individualno za svakog ispitanika, formirali smo jednodimenzioni matematički model promene pritiska u arterijama zasnovan na rešenjima asimetričnih Navier-Stoksovih jednačina za protok fluida kroz elastične cevi.

Zaključak: Uticaj refleksije usled terminalne otpornosti kod svih ispitanika u signalu pritiska se detektuje kao poslednji talas u signalu, ali nema uticaja na maksimalnu vrednost pritiska.

Ključne reči: hemodinamika, matematičko modelovanje, arterijski pritisak

INFLUENCE OF CAMPHOR ON THE VIABILITY AND OXIDATIVE STRESS IN RAT THYMOCYTES

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Introduction: Camphor ($C_{10}H_{16}O$) is a bicyclic monoterpene, which is widely distributed in plants. Although well known for its antiviral, antibiotic and analgesic effect, its effect on immune cells is still unknown.

The Aim: In our study we tried to determine what impact has camphor in immune system cells, as well as potential mechanisms involved in this process.

Material and Methods: Experiments were performed on Wistar rats, isolated thymocytes were treated with increasing concentrations of camphor (0.1, 1, 10 $\mu\text{g}/\text{pool}$) for 24h. After the expiry of the cultivation period, thymocyte viability, overall change in the amount of intracellular ROS and changes in MMP were determined.

Results: The results of our study indicate that application of camphor does not lead to statistically significant cytotoxicity and that leads to an increase in cell viability. Incubation of thymocytes with camphor led to significant increase of intracellular ROS production, in all tested concentrations, as well as disturbance of MMP.

Conclusion: Camphor did not cause significant toxicity of rat thymocytes, but high concentrations of camphor increased the viability of thymocytes, indicating its stimulatory effect on the immune system. The induction of oxidative stress and mitochondrial membrane potential disruption, is not the dominant mechanism of cytotoxic effects on the immune cells.

Key words: camphor, viability, oxidative stress, rat thymocytes.

THE MODEL OF ARTERIAL PRESSURE WAVEFORM IN LARGE ARTERIES OF THE UPPER EXTREMITY IN HUMANS

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Introduction: Blood flow modelling has direct implications for better biophysical understanding of arterial hemodynamics.

The Aim: The aim of our study was to develop the model of arterial blood flow and reconstructed model of pressure based on unidimensional linear theory in the frequency domain for the waves spreading in elastic tubes, and to compare the characteristics of pressure waveform changes in large arteries of the upper extremity

Materials and Methods: By using infrared sensors, we performed the simultaneous measurements of blood flow in the brachial and radial arteries in young, middle-aged and elderly subjects.

Results: Using the data for reflection coefficient, terminal resistance and arterial dimensions we formed a one-dimensional mathematical model of the blood flow in arteries, based on the solution of asymmetric Navier-Stokes equations for the flow of fluids in elastic tubes.

Conclusion: The reflection from the high resistance terminal beds is detected as the last wave in the recorded signal. However, it has no effect on the maximal level of arterial pressure.

Key words: hemodynamics, arterial pressure, mathematical modelling

ЕФЕКТИ РАЗЛИЧИТИХ ИЗОФОРМИ ХОМОЦИСТЕИНА НА МАРКЕРЕ ОКСИДАТИВНОГ СТРЕСА КОД ИЗОЛОВАНОГ СРЦА ПАЦОВА

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Увод: Јединствени биохемијски профил хомоцистеина (Hcy) се одликује хемијском реактивношћу која подразумева широк спектар молекуларних ефеката и тенденцијом да промовише оксидативним стресом-индуковану хелијску токсичност. Бројне епидемиолошке студије су показале да хиперхомоцистеинија, као независни фактор ризика за кардиоваскуларне болести, ремети нормалне функције ендотела посредством механизма у које су укључене реактивне врсте кисеоника.

Циљ истраживања: Циљ нашег рада је био да се утврди утицај различитих изоформи хомоцистеина на параметре оксидативног стреса у изолованом срцу пацова.

Материјал и методе: Срца (укупан број $n=18$, 6 за сваку експерименталну групу) изолована из соја Wistar albino пацова, мушког пола, старости 8 недеља, телесне масе 180-200g, су била прикључена на Лангендорф апарат, техником ретроградне перфузије при константном притиску (70cm H₂O) уз администрацију 3 изоформе хомоцистеина (DL-Hcy, L-Hcy TLHC и DL-Hcy TLHC), примењених у истој концентрацији: 10 μ M. У прикупљеним узорцима коронарног венског ефлуента, спектофотометријски су одређивани следећи параметри оксидативног стреса: индекс липидне пероксидације, мерен као TBARS, азот моноксид NO, супероксид анјон радикал O₂⁻ и водоник пероксид H₂O₂.

Резултати: L-Hcy TLHC је довео до статистички значајног смањења у ослобађању O₂⁻, у односу на контролну групу, али без значајних промена других маркера оксидативног стреса. DL-Hcy и DL-Hcy TLHC нису утицали значајно на промену испитиваних параметара оксидативног стреса у односу на контролну.

Закључак: Добијени резултати показују да L-Hcy TLHC показује изванредан антиоксидативни потенцијал па тако може представљати најмање штетан облик хомоцистеина за ендотелну функцију.

Кључне речи: хомоцистеин- изоловано срце пацова- оксидативни стрес.

THE EFFECTS OF DIFFERENT HOMOCYSTEINE ISOFORMS ON OXIDATIVE STRESS MARKERS IN ISOLATED RAT HEART

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Introduction: The unique biochemical profile of homocysteine (Hcy) is characterized by chemical reactivity supporting a wide range of molecular effects and by a tendency to promote oxidative stress-induced cellular toxicity. Numerous epidemiological reports have established that hyperhomocysteinemia, a risk factor in cardiovascular diseases, disturbs the normal endothelium functions through a mechanism in which reactive oxygen species seem to be also involved.

The aim of study: The aim of our study was to estimate the influence of different homocysteine isoforms on oxidative stress parameters in isolated rat heart. **Material and methods:** The hearts (total number $n=18$, 6 for each experimental group) excised from Wistar albino rats, male sex, age 8 weeks, body mass 180-200 g, were retrogradely perfused according to the Langendorff technique at constant perfusion pressure (70 cm H₂O) and administered with 3 isoforms of 10 μ M homocysteine (DL-Hcy, L-Hcy TLHC and DL-Hcy TLHC). In collected samples of the coronary venous effluent, oxidative stress parameters (index of lipid peroxidation, measured as TBARS, superoxide anion radical O₂⁻, hydrogen peroxide H₂O₂ and nitric oxide NO) were determined spectrophotometrically.

Results: L-Hcy TLHC induced significant decrease in level of O₂⁻ release, comparing to control group, but without significant changes in other oxidative stress markers. DL-Hcy and DL-Hcy TLHC did not affect significantly any of estimated oxidative stress parameters comparing to control.

Conclusion: Obtained results shows that L-Hcy TLHC seems to have some antioxidative potential, and may be the less dangerous Hcy compound for risk of endothelial dysfunction.

Key words: homocysteine - isolated rat heart - oxidative stress



GINEKOLOGIJA I OPSTETRICIJA

KOMPRESIVNE SUTURE UTERUSA KOD POSTPARTALNOG KRVARENJA

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Uvod: Postpartalna hemoragija predstavlja najčešći uzrok maternalnog mortaliteta i morbiditeta. Najčešće nastaje zbog atonije uterusa, traume genitalnog trakta, bolesti placente i koagulopatija. Lečenje uključuje mehaničke, medikamentozne i hiruške metode, kombinovane sa reanimacijskim merama hipovolemijskog šoka. Kompresivne suture uterusa predstavljaju konzervativni vid terapije, najpoznatija je B-Lynch sutura uterusa.

Cilj: Analiza mogućnosti sanacije postpartalne hemoragije konzervativnim putem tj primenom kompresivnih sutura na uterus i naglašavanje značaja ove metode u cilju očuvanja reproduktivne sposobnosti žene nakon postpartalne hemoragije.

Materijal i metode: U retrospektivnoj studiji analizirane su 32 postpartalne hemoragije koje su dijagnostikovane u Klinici za ginekologiju i akušerstvo, KCS, Beograd u trogodišnjem periodu (2008-2010). Na osnovu hemodinamske stabilnosti pacijentkinja kao i mogućnosti zaustavljanja krvarenja konzervativnim pristupom primenom kompresivnog šava na uterus kod pet pacijentkinja je izbegnuta radikalna histerektomija. Za analizu podataka korišćene su standardne statističke metode.

Rezultati: Od 32 pacijentkinje koje su imale postpartalnu hemoragiju, kod 24 (75%) je uzrok krvarenja bila atonija uterusa. Kod 5 pacijentkinja (15,62%) krvarenje je zaustavljeno primenom kompresivne suture materice i na taj način je sačuvana fertilitet kod ovih žena.

Zaključak: Kompresivne suture uterusa predstavljaju jako bitan način sanacije postpartalne hemoragije jer pored toga što sprečavaju radikalnu histerektomiju posledično čuvaju reproduktivnu sposobnost pacijentkinja. Odluka o modalitetu lečenja se donosi na osnovu kliničkog stanja pacijentkinje i procene iskusnog akušera.

Ključne reči: Kompresivne suture, B-Lynch sutura, atonija uterusa, postpartalna hemoragija

COMPRESSION SUTURES OF UTERUS AT POSTPARTUM HEMORRHAGE

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Introduction: Postpartum hemorrhage is the most common cause of maternal mortality and morbidity. Main reasons are Uterine atony, trauma of the genital tract, placenta diseases and coagulopathies. Treating management includes mechanic, medicament and surgical methods, combined with hypovolemic shock reanimation measured. Compression sutures represent conservative approach, and the best known is B-Lynch suture of uterus.

The Aim: of this study was to examine the possibility of resolving the hemorrhage in the conservative way using the compression sutures and to emphasise the importance of this method in order to preserve fertility of the patients.

Materials and Methods: This retrospective study includes 32 PH diagnosed in the Clinic for Gynecology and Obstetrics, in the three year time. According the hemodynamic stability, and the possibility of stopping the hemorrhage conservatively using the compression suture on the uterus at five patients radical hysterectomy has been avoided. For data analysis we have used standard statistics.

Results: Out of 32 patients with the PH, 24 of them (75%) had the uterine atony as a main reason of hemorrhage. At Five patients (15,62%) bleeding has been stopped by usage of the compression suture on the uterus, and in that way we have saved the fertility of women.

Conclusion: Compression suture of uterus represent very important method of resolution of the PH not only by preventing from radical hysterectomy but as well saving the fertility. The final decision about the management of the treatment can be based on the on the clinical status of the patient and the estimation of the experienced surgeon.

Keywords: Compression suture, B-Lynch suture, uterine atony, postpartum hemorrhage

KORELACIJA FAKTORA RIZIKA, ULTRAZVUČNE DEBLJINE ENDOMETRIJUMA I HISTOPATOLOŠKOG NALAZA KOD PACIJENTKINJA SA KARCINOMOM ENDOMETRIJUMA

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Uvod: Karcinom endometrijuma je jedan od najčešćih maligniteta genitalnog trakta u ženskoj populaciji. Indetifikovani su brojni faktori rizika za njegov nastanak, dok se debljina endometrijuma izmerena ultrazvukom preko 5 mm smatra parametrom za dokazivanje ovog karcinoma.

Cilj rada: Cilj rada je bio istražiti povezanost faktora rizika, kao i debljinu endometrijuma kod obolelih žena u zavisnosti od hirušskog FIGO stadijuma.

Materijal i metode: Retrospektivnom studijom u trajanju od 12 meseci su obuhvaćene 73 pacijentkinje sa karcinomom endometrijuma. Uzeti su anamnestički podaci i urađeni ginekološki i ultrazvučni pregled. Postoperativno je urađena histopatološka obrada preparata i izvršena klasifikacija po FIGO stadijumima.

Rezultati: Analizirajući faktore rizika dobijeno je da značajno više pacijentkinja nije imalo dijabetes ($\chi^2=65,288$; $p=0,000$), značajno više pacijentkinja je imalo hipertenziju ($\chi^2=7,247$; $p=0,007$) i statistički značajno više pacijentkinja je bilo gojazno ($\chi^2=30,260$; $p=0,000$). Sve ispitanice su imale debljinu endometrijuma veću od 5mm. Najviše pacijentkinja je imalo 1B, a najmanje 3A FIGO stadijum oboljenja ($\chi^2=51,192$; $p=0,000$). Statistički su značajno povezane debljina endometrijuma i karcinom endometrijuma.

Zaključci: U našem istraživanju kao značajni faktori rizika izdvojili su se gojaznost i hipertenzija. Ultrazvučno izmerena debljina endometrijuma bila je parametar koji ukazuje na postojanje ovog karcinoma i značajno je povezana sa karcinomom endometrijuma.

Ključne reči: Karcinom endometrijuma, faktori rizika, transvaginalni ultrazvuk, FIGO stadijumi

CORRELATION OF RISK FACTORS, ULTRASOUND ENDOMETRIAL THICKNESS AND HISTOPATHOLOGICAL FINDINGS IN PATIENTS WITH ENDOMETRIAL CARCINOMA

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Introduction: Endometrial carcinoma is one of the most common malignancy of the genital tract in women. Numerous risk factors have been identified for its development, and the endometrial thickness measured by ultrasound greater than 5 mm is considered the parameter for the detection of this cancer.

The Aim: the aim of study was to determine the association of risk factors, and endometrial thickness depending on the FIGO surgical stage.

Materials and Methods: A retrospective study of 12 months included 73 patients with endometrial carcinoma. We took a medical history and did gynecological and ultrasound examination. Postoperative histopathological processing was done and specimens were classified according to FIGO stage.

Results: The analysis of risk factors was obtained that significantly more patients had diabetes ($\chi^2 = 65.288$, $p = 0.000$), significantly more patients had hypertension ($\chi^2 = 7.247$, $p = 0.007$) and significantly more patients were obese ($\chi^2 = 30.260$, $p = 0.000$). All patients had an endometrial thickness greater than 5 mm. The most patients had a 1B and the least had a 3A FIGO stage of disease. The endometrial thickness was significantly associated with endometrial carcinoma.

Conclusion: In our study as significant risk factors can be singled out obesity and hypertension. Ultrasound measured endometrial thickness was a parameter that indicated the existence of cancer and it was significantly associated with endometrial carcinoma.

Key words: Endometrial cancer, risk factors, transvaginal ultrasound, FIGO stages

HIPERPROLAKTINEMIJA I INFERTILITET

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Uvod: Prolaktin je hormon koji se luči u prednjem režnju hipofize neophodan za započinjanje lučenja mleka nakon porođaja. Istraživanje hormonskih poremećaja je jedan od najvažnijih koraka u ispitivanju infertiliteta, te pri svakom hormonskom ispitivanju koje se obavlja kod osoba sa infertilitetom neophodno je odrediti vrednost prolaktina.

Cilj: Cilj ove studije je bio da se proceni značaj, učestalost i efikasnost lečenja stanja hiperprolaktinemije kod infertilnih pacijentkinja. 96 pacijentkinja je bilo ispitano u ovoj studiji.

Materijal i metode: Odgovarajući uzorci periferne krvi su uzimani za hormonske analize u ranoj folikularnoj, periovulatornoj i midlutealnoj fazi ciklusa. Između 4 i 7 dana ciklusa ultrasonografska i hemodinamska ispitivanja su sprovedena na ovarijalnom i uterušnom nivou.

Rezultati: Hiperprolaktinemija je detektovana kod 30 žena, kod kojih se nivo prolaktina kretao između 628.4-8000 mIU/L. Započeta je terapija dopaminskim agonistima (bromokriptin/kabergolin), individualno dozirano. Menstrualna cikličnost, kao i nivoi prolaktina su se normalizovali kod svih pacijentkinja tri meseca nakon početka terapije.

Zaključak: Hiperprolaktinemija može da poremeti fertilitet, te je njegova rana i precizna detekcija i adekvatna terapija veoma važna za uspostavljanje regularne menstrualne cikličnosti i uspešni tretman infertiliteta.

Ključne reči: hiperprolaktinemija, infertilitet.

HYPERPROLACTINEMIA AND INFERTILITY

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Introduction: A hormone prolactin, which is secreted in the front pituitary lobe, is necessary for the initiation of secretion of milk after delivery. Researching of hormonal disorders is one of the most important steps in the examination of infertility, so it is necessary to determine the prolactin level in case of every hormonal examination of infertile women.

The Aim: The goal of this study was to estimate importance, frequency and efficiency of treatment of hyperprolactinemia with infertile patients. In this study 96 patients were examined.

Material and Methods: The appropriate samples of periphery blood were taken for hormonal analysis in early follicular, periovulatory and midluteal phase of menstrual cycle. From the forth to seventh day of menstrual cycle ultrasonographic and hemodynamic examination was conducted on ovarial and uterus level.

Results: Hyperlactonemia was detected among 30 women, whose prolactin level was in range from 628.4 to 8000mIU/L. Treatment with dopamin agonists was set up (bromocriptine/cabergoline) and individually dosed. Menstrual cycle, as well as prolactin levels were normalized among all the patients after 3 months of treatment.

Conclusion: Hyperlactonemia can disorder the fertility potential, so its early and precise detection, as well as appropriate therapy are very important to establishing a normal menstrual cycle and succesful treatment of fertility.

Key words: Hyperprolactinemia, infertility.

UTICAJ INSULINSKE REZISTENCIJE NA FUNKCIJU JAJNIKA KOD ŽENA KOJE BOLUJU OD SINDROMA POLICISTIČNIH JAJNIKA

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Uvod: Sindrom policističnih jajnika (PCOS) je jedan od najčešćih endokrinoloških problema reproduktivnog zdravlja žena. Osnovni hormonski disbalans u PCOS je povećanje vrednosti androgena i/ili insulina u krvi.

Cilj: Cilj istraživanja je ispitivanje uticaja insulinemije na lučenje androgena iz jajnika.

Materijal i metode: Istraživanje obuhvata 40 pacijentkinja kojima je dijagnostikovani sindrom policističnih jajnika. Dijagnoza je postavljena prema Roterdamskim kriterijumima iz 2003 godine. Analizirani su rezultati OGTT testa sa insulinemijama, vrednosti androstenediona, prolaktina, FSH, LH, progesterona i estradiola i kliničke karakteristike sindroma: hirsutizam, akne i broj menstrualnih ciklusa u toku godine.

Rezultati: 18 pacijentkinja ima insulinsku rezistenciju (45%). 24 pacijentkinje ima povećane vrednosti androstenediona (60%). Uočena je statistički značajna pozitivna korelacija vrednosti androstenediona i bazalnog insulina ($p<0,05$). Uočena je statistički značajna pozitivna korelacija vrednosti androstenediona i HOMA – IR ($p<0,05$).

Zaključak: Rezultati su pokazali da se kod žena sa PCOS u visokom procentu javlja insulinska rezistencija (45% pacijentkinja) i povećanje vrednosti androgena u krvi (60% pacijentkinja). Rezultati su pokazali statistički značajnu pozitivnu korelaciju vrednosti androstenediona i bazalnog insulina, kao i statistički značajnu pozitivnu korelaciju vrednosti androstenediona i HOMA – IR indeksa. Dobijene pozitivne korelacije ukazuju da postoji uzročna posledična veza insulinske rezistencije i vrednosti androgena kod žena sa PCOS.

Ključne reči: PCOS, OGTT, insulinska rezistencija, hiperandrogenizam

IMPACT OF INSULIN RESISTANCE ON OVARIAN FUNCTION IN WOMEN WITH POLYCYSTIC OVARY SYNDROME

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Introduction: Polycystic ovary syndrome (PCOS) is one of the most common reproductive health problems of women. The basic hormonal imbalance in PCOS is created by a combination of increased androgens and/or insulin.

The Aim: The aim of the research is to examine the impact of insulinemia on the secretion of androgens from the ovary.

Materials and Methods: This study includes 40 women who were diagnosed polycystic ovary syndrome. The diagnosis was made according to the Rotterdam criteria in 2003. We analyzed the results of OGTT test and insulinemia, the values of androstenedione, prolactin, FSH, LH, progesterone and estradiol and clinical characteristics of the syndrome: hirsutism, acne and the number of menstrual cycles during the course of a year.

Results: 18 patients have insulin resistance (45%). 24 patients have increased levels of androstenedione (60%). There was a statistically significant positive correlation between the values of basal insulin and androstenedione ($p<0,05$). There was a significant positive correlation between the values of androstenedione and HOMA – IR ($p<0,05$).

Conclusion: The results of this study show that high percentage of women with PCOS have insulin resistance (45% of patients) and increased levels of androgens (60% of patients). The results show statistically significant positive correlation of basal insulin and androstenedione, as well as statistically significant positive correlation of androstenedione and HOMA – IR index. Obtained positive correlations indicate that there is a causality between insulin resistance and levels of androgens in women with PCOS.

Key words: PCOS, OGTT, insulin resistance, hyperandrogenism

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Uvod: Abruption posteljice predstavlja jedan od najčešćih uzroka krvarenja u poslednjem trimestru trudnoće. Nastaje kao rezultat poremećaja placentacije. Najznačajniji faktori rizika za nastanak abrupcije su: prethodni carski rez, hipertenzivni sindrom u trudnoći, amniocenteza, miomatozni čvorovi. Porast broja carskih rezova utiče na dramatičan porast učestalosti abrupcija.

Cilj rada: Analizirati incidencu i faktore rizika abrupcije placente.

Materijal i metode: Retrospektivnom studijom je obuhvaćeno 6879 pacijentkinja porođenih na Klinici za ginekologiju i akušerstvo Kliničkog centra Srbije tokom 2003 godine i 6748 pacijentkinja porođenih tokom 2010. god. Analizirani su učestalost pojave abrupcije posteljice, način porođaja, paritet i faktori rizika (prethodni carski rez, dijagnostička amniocenteza, Diabetes Mellitus type I, PIH, Preeclampsio, Eclampsio, Myoma et Polymyomata uteri, Gemelli).

Rezultati: Postoji statistički značajan porast broja porođaja završenih carskim rezom u 2010. u odnosu na period 2003. godine. Takođe je došlo do statistički značajnog porasta ukupnog broja abrupcija posteljice u 2010. godini. Statističkom obradom faktora rizika za nastanak abrupcije posteljice nije utvrđena razlika, a kao vodeći rizični faktori se izdvajaju: prethodni carski rez bez abrupcije posteljice, dijagnostička amniocenteza, Diabetes mellitus, Polymyomata uteri, hipertenzivni sindrom.

Zaključak: Retrospektivnom analizom konstatovano je značajno povećanje broja carskih rezova koji imaju za posledicu značajno povećanje učestalosti abrupcije posteljice kao jedne od najozbiljnijih komplikacija u poslednjem trimestru graviditeta. Vodeći faktori rizika za nastanak abrupcije posteljice ostaju nepromenjeni u oba ispitivana perioda. Najznačajniji su: prethodni carski rez, dijagnostička amniocenteza, Diabetes mellitus, Polymyomata uteri i hipertenzivni sindrom u trudnoći.

Ključne reči: abrupcija posteljice, carski rez, faktori rizika

IMPACT OF INCREASING NUMBER OF CAESAREAN SECTIONS IN THE OCCURRENCE OF PLACENTAL ABRUPTION

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Introduction: Placental abruption is one of the most common causes of hemorrhage in the last pregnancy trimester. It occurs as disorder of normal placentation. Leading risk factors for placental abruption are: Previous caesarean section, hypertensive disorders, Polymyomata uteri. The significant increase in number of cesarean sections influence the dramatic increase in the incidence of placental abruptions.

The Aim: Analysis of incidence and risk factors for placental abruption.

Methods and materials: Retrospective study was carried out on 6879 pregnant women during 2003. year and 6748 during 2010 year, who were hospitalized at Clinic of Gynecology and Obstetrics, Clinical Center of Serbia. Incidence of placental abruption, way of delivery, number of births, risk factors (previous caesarean section, diagnostic amniocentesis, Diabetes Mellitus tip I, hypertensive disorders, Polymyomata uteri, Gemelli) were analyzed.

Results: We found a significant increase in cesarian sections in 2010, compared with number of sections in 2003. There was a statistically significant increase in total placental abruptions in 2010. The incidence of risk factors has not change. The leading risk factors remained the same: Previous caesarean section, diagnostic amniocentesis, Diabetes Mellitus tip I, hypertensive disorders, Polymyomata uteri.

Conclusion: Retrospective analysis has confirmed significant increase in number of cesarian section that have resulted with significant increase of placental abruption as one of most serious complications during the last trimester. Leading risk factors for placental abruption remain unchanged in both periods. These are primarily: Previous caesarean section, diagnostic amniocentesis, Diabetes Mellitus tip I, hypertensive disorders, Polymyomata uteri.

Key words: placental abruption, caesarean section, risk factors

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Uvod: Kontracepcija obuhvata sve metode koje sprečavaju nastanak neželjene trudnoće.

Cilj rada: Cilj našeg rada je da odredimo incidencu kontracepcije kod studentske populacije na Kosovu i Metohiji u odnosu na stepen zdravstvene prosvetćenosti.

Materijal i metode: U toku ovog istraživanja koristili smo sledeće metode: intervju sa studentima, anketu. Dobijene rezultate statistički smo obradili hi kvadrat testom.

Rezultati: Analizom podataka prikupljenih anketiranjem 176 studenata dobili smo rezultate o obimu korišćenja kontracepcije, faktorima koji utiču na upotrebu kontracepcije i postojanju negativnih stavova o kontracepciji.

Obim upotrebe kontracepcije u ispitivanoj populaciji je 66,1%, s tim da od tog broja 30,4 % koristi uvek, 35,7% ponekad, 33,9% ne koristi nikada kontracepciju. Najčešće kontraceptivno sredstvo je kondom (43%), zatim slede koitus interruptus (28%), računanje plodnih i neplodnih dana (14%), kontraceptivne tablete (8%), spirala (3%) i „pilula dan posle“ (4%).

Sa statistički značajnom razlikom ($p < 0,05$) dokazano je da obim korišćenja kontracepcije raste sa godinama starosti, nivoom obrazovanja žene, kao i sa nivoom obrazovanja njenog partnera. Takođe je potvrđeno da postoji statistička značajnost ($p < 0,05$) u odnosu redovne kontrole u ginekološkoj ordinaciji poliklinike i to kod studenata koji posećuju ginekologa veći je procenat upotrebe kontracepcije od onih koji neredovno posećuju ginekologa.

Zaključak: U populaciji nisu prisutne zablude o kontracepciji u značajnijem obimu, ali su prisutne zablude i strah od kontraceptivnih tableta (debljina, neplodnost, tumori, tromboze).

Ključne reči: Kontracepcija, stepen zdravstvene prosvetćenosti, studenti.

INCIDENCE OF CONTRACEPTION AMONG UNIVERSITY STUDENTS IN KOSOVO AND METOHJA IN RELATION TO THE EXTENT OF HEALTH CONSCIOUSNESS

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Introduction: Contraception involves all those methods aimed at preventing unwanted pregnancy.

Aim of the paper: The paper aims at identifying the incidence of utilization of contraceptives among university students in Kosovo and Metohija with regard to the extent of health consciousness.

Material and methods: In the course of this research the following methods have been employed: interviews, polls and questionnaires. The obtained results have been statistically processed using chi square test.

Results: Analysis of data obtained in the course of poll that was conducted among 176 undergraduates has yielded results concerning the rate of utilization of contraceptives, factors contributing to the use of contraception as well as negative attitudes the undergraduates hold towards contraception. The research has shown that the rate of utilization of contraception among the respondents amounts to 66,1%, 30,4% of whom said they always used contraception, 35,7% answered they sometimes used it, and 33,9% responded they never made use of contraception. The contraceptive cited as the most frequently used is the condom (43%), followed by the coitus interruptus (28%), counting fertile and infertile days (14%), oral contraceptive pills (8%), spiral (3%), and Postinor emergency contraceptive pills ("morning-after pills") (4%).

With statistically significant difference ($p < 0,05$), it has been proved that the rate of utilization of contraception increases with the age of respondents, the level of education of females, as well as with the level of education of their male partners. The research has also confirmed the existence of statistical significance ($p < 0,05$) in regard to regular medical check-ups in gynaecology clinic sought by those undergraduates who visit gynaecologist. The percentage of utilization of contraception has been shown to be much greater among the undergraduates who regularly visit gynaecologist than among those ones who seek gynaecologist's help irregularly.

Conclusion: The studied undergraduates have displayed no greater misconceptions regarding contraception, but they have displayed misconceptions coupled with fear of contraceptive pills (obesity, infertility, tumours, thrombosis).

Key words: contraception, the extent of health consciousness, university students.

MOLARNE TRUDNOĆE NA SEVERNOM KOSOVU I SRPSKIM ENKLAVAMA I UTICAJ NATO BOMBARDOVANJA

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Uvod: Hidatiformne mole (parcijalne i totalne) predstavljaju najčešće vidove gestacijskih trofoblastnih bolesti (GTB). Osnovna karakteristika svih gestacijskih trofoblastnih bolesti je gubitak kontrole proliferacije trofoblastnih ćelija placente, koja se odlikuje specifičnim patološkim karakteristikama, morfološki ispoljene imitacijom fiziološkog rasta trofoblasta rane faze placentacije. U zadnje vreme se sve više govori o ulozi imunoreakcije kao i o uticaju spoljašnjih faktora, među kojima je jedan od najznačajnijih, uticaj zračenja.

Cilj: Utvrđivanje učestalosti poremećaja u razvoju trudnoće (posebno molarnih trudnoća) kod žena na Severnom Kosovu nakon bombardovanja osiromašenim uranijumom i komparacija ovih podataka sa podacima iz domaće i strane literature.

Materijal i Metode: Retrospektivna studija je izvršena u periodu od 1. januara 2011.g. do 31. decembra 2011.g. Podaci su prikupljeni iz protokola Ginekološko akušerskog odeljenja u Kosovskoj Mitrovici.

Rezultati: U periodu 1990-1999.g. na Severnom Kosovu bilo je ukupno 25.933 porođaja. U istom periodu je bilo ukupno 18 molarnih trudnoća (0,07%). U periodu 2000-2010.g. na Severnom Kosovu bilo ukupno 6.335 porođaja. U istom periodu je bilo ukupno 42 molarne trudnoće (0,66%). Zabeležen je desetrostruki porast učestalosti molarnih trudnoća u periodu posle bombardovanja. Svi ovi navedeni podaci pokazuju znatno veću učestalost molarnih trudnoća u odnosu na podatke iz domaće i strane literature (1 mola na 1500 do 2000 novorođenčadi ili oko 0.0005%).

Zaključci: Na osnovu podataka naše retrospektivne studije možemo zaključiti da je povećana učestalost molarnih trudnoća kod žena na Severnom Kosovu nakon Nato bombardovanja.

Ključne reči: Molarne trudnoće, osiromašeni uranijum, trofoblastne ćelije placente.

ANOMALIJE RAZVOJA UTERUSA OTKRIVENE HSG-OM U KOSOVSKO MITROVAČKOJ BOLNICI U PERIODU 2005-2010

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Uvod: Abnormalnosti razvoja uterusa često nisu udružene sa abnormalnostima razvoja ovarijuma, zbog toga što se razvijaju iz različitih kličinih listova. Kategorizacija malformacija uterusa izvršena od strane Butrama i Gibbonsa 1979.g. deli sve malformacije u pet kategorija: 1) Parcijalna hipoplazija ili aplazija; 2) jednorogi uterusa sa različitim varijacijama rudimentiranog roga; 3) uterus didelfus; 4) različiti stepeni uterusa bikornisa i 5) različiti stepeni uterusa septusa.

Cilj: Osnovni cilj rada je bio da analizirajući slučajeve primarnog i sekundarnog steriliteta lečenih na Ginekološko-akušerskom odeljenju u Kosovskoj Mitrovici Pristini u periodu od 1.1.2005. do 31.05.2010.g. utvrdimo učestalost javljanja razvojnih anomalija uterusa.

Materijal i metode rada: Po prijemu bolesnica pored anamneze i ginekološkog pregleda svakoj je uradjena histerosalpingografija, ultrazvuk a u određenom broju slučajeva je radjena i dopunska laparoskopija, kao i ostale laboratorijske analize.

Rezultati: U periodu 2005-2010.g. ukupno lečeno 581 žena od primarnog ili sekundarnog steriliteta, a HSG je uradjen kod 537 žena ili kod 92,5% ispitivanih žena.

U posmatranom petogodišnjem period, HSG-om je otkriveno 18 razvojnih anomalija, što predstavlja 3,35% od svih HSG-a uradjenih u tom periodu.

Zaključak: Imajući u vidu osnovni cilj našeg istraživanja, možemo zaključiti da su naši dobijeni rezultati potpuno u skladu sa rezultatima ostalih autora.

Ključne reči: HSG, razvoj uterusa, kongenitalne anomalije, primarni i sekundarni sterilitet.

MOLAR PREGNANCY IN NORTHERN KOSOVO AND SERBIAN ENCLAVES AND INFLUENZE OF NATO BOMBING

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Introduction: Hydatidiform mole (partial and total) are the most common forms of gestational trofoblastnih disease (GTD). The main characteristic of all gestational trofoblastnih disease is loss of control of proliferation of trofoblastnih cells of the placenta, which are characterized by specific pathological features, morphologically manifested imitation of normal trofoblast growth in the early stages of placentation. Lately, more and more about the role of the immune reaction as well as the impact of external factors, among which is one of the most important, the impact of radiation.

Objective: Determine the frequency of developmental disorders of pregnancy (especially molar pregnancies) among women in northern Kosovo after the bombing with depleted uranium, and compare these data with data from local and foreign literature.

Material and Methods: A retrospective study was performed between 1 January 2011.g. to 31 December 2011.g. Data were collected from the Gynecology and Obstetric Department of the protocol in Kosovska Mitrovica.

Results: During 1990, 1999. in northern Kosovo, there were 25 933 births. In the same period, there were a total of 18 molar pregnancies (0.07%). In the period 2000-2010.g. in northern Kosovo were a total of 6335 births. In the same period, there were a total of 42 molar pregnancies (0.66%). There was desetrostruki increase in the incidence of molar pregnancies in the period after the bombing. All the above data show a significantly higher incidence of molar pregnancy in relation to data from national and international literature (1 mole in 1500 and 2000 newborns, or about 0.0005%).

Conclusions: Based on the data of our retrospective study we conclude that the increased incidence of molar pregnancies among women in northern Kosovo after the Nato bombing.

Key words: Molar pregnancy, depleted uranium, placental trofoblast cells.

ANOMALIES OF UTERINE HSG-OM DISCOVERED IN KOSOVSKA MITROVICA HOSPITAL IN THE PERIOD 2005-2010

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Introduction: The development of uterine abnormalities are often associated with abnormalities of ovarian development, because it developed from different germinal leaves. Categorization of malformations of the uterus was carried out by Gibbons and Butra 1979 shares all malformations in five categories: 1) partial hypoplasia or aplasia, 2) a unicorn uterus with different variations rudiment corns, 3) didelfus uterus, 4) different degrees of uterine bicornisa and 5) different degrees of uterine septus.

The Aim: The main objective of this study was to analyzing cases of primary and secondary infertility treated at the Gynecology and Obstetrics Department of Kosovska Mitrovica during the period from 1.1.2005. to 31.05.2010.g. determine the incidence of developmental anomalies of the uterus.

Material and methods: Upon receipt of the patient by medical history and gynecological examination was done every hysterosalpingography, ultrasound and in a number of cases was performed and additional laparoscopy, as well as other laboratory tests.

Results: In the period 2005-2010.g. total of 581 women were treated by primary or secondary infertility, and HSG was performed in 537 women or 92.5% of examined women. The observed five-year period, HSG-18 was discovered with developmental anomalies, which represents 3.35% of all HSG-a made at this time.

Conclusion: Given the primary goal of our research, we can conclude that our results obtained in full accordance with results of other authors.

Keywords: HSG, razvoj uterusa, kongenitalne anomalije, primarni i sekundarni sterilitet.

UČESTALOST CARSKOG REZA NA MATERIJALU AKUŠERSKOG ODELJENJA Z.C. KOSOVSKA MITROVICA
U PERIODU OD 2000.-2009.GODINE

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Uvod: Carski rez je akušerska operacija kojom se kroz rezove na trbušnom zidu i donjem materičnom segmentu vrši ekstrakcija ploda u odmaklom stadijumu trudnoće i završava porođaj abdominalnim putem.

Cilj: Cilj ovog rada je da se uporedi učestalost porođaja završenih carskim rezom u odnosu na normalne porođaje, izvršenih na akušerskom odeljenju Z.C. Kosovska Mitrovica, u periodu od 2000.-2009.godine.

Materijal i metode: Materijal korišćen u radu predstavlja populaciju od 20. 161 žena, koje su porođene u Kosovsko Mitrovačkom porodilištu u periodu od 2000.-2009. Kao metod koristi se carski rez, kao način kojom se vrši ekstrakcija ploda i završava porođaj.

Rezultati: Praćenjem učestalosti carskog reza u odnosu na normalan porođaj tokom godina, uočeno je povećanje učestalosti carskog reza (2009.-2009.-70%) uočeno je povećanje zastupljenosti trudnica iz srpskih enklava na Kosovu i Metohiji u Kosovsko Mitrovačkom porodilištu (2009.-32,10%), tako da u poslednje dve godine, svaka druga operisana trudnica je bila iz srpskih enklava, ali je uočeno i da su među pacijentkinjama koje su operisane, najzastupljenije su bile učenice i studentkinje (32,85%). Praćenjem vrednosti Apgar skora uočeno je da su indikacije za carski rez bile na vreme postavljene i blagovremeno urađene (Apgar skor od 7-10, 47.50%).

Zaključak: Možemo zaključiti da je u desetogodišnjem periodu, povećanje procenta carskih rezova, uzrokovano lošim socijalno-ekonomskim uslovima, lošom ishranom, većim brojem maloletnih trudnica, kao i mnogih drugih sudelujućih faktora.

Ključne reči: carski rez, Apgar skor

INCIDENCE OF CESAREAN SECTION ON THE MATERIAL OF OBSTETRICS DEPARTMENT H.C. KOSOVSKA MITROVICA
FOR THE PERIOD OF 2000.-2009. YEAR

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Introduction: Cesarean section is obstetrical surgery by which through the cut on abdominal wall and lower uterine segment is possible to extract the fruit in advanced stages of pregnancy and childbirth finishes by abdominal way.

The Aim: The aim of this study was to compare the incidence of cesarean section deliveries completed compared to normal births, performed at the Obstetrics Department of the H.C. Kosovska Mitrovica, in the period from 2000.-2009.year.

Materials and Methods: The material used in the present study is a population of 20 161 women who delivered their babies in Kosovo's Mitrovica hospital during the period from 2000-2009. As the method uses a C-section, as a way of which performs extraction of the fetus and ends with birth.

Results: By monitoring the frequency of cesarean section compared to normal birth over the years, the observed increase in the incidence of cesarean section, (2008.-2009.-70%) it was observed an increase in the representation of a pregnant woman from the Serbian enclaves in Kosovo and Metohija in the Kosovo Mitrovica hospital, (2009.-32,10%) so that in the last two years, every other pregnant woman that was operated was from the Serbian enclaves, but it was noted that among the patients who were operated, were most prevalent female pupils and female students (32,85%). By monitoring the value of Apgar scores was observed that the indications for cesarean section were placed in time and made a timely manner (Apgar skor od 7-10, 47.50%).

Conclusion: We conclude that in the ten-year period, increasing the percentage of cesarean sections, due to the poor socio-economic conditions, poor nutrition, a number of underage pregnant women, and many other factors.

Keywords: cesarean section, Apgar score.

DIJAGNOSTIKA I TERAPIJA HIDROSALPIKSA LAPAROSKOPIJOM U OKVIRU PRIPREME
ZA POSTUPKE VTO

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Uvod: Oboljenje jajovoda jedan je od najčešćih uzroka steriliteta i predstavlja oštećenje ili obstrukciju jajovoda.. Najčešće su promene distalnog dela jajovoda. Postoje različiti kriterijumi za skorovanje distalnog dela jajovoda, ali se najčešće primenjuje klasifikacija ADRM, koja se bazira na skorovanju u toku laparoskopije.

Cilj rada: Cilj rada je da se u pacijentkinja lečenih od neplodnosti u braku zbog tubarnog činioca, a u toku pripreme za postupke vantelesnog oplođenja sa urađenom laparoskopijom utvrdi zastupljenost i stepen hidrosalpinga kao i vrsta operativne terapije.

Materijal i metode: U periodu od dve godine na GAK-u u 75 pacijentkinja je urađena videolaparoskopija u cilju potvrde prethodno postavljene dijagnoze hidrosalpinga. Operativna terapija je primenjena u zavisnosti od stepena izraženosti hidrosalpinga. Odstranjeni jajovodi histopatološki su analizirani u Institutu za patologiju KC Niš.

Rezultati: U najmanje izraženom stepenu hidrosalpinga koji je u toku laparoskopije dijagnostikovano u 32 jajovoda, odstranjeno je 9 jajovoda, a rekonstruktivna operacija je urađena u njih 21. U 46 jajovoda sa najizraženijim promenama (hidrosalpinga III stepena) operacijom je odstranjen 41 jajovod, 5 njih je okludirano u istmičnom delu, a nijedna rekonstruktivna operacija nije urađena (statistički značajna veza na nivou $p < 0,001$ između stepena hidrosalpinga i vrste operacije). Histopatološka analiza odstranjenih jajovoda pokazuje hroničnu upalu u 84,27 %.

Zaključak: Neophodno je koristiti jasne i iste kriterijume u dijagnostikovanju i napraviti pravilan odabir pacijenata.

Ključne reči: hidrosalpinga, laparoskopija, VTO

DIAGNOSIS AND TREATMENT OF HYDROSALPINX WITH LAPAROSCOPY AS PART
OF PREPARATION FOR IVF

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Introduction: Fallopian tube disorders are one of the most common causes of infertility and represent damage or obstruction of the tubes. Different criteria are used for the assessment of the tubal distality, but the most common is the classification by the ASRM.

The aim: The aim is to establish how often and to which degree hydrosalpinx occurs and what type of operative treatment is prescribed to patients treated for marital infertility due to a tubal cause during preparations for IVF.

Materials and methods: During a period of 2 years, 75 patients underwent videolaparoscopy for the purpose of confirming the diagnosis of hydrosalpinga at the GOC. Operative treatment was used depending on the level of hydrosalpinx. Removed tubes were sent for histopathological examination to the Institute for Pathology.

Results: Of the 32 Fallopian tubes with low level hydrosalpinx, 9 were removed via salpingectomy, and the 22 underwent reconstructive surgery. Of the 46 Fallopian tubes with most prominent pathological changes, 41 were removed, 5 had no occlusions, and no tuboplasty was performed (statistically relevant ratio of $p < 0.001$ between the level of hydrosalpinx and surgery type). Histopathological examination of the removed tubes showed a chronic inflammation in 84.27 % cases.

Conclusion: It is necessary to use clearly established criteria in diagnosis and to choose patients who will have most benefit.

Key words: Hydrosalpinx, laparoscopy, IVF

REZULTATI LEČENJA NEPLODNOSTI U BRAKU VANTELESNIM OPOLOĐENJEM U PACIJENTKINJA SA POLICISTIČNIM OVARIJALNIM SINDROMOM

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Uvod: Policistični ovarijalni sindrom (PCOS) je kompleksni multidimenzionalni poremećaj reprodukcije i metabolizma. Vantelesno oplođenje (VTO) predstavlja efektivnu terapiju u pacijentkinja kod kojih nije postignut uspeh standardnim terapijskim procedurama ili kod kojih postoje koezistirajući uzroci infertiliteta.

Cilj rada: Istraživanje je imalo za cilj da u pacijentkinja sa PCOS lečenih metodom VTO utvrdi stopu trudnoće i stopu porođaja.

Materijal i metode: U periodu od 1.1.2010. do 15.9.2011. na Odeljenju za sterilitet Klinike za ginekologiju i akušerstvo, urađeno je u 87 pacijentkinja sa PCOS postupak VTO.

Rezultati: Prosečne godine života u ispitivanih pacijentkinja su 33.05 ± 3.93 . Većina pacijentkinja (75.9%) je lečeno zbog primarnog uzroka neplodnosti. U 18 partnera lečenih pacijentkinja (20.7%), postojao je muški faktor neplodnosti. Prosečne vrednosti anti-Mullerovog hormona (AMH) su 5.23 ± 3.56 , a broj dobijenih jajnih ćelija 14.67 ± 8.75 . Dobijena je jaka pozitivna korelacija ($r=0.45, p<0.001$) između AMH i broja jajnih ćelija za 2010. godinu, jer je samo za ovu godinu bilo moguće kompletirati podatke o trudnoćama koje su završene porođajem. Od 43 lečenih pacijentkinja, u 38 je urađen embriotransfer (ET), trudnoća je postignuta kod 17 (44.74% u odnosu na ET, 39.53% u odnosu na započeti ciklus). Porodilo se 14 pacijentkinja, što predstavlja stopu porođaja od 36.84% u odnosu na ET i 32.56% u odnosu na započeti ciklus.

Zaključak: Lečenje pacijentkinja sa PCOS metodima VTO pokazuje visoku stopu trudnoće i porođaja. Adekvatan odabir pacijentkinja, individualni pristup, pravilno doziranje induktora ovulacije, smanjivanje rizika od komplikacija, opravdavaju primenu ove metode u lečenju PCOS i rezultiraju rođenjem donesenog novorođenčeta.

Ključne reči: Policistični ovarijalni sindrom, vantelesno oplođenje

RESULTS OF TREATMENT MARRIAGE INFERTILITY USING IN VITRO FERTILIZATION IN PATIENTS WITH POLYCYSTIC OVARY SYNDROME

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Introduction: Polycystic ovary syndrome (PCOS) is multidimensional disorder of metabolism and reproduction. In vitro fertilization (IVF) is an effective therapy in patients who haven't achieved the success of standard therapies or who have coexisting causes of infertility.

The Aim: Determine pregnancy rate and birth rate in women with PCOS who were treated using IVF.

Materials and Methods: In the period from 1.1.2010. up to 15.9.2011. in the Department of Infertility Clinic of Gynecology and Obstetrics, was performed IVF in 87 patients with PCOS.

Results: The average age of the studied patients were 33.05 ± 3.93 . Most of them (75.9%) were treated for primary cause of infertility. 18 partners of treated patients (20.7%) had male factor of infertility. Average values of anti-Mullerian hormone (AMH) were 5.23 ± 3.56 and number of oocytes obtained 14.67 ± 8.75 . Analysis extracted strong positive correlation ($r=0.45, p<0.001$) between AMH and number of oocytes in 2010, because only for this year was possible to complete data of pregnancies that ended with childbirth. From 43 treated patients, embryo transfer (ET) was performed in 38, pregnancy was achieved in 17 (44.74% compared to ET, 39.59% compared to started cycle). 14 patients gave birth (rate of delivery 36.48% compared to ET, 32.56% compared to started cycle).

Conclusion: Treatment of patients with PCOS using IVF shows high rate of pregnancy and childbirth. Adequate selection of patients, individual approach, appropriate dosage of ovulation induction, reducing the risk of complications, justifies application of this method in treatment PCOS and results with childbirth.

Key words: Polycystic ovary syndrome, in vitro fertilization

ZNAČAJ NK ĆELIJA DECIDUE U PONAVLJANIM SPONTANIM POBAČAJIMA

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Uvod: Ponavljani ili habitualni pobačaji (PSP) se definišu kao tri ili više uzastopnih gubitaka trudnoće. Uzroci su multifaktorijski, u 50% nepoznate etiologije. Smatra se da najveći broj PSP uzrokuje neadekvatni aloimuni odgovor majke na trudnoću. NK ćelije su u fokusu istraživanja mnogih studija koje se bave proučavanjem patofiziologije PSP nepoznate etiologije.

Cilj rada: Da se imunohistohehmijskim metodom u decidui kod ponavljanih spontananih pobačaja nepoznate etiologije utvrdi broj i subpopulaciona distribucija decidualnih NK ćelija.

Materijali i metod rada: Ispitivanje, sprovedeno u Klinici za ginekologiju i akušerstvo KC u Nišu, obuhvatilo je 30 žena sa dva spontana pobačaja uzastopno u prvom trimestru trudnoće a kiretman kod trećeg spontanog abortusa je histopatološki i imunohistohehmijski analiziran na parafinskim preparatima. Kontrolnu grupu činilo 20 žena bez opterećene reproduktivne anamneze, prekid trudnoće urađen iz socijalnih razloga. Podaci su statistički obrađeni.

Rezultati: Ukupan broj NK ćelija je značajno veći u tkivu decidue ispitivane grupe u odnosu na kontrolnu ($p<0,01$). Broj NK CD56 ćelija nije se značajno razlikovao u ispitivanim grupama. U tkivu decidue broj NK CD57 ćelija je značajno veći kod spontananih prekida trudnoće (95.3 ± 26.1) u odnosu na arteficialne (15.2 ± 2.6). U decidui kod spontananih prekida trudnoće prevladavaju CD56 dim, kod arteficialnih CD56 bright ćelije.

Zaključak: Broj i fenotipska struktura NK ćelija značajno se razlikuje u decidui normalnih trudnoća i kod PSP. U decidui kod PSP se značajno više javljaju NK ćelije fenotipa periferne cirkulacije CD57 i CD56 dim a u kontrolnoj grupi dominiraju uteruse NK ćelije subpopulacije CD56 bright.

Ključne reči: ponavljani spontani pobačaji, NK ćelije decidue.

SIGNIFICANCE OF DECIDUAL NK CELLS IN REPEATED SPONTANEOUS MISCARRIAGES

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Introduction: Repeated or habitual miscarriage (RSM) is defined as three or more repeated pregnancy losses. Causes are multifactorial, in 50% unknown etiology. It's considered that most RSM are consequence of inadequate alloimmune response of mother on pregnancy. NK cells are in focus of many research studies involved in understanding pathophysiology of unknown etiology RSM.

Objective: To determine number and subpopulation distribution of decidual NK cells in unknown etiology repeated spontaneous miscarriages using immunohistochemical method.

Materials: Research, conducted in Clinic for obstetrics and gynecology of Clinical center Nis, included 30 women with two spontaneous miscarriages repeatedly in first trimester of pregnancy, and curettage specimens in third abortion were histopathologically and immunohistochemically analyzed on paraffin products. Control group consisted of 20 women unburdened by reproduction anamnesis, abortion done for social reasons. Data were statistically processed.

Results: Total NK cell number is significantly higher in decidual tissue of examined group in relation to the control ($p<0,01$). NK CD56 cell number wasn't significantly different in both groups. In decidual tissue there was significantly higher number of NK CD57 cells in spontaneous miscarriages (95.3 ± 26.1) in relation to artificials (15.2 ± 2.6). In spontaneous miscarriages CD56 dim cells prevail in decidua and CD56 bright in artificials.

Conclusion: NK cell number and fenotype structure is significantly different in decidua of normal pregnancies and RSM. In decidua of RSM there are significantly more NK cells of CD57 periferal circulation fenotype and CD56 dim, while in control group CD56 bright NK cells prevail.

Key words: repeated spontaneous miscarriages, decidual NK cells.

INFEKCIJE URINARNOG TRAKTA U GRAVIDITETU I PERINATALNI ISHOD

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Uvod: Urinarna infekcija utiče na loš perinatalni ishod. Nelečena urinarna infekcija može da dovede do promena čak u smislu preeklampsije, eklampsije, horioamionitisa i endometritisa.

Cilj rada: Cilj rada bio je da se retrospektivnom studijom utvrdi povezanost između urinarnih infekcija u trećem trimestru i prevremeih porođaja.

Materijal i metode: Od januara 2010 do novembra 2011 bilo je 6142 trudnica koje su bile praćene kako na odeljenju patologije trudnoće GAK Niš ili kroz dnevnu bolnicu iste ustanove. One su bile prgledane vaginalnim pregledima, a istovremeno su praćeni parametri eventualnih promena u vaginalnom i cervikalnom brisu kao i urinarne infekcije.

Rezultati rada: S obzirom da se vaginalna infekcija smatra faktorom koji može da utiče na ishod trudnoće u smislu prevremenog porođaja samo ako je cerviks kratak pre 28-e nedelje ili ako je cervikalni kanal kratak pre 37-e nedelje, bilo je interesantno videti kakav je uticaj urinarnih infekcija na perinatalni ishod i eventualni prevremeni porođaj. Pacijentkinje sa infekcijom urinarnog trakta bile su više pogođene lošijim perinatalnim ishodom nego grupa žena koje nisu imale urinarnu infekciju.

Zaključak: Utvrđeno je da ne samo uticu na prevremeni porođaj nego i na rađanje dece sa malom telesnom porođajnom masom, što bi značilo da dobar dijagnostički skrining igra veliku ulogu u registrovanju ovih pacijenata pa samim tim i njihov adekvatan tretman.

KLjučne reči: Infekcije urinarnog trakta, prevremeni porođaj, perinatalni ishod.

URINARY TRACT INFECTIONS IN PREGNANCY AND PERINATAL OUTCOME

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Introduction: Urinary infections affect a poor perinatal outcome. Untreated urinary infection can lead to changes even in terms of pre-eclampsia, eclampsia, chorioamnionitis and endometritis.

Aim of the paper: The aim of the paper was to retrospectively determine the connection between urinary tract infections in the third trimester of pregnancy and premature birth.

Material and methods: From January 2010 to November 2011 there were 6142 pregnant women who were monitored at the pregnancy pathology department "GAK Niš" as well as through the outpatient hospital department of the same institution. They were vaginally examined, and at the same time the parameters of possible changes in the vaginal and cervical swabs were monitored, as well as urinary infections.

Results: With regard to the fact that a vaginal infection is considered a factor which can influence the outcome of pregnancy in terms of preterm delivery only if the cervix is short before the 28th week or 37-th week, it was interesting to see what is the effect of urinary tract infections on the perinatal outcome and a possible premature birth. Patients with urinary tract infections were more affected by poor perinatal outcome than the group of women who had urinary tract infection.

Conclusion: It was found that not only do the UTI affect preterm delivery, but they also cause birth of children with low body weight, which would mean that a good diagnostic screening plays an important role in registering these patients and consequently their proper treatment.

Keywords: Urinary tract infections (UTI), preterm delivery, perinatal outcome.

KOLPOSKOPIJA I CITOLOGIJA U RANOJ DETEKCIJI PREMALIGNIH PROMENA NA GRLIČU MATERICE

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Uvod: Nastanak karcinoma grlića materice prethodera različite forme premalignih lezija koje obuhvataju niz progresivnih morfoloških promena, od najblažih hiperplazija do karcinoma in situ. Papanicolaou pregleda kao pojedinačnih metoda u otkriva kolposkopski pregleds standardne procedure koje se koriste za otkrivanje premalignih stanja.

Cilj rada: je bio da utvrdimo pouzdanost kolposkopije i Papanicolaou pregleda kao pojedinačnih metoda u otkriva njupremalignitetanagrliču materice; da ispitamo njihovu pouzdanost kada se koriste zajedno u dijagnostici, ali i utvrđivanjelažno-pozitivnih i lažno-negativnih rezultata navedenih pregleda prekonaknadne histopatološke analize.

Materijal i metode: Ispitano je ukupno 130 bolesnica (30 njih je činilo kontrolnu grupu). Kolposkopski pregled je vršen standardnim načinom uz potrebom 3% sirćetne kiseline i Lugolovog rastvora. Brisevi vaginalne porocije grlića cervikalnog kanala kao materijal za Papanicolaou pregled uziman je pre kolposkopskog pregleda. Materijal za histopatološku analizu uziman je ciljanom biopsijom, nakon Šilerove jedne probe.

Rezultati: Bilo je 45% benignih citoloških nalaza, 37% patoloških, a suspektih 18%. 96% bolesnica imalo je patološki kolposkopski nalaz, a najzastupljeniji sublimozaik i punktacija. Histopatološka analiza uzoraka 61 bolesnica je imala CIN promene, a od njih su 43 imale i patološki citološki nalaz, dok je kolposkopski otkriven patološki nalaz u njih 59. CIN nalaz je bio prisutan u 51 bolesnice koje su imale patološki kolposkopski i citološki nalaz.

Zaključak: Specifičnost kolposkopije u otkrivanju premalignih lezija je 96% i veća je od specifičnosti citologije. Procenat lažno pozitivnih rezultata u kolposkopiji je znatno veći nego u citologiji, a lažno negativni znatno manji.

KLjučne reči: kolposkopija, citologija, CIN (cervikalna intraepitelna neoplazija)

COLPOSCOPY AND CITOLGY IN EARLY DETECTION OF PREMALIGNANT CERVICAL LESIONS

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Introduction: Cervical cancer is preceded by various forms of premalignant lesions. Papanicolaou cervical smear method and colposcopic examination are standard procedures used for detection of premalignant conditions.

The aim: was to determine the reliability of colposcopy and Papanicolaou examination as a single method in detection of cervical changes; to examine their reliability when used together in diagnostics, and to identify false-positive and false-negative results of this examination over the subsequent histopathological analysis.

Material and methods: 130 patients (30 patients consisted control group) were evaluated. Colposcopic examination was performed in standard way using a 3% acetic acid and the Lugol solution. Swabs of vaginal cervical portion and cervical canal for Papanicolaou examination was taken before colposcopic examination. Material for histopathological analysis was taken with targeted biopsy after Schiller iodine test.

Results: There was 45% of benign cytologic findings, 37% pathological, while suspected was in 18%. 96% had abnormal colposcopic findings. 61 patients had CIN changes, and of these, 43 had abnormal cytologic findings; colposcopy abnormal findings had 59 patients. CIN was present in 51 patients who had abnormal colposcopic and cytologic findings.

Conclusion: The specificity of colposcopy in detection of premalignant lesions is 96%, and it is greater than the specificity of the cytology. The percentage of false positive results in the colposcopy is significantly higher than in the cytology, while a false negative is much smaller.

Keywords: colposcopy, cytology, CIN

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Uvod: Svako delimično ili potpuno odlubljanje, odnosno separacija normalno usađene posteljice pre trećeg porođajnog doba je prevremeno odlubljanje (abruptio praecox placentae insertio normalitas).

Cilj rada: Utvrditi incidencu abrupcije placente u Ginekološko-akušerskoj klinici Kliničkog centra u Nišu.

Materijal i metode: Istraživanje je sprovedeno u Ginekološko-akušerskoj klinici Kliničkog centra u Nišu retrogradnom analizom kliničkog materijala u periodu od 2007. do 2011. godine

Rezultati: U Ginekološko-akušerskoj klinici u Nišu u petogodišnjem periodu obavljeno je 15828 porođaja, od čega je do abrupcije placente došlo u 60 porođaja. U 80% trudnica sa abrupcijom placente porođaj je dovršen carskim rezom a u 20% slučajeva vaginalnim porođajem. Od ukupnog broja pretermijskih porođaja komplikovanih abrupcijom placente 84,84% je dovršeno carskim rezom a 15,15% vaginalnim putem. Od 27 terminskih porođaja 74,07% je dovršeno carskim rezom a 25,03% vaginalnim putem.

Zaključak: Abrupcija placente je veoma ozbiljan i težak obstetrički problem uzevši u obzir visok mortalitet i morbiditet novorođenčeta i majke.

Gljučne reči: abrupcija placente, carski rez, porođaj

PLACENTA ABRUPTION-A METHOD OF CHILDBIRTH COMPLETION AND PERINATAL OUTCOME

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Introduction: Any partial or complete separation of normally inserted placenta before the third stage of labor was premature abruption (abruptio placentae praecox insertio normalitas).

The Aim: To evaluate the incidence of placental abruption in Gynecology and Obstetrics, Clinical Center Nis.

Material and Methods: Retrospective analysis, conducted at the Clinic of Gynecology and Obstetrics, Clinical Center Niš, included the interval from 2007. to 2011.

Results: At the Clinic of Gynecology and Obstetrics, Clinical Center Niš during five years was carried out 15 828 births. The number of labors complicated by placenta abruption was 60. In 80% of pregnant women, with verified placenta abruption, delivery was completed with Caesarean section, and 20% by vaginal labor. Of the total number of preterm births complicated with placenta abruption 84.84% was finished with Caesarean section and 15.15% with vaginal labor. Of the 27 term delivery 74.07% was completed with Caesarean section and 25.03% vaginal labor.

Conclusion: Placenta abruption is a serious and difficult obstetric accident which endangers life and health of both mother and newborn.

Key words: placenta abruption, Cesarean section, childbirth

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Uvod: Ca grlića predstavlja najčešći tip malignih tumora genitalnih organa žene, na prelazu pločasto-slojevitog epitela u cilindrični. Sporo raste i prolazi kroz faze u kojima se može lako otkriti i izlečiti, kasnije je lečenje i preživljavanje teže.

Cilj rada: Cilj rada je utvrđivanje i praćenje osnovnih epidemioloških karakteristika karcinoma grlića materice kod žena u Srbiji, Evropi i u Svetu u periodu od 1999. do 2011.

Materijal i metode: Na osnovu statističkih i epidemioloških podataka hospitalnog registra za rak na Klinici za onkologiju KC / Niš, podacima iz Batutovog instituta, i primenom deskriptivne metode obrađeni su podaci iz registra obolelih i umrlih žena. Podaci na području Srbije su komparirani sa podacima na teritoriji Evrope i Sveta o 1999-2011. Kompariran je Ca grlića u odnosu na druge tipove karcinoma drugih lokalizacija. Stope obolevanja i umiranja su urađene na 100.000 stanovnika.

Rezultati rada: Karcinom grlića drugi je po učestalosti u Svetu, pola miliona novih slučajeva svake godine čini 12% svih slučajeva raka u žena. Na Klinici za onkologiju KC Niš zapaža se da je rak grlića drugi po zastupljenosti svih tumora žena.

Zaključak: Karcinom grlića materice u Svetu i Srbiji, predstavlja jedan od najvećih zdravstvenih problema današnjice. Tome se dodaje, gotovo u potpunosti asimptomatska klinička slika u ranim stadijumima, i neinformisanost i neredovnost ginekoloških pregleda žena o čemu treba najviše voditi računa.

Gljučne reči: rak, grlić, pregled, lečenje

CERVICAL CANCER

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Introduction: Cervical cancer is most common cancer type located at the womens genital tract, where stratified squamous epithelium exceeds in columnar. It has slow growth and passes through the stages where it can be discovered and threatened, as the time passes, survival rate is smaller.

The aim of study: The aim is to establish and monitoring of some epidemiological characteristics of cervical cancer in women in Serbia, Europe and the World (1999-2011).

Material and methods: Based on statistical and epidemiological data of hospital cancer registry at the Department of Oncology, Clinical Center Niš, and Institute Batut, using descriptive method, data from the register of deaths and suffering of women is processed. Data from Serbian territory are compared with Europe and World 1999-2011. Cervical cancer is compared with other types of cancer. Morbidity and mortality rates are per 100,000 population.

Results: Cervical cancer is 2. in the World and with half a million new cases each year is 12% of all cancers in women. At the Oncology Center Nis, cervical cancer is the second most frequent group of all tumors in women (2001-2011).

Conclusion: Cervical cancer in World, and Serbia, is one of the major health problems nowadays. There are almost completely asymptomatic clinical features in the early stages, lack of information, irregularity of gynecological examinations of women which should be taken into consideration.

Key words: cancer, cervix, examination, treatment

BAKTERIJSKA VAGINOZA U TRUDNOĆI

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Uvod: Bakterijska vaginoza je polimikrobna infekcija koja se karakteriše poremećajem normalne vaginalne flore, smanjene sekrecije H_2O_2 , Lactobacillus spp. i porastom broja gram-varijabilnih kokobacila (Gardnerella vaginalis), anaerobnih mikroorganizama i genitalnih mikoplazmi.

Cilj: Cilj rada je bio da se ispita da li prisustvo bakterijske vaginoze, određivanje pH vagine i CRP-a se mogu koristiti kao biomarkeri u predikciji prevremenih porodajaja.

Materijal i metode: Istraživanje je sprovedeno kao prospektivna studija, koja je obuhvatila 61 pacijentkinju gestacijske starosti 16 do 19 NG. Ispitivanu grupu je predstavljalo 20 trudnica porodjenih pre termina (34 - 36 NG), a kontrolnu grupu 41 trudnica gde je porodaj bio u terminu (37 - 42 NG).

Rezultati: Rezultati ukazuju da je 15/20 (75%) trudnica porodjenih pre termina imalo bakterijsku vaginozu, a 4/41 (9.7%) porodjenih u terminu (χ^2 test $p > 0.05$). Pozitivan CRP je utvrdjen kod 17/20 (85%) pacijentkinja sa prevremenim porodajajem a kod 11/41 (26.8%) trudnica sa terminskim porodajajem (χ^2 test $p > 0.05$). Kod 16/20 (80%) trudnica koje su se porodile pre termina pH vagine je bio $> 4,5$, dok je kod 6/41 (14.6%) pacijentkinja porodjenih u terminu (χ^2 test $p > 0.05$).

Zaključak: Rezultati našeg istraživanja ukazuju na statistički značajno veće prisustvo bakterijske vaginoze, pH vagine > 4.5 i pozitivne vrednosti CRP-a u ranom drugom trimestru u grupi pacijentkinja kod kojih je trudnoća završena pre termina u odnosu na trudnice kod kojih je porodaj nastupio u terminu.

Ključne reči: bakterijska vaginoza, pH vagine, CRP, prevremeni porodaj.

BACTERIAL VAGINOSIS IN PREGNANCY

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Introduction: Bacterial vaginosis is characterized by a disturbance of the normal vaginal flora, with a loss of H_2O_2 -producing Lactobacillus spp. and an increase in the number of gram-variable coccobacilli (Gardnerella vaginalis), anaerobic organisms and genital mycoplasmas.

Goal: The aim of this study was to examine whether the presence of bacterial vaginosis, determination vaginal pH and CRP can be used as biomarkers for the prediction of preterm delivery.

Materials and Methods: The study was conducted as a prospective study, included of 61 pregnant women at a gestational age ranging from 16 to 19 weeks of gestation (WG). The study group represented 20 pregnant women delivered preterm (34-36 WG), a control group of 41 pregnant women where the delivery was at term (37-42 WG).

Results: Results indicate that 15/20 (75%) pregnant women delivered preterm had bacterial vaginosis, but 4/41 (9.7%) women delivered at term (χ^2 test $p < 0.05$).

Positive CRP was determined in 17/20 (85%) patients with preterm delivery but in 11/41 (26.8%) women delivered at term (χ^2 test $p < 0.05$). At 16/20 (80%) pregnant women who had preterm delivered vaginal pH was > 4.5 , while in 6/41 (14.6%) patients who had delivery at term (χ^2 test $p < 0.05$).

Conclusion: Our findings indicate a significantly higher presence of bacterial vaginosis, vaginal pH > 4.5 and positive CRP values in the early second trimester in the group of patients in whom the pregnancy was completed preterm in relation to pregnant women in whom delivery in the term.

Key words: Bacterial vaginosis, vaginal pH, CRP, premature delivery.

STIMULACIJU U POSTUPKU VANTELESNE OPLODNJE PROCENA SLABOG ODGOVORA NA OVARIJALNU

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Uvod: Značajan broj pacijentkinja koje ulaze u postupak vantelesne oplodnje se suočava sa problemom slabog odgovora na stimulaciju ovulacije.

Cilj: Cilj rada je utvrđivanje prevalencije i stope trudnoće, kao i relevantnih faktora za prognozu ishoda vantelesne oplodnje kod pacijentkinja sa slabim odgovorom na ovarijalnu stimulaciju.

Materijal i metode: Ispitano je 1599 pacijentkinja, 446 sa slabim odgovorom na stimulaciju ovulacije. Utvrđene su njihove stope trudnoće, starosna distribucija, stope trudnoće u podgrupama pacijentkinja sa slabim odgovorom, formiranim u odnosu na njihovu starost, indeks telesne mase i nivo anti-Müllerian hormona. Izvršena je procena značajnosti parametara u prognozi pozitivnog ishoda i verovatnoća ostvarivanja trudnoće u odnosu na broj aspiriranih oocita.

Rezultati: Prevalenca pacijentkinja bez zadovoljavajućeg odgovora na stimulaciju ovulacije iznosi 27,89%, a njihova stopa trudnoće značajno je niža u odnosu na pacijentkinje sa normalnim odgovorom (21,71% vs. 41,34%). Stopa trudnoće pacijentkinja mlađih i starijih od 36 godina nije značajno različita (22% vs. 19,05%), ali kod mlađih i starijih od 40 godina jeste (22,05% vs. 0%). Gojazne i normalno uhranjene pacijentkinje nisu se značajno razlikovale u stopama trudnoće (17,31% vs. 22,55%), ali pacijentkinje sa AMH nižim i višim od 0,5 ng/ml jesu (5,26% vs. 26,38%). Verovatnoća koncepcije iznosila je 0,89% za pacijentkinje sa jednom, 9,44% za pacijentkinje sa dve i 12,24% sa tri jajne ćelije.

Zaključak: Pacijentkinje sa smanjenim odgovorom na ovarijalnu stimulaciju imaju lošije izgleda za trudnoću, pogotovo ukoliko su starije od 40 godina ili imaju ekstremno nizak nivo AMH. Poseban značaj za prognozu ishoda postupka vantelesne oplodnje ima stepen slabog odgovora.

Ključne reči: IVF, ovarijalna stimulacija, slab odgovor, stopa trudnoće.

EVALUATION OF POOR OVARIAN RESPONSE DURING IN VITRO FERTILIZATION

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Introduction: In IVF treatment a considerable proportion of women are faced with poor ovarian response—a low number of oocytes retrieved.

The Aim: The aim was to determine prevalence and pregnancy rate of poor responders, as well as relevant predictive factors for IVF outcome within this group of patients.

Materials and methods: The research included 1599 patients and 446 of them had poor ovarian response. Their pregnancy rate, age distribution, and predictive factors such as age, BMI and anti-Müllerian hormone were analysed, but also their pregnancy prospective depending on number of oocyte retrieved.

Results: Prevalence of poor responders was 27,89%, and they had significantly lower pregnancy rate than normal responders (21,71% vs. 41,34%). There is no significant difference in pregnancy rate between patients younger and older than 36 years (22% vs. 19,05%), but there clearly is between patients younger and older than 40 years (100% vs. 0%). Obese and patients with normal BMI also weren't significantly different in pregnancy rate (17,31% vs. 22,55%), but patients with AMH below and above 0,5 were (5,26% vs. 26,38%). Probability for conception within patients with one oocyte retrieved was 0,89%, with two oocytes 9,44% and 12,24% with three oocytes.

Conclusion: Poor responders have poor pregnancy prospect, especially if they are older than 40 years or they have extremely low AMH. Very important factor in their prognosis is number of oocytes retrieved. IVF, as last option for infertility treatment should not be delayed.

Key words: IVF, ovarian stimulation, poor response, pregnancy rate

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Uvod: Prema globalnoj skali, karcinom grlića materice je na drugom mestu u ženskoj populaciji obolelih od malignih neoplazija. Ciklooksigenaza (COX) ili prostaglandin H2 sintaza je prvi enzim koji katalizuje prva dva koraka u biosintezi prostaglandina iz arahidonske kiseline.

Cilj: Ispitati prisustvo i stepen ekspresije COX-2 u tkivu grlića materice ispitanica podeljenih u dve grupe: Kontrolna grupa i Grupa A (Karcinom grlića materice, FIGO st I-IIA). Uporediti stepen ekspresije COX-2 kod pacijentkinja sa dijagnostikovanim karcinomom grlića materice u odnosu na prognostičke patohistološke parametre.

Materijal i metode: Istraživanjem je obuhvaćen patohistološki materijal 76 pacijentkinja podeljenih u dve grupe: Kontrolna grupa, 30 pacijentkinja bez patohistoloških promena na grliću i Grupa A, 46 pacijentkinja sa verifikovanim karcinomom grlića materice, FIGO stadijum IB-IIA. Nakon patohistološke analize materijala isti je pripremljen za imunohistochemijsku obradu u cilju detekcije ekspresije COX-2. Potom je vršeno ispitivanje postojanja ekspresije, stepena ekspresije COX-2 i odnosa između dve ispitivane grupe.

Rezultati: U kontrolnoj grupi nije potvrđena ekspresija COX-2, a u grupi A kod 26 pacijentkinja (56,52%) uz statistički značajnu razliku između dve ispitivane grupe. Nije utvrđena statistički značajna razlika između prisustva i stepena ekspresije COX-2 poređenjem sa stadijumom bolesti unutar grupe A ($p>0,05$). Ekspresija COX-2 bila je izraženija u tkivu bez limfocitne stromalne infiltracije (80%). Utvrđeno je postojanje visoke statističke značajne razlike u odnosu na prisustvo limfocitne stromalne infiltracije ($p=0,003$) i stepena ekspresije COX-2.

Zaključak: Postojanje ekspresije COX-2 u grupi sa karcinomom grlića materice u odnosu na kontrolnu grupu ukazuje na mogući uticaj COX-2 u karcinogenezi raka grlića materice. Ekspresija COX-2 bila je izraženija u karcinomu grlića materice bez limfocitne stromalne infiltracije. Nalaz češće ekspresije COX-2 u podgrupi sa lošijim prognostičkim patohistološkim parametrima u grupi A upućuju na značaj aktivnosti ekspresije COX-2 u procesu karcinogeneze karcinoma grlić materice i uticaja na njegovu progresiju.

Ključne reči: grlić materice, cervikalni karcinom, ciklooksigenaza-2

EXPRESSION OF CYCLOOXYGENASE-2 IN CERVICAL CANCER

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Background: According to a global scale, cervical cancer remains on the second place in women with malignant neoplasms. Cyclooxygenase (COX) or prostaglandin H2 synthase is the first enzyme that catalyzes the first two steps in the biosynthesis of prostaglandins from arachidonic acid.

Objective: To investigate the presence and expression of COX-2 in cervical tissue of patients divided into two groups: the control group and group A (cervical cancer, FIGO stage I-IIA). Compare the expression level of COX-2 in patients with cervical cancer in relation to the prognostic histological parameters.

Material and methods: The study included histologically material of 76 patients were divided into two groups: control group-30 patients without patohistological changes in the cervix and group A-46 patients with verified carcinoma of the cervix, FIGO stage IB-IIA. After histopathological analysis, material was prepared for immunohistochemical processing to detect the expression of COX-2. We then focused on examining the existence of expression COX-2 and the relations between two groups.

Results: In control group was not confirmed expression of COX-2, while in group A in 26 patients (56.52%) with a statistically significant difference between the two groups. By examining the expression of COX-2 and histopathologic parameters showed a statistically significant difference in the presence of lymphocytic infiltration ($p = 0.0053$). The expression of COX-2 was more pronounced in the stromal tissue without lymphocytic infiltration (80%).

Conclusion: COX-2 expression in the group with cervical cancer compared to the control group points to the potential impact of COX-2 in carcinogenesis of cervical cancer. The expression of COX-2 was higher in cervical carcinoma without stromal lymphocytic infiltration. The finding of frequent expression COX-2 in the subgroup with poor prognostic histological parameters in group A indicate the importance of the COX-2 expression in the carcinogenesis of cervical cancer and its impact on progression.

Keywords: cervix, cervical cancer, cyclooxygenase-2

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Uvod: Etiologija prevremenih porođaja je veoma kompleksna. Postoji mišljenje da je ascendentna genitalna bakterijska infekcija značajan uzrok prevremenog porođaja.

Cilj: Utvrditi da li bakterijska infekcija grlića materice može biti jedan od ranih markera prevremenog porođaja.

Materijal i metode: Istraživanje je obuhvatilo 61 trudnicu u periodu od 16 do 19 nedelja gestacije (NG). Ispitivanu grupu su činile (N 20) trudnice porođene pre termina (u 34-36 NG) a kontrolnu grupu (N 41) trudnice porođene u terminu (37-42NG). Kod svih trudnica su sprovedena bakteriološka ispitivanja iz brisa cerviksa, specifičnim testovima.

Rezultati: Bakterijska cervikalna infekcija je statistički značajno češće prisutna u ispitivanoj grupi 9/20 (45%), u odnosu na kontrolnu grupu 3/41 (8%) (χ^2 test $p<0.05$). Ureaplasma izolovana cervikalnim brisom je statistički značajno češće prisutna kod 7/20 (35%) pacijentkinja porođenih pre termina u odnosu na trudnice porođene u terminu 1/41 (2, 4%), (χ^2 test $p<0.05$). Mycoplasma je statistički značajno češće prisutna u ispitivanoj grupi kod 6/20 (30%) u odnosu na kontrolnu grupu 1/41 (2, 4%) (χ^2 test $p<0.05$). Chlamydia Trachomatis je utvrđena statistički značajno češće 9/20 (45%) kod trudnica sa prevremenim porođajem u odnosu na porođene u terminu 2/41 (4, 8%) (χ^2 test $p<0.05$).

Zaključak: Rezultati istraživanja ukazuju da je bakterijska infekcija grlića materice, kao i infekcija uzrokovana Chlamydiom Trachomatis, Mycoplasmom i Ureaplasmom statistički značajano češće prisutna u ranom drugom trimestru kod pacijentkinja kod kojih je usledio pretermijski porođaj u odnosu na trudnice porođene u terminu.

Ključne reči: prevremeni porođaj, bakterijska infekcija cerviksa, Chlamydia Trachomatis, Mycoplasma i Ureaplasma.

LOCAL BACTERIAL INFECTION DURING PREGNANCY, POTENTIAL CAUSE OF PRETERM DELIVERY

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Introduction: The Etiology of preterm delivery is very complex. Last data indicate that ascending genital bacterial infection is important cause of preterm delivery.

The Aim: Goal of this prospective study was to investigate does cervical bacterial infection can be early marker of preterm delivery.

Materials and Methods: Study included 61 pregnant women between 16 and 19 week of pregnancy (WG). Study group consisted of (N 21) women delivered pre term (in 34-36 WG) and control group (N 41) women delivered in term (37-42 WG). In all pregnant women we conducted bacteriological tests of cervical smear with specific tests.

Results: Bacterial cervical infection was statistically significant more present in study group 9/20 (45%) than in control group 3/41 (8%) (χ^2 test $p<0.05$). Ureaplasma was statistically significant more present in 7/20 (35%) women delivered preterm in correlation to the women delivered in term 1/41 (2.4%), (χ^2 test $p<0.05$). Mycoplasma was statistically significant more present in 6/20 (30%) patients in correlation to the control group 1/41 (2,4%),

(χ^2 test $p<0.05$). Chlamydia Trachomatis was found statistically significant more present in 9/20 (45%) women delivered preterm in correlation to the women delivered in term 2/41(4,8%) (χ^2 test $p<0.05$).

Conclusion: Results of research indicate that cervical bacterial infection, infection caused by Chlamydia Trachomatis, Mycoplasma and Ureaplasma, are statistically significant more present in early second trimester in women delivered preterm in correlation to the women who delivered in term.

Keywords: preterm delivery, cervical bacterial infection, Chlamydia Trachomatis, Mycoplasma and Ureaplasma.



A line art illustration in the background. On the left, a dove is shown in flight, carrying an olive branch. In the center, there are stylized mountain peaks. On the right, a large, rounded tent or shelter is depicted. The entire illustration is rendered in a light gray color.

HIRURGIJA I URGENTNA MEDICINA

KORELACIJA SERUMSKIH VREDNOSTI KALCITONINA SA KLINIČKIM KARAKTERISTIKAMA MEDULARNOG KARCINOMA TIROIDNE ŽLEZDE

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Uvod: Medularni karcinom tiroidne žlezde je maligni tumor porekla parafolikularnih C ćelija. Tumor proizvodi brojne molekule od kojih je najvažniji kalcitonin. Serumski kalcitonin je najsenzitivniji tumorski marker kada je u pitanju medularni karcinom tiroideje.

Cilj: Cilj ovog rada je da se utvrdi da li postoji korelacija između serumskih vrednosti kalcitonina sa kliničkim i patološkim karakteristikama medularnog karcinoma (veličinom, prisustvom regionalnih limfonodalnih i udaljenih metastaza). Potrebno je da se utvrdi do kojih predoperativnih vrednosti kalcitonina se može očekivati biohemijsko izlečenje nakon učinjene operacije.

Materijal i metode: Ispitivanje je obuhvatilo 43 pacijenta operisanih na Institutu za Onkologiju i Radiologiju Srbije u periodu 2007-2011. Kod svih pacijenata su određivane serumске vrednosti kalcitonina pre i nakon hirurške intervencije. Od kliničkih i patoloških karakteristika tumora ispitivane su: veličina tumora, prisustvo regionalnih limfonodalnih metastaza, broj zahvaćenih limfnih čvorova, prisustvo udaljenih metastaza.

Rezultati: Postoji pozitivna korelacija između veličine tumora i predoperativnih serumskih vrednosti kalcitonina ($p < 0,01$). Pozitivna korelacija postoji između predoperativnih vrednosti kalcitonina i prisustva regionalnih limfonodalnih metastaza ($p < 0,01$). Udaljene metastaze su bile prisutne kod pacijenata sa predoperativnim vrednostima kalcitonina većim od 1000 pg/ml. Kod pacijenata sa predoperativnim vrednostima kalcitonina manjim od 1000 pg/ml, postoperativne vrednosti kalcitonina su bile do 10 pg/ml, a pacijenti nisu imali udaljene metastaze.

Zaključak: Serumске vrednosti kalcitonina se povećavaju sa veličinom tumora i prisustvom regionalnih limfonodalnih metastaza (procenom zahvaćenih limfnih čvorova). Udaljene metastaze se mogu očekivati kod pacijenata kod kojih su predoperativne vrednosti kalcitonina veće od 1000 pg/ml. Biohemijsko izlečenje pacijenata posle hirurškog zahvata (postoperativne vrednosti kalcitonin do 10 pg/ml) se može očekivati ukoliko je predoperativna koncentracija kalcitonina u serumu manja od 1000 pg/ml.

KLJUČNE REČI: medularni karcinom, kalcitonin, hirurgija, biohemijsko izlečenje

THE CORRELATION BETWEEN THE BLOOD CONCENTRATION OF CALCITONIN AND THE CLINICAL CHARACTERISTICS OF MEDULLARY THYROID CARCINOMA

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Introduction: Medullary thyroid carcinoma (MTC) is malign tumor that has origins in parafollicular C cells. Tumor produces numerous molecules and calcitonin is most important of them. Regarding MTC, serum calcitonin is most important tumor marker.

Aim: Aim of this study was to establish if there is correlation between blood concentration of calcitonin and clinical, pathological characteristics of MTC (size, presence of regional metastases on lymph nodes and remote metastases). It was necessary to establish what pre-operational concentration of calcitonin are expected to bring about biochemical recovery after surgery.

Material and methods: Examination included 43 patients operated at Serbian Institute for Oncology and Radiology between 2007 and 2011. Blood concentration of calcitonin both before and after surgery was determined in all patients. Following clinical, pathological characteristics of tumor were examined: size of tumor, number of regional metastases on lymph nodes, number of affected lymph nodes, presence of remote metastases.

Results: There is positive correlation between size of tumor and pre-operational blood concentration of calcitonin ($p < 0,01$). There is positive correlation between pre-operational concentration of calcitonin and presence of regional metastases on lymph nodes ($p < 0,01$). Remote metastases were present in patients with pre-operational values of calcitonin higher than 1000 pg/ml. In patients with pre-operational concentration of calcitonin lower than 1000 pg/ml, post-operational concentration of calcitonin was lower than 10 pg/ml, and those patients didn't have remote metastases.

Conclusion: The blood concentration of calcitonin increases parallel with size of tumor, presence of regional metastases on lymph nodes (percentage of affected lymph nodes). Remote metastases can be expected in patients whose pre-operative concentration of calcitonin is higher than 1000 pg/ml. Biochemical recovery of patients after surgery (post-operative concentration of calcitonin lower than 10 pg/ml) can be expected if pre-operational blood concentration of calcitonin is lower than 1000 pg/ml.

Key words: medullary cancer, calcitonin, surgery, biochemical recovery

HIRURŠKO LEČENJE NEZARASLIH PRELOMA DIJAFIZE HUMERUSA

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Uvod: U literaturi se opisuje niska učestalost nezarastanja nakon dijafizarnih preloma humerusa, uglavnom zbog povoljnih rezultata konzervativnog lečenja. T

Cilj: opisane su različite hirurške metode u lečenju nezarastalih dijafizarnih preloma humerusa.

Materijal i metode: : Praceo je 31 pacijenata sa aseptičnim nezarastlim prelomom dijafize, lečenih različitim metodama. Period praćenja prosečno je iznosio 36 meseci (36-66). U studiju su uključeni pacijenti sa aseptičnim nezarastlim prelomima dijafize humerusa sa koštanim defektom manjim od 2cm. Hipertrofični tip nezarastlog preloma dijagnostikovao je kod 4 pacijenta, a atrofični tip 27 kod pacijenata.

Rezultati: Zarastanje preloma, dokumentovano na radiografskim snimcima, postignuto je kod svih pacijenata. Na osnovu Constant and Murlay bodovnog sistema, 22 (69,7%) je imalo odličan rezultat i 9 (30,3%) pacijenata dobar rezultat. Odličan rezultat je postignut 20 pacijenata kod kojih je primenjen samodinamizirajući unutrašnji fixator, kod 2 pacijenata je primenjen Mitković spoljašnji fixator, kod 5 pacijenata kod kojih je primenjena ploča i kod 4 je primenjen intramedularni klin.

Zaključak: U prikazanoj retrospektivnoj studiji, primenom samodinamizirajućeg unutrašnjeg fixatora i unilateralnog spoljašnjeg fixatora minimalno invazivnom hirurškom tehnikom, postignuti su jednako povoljni rezultati kao i primenom ploče i intramedularnog klina. U našoj seriji, primenom svake metode, postignet je visok stepen zarastanja uz dobar funkcionalni rezultat i uz minimalne komplikacije.

KLJUČNE REČI: dijafiza humerusa, nezarastanje, Mitković samodinamizirajući unutrašnji fixator, Mitković unilateralni spoljašnji fixator.

SURGICAL TREATMENT FOR UNHEALED FRACTURES OF HUMERAL DIAPHYSIS

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Introduction: The incidence of nonunion after humeral shaft fractures is reported as low because of the favorable results of conservative treatment.

The Aim: Different surgical methods were described for humeral shaft nonunion with complication such as radial nerve palsy or joint stiffness.

Material and methods: Retrospectively, 31 patients with aseptic humeral shaft nonunion, treated by different methods. The study included patients with aseptic humeral shaft nonunion of the humerus without bone defects more than 2cm. Hypertrophic solid union of fracture was diagnosed in 4 patients, and atrophic type in 27 patients.

Results: The healing of fractures, documented on radiographic images, was obtained in all patients. Overall, the average healing time was 4.5 months (3-9). Based on the Constant scoring system and Murlay, 22 (69.7%) had excellent results and 9 (30.3%) patients had good outcome. Excellent results were achieved in 20 patients were subjected to selfdynamisable internal fixator, in 2 patients the external fixator applied Mitkovic, plate in five and intramedullary nail in four patient.

Conclusion: In this retrospective study, the selfdynamisable internal fixator and unilateral external fixator a minimally invasive surgical technique, achieved the same favorable results as well as by plate and intramedullary pin. In our series, each method, postigneta a high degree of healing with good functional results with minimal complications.

Key words: humeral shaft, nonunion, Mitković selfdynamisable internal fixator, unilateral external fixator Mitković.

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Uvod: Uprkos velikom napretku u dijagnostici i terapiji raka, on je i dalje glavni uzrok smrti u razvijenim zemljama. Iako je operacija i hemoterapija uspešno lečenje nekih vrsta raka je neophodno u ovih bolesnika uključuju posebnu dijetu za vreme lečenja i posle toga. Budući da postoji mnogo supstance koje izazivaju.

Cilj: Cilj ovog rada je da prikaže dijetu u onkolshkite bolesnika u zavisnosti od faze bolesti i uključivanje tkiva i organa. Da se napravi poređenje između onkoloških pacijenata koji su bili pod posebnom ishranom nakon tretmana i onkoloških pacijenata koji nisu bili pod bilo ishrane posle tretmana.

Materijal i metode: Naše informacije i uspešne priče dolaze iz časopisa pisanih lekari i ljudi koji je posle uspešnog medicinskog tretmana temi pod posebnom ishranom i žele da podele svoja iskustva sa drugima.

Rezultati: Analizirani 10 pacijenata koji su pod posebnom ishranom i 10 pacijenata koji su posle tretmana ne brinu o njihovoj ishrani. U 4 od 10 pacijenata koji ne brinu o ishrani za manje od godinu dana se pojavio dok je ostatak u onim pacijentima koji su na poseban način ishrane u toku jedne godine samo kod jedan pacijent doslo do recidiv.

Zaključci: Iz prikupljenih podataka i analiza može se zaključiti da ishrana direktno vlijaee u vraćanje bolesti kod onkoloških pacijenata.

Ključne reči: raka, ishrana, onkologija bolestan.

DIET FOR CANCER PATIENTS

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Introduction: Despite great advances in diagnosis and therapy of cancer, he remains a major cause of death in developed countries. Although surgery and chemotherapy to successfully treat some types of cancer is necessary in these patients include a special diet during treatment and afterwards. Because there are many substances that cause.

The Aim: The purpose of this paper is to present diet in onkolshkite patients depending on their stage of disease and involvement of tissues and organs. To make a comparison between oncology patients who were under special diet after treatment and oncology patients who were not under any diet after treatment.

Materials and Methods: Our information and success stories come from journals written by doctors and people who after successful medical treatment subject under a special diet and wanting to share their experiences with others.

Results: Analyzed 10 patients who were under special diet and 10 patients who after treatment not care about their diet. In 4 of 10 patients who do not care about the diet for less than one year has appeared left-over whereas in those patients who are at special diet during one year only one patient having a relapse occurred.

Conclusion: From the collected data and the analysis can be concluded that diet directly vlijaee in recurrence of disease in oncology patients.

Keywords: cancer, nutrition, oncology ill.

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Uvod: Zahvaljujući velikom potencijalu samoobnavljanja, proliferacije i sposobnosti diferencijacije u sve krvne loze, pluripotentne matične ćelije hematopoze mogu obezbediti repopulaciju kosne srži i rekonstrukciju hematopoze, što je i cilj transplantacije matičnih ćelija hematopoze. Prikupljanje matičnih ćelija hematopoze za transplantaciju se vrši multiplim aspiracijama iz sponginoznih delova kostiju ili aferezom nakon njihove mobilizacije u perifernu krv.

Cilj: Utvrđivanje efikasnosti mobilizacije matičnih ćelija hematopoze u zavisnosti od pola, starosti, broja prethodno primenjenih hemioterapijskih protokola, prirode oboljenja, vrste mobilizacionog hemioterapijskog protokola i rednog broja aferezne procedure na dobijanje adekvatnog broja CD34 matičnih ćelija.

MATERIJALI I METODE: Koristili smo rezultate afereza matičnih ćelija hematopoze iz periferne krvi kod 22 bolesnika (ukupno je bilo 35 aferezni postupaka) kojima je rađena autologna transplantacija matičnih ćelija hematopoze. Broj CD34 ćelija je određivan protočnom citometrijskom analizom, a upoređivanjem ovih vrednosti Chi kvadrat testom došli smo do zaključka o statistički značajnoj razlici.

REZULTATI: Medijana dobijenih vrednosti broja CD34 ćelija u perifernoj krvi pre afereze je 28,2 ćelija/ μ l, a u afereznom produktu 3,0x10⁶/kg, uzimajući u obzir sve bolesnike. Statistički značajna razlika nije pronađena ni u jednom poređenju od posmatranih šest parametara. **ZAKLJUČAK:** Starost bolesnika, vrsta mobilizacionog protokola, pol, priroda oboljenja, broj prethodno primljenih hemioterapijskih protokola i redni broj afereznog postupka su bez značajnog uticaja na mobilizaciju matičnih ćelija hematopoze.

KLJUČNE REČI: transplantacija matičnih ćelija hematopoze, mobilizacija, afereza

THE EFFICIENCY OF HEMATOPOIETIC STEM CELLS MOBILIZATION

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INTRODUCTION: Thanks to the great potential of proliferation and self-repair capability of differentiation into all blood cells, pluripotent hematopoietic stem cells may provide repopulation of bone marrow and hematopoietic reconstitution. The collection of hematopoietic stem cell transplantation is performed with multiple aspirations from cancellous bone parts, by apheresis after mobilization into peripheral blood using chemotherapy and/or growth factors.

GOAL: Determination of the effectiveness of hematopoietic stem cells mobilization depending on sex, age, the number of previously received chemotherapy protocols, nature of the disease, kind of the mobilization chemotherapy protocol and the order of the apheresis procedure, on acquiring the adequate number of CD34 cells.

MATERIAL AND METHODS: We used the results of hematopoietic stem cells apheresis from peripheral blood of 22 patients, in total 35 apheresis procedure. The number of CD34 cells was monitored by flow cytometry and by comparing these values using the Chi square test we have reached a conclusion on a statistically significant difference.

RESULTS: Median value of the CD34 cell number in peripheral blood before apheresis is 28,2 cells / μ l, and in the apheresis product 3x10⁶/kg, including all patients. Statistically significant difference has not been found in comparing any of the 6 parameters.

CONCLUSION: Age of the patients, the kind of the mobilization protocol, sex, nature of the disease, the number of previously received chemotherapy protocols and the order of the apheresis procedure do not have a significant influence on the hematopoietic stem cells mobilization.

KEY WORDS: Stem cell transplantation, mobilization, apheresis

KIDANJE TETIVE ČETVOROGLAVOG MIŠIĆA BUTA: SIMPTOMATOLOGIJA, MEHANIZAM POVREDE I FAKTORI RIZIKA

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Uvod: Kidanje tetive četvoroglavog mišića buta je retka povreda ekstenzornog aparata kolena koja iziskuje rani hirurški tretman. Njeni simptomi su bol u kolenu, nemogućnost aktivnog pokreta ispružanja u zglobu kolena, otok, izliv i palpabilni defekt iznad čašice. Faktori rizika za kidanje tetive su gojaznost, starije životno doba, šećerna bolest, hronična bubrežna insuficijencija, hiperparatiroidizam i reumatske bolesti.

Cilj rada: Cilj istraživanja je da ukaže na simptome kidanja tetive četvoroglavog mišića buta, mehanizam povređivanja i faktore rizika koji pogoduju kidanju tetive.

Materijal i metode: Retrospektivnom multicentričnom studijom, obuhvaćeno je 18 pacijenata (17 muškog pola), prosečne starosti 53 godine (vrednost medijane je 55,5 godina). Na uzorku smo ispitali mehanizam povređivanja, prirodu traume, simptome, lateralizaciju, korišćene imidžing tehnike, vreme proteklo od povređivanja do operacije, faktore rizika, metod hirurške reparacije, farmakoterapiju i komplikacije u ranom postoperativnom periodu. Za kategorijalne podatke određena je učestalost pojavljivanja, dok su za numerički podatak korišćeni kvartili. Primenom Fišerovog testa analizirana je veza između prisustva rizikofaktornih bolesti i prirode traume.

Rezultati: Najveći broj pacijenata (n=7) povredio se usled banalnog pada. Njačešći simptomi su bol u kolenu i nemogućnost aktivnog ispružanja. Sedam ispitanika boluje od šećerne bolesti, njih četvoro ima hroničnu bubrežnu insuficijenciju. Jedan pacijent boluje od sekundarnog hiperparatiroidizma. Tri ispitanika su u vreme povređivanja bila gojazna.

Zaključak: Faktori rizika (diabetes mellitus, hronična bubrežna insuficijencija, gojaznost) prisutni su kod većine ispitanika. Banalan pad je najčešći uzrok povređivanja. Prisustvo faktora rizika predisponira mehanizmu povređivanja u vidu minimalne, neadekvatne traume

Ključne reči: kidanje tetive četvoroglavog mišića buta, mehanizam povrede, simptomi, faktori rizika

LOKALNI RECIDIVI I PREŽIVLJAVANJE PACIJENTKINJA OBOLELIH OD KARCINOMA DOJKE N AKON SUBKUTANE MASTEKTOMIJE I PRIMARNE REKONSTRUKCIJE

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Uvod: Subkutana mastektomija podrazumeva odstranjenje tumora i kompletne mlečne žlezde sa očuvanjem kože. Indikacije za subkutanu mastektomiju su: multicentrični, veliki tumor preko 3 cm, ekstenzivni DCIS (Ductal Carcinoma in Situ) ili recidiv nakon poštednih operacija. Obzirom na estetske i psihološke efekte poslednjih godina beleži se stalni porast ovih operacija.

Cilj rada: Analiza učestalosti lokalnih recidiva i preživljavanja pacijentkinja nakon subkutane mastektomije i primarne rekonstrukcije dojke.

Materijal i metode: Istraživanjem je obuhvaćeno 255 pacijentkinja kojima je urađeno 264 (246 unilateralnih i 9 bilateralnih) subkutanih mastektomija na Institutu za onkologiju Vojvodine u periodu od 2004. do 2010. godine. Statistička analiza podataka izvršena je softverskim paketom SPSS verzija 16. Od statističkih procedura korišćeni su deskriptivni statistički pokazatelji, a analize preživljavanja izvedene su Kaplan-Meier-ovom metodom. Nivo značajnosti je određen na 0,05.

Rezultati: Pojava lokalnog recidiva zabeležena je kod 9 bolesnica (3,4%). Prosečno preživljavanje iznosi 50,09 meseci, a medijana preživljavanja je 58 meseci. Ukupno 8-godišnje preživljavanje određeno Kaplan-Meier-ovom metodom iznosi 82%.

Zaključak: Subkutana mastektomija i primarna rekonstrukcija dojke je onkološki bezbedna procedura sa preživljavanjem i pojavom lokalnih recidiva koja se statistički značajno ne razlikuje u odnosu na druge hirurške operacije karcinoma dojke. Pojava lokalnih recidiva češća je kod pacijentkinja sa većim tumorom (T stadijum), dok zahvaćenost limfnih čvorova aksile i postoperativna zračna terapija ne utiču na pojavu lokalnih recidiva.

Ključne reči: subkutana mastektomija, lokalni recidivi, preživljavanje

QUADRICEPS TENDON RUPTURE: CLINICAL FINDINGS, MECHANISM OF INJURY AND RISK FACTORS

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Introduction: Quadriceps tendon rupture is an uncommon injury. Clinical findings include pain, inability to actively extend the knee, swelling and palpable gap above the patella. Factors that contribute to injury are obesity, advanced age, diabetes, chronic renal failure, hyperparathyroidism etc.

The Aim: Our goal is to point out the main symptoms and mechanisms of this injury, as well as the most often systemic disorders that contribute to tendon rupturing.

Materials and Methods: This research includes eighteen patients (17 are male). Average age at the time of injury was 53 years. We have analyzed the following: mechanism of injury, type of trauma, clinical findings, imaging diagnostic methods, time that has elapsed from injury until operation, risk factors, type of operation technique as well as potential early postoperative complications. Frequency was determined for categorical variables. In order to examine the relation between the type of trauma and coexistence of the risk factors, we used Fischer's test.

Results: Most patients have suffered injuries due to a simple fall (n=7). The most common symptoms were knee pain and inability to actively extend the knee. Seven patients are diabetic, four of them suffer from chronic renal failure. Secondary hyperparathyroidism is present in one case; in three cases patients were obese.

Conclusion: Risk factors (diabetes mellitus, obesity) are present in most cases. Simple fall is the most common mechanism of injury. Coexisting risk factor contributes to tendon rupturing due to a minimal trauma.

Key words: quadriceps tendon rupture, mechanism of injury, symptoms, risk factors

LOCAL RECURRENCES AND SURVIVAL IN BREAST CANCER PATIENTS AFTER SUBCUTANEOUS MASTECTOMY AND IMMEDIATE RECONSTRUCTION

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Introduction: Subcutaneous mastectomy involves removal of the tumor and the entire mammary gland with preservation of the skin. Indications for operation are: multicentric, large tumors over 3 cm or local recurrences after breast conserving surgery. According to better esthetic and psychological effects number of subcutaneous mastectomies is progressively increasing.

The Aim: Analysis of the incidence of local recurrence and patient survival after primary subcutaneous mastectomy and immediate breast reconstruction.

Materials and Methods: This study included 255 patients who underwent 264 (246 unilateral and 9 bilateral) subcutaneous mastectomies at the Oncology Institute of Vojvodina in the period since 2004. until 2010. Statistical analysis was performed with the software package SPSS version 16. Descriptive statistical indicators were used and survival analyses were performed using the Kaplan-Meier's method. The significance level was set at 0.05.

Results: Local recurrence was diagnosed in 9 patients (3.4%). Average survival was 50.09 months and median survival was 58 months. Overall survival with a 8-year follow-up provided by Kaplan-Meier's method was 82%.

Conclusion: Subcutaneous mastectomy and breast reconstruction is safe procedure with survival and local recurrence not significantly different compared to other breast cancer surgery. The occurrence of local recurrence was more common in patients with larger tumors (T stage), while axillary lymph nodes and postoperative radiotherapy does not influence the occurrence of local recurrence.

Key words: subcutaneous mastectomy, local recurrence, survival

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Uvod: Lečenje pacijenata sa srčanom slabošću predstavlja jedan od najvećih izazova kako u savremenoj kardiologiji tako i u kardiohirurgiji. Resinhronizaciona terapija srčane slabosti (CRT) uvedena je u kliničku praksu 2001.

godine i u protekloj deceniji postala je metoda izbora u lečenju bolesnika sa teškom disfunkcijom leve komore i verifikovanom ventrikularnom asinhronijom. Brojne anomalije srčanog venskog sistema u preko 15% slučajeva onemogućavaju implantaciju elektrode standardnim, transvenskim putem te se mioepikardni pristup nameće kao rešenje.

Cilj: Ispitivanje korisnosti i bezbednosti alternativnog, mioepikardnog pristupa u lečenju srčane slabosti.

Materijal i metode: U našu studiju uključili smo 8 pacijenata kojima je ugrađena mioepikardna elektroda za stimulaciju leve komore na Klinici za Kardiohirurgiju KCS. Kontrole funkcionalnih parametara posle ugradnje mioepikardnih elektroda radjene su nakon šest meseci i te vrednosti su obuhvaćene našim radom. Takođe praćeni su i neposredni postoperativni parametri.

Rezultati: Na šestomesečnoj kontroli registrovano je značajno povećanje vrednosti šestominutnog testa hoda, ejectionne frakcije (EF) kao i redukcija širine QRS kompleksa. Postoperativno samo kod jednog pacijenta registrovan je hematoma lože koji nije zahtevao hiruršku evakuaciju. Mortalitet među posmatranim pacijentima nije bio prisutan.

Zaključak: Epikardni pristup za plasiranje elektrode u cilju stimulacije leve komore je bezbedno i efikasno rešenje kod bolesnika kod kojih endovenoski pristup nije moguć.

Ključne reci: resinhronizacija, mioepikardni pristup, srčana slabost.

MYOEPICARDIAL APPROACH IN RESYNCHRONIZED TREATMENT OF CARDIAC INFIRMITY

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Introduction: Treatment of patients with heart failure is one of the biggest challenges in the modern cardiology and in cardiac surgery. Cardiac resynchronization therapy (CRT) was introduced into clinical practice in 2001. and in the past decade has become the method of choice in patients with severe left ventricular dysfunction and verified ventricular asynchrony. Numerous abnormalities of cardiac venous system in more than 15% of cases prevent implantation of standard electrode, and transvenous myoelectrical approach imposes as solution.

The Aim: The aim of the study was to test the usefulness and safety of this alternative, myoelectrical approach in the treatment of heart failure.

Materials and methods: Eight patients were included in our study after the implantation of myoelectrical electrodes for left ventricular stimulation at the Department of Cardiac surgery, Clinical Center of Serbia. The assessment of functional parameters was made six months after the installation of myoelectrical electrodes. The immediate postoperative parameters were also monitored.

Results: The six month control indicated a substantial increase in the value of six minute walk test, EF and QRS complex. In postoperative period only in one patient was registered hematoma which wasn't required surgical evacuation. The mortality was not present.

Conclusion: Epicardial approach for placement of the electrode which stimulates the left ventricle is safe and effective in patients in who standard approach is not possible.

Key words: resynchronization, myoelectrical approach, heart failure

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Uvod: Razvojni poremećaj kuka je najčešće oboljenje tog zgloba. Manifestuje se kao displazija, sublukacija ili luksacija kod dece, odnosno kao rana artroza kod odraslih, nastala na bazi napred opisanih promena, koje u dečijem dobu često budu asimptomatske. Oboljenje može dovesti do značajnih abnormalnosti koje totalnu artroplastiku kuka čine izazovnom procedurom.

Cilj rada: Cilj našeg rada je analiza kliničkih parametara, kao i postoperativnog ishoda totalne artroplastike kuka, kod sekundarne osteoartroze nastale usled razvojnog poremećaja kuka.

Materijal i metode: Istraživanje je zasnovano na retrospektivnoj studiji. Podaci su prikupljeni iz istorija bolesti 52 pacijenata operisana na Institutu za ortopedsko-hirurške bolesti „Banjica“ u periodu Januar 2009 – Decembar 2011.

Rezultati: Podaci su statistički obrađeni i dobijeno je da je učestalost pacijenata ženskog pola statistički značajno veća u odnosu na muški. Zaključeno je da se oboljenje češće javlja na levoj strani u odnosu na desnu stranu. Dosl je do značajnog poboljšanja rezultata po Harrisovoj skali pre operacije 45 (u opsegu 31-49), i posle operacije 95 (u opsegu 85-100).

Zaključak: Totalna artroplastika kuka je sigurna i efikasna metoda lečenja kod osteoartroze usled razvojnog poremećaja kuka. Osnovna namena totalne endoproteze kuka nekada je bila da omogući bezbolnost i pokret polomljenom ili artrotičnom zglobu. Sa povećanjem kvaliteta implantata i usavršavanjem operativnih postupaka, indikacije za ugradnju veštačkih zglobova proširene su i na mlade i aktivne pacijente.

Ključne reči: razvojni poremećaj kuka, totalna artroplastika kuka, operacija, ishod

ARTHROPLASTY IN SECONDARY OSTEOARTHROSIS DUE TO DEVELOPMENTAL DYSPLASIA OF THE HIP

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Introduction: Developmental disorder of the hip (DDH) is the most frequent disease of this joint, manifested as dysplasia, subluxation or luxation in childhood period and early arthritis in adulthood. Early degenerative changes of the hip occur at the bases of the disturbed anatomy already in youth, while in the childhood age they are mostly asymptomatic. DDH may lead to severe abnormalities that can make total hip arthroplasty a challenging procedure.

The Aim: The aim of our study is to analyze the clinical parameters as well as the postoperative outcome of developmental disorder of the hip treated by total hip arthroplasty.

Materials and Methods: Our research is based on retrospective study. Data were collected from the medical records of 52 patients operated at the Institute of Orthopaedic Surgery „Banjica“, January 2009.- December 2011.

Results: It was established that we had significantly higher rate of female patients than male. Moreover, the DDH is more common on the left side than on the right. Average Harris Hip Score was 45 (range 31-49) preoperatively, 95 (range 85-100) postoperatively.

Conclusion: Total hip arthroplasty is an effective method of surgical treatment. The main purpose of the total hip implant was to achieve pain free move of the hip. As the quality of implants is now on higher level, they are also used on younger patients.

Keywords: developmental disorder of the hip, total hip arthroplasty, surgery, outcome

HIRUŠKO LEČENJE TROHANTERNIH PRELOMA

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Uvod: U radu prikazujemo rezultate primene dinamičke ploče po Mitkoviću kod trohanternih preloma.

Cilj rada: je da istakne prednost operativnog načina lečenja preloma trohanternog masiva i upotrebu dinamičke metode unutrašnje fiksacije. Dinamičkom pločom postižemo dobru stabilnost i stvaramo uslove za dinamizaciju fragmenata.

Materijal i metod: Mi smo koristili specijalnu dinamičku ploču tipa Mitković za operaciju preloma u trohanternoj regiji, i to kod 175 bolesnika. Radi se o starijoj populaciji sa izraženim stepenom osteoporoze. Operativni zahvat smo radili neposredno posle povrede, tj. odmah po saniranju pratećih hroničnih bolesti pulmonalnog i kardiovaskularnog sistema. Za klasifikaciju preloma koristili smo Jensen – Michaels-ovu modifikaciju Evans-ove podele.

Rezultati: Funkcionalni rezultati lečenja su dobijeni ocenjivanjem po modifikovanoj skali Merle d'Aubigneu. Prema njoj se ocenjuje hod, bol, mobilnost i položaj ekstremiteta. Odlično i dobro stanje je imalo 144 (82,3%) bolesnika, umereno 22 (12,6%) i loše 9 (5,14%) bolesnika. Zbirno gledano, rezultati primene dinamičke ploče su dobri, mali je procenat komplikacija i loših rezultata. Od komplikacija bilo je: infekcija kod 7 (4%) bolesnika, varijacija kolodijafizarnog ugla kod 11 (6,28%) i dezintegracija osteosinteze kod 7 (4%) bolesnika.

Zaključak: Metoda primene dinamičke ploče kod trohanternih preloma ima veliku primenu i prednost u odnosu na krute ugaone ploče. Prednost se ogleda u dinamizaciji u osi vrata i dijafize femura. Dinamizacijom nastaje teleskopsko pomeranje fragmenata ka frakturnoj pukotini pri čemu dolazi do sekundarnog impaktiranja fragmenata. Uz prisutnu stabilnost fragmenata, što obezbeđuje dinamičku ploča, fenomen dinamizacije doprinosi sigurnom i brzom zarastanju i omogućuje ranu vertikalizaciju bolesnika.

Ključne reči: fractura trochanterica, dinamička ploča, dinamizacija

SEKUNDARNI LIMFEDEM RUKE KOD PACIJENTKINJA SA KARCINOMOM DOJKE OPERISANIH U INSTITUTU ZA ONKOLOGIJU VOJVODINE, 2005-2009. GODINE

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Uvod: Kod 5-30% pacijenata operisanih zbog karcinoma dojke razvija se sekundarni limfedem ruke. Ova funkcionalna komplikacija spada u grupu preventabilnih komplikacija.

Cilj: Prikaz incidencije sekundarnog limfedema ruke kod pacijentkinja operisanih od karcinoma dojke u Institutu za onkologiju Vojvodine u periodu od 2005-2009. godine.

Materijal i metode: Retrospektivno je analizirano 188 pacijentkinja sa utvrđenom dijagnozom sekundarnog limfedema ruke u Institutu za onkologiju Vojvodine u Sremskoj Kamenici, u periodu od 1. januara 2005. godine do 31. decembra 2009. godine. Podaci su prikupljeni iz zdravstvenih kartona u Zavodu za rehabilitaciju, gde je pacijentima dijagnostikovano i/ili kontrolisan sekundarni limfedem ruke.

Rezultati: U periodu od 2005-2009. godine od ukupno 2190 pacijenata operisanih od karcinoma dojke, kod 188 njih su se razvili simptomi sekundarnog limfedema ruke. Percentualna zastupljenost edema ipsilateralne ruke u ispitivanom periodu je 8,58%, a kretala se od 5,94%-11,86%. Prosečno vreme izraženo u mesecima, od operacije do pojave sekundarnog limfedema ruke iznosi 16,12 meseci. Većina pacijentkinja je imala promene na levoj ruci (54,26%) u odnosu na pacijentkinje koje su imale zahvaćenu desnu ruku (45,74%).

Zaključak: Implementacija programa rane rehabilitacije, kineziterapija i edukacija pacijenata o faktorima rizika, kao i kontinuirano praćenje, dovelo je do relativno niske incidencije sekundarnog limfedema ruke u odnosu na literaturne podatke.

Ključne reči: karcinom dojke, sekundarni limfedem ruke, incidencija

SURGICAL TREATMENT OF TROCHANTERIC FRACTURES

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Introduction: Paper presents results achieved in application of a dynamic plate with the trochanter fractures by Mitkovic.

The aim of the paper was highlighting the advantages of the operative way in the treatment of trochanter massive fractures and the use of dynamic internal fixation. The dynamic plate provides good stability and creates conditions for the fragment dynamisation.

Methods and material: We have used a special Mitkovic type dynamic plate for the surgical operation of fractures in the trochanter region with 175 patients. Those were elderly people with expressed degree of osteoporosis. The surgical operation was done immediately after injury. We classified fractures using Jensen – Michaels modification of Evans division.

Results: Functional results were achieved by estimating the treatment using the modified Merle d'Aubignon scale. Excellent and good condition was recorded with 144 (82,28 %), moderate with 22 (12,6 %) and bad with 9 (5,14 %) patients. Finally, the results in dynamic plate application are good, with less complications and bad results. The complications were: infections with 7 (4%), variegation of collo-diaphysis angle with 11 (6,28 %) and osteosynthesis disintegration with 7 (4%) patients.

Conclusion: Dynamic plate method in trochanter fractures has great advantages related to the rigid angle plates. Advantages are in dynamisation in the neck axis and femur diaphysis. The dynamisation causes gradual movement of fragments toward the fractured fissure, whereby secondary impaction of fragments occurs. The dynamic plate provides fragments stability, dynamisation contributes to the safe and fast healing.

Key words: Trochanter fracture, dynamic plate, dynamisation

SECONDARY LYMPHEDEMA OF THE ARM IN PATIENTS WITH BREAST CARCINOMA OPERATED AT THE ONCOLOGY INSTITUTE OF VOJVODINA, 2005-2009. YEAR

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Introduction: Secondary lymphedema of the arm develops in 5-30% of patients after breast cancer surgery. This feature belongs to a group of preventable complications.

The Aim: Review of incidence of secondary lymphedema of the arm in patients with breast carcinoma operated at the Oncology Institute of Vojvodina in the period of 2005-2009 year.

Materials and methods: From 1st January 2005 to 31st December 2009 year, 188 patients with established diagnosis of secondary lymphedema of the arm were analyzed retrospectively at the Institute of Oncology, Sremska Kamenica. Data were collected from medical records at the Department of rehabilitation, where patients were diagnosed and/or received aftercare for secondary lymphedema of the arm.

Results: During the period between 2005. and 2009. a total of 2190 patients had undergone surgery for breast cancer. Symptoms of secondary lymphedema of the arm have developed in 188 of them. Percentage of ipsilateral arm edema during the study period was 8.58%, and ranged from 5.94%-11.86%. The average time expressed in months from surgery to the appearance of secondary lymphedema of the arm was 16.12 months. Most of the patients had changes in the left hand (54.23%) in comparison to patients who have had their right arm affected (45.74%).

Conclusion: Implementation of early rehabilitation program, kineziterapija and patient education about risk factors, as well as continuous monitoring, led to a relatively low incidence of secondary lymphedema of the arm compared to a literature data.

Key words: breast cancer, secondary lymphedema of the arm, incidence

KARAKTERISTIKE KARCINOMA DOJKE KOD ŽENA MLAĐIH OD 35 GODINA

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Uvod: Karcinom dojke se u populaciji žena mlađih od 35 godina javlja u svega 2 % slučajeva, ali se veruje da je on u ovoj starosnoj kategoriji agresivnijeg biološkog ponašanja i da ima lošiju prognozu nego kod postmenopausalnih žena.

Cilj: Utvrditi kliničko-patološke i biološke karakteristike karcinoma dojke kod žena mlađih od 35 godina starosti.

Materijal i metode: Istraživanjem su obuhvaćene 93 pacijentkinje sa karcinomom dojke, starosti 35 godina ili mlađe, koje su se lečene na Institutu za onkologiju u Sremskoj Kamenici, u periodu od 2007. do 2011. godine. Korišćeni su podaci iz istorija bolesti i patoloških izveštaja bolesnica, dobijeni retrospektivnom analizom kompjuterske baze podataka Instituta.

Rezultati: Istoriju karcinoma dojke u porodičnoj anamnezi imalo je 19% bolesnica, a 29% istoriju druge maligne bolesti. Najviše pacijentkinja imalo je tumore gradusa 2, dok je najčešći histološki tip tumora bio duktalni invazivni karcinom. Najveći broj bolesnica imalo je tumore veličine između 2 i 5 cm (T2). Limfni čvor „stražar“ bio je pozitivan u 64% slučajeva, a najviše bolesnica bilo je u pN1 stadijumu (36%). Vaskularna invazija bila je prisutna kod 54%, limfovaskularna kod 65%, dok je perineuralna invazija bila prisutna kod 48% pacijentkinja. Estrogenski i progesteronski receptori bili su pozitivni kod 51% pacijentkinja, a HER 2 u svega 28%. Najviše pacijentkinja bilo je u kliničkom stadijumu IIA (30%).

Zaključak: Pojedine kliničko-patološke karakteristike utvrđene u istraživanju saglasne su sa tvrdnjama o agresivnijem biološkom obliku karcinoma dojke kod mlađih žena, dok se o drugim karakteristikama nije mogao doneti konkretan zaključak.

Ključne reči: karcinom dojke, mlade životno doba, kliničko-patološke karakteristike

THE CHARACTERISTICS OF BREAST CANCER IN WOMEN YOUNGER THAN 35

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Introduction: Breast cancer occurs in the population of women under the age of 35 in only 2% of cases, but is believed to have a more aggressive biological behavior and to be associated with a more unfavorable prognosis compared with the disease in older patients.

The Aim: To investigate clinicopathological and biological characteristics of breast cancer in women younger than 35 years of age.

Materials and methods: The research included 93 breast cancer patients, aged 35 or younger, who were treated in the Institute of oncology in Sremska Kamenica, between 2007. and 2011. The data used in this research was obtained from the patients' medical histories and pathological reports, through a retrospective review of the Institute's computerized database.

Results: Family history of breast cancer was present in 19% of the patients, while 29% of them had a family history of other malignant diseases. Most of the patients had grade 2 tumors, and the invasive ductal carcinoma was the most common histological type. The most common tumor size was between 2 and 5 cm (T2). Sentinel lymph node was positive in 64% of the cases, and the majority of the patients were in the pN1 stadium (36%). Vascular invasion was present in 54%, lymphovascular in 65%, while perineural invasion was present in 48% of the patients. Estrogen and progesterone receptors were positive in 51%, while HER 2 receptors were positive in only 28% of patients. Most of the patients were in the IIA clinical stadium.

Conclusion: Some of the clinicopathological features that we researched are in accordance with the claims of a biologically more aggressive breast cancer in younger women, while others didn't lead to a concrete conclusion.

Key words: breast cancer, young age, clinicopathological characteristics

HIRURGIJA SRCA KOD BOLESNIKA NA HRONIČNOJ HEMODIJALIZI

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Uvod: Broj bolesnika na hroničnoj hemodijalizi koji zahtevaju hirurške procedure na otvorenom srcu u značajnom je porastu proteklih godina. Prevalencija srčanih bolesti u ovoj populaciji je veća nego u opštoj populaciji. Terminalna bubrežna insuficijencija je značajan faktor rizika za kardiohirurške intervencije urađene uz primenu ekstrakorporealne cirkulacije.

Cilj: Cilj rada je da se prikažu perioperativni morbiditet i mortalitet bolesnika na hroničnom programu hemodijalize koji su podvrgnuti kardiohirurškim intervencijama.

Materijal i metode: Urađena je retrospektivna analiza istorija bolesti bolesnika na hroničnoj hemodijalizi koji su podvrgnuti kardiohirurškim operacijama u periodu od 2009-2012 godine u Institutu za kardiovaskularne bolesti "Dedinje". Praćeni su preoperativne karakteristike bolesnika, intraoperativni parametri i postoperativne komplikacije.

Rezultati: Prosečna starost naše serije bolesnika je 61.7 godina (između 33-77 god.). Period preoperativnog lečenja na hemodijalizi prosečno je trajao 51 mesec (3-180 meseci). Kod četiri bolesnika (16.6%) izvedena je valvularna hirurgija, kod 10 (41.6%) bolesnika aortokoronarna bajpas hirurgija i kod 8 (29.1%) kombinovana koronarna revaskularizacija i valvularna hirurgija. Kod 18 bolesnika (73%) zabeležena je bar jedna kardiološka komplikacija. Stanje niskog minutnog volumena i cirkulatorne insuficijencije zabeleženi su kod 14 bolesnika (58%).

Zaključci: Perioperativni rizici povećanog mortaliteta i morbiditeta bolesnika na hroničnoj hemodijalizi je veći nego kod ostalih kardiohirurških bolesnika, ali nipošto nije kontraindikacija i dobri kandidati za kardiohirurške procedure mogu biti uspešno izabrani.

Ključne reči: hirurgija srca, terminalna bubrežna insuficijencija, hemodijaliza.

OPEN HEART SURGERY IN CHRONIC HEMODIALYSIS PATIENTS

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Introduction: The number of patients on chronic hemodialysis who underwent open heart surgery is significantly increasing in recent years. The prevalence of heart disease in this population is higher than in the general population. Terminal renal failure is a the significant risk factor for a heart surgery procedures performed on extracorporeal circulation.

The Aim: The Aim of the study was to present the perioperative morbidity and mortality in patients on chronic hemodialysis who underwent open heart surgery.

Materials and Methods: The retrospective analysis of case histories of patients on chronic hemodialysis who underwent cardiac surgery in the period 2009 – 2012 years at the Institute for Cardiovascular Diseases Dedinje. We assessed the preoperative patient characteristics, intraoperative parameters and postoperative complications.

Results: The mean was 61.7 years (between 33-77 years). The average duration of hemodialysis was 51 months (3-180 months). Valve surgery was performed in four patients (16.6%), 11 patients (45.8%) underwent coronary artery bypass surgery will 8 patients (29.1%) had combined coronary and valve surgery. 18 patients (73%) had at least one cardiac complication. Low cardiac output and circulatory failure were registered in 14 patients (58%).

Conclusion: Perioperative mortality and morbidity in patients on chronic hemodialysis is higher in other cardiac surgery patients. Hemodialysis is not limiting and good candidates for heart surgery procedure can be successfully elected.

Keywords: heart surgery, terminal renal failure, hemodialysis

KLINIČKE KARAKTERISTIKE SEKUNDARNOG LIMFEDEMA DONJIH EKSTREMITETA KOD PACIJENTKINJA SA KARCINOMOM CERVIKSA

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Uvod: Sekundarni limfedem donjih ekstremiteta predstavlja veliki zdravstveni problem u srednje i visoko razvijenim zemljama. Nastanak sekundarnog limfedema donjih ekstremiteta povezan je sa osnovnom bolesti i faktorima rizika. Ova funkcionalna komplikacija spada u grupu preventabilnih komplikacija.

Cilj: Cilj našeg istraživanja bio je ispitivanje kliničkih karakteristika sekundarnog limfedema kod pacijentkinja koje su lečene od karcinoma cerviksa.

Materijal i metode: Retrospektivno je analizirano 20 pacijentkinja sa dijagnozom sekundarnog limfedema noge u Institutu za onkologiju Vojvodine u Sremskoj Kamenici. Podaci su prikupljeni iz zdravstvenih kartona u Zavodu za rehabilitaciju, od žena lečenih od karcinoma cerviksa.

Rezultati: Starosna struktura ispitanika u vreme operacije iznosila je u proseku 44,4 godina, a prosečno vreme izraženo u mesecima, od operacije do pojave sekundarnog limfedema iznosi 35,5 meseci. Sekundarni limfedem dijagnostikovao je kod 55% žena gde su operacijom uklonjene materice, jajnici i regionalne limfne žlezde. Prosečno povećanje obima noge najizraženije je na šestom merenom mestu i iznosi 3,92 cm. Najveći procenat pacijentkinja, čak 45% ima povećanje obima noge na drugom merenom nivou. Težak oblik kliničke slike ima 40% pacijentkinja.

Zaključak: Sekundarni limfedem predstavlja tešku postterapijsku komplikaciju, koja se u većem procentu javlja u žena kod kojih je izvršena radikalna operacija i može se javiti i posle više desetina godina nakon lečenja invazivnih formi karcinoma cerviksa.

Ključne reči: karcinom cerviksa, sekundarni limfedem noge, incidencija.

CLINICAL CHARACTERISTICS SECONDARY LYMPHEDEMA OF THE LOWER EXTREMITIES IN PATIENTS WITH CARCINOMA OF THE CERVIX

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Introduction: Secondary lymphedema of the lower extremities is a major health problem in middle and high in come countries. The emergence of secondary lymphedema is associated with underlying diseases and risk factors. These functional complications are among the preventable complications.

The Aim: The aim of this study was to investigate the clinical characteristics of secondary lymphedema in lower extremities in patients who were treated for cervical cancer.

Material and Methods: We retrospectively analyzed 20 patients diagnosed with secondary leg lymphedema at the Oncology Institute in Sremska Kamenica. Data was collected from medical records of women treated for cervical cancer at the Department of Rehabilitation.

Results: The age structure of respondents at the time of surgery was 44.4 years on average, and the average time, expressed in months, from surgery until the occurrence of secondary lymphedema was 35.5 months. Secondary lymphedema was diagnosed in 55% of women where the operation removed the uterus, ovaries and regional lymph nodes. The average increase in circumference is 3,92cm the most prominent value was measured on the sixth measurement point. Most of the patients 45% has increased circumference on the 2nd measurement point. Severe from of the clinical features was found in 40% of the patients.

Conclusion: Secondary lymphedema is a difficult postoperative complication. It occurs in greater percentage in women who had undergone radical surgery procedures and can occur several decades after the treatment of invasive forms of cervical cancer.

Key words: cervical cancer, secondary leg lymphedema, incidence.

HIRURSKO LEČENJE PRELOMA ACETABULUMA

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Uvod Prelomi acetabuluma su teške povrede, nastaju najčešće dejstvom jakih sila "high energy trauma", uglavnom u saobraćajnim udesima i padovima sa visine. Prelomi ekstremiteta, povrede glave, grudnog koša, abdomena i karličnog prstena su najčešće udružene povrede.

Cilj rada je ocena rezultata otvorene repozicije i unutrašnje fiksacije preloma acetabuluma. Otvorena anatomska repozicija i unutrašnja fiksacija, rana mobilizacija predstavljaju standard u lečenju ovih povreda.

Materijal i metode Retrospektivnom studijom je analizirano 22 pacijenta prosečne starosti 41.13 godina. Pacijenti su lečeni metodom otvorene repozicije i unutrašnje fiksacije na Klinici za ortopediju i traumatologiju Kc u Nišu od 2005-2009.godine. Pacijenti su praćeni 12-36 meseci postoperativno, prosečno 21,3 meseci.

Rezultati Svi povredjeni pacijenti su operisani između 4 i 11 dana posle hospitalizacije, 5,7 dana prosečno. Prema klasifikaciji Judet i Letournel 15 (68.18%) pacijenata imalo je elementarni prelom acetabuluma, 7 (31.82%) je imalo kompleksan prelom acetabuluma. Zadovoljavajuća postoperativna repozicija postignuta je kod 19 (86.36%) pacijenata. Radiološki status zgloba kuka, na osnovu Matta skora, bio je odličan kod 15 (68.18%), dobar kod 4 (18.18%), umeren kod 3 (13.63%) pacijenta. Prema Merle d'Aubigne-ovoj skali, krajnji funkcionalni rezultati lečenja su odlični kod 12 (54.54%) pacijenata, dobri kod 7 (31.87%) pacijenata i umereni kod 3 (13.63%) pacijenta.

Zaključak Hirurško lečenje dislociranih preloma acetabuluma zahteva otvorenu repoziciju i stabilnu unutrašnju fiksaciju. Odlični i dobri rezultati lečenja mogu se očekivati samo ako su postignuti anatomska repozicija i stabilna unutrašnja fiksacija.

Ključne reči: Prelomi, acetabulum, hirurško lečenje.

SURGICAL TREATMENT OF ACETABULAR FRACTURES

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Introduction Acetabular fractures are severe injuries, caused by high-energy trauma, mostly from traffic accidents or falls from heights. Fractures of the extremities, head, chest, abdomen and pelvic are most commonly associated injuries.

The aim: The purpose of this study was to evaluate the results of open reduction and internal fixation of acetabular fractures. Open anatomical reduction of the articular surface combined with a rigid internal fixation and early mobilisation became standard treatment of these injuries.

Materials and methods We conducted a retrospective analysis of 22 patients (average 43.13 years). The patients were treated by open reduction and internal fixation at the Orthopaedic Clinic of Niš from 2005–2009. The follow-up was 12-60 months, average 21.18 months after surgery.

Results All injured patients were operated on 4-11 days (5.7 days average). According to the classification by Judet and Letournel, 15 (68.18%) had an elementary acetabular fracture, 7 (31.82%) patients had associated fracture. A satisfactory postoperative reduction was achieved in 19 (86.36%) patients. The radiological status of the hip joint, according to Matta score, was excellent in 15 (68.18%), good in 4 (18.18%) and moderate in 3 (13.63%) patients. According to Merle d'Aubigné Scale, the final functional results of operated patients were excellent in 12 (54.54%), good in 7 (31.81%) and moderate in 3 (13.63%) patients.

Conclusion Dislocated acetabular fractures requires surgical treatment, open reduction and a stable internal fixation. Excellent and good results can be expected only if anatomical reduction and stable internal fixation are achieved.

Keywords: fractures; acetabulum; surgical treatment.

FAKTORI RIZIKA ZA REHOSPITALIZACIJU BOLESNIKA NAKON KARDIOHIRURŠKIH INTERVENCIJA

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Uvod: Kardiohirurški zahvati danas predstavljaju najučestalije operativne zahvate. Postoperativne komplikacije direkto utiču na dužinu boravka u bolnici i kasnije rehospitalizacije.

Cilj: Utvrditi uticaj preoperativnih faktora (pol, starost, BMI) i operativnih faktora (tip kardiohirurškog zahvata, dužina trajanja totalne kleme (cardiac arrest) i vantelesnog krvotoka) na učestalost rehospitalizacija do godinu dana od operativnog zahvata.

Materijal i metode: Istraživanje je vršeno analizom podataka svih bolesnika koji su podvrgnuti kardiohirurškom zahvatu na Klinici za kardiovaskularnu hirurgiju Instituta za kardiovaskularne bolesti Vojvodine, u periodu od 1. januara do 31. decembra 2009. godine.

Rezultati: Ukupan uzorak je činilo 1155 bolesnika podvrgnutih kardiohirurškoj intervenciji od čega je njih 776 (67%) bilo muškog pola. Od ukupnog broja bolesnika njih 80 (6,92%) rehospitalizovano je u periodu do godinu dana od datuma operacije. Pacijenti koji su stariji od 65 godina su češće rehospitalizovani (8,08%/5,93%). Procenat rehospitalizovanih pacijenata posle koronarne hirurgije je 4,81%, nakon valvularne hirurgije (zamena aortne i mitralne valvule) 7,53%, dok je posle kombinovane hirurgije (koronarna i valvularna hirurgija) 12,44% pacijenata ponovo hospitalizovano. Prosečna dužina trajanja kleme kod rehospitalizovanih pacijenata iznosi 80,68 minuta, a kod pacijenata koji nisu rehospitalizovani 72,66 minuta. Prosečno vreme trajanja vantelesnog krvotoka kod rehospitalizovanih iznosi 97,43 minuta, a kod pacijenata koji nisu rehospitalizovani 87,72 minuta.

Zaključak: Starost predstavlja preoperativni prediktivni faktor, dok su tip operacije, dužina trajanja kleme i vantelesnog krvotoka intraoperativni prediktivni faktori za rehospitalizaciju bolesnika do godinu dana nakon kardiohirurškog zahvata.

Ključne reči: rehospitalizacija, faktori rizika, kardiohirurške intervencije

RISK FACTORS FOR READMISSION OF PATIENTS AFTER CARDIAC SURGERY

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Introduction: Cardiac surgery today represent the most common surgical procedures. Postoperative complications directly affect the length of hospital stay and later readmission.

The Aim: To determine the effect of preoperative factors (sex, age, BMI) and procedural factors (type of cardiac surgery, duration of total clamp (cardiac arrest) and extracorporeal circulation) on the incidence of readmission within one year of operation.

Materials and Methods: The study was conducted by analyzing data of all patients underwent cardiothoracic procedure at the Clinic of Cardiovascular Surgery, Institute of Cardiovascular Diseases Vojvodina during 2009. year.

Results: The total sample consisted of 1155 patients underwent cardiac surgery. 776 of them (67%) were male. Of all operated patients, 80 (6.92%) were readmitted in one year from the date of surgery. Patients who were older than 65 year were more frequently readmitted (8.08% / 5.93%). The readmission rate for patients after coronary surgery was 4.81%, after valvular surgery (aortic valve replacement and mitral valve) 7.53% and after combined surgery (coronary and valvular surgery) 12.44%. The average cross-clamping time in readmitted patients was 80.68 minutes, and in other patients 72.66 minutes. Average duration of extracorporeal circulation in readmitted patients was 97.43 minutes, and in other patients 87.72 minutes

Conclusion: Age is a preoperative predictive factor, while the type of surgery, length of the clamp and extracorporeal circulation are intraoperative predictive factors for readmission of patients one year after cardiac surgery.

Key words: readmission, risk factors, cardiac surgery

ZNAČAJ HIRURGIJE U LEČENJU METASTATSKE BOLESTI KOLOREKTALNOG KARCINOMA PLUĆA I JETRE

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Uvod: Kolorektalni karcinom (CRC) je po učestalosti treći malignitet u svetu. Približno polovina pacijenata razvije udaljene metastaze (mCRC), zavisno od stadijuma primarnog CRC: u jetri u 20% - 70% bolesnika, u plućima 10% - 20%. Hirurgija je usmerena na povećanje stope resektabilnosti i višegodišnjeg preživljavanja.

Cilj: utvrditi obim, mesto i značaj hirurgije u tretmanu mCRC na plućima i jetri.

Materijal i metode: Retrospektivnom analizom obuhvaćeno 76 pacijenata oba pola, operisanih u periodu od 01.01.2007. do 31.12.2011. na Klinici za grudnu hirurgiju Instituta za plućne bolesti Vojvodine zbog prisutnih mCRC. Podeljeni su u tri grupe zavisno od lokalizacije metastaza: na plućima, na jetri, na plućima i jetri. Analizirana je uloga hirurškog tretmana u lečenju ovih pacijenata.

Rezultati: Operisano je 49 osoba muškog i 27 osoba ženskog pola, sa pikom javljanja primarnog CRC od 47.4% u starosnoj dobi 60 - 69 godina. Kod 61.8% pacijenata primarni CRC lokalizacije na kolonu (od čega 63.8% na sigmoidu). Izvršena je 121 operacija, 1.7 operacija po pacijentu. Odstranjene su 202 metastatske promene, odnosno 2.9 metastaza po pacijentu i 1.7 po operaciji. CRC kolona dvostruko češće metastazirao u jetru, podjednako u desno i levo pluće, a CRC rektosigme i rektuma približno jednako u jetru i oba plućna krila. Jednu operaciju metastaze imalo je 56.6% pacijenata, dve 31.6%, a tri i više 11.8% pacijenata.

Zaključak: Hirurgija predstavlja jedino radikalno lečenje mCRC, moguća je kod većeg broja pacijenata upotrebom hemioterapije, bezbedna je ukoliko se operacija planira i izvede na onkološki radikalni način: R0 resekcija sa prezervacijom tkiva pluća i jetre. Krajnji cilj je potpuno uklanjanje malignog tkiva metastaze resekcijom više metastaza - istovremeno ili etapno. Sistem praćenja svih pacijenata doprineo bi pravoj proceni dalje evolucije oboljenja i stope mortaliteta.

Ključne reči: kolorektalni karcinom, metastaze, mCRC, pluća, jetra, hirurški tretman

SIGNIFICANCE OF SURGERY IN TREATMENT OF COLORECTAL METASTATIC DISEASE IN LUNGS AND LIVER

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Introduction: Colorectal carcinoma (CRC) is third of malignancy in the world. Near half of patients develop metastases (mCRC), depending of primary CRC: in liver 20% - 70% of patients, in lungs 10% - 20%. Surgery is directed on increasing of rate of respectability and several years survival.

The Aim: to determine volume, place and significance of surgery in treatment mCRC of lungs and liver.

Materials and Methods: The retrospective analysis included 76 patients, male and female, who were surgically treated in period 01.01.2007. - 31.12.2011. in Clinic for thoracic surgery of Institute for lung diseases of Vojvodina with diagnosed mCRC. Patients were separated in three groups depending of metastases localization: in lungs, in liver, in lungs and liver. It was analysed role of surgery treatment in healing of these patients.

Results: There were 49 males and 27 females, with primary CRC peak of 47.4% in age 60 - 69 years. In 61.8% of patients primary CRC had localization in colon (of which 63.8% in sigma). It was done 121 surgeries, 1.7 surgery per patient. There were removed 202 metastases, respectively 2.9 metastases per patient and 1.7 per surgery. CRC in colon twice as often gave metastases in liver, equally in right and left lung, but CRC in rectosigma and rectum approximately the same in liver and both lungs. One surgery had 56.6% of patients, two 31.6%, and three or more 11.8% of patients.

Conclusion: Surgery is the only radical treatment of mCRC, it's possible within more patients using chemotherapy, safe if surgery is well planned and done on oncological radical way: R0 resection with preservation of lungs and liver tissue. The ultimate goal is completely removing malignant tissue of metastases by resection more metastases - in same time or in stages. Monitoring system of these patients could contribute proper evaluation further evolution of the disease and also mortality rate.

Key words: colorectal carcinoma, metastases, mCRC, lungs, liver, surgery treatment

HIRURŠKO LEČENJE OBOLJENJA ŠTITASTE ŽLEZDE KOD DECE I ADOLESCENATA

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Uvod: Iako su oboljenja štitaste žlezde kod dece znatno ređa, zahtevaju adekvatan pristup dijagnozi i lečenju. Ovaj pristup je predmet sučeljavanja veoma različitih stavova, imajući u vidu da se godišnje objavi oko 2500 stručnih radova o oboljenjima štitaste žlezde.

Cilj rada: Analiza učestalosti pojedinih oboljenja štitaste žlezde kod dece i adolescenata, distribucija prema polu i uzrastu i ispitivanje razlike učestalosti u odnosu na populaciju odraslih.

Materijal i metode: U ovom radu su analizirani podaci za 170 bolesnika mlađih od 20 godina, čija je prosečna starost 16,8 godina, koji su u desetogodišnjem periodu, u Centru za endokrinu hirurgiju KC Srbije u Beogradu, lečeni hirurškim putem zbog oboljenja štitaste žlezde. Podaci su upoređeni sa populacijom odraslih.

Rezultati: Maligna oboljenja u populaciji dece i adolescenata učestvuju sa 34,12%, a benigna sa 65,88%. Najčešće maligno oboljenje je papilarni karcinom (oko 30%), a najčešća benigna čine benigni tumori i ciste (30,59%). Najveći broj operisanih pripada uzrasnoj grupi od 15 do 20 godina (77,06%). U populaciji odraslih maligna oboljenja učestvuju sa 27,36%, a benigna sa 72,64%. Od malignih oboljenja najčeći je, takođe papilarni karcinom (22,08%), a od benignih benigna struma (32,64%).

Zaključak: Sa povećanjem starosti povećava se učestalost oboljenja štitaste žlezde, a pretežno se javljaju kod osoba ženskog pola. U populaciji dece i adolescenata značajno viša je pojava papilarnog karcinoma, kao i Morbus Graves i benignih tumora, dok se kod odraslih značajno češće javljaju benigna struma i Thyroiditis Hashimoto.

Ključne reči: deca; adolescenti; oboljenja štitaste žlezde;

KORELACIJA IZMEĐU EPIDEMIOLOŠKO-RADIOLOŠKIH KARAKTERISTIKA I MESTA PRELOMA VRATA BUTNE KOSTI

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Uvod: Vrat butne kosti je prosečne debljine 3.5cm i formira sa dijafizom kolo-dijafizalni ugao koji iznosi 120°-140°. Prelom vrata butne kosti praćen je visokim morbiditetom i mortalitetom. Prelomi vrata butne kosti se po mestu preloma dele na bazicervikalne, transcervikalne i subkapitalne.

Cilj: Cilj rada je da pokažemo da li postoji veza između mesta preloma vrata butne kosti i radioloških i epidemioloških karakteristika pacijenata.

Materijal i metode: Ispitivanje je obuhvatilo analizu podataka 28 pacijenata, hospitalizovanih zbog preloma vrata butne kosti. Metoda se zasniva na analizi istorija bolesti i merenju radiografskih karakteristika pacijenata. Pacijente smo u okviru oba pola podelili na tri podgrupe (po mestu preloma), koje smo poredili na osnovu starosti, kolo-dijafizalnog ugla i debljine vrata butne kosti.

Rezultati: Bazicervikalni prelom imali su devet muškaraca i dve žene, transcervikalni pet muškaraca i pet žena, i subkapitalni dva muškarca i pet žena. Muškarci imaju veću verovatnoću bazicervikalnog($p=0.035$), žene veću verovatnoću subkapitalnog($p=0.08=0.05$), dok kod transcervikalnog preloma nema razlike($p=0.1$). Starost kod muškaraca($p=0.2$) i kod žena($p=0.3$), kolo-dijafizalni ugao kod muškaraca($p=0.97$) i kod žena($p=0.3$) i debljina vrata butne kosti kod muškaraca($p=0.85$) nisu povezani sa mestom preloma. Transcervikalni prelom je učestaliji kod žena sa manjom, dok je subkapitalni prelom učestaliji kod žena sa većom debljinom vrata butne kosti($p=0.05$).

Zaključak: Muškarci imaju veću verovatnoću bazicervikalnog, a žene subkapitalnog preloma. Transcervikalni prelom češće imaju žene sa manjom, dok subkapitalni prelom češće imaju žene sa većom debljinom vrata butne kosti.

Ključne reči: mesto preloma vrata butne kosti, kolo-dijafizalni ugao, debljina vrata butne kosti

SURGICAL TREATMENT OF THYROID DISEASE IN CHILDREN AND ADOLESCENTS

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Introduction: Although children thyroid diseases are considerably lower, they require adequate access to diagnosis and treatment. This approach causes many debates based on different views of this disease, considering that there are about 2500 papers, published annually regarding on disease of the thyroid gland.

The Aim: To analyze a frequency of thyroid diseases in population of children and adolescents, distribution based on sex and age difference at frequency, comparing with adult population.

Material and methods: In this paper we analyzed data from 170 patients younger than 20 years, average age 16,8 years, who were treated surgically due to thyroid gland diseases, during ten-year period in the Endocrine Surgery Center of Serbia, Belgrade. Data are compared with adult population.

Results: Of total thyroid diseases, malignant diseases take 34,12% and benign 65,88%. The most common malignant disease is papillary carcinoma (about 30%) and benign are cysts and benign tumors (30,59%). The largest number of operated patients belongs to age group from 15 to 20 years (77,06%). In adult population malignant participated with 27,36% and benign with 72,64%. Of total malignant diseases the most often is, also, papillary carcinoma (22,08%) and of benign, benign goitre (32,64%).

Conclusion: With age increasing the frequency of thyroid diseases increases, and they occur mostly at female population. Appearance of papillary carcinoma is more often in population of children and adolescents, as well as Morbus Graves and benign tumors. On the other side, benign goitre and Thyroiditis Hashimoto are more often in adult population.

Keywords: children; adolescents; thyroid diseases

CORRELATION BETWEEN EPIDEMIO-RADIOLOGICAL CHARACTERISTICS AND PLACE OF FEMORAL NECK FRACTURE

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Introduction: Femoral neck, average width around 3.5cm, and diaphysis are forming neck-shaft angle, which has 120-140 degree. Femoral neck fracture has high incidence of morbidity and mortality. Based on place of femoral neck fracture, there are basicervical, transcervical and subcapital fracture.

The Aim: To determine whether the radiographic parameters and epidemiological parameters affect the place of femoral neck fracture.

Material and Methods: Our study comprises analysis of documentations of 28 patients, who were hospitalized for femoral neck fracture. Our method is based on patients history analysis and radiographic parameters measurements. In each sex group, patients were divided, based on place of femoral neck fracture, into three subgroups, which were compared depending on age, neck-shaft angle and femoral neck width.

Results: Nine men and two women had basicervical, five men and five women had transcervical, and two men and five women had subcapital fracture. Men have higher probability of basicervical($p=0.035$), women have higher probability of subcapital($p=0.08=0.05$) fracture. Age in men($p=0.2$) and women($p=0.3$), neck-shaft angle in men($p=0.97$) and women($p=0.3$), and neck width in men($p=0.85$), don't have influence on place of fracture. Women with smaller neck diameter have higher probability of transcervical, while those with bigger diameter have higher probability of subcapital fracture.

Conclusion: Men have higher probability of basicervical, while women have higher probability of subcapital fracture. Women with bigger neck diameter have higher probability of subcapital, while those with smaller one have higher probability of transcervical fracture.

Key words: place of the femoral neck fracture, neck-shaft angle, femoral neck width

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Uvod: Aspiracija stranog tela u traheobronhijalno stablo predstavlja urgentno stanje visokog rizika. Etiologija je različita, a pojava je karakteristična za sve uzraste sa najvećom incidencijom u pedijatrijskoj populaciji.

Ciljevi: Analizirati polnu i starosnu strukturu, tegobe zbog kojih su pacijenti primljeni i period od početka tegoba do hospitalizacije, kao i podatke o mogućoj aspiraciji stranog tela, podatke o bronhoskopiji i bronhoskopski nalaz.

Materijal i metode: U retrospektivnu studiju za period od pet godina, od januara 2007. do decembra 2011. godine, bilo je uključeno 18 ispitanika. Ispitivanu grupu činili su pacijenti sa sumnjom na prisustvo stranog tela u disajnim putevima.

Rezultati: Aspiracija stranog tela u traheobronhijalno stablo se javlja najčešće do treće godine života, sa podjednako zastupjenošću u oba pola. Najčešće tegobe pacijenata koje se navode su kašalj, otežano i čujno disanje. Period od početka simptoma do prijema i izvođenja bronhoskopije kod većeg broja pacijenata je značajno duži od 24-48 sati. Više od polovine roditelja daje podatke o mogućoj aspiraciji stranog tela. Skoro trećina pacijenata je primljena kao hitno stanje. Rigidna bronhoskopija je izvedena u opštoj, najčešće balansiranoj anesteziji, sa prosečnim trajanjem od 40 minuta. Kod 77,78% pacijenata je pronađeno strano telo u disajnim putevima, pri čemu je kod više od polovine strano telo pronađeno u desnom bronhijalnom stablu. Kod polovine pacijenata strano telo je činila hrana, najčešće zrnjevlje (kikiriki, orasi, lešnici).

Zaključak: Obzirom na rezultate proistekle iz našeg ispitivanja i rezultate brojnih studija, pažnju treba posvetiti edukaciji roditelja o potencijalnim rizicima aspiracije stranog tela i metodama prevencije.

Ključne reči: strana tela, bronhoskopija

FOREIGN BODIES IN THE AIRWAYS IN PEDIATRIC POPULATION

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Introduction: Foreign body aspiration into tracheobronchial tree represents an urgent condition at a high level of risk. Etiology is different, and this condition is typical for all ages with highest incidence in pediatric population.

Aims: To analyze gender and age distribution, problems due to which patients are admitted and period from onset of symptoms to hospitalization, as well as information about possible foreign body aspiration, bronchoscopy data and bronchoscopic findings.

Material and methods: Retrospective study for a period of five years, from January 2007 to December 2011, included 18 patients. The study group consisted of patients with suspected foreign body aspiration.

Results: Aspiration of foreign bodies into tracheobronchial tree occurs most often by the age of three, with equal presence into both genders. The most common symptoms were cough, shortness of breath and audible breath. Time interval from onset of symptoms to admission and performance of bronchoscopy in a significant number of patients was considerably longer than 24-48 hours. More than half of the parents gave information about a possible foreign body aspiration. Nearly a third of the patients were admitted as an emergency condition. Rigid bronchoscopy was performed under general, mostly balanced anesthesia, and mean duration of 40 minutes. In 77,78% of patients a foreign body was found in the airways, where more than half of the foreign bodies were found in the right bronchial tree. In half of the patients the foreign body was food, most commonly seeds (peanuts, nuts, hazelnuts).

Conclusion: Based on the results of our research as well as the results of numerous studies, attention should be devoted to the education of parents about the potential risks of foreign body aspiration and prevention methods.

Key words: foreign bodies, bronchoscopy

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Uvod: Povreda slezine u abdominalnoj traumi predstavljaju skoro 60% od svih povreda intraabdominalnih organa i predstavljaju najčešću izolovanu povredu u trauma centrima.

Cilj: Cilj istraživanja je da se izvrši klinička procena pojedinih dijagnostičkih metoda i postupaka u ranom otkrivanju povreda slezine i njihov značaj u donošenju odluke za operativnim tretmanom.

Materijal i metode: U periodu januar 2010–decembar 2011. godine u Centru za Urgentnu hirurgiju KCS i na Hirurškoj klinici KBC Priština, sa privremenim sedištem u Gračanici zbrinuto je 197 politraumatizovanih bolesnika od kojih 104 sa povredom slezine. 87 pacijenata sa povredom slezine je imalo tupu, a samo 17 pacijenata je imalo penetrantnu povredu. Najčešći uzrok povreda su saobraćajne nezgode (70%), a zatim pad sa visine (15%). Velika je prevalenca muškog pola.

Rezultati: U našem istraživanju preciznost dijagnostičke peritonealne punkcije je veoma visoka-92,7%, bez evidentiranih komplikacija. Preciznost UZ pregleda je oko 89,4%, dok podaci dobijeni CT pregledom pokazuju visoku preciznost-96%.

Zaključak: Dijagnoza intraabdominalnog krvarenja uzrokovano povredom slezine mora biti izvedena u najkraćem vremenskom intervalu, sa malim rizikom po bolesnika, a sa visokom tačnošću. CT zauzima vodeće mesto po pitanju dijagnostikovanja povreda slezine kod hemodinamski stabilnih pacijenata, dok je kod hemodinamski nestabilnih pacijenata dijagnostička metoda izbora DPP.

Ključne reči: politrauma, slezina, dijagnostika.

ASSESSMENT OF DIAGNOSTIC METHODS AT SPLEEN INJURE IN POLYTRAUMA

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Introduction: Spleen injuries in abdominal trauma represent almost 60% of all injuries to the intra-abdominal organs, and they account for the most frequently isolated injuries in trauma centers.

Aim: The purpose of this medical research is clinical assessment of the diagnostic methods and treatments for the early discovery of spleen injury and their importance in making a decision regarding surgical treatment.

Materials and methods: During the period January 2010 - December 2011 in the Center for Emergency surgery CCS and in the Surgical Clinic CHC Pristina with temporal seat in Gračanica, 197 poly-traumatized patients were treated, out of which 104 had injuries to their spleens. 87 patients with spleen injuries had blunt, and just 17 of them had penetrating injuries. The most common cause of these injuries are traffic accidents (70%), followed by falls (15%). There is a big prevalence of males among the injured.

Results: In our research, the precision of diagnostic peritoneal puncture is very high-92,7% without any complications noticed.

The precision of the UZ test is about 89,4% while information taken from CT test shows a high precision-96%.

Conclusions: Diagnosis of intraabdominal hemorrhage caused by spleen injury has to be done as soon as possible, with the minimum risk for the patient, and with high precision. CT test takes a leading position when we speak of diagnosis of spleen injuries for hemodynamic stable patients, while for hemodynamic unstable patients the choice should be the DPP method.

Keywords: polytrauma, spleen, diagnosis.

POSTOPERATIVNI OPORAVAK KOD PACIJENATA SA LAPAROSKOPSKI IZVEDENOM HOLECISTEKTOMIJOM SA I BEZ DRENAŽE

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Uvod Hirurzi su postali podeljeni po pitanju upotrebe drenova kod operacija koje nisu pratile intraoperativne komplikacije.

Cilj Cilj ovog rada je da proceni da li postoji razlika u dužini boravka u bolnici i da li dolazi do pojave postoperativnog bola kod pacijenata, podvrgnutih elektivnoj hirurgiji nekomplikovanih bolesti žučne kese, sa i bez drena.

Materijal i metode Ova studija je retrospektivnog karaktera, u kojoj su podaci prikupljeni iz protokola i istorija bolesti pacijenata, kao i odeljenske naučno-istraživačke dokumentacije, koji su operisani na I (prvom) odeljenju klinike za digestivnu hirurgiju Kliničkog centra Srbije u periodu od januara 2011 do decembra 2011 godine. Pacijenti su podeljeni u dve grupe, sa i bez drena.

Rezultati U ovom istraživanju je učestvovalo 114 operisanih pacijenata. Nije uočena statistički značajna razlika u postoperativnom bolničkom boravku između 2 grupe, ali postoperativni bol je bio značajno povećan kod pacijenata sa postavljenim drenom, i dobijena je statistički visoko značajna razlika. ($P < 0.01$)

Zaključak Rezultati ovog rada pokazuju da rutinska primena drenova kod laparoskopski operisanih nekomplikovanih bolesti žučne kese ima malo da ponudi i nasuprot tome pokazala se povezanom sa većim postoperativnim bolom.

Ključne reči Dreniranje, laparoskopiska holecistektomija, bol, bolnički boravak

SAVREMENI MATERIJALI U GINEKOLOŠKOJ UROLOGIJI

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Uvod: Biomaterijal je bilo koja supstanca ili kombinacija supstanci, sintetička ili prirodna, koja može biti upotrebljena tokom bilo kog vremenskog perioda, kao celina ili deo sistema koji leci, ili zamenjuje bilo koje tkivo, organ ili funkciju u organizmu (NIH, 1982)

Cilj: Cilj rada je ispitivanje karakteristika i primene savremenih materijala u ginekološkoj urologiji.

Metode: Rad je baziran na ispitivanju biomaterijala u pogledu biokompatibilnosti, poroznosti, ultrastrukture, elastičnosti, izdržljivosti, memorije i načina aplikacije. Ispitivanje je urađeno korišćenjem Medline database.

Rezultati: Najčešće upotrebljavani sintetski biomaterijal u uroginekologiji je polipropilen. Pleteni makroporni polipropilen je materijal izbora za suburetralnu implantaciju, daje određeni stepen fibroze i malu inflamatornu reakciju. TVT Secur® (Gynecare) je makroporna monofilamentna polipropilenska traka (Prolen) sa apsorptivnim krajevima za fiksaciju i predstavlja standardnu referencu za aktuelne i nove materijale. Safyre® TOT daje izuzetno visoku stopu uspeha od 97%, bez komplikacija. Pelvicol® je prirodni kolageni acelularni biomaterijal, u upotrebi je kao suburetralni sling, kolposuspenzija, kod vaginoplastike, cistoplastike, faloplastike. U prolaps hirurgiji je vrlo efektivan 95%.

Zaključak: Sintetski biomaterijali zbog svoje postojanosti, dostupnosti, optimalne rastegljivosti, kao i male mogućnosti prenosnja biopatogena su idealni u uroginekologiji. Pleteni makroporni polipropilen je materijal izbora za suburetralnu implantaciju. TVT Secur® (Gynecare) je standardna referenca za aktuelne i nove materijale, dok Safyre® TOT postaje novi standard u uroginekologiji.

Ključne reči: Polipropilen, TVT Secur® (Gynecare), Safyre® TOT

POSTOPERATIVE RECOVERY IN PATIENTS WITH LAPAROSCOPIC CHOLECYSTECTOMY PERFORMED WITH AND WITHOUT DRAINAGE

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Introduction Surgeons have become divided on the opinion when it comes to usage of drains in non complicated laparoscopic cholecystectomy.

The aim The aim of this study was to show are there differences in the length of hospital stays and postoperative pain in patients subjected to laparoscopic cholecystectomy with or without drainage.

Material and methods This study is of retrospective character in which the data were acquired from hospital protocols and patient medical documentation and also medical departments scientific database which were operated at the I (first) ward of the clinic for digestive surgery, Clinical center of Serbia from January 2011 until December 2011. Patients were divided into two groups, those with and without drainage.

Results In this research 114 operated patients charts were processed. A statistical importance was not found when comparing the postoperative stay of the two groups, but postoperative pain was significantly increased in patients with a drain in place ($P < 0.01$).

Conclusion The results of this study show that routine drain placement in laparoscopically operated, noncomplicated, gallbladder disease has little to offer and in contrast it is associated with increased postoperative pain.

Key words Drainage, laparoscopic cholecystectomy, pain, hospital stay

MODERN MATERIALS IN GYNECOLOGICAL UROLOGY

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Introduction: Biomaterial is substance or mixture of substances, synthetic or natural, that can be used during the time, as a whole or a part of the leaflets, or replaces any tissue, organ or function in the body (NIH, 1982)

The aim: The aim of study was to investigate application of modern materials in gynecological urology.

Methods: This study investigate biomaterials and their biocompatibility, porosity, construction modality, tensile strength, elasticity, durability, shape and memory and methods of application. This investigation was undertaken with the use of the Medline database.

Results: The most commonly used synthetic biomaterial in a polypropylene. Knitted macroporous polypropylene is the material of choice for suburethral implantation and gives a certain degree of fibrosis and a small inflammatory reaction. TVT Secur® (Gynecare) is monofilament polypropylene tape with absorptive ends for fixation and it is a standard reference for current and new materials. Safyre® TOT provides an extremely high success rate of 97%, without complications. Pelvicol® is a natural acellular collagen biomaterial, used as a suburethral sling, colpoplasty, vaginoplasty, cystoplasty, phalloplasty. In prolapse surgery is very effective 95%.

Conclusion: Synthetic biomaterials because of their durability, availability, and maintenance of tensile strength, and low theoretical transmission of potential biopathogens are vital in uro-gynecology. Macroporous knitted polypropylene is the material of choice for suburethral implantation. TVT Secur® (Gynecare) is a standard reference for current and new materials, while TOT Safyre® becomes the new standard in gynecological urology.

Keywords: Polypropylene, TVT Secur® (Gynecare), Safyre® TOT

OPERATIVNI TRETMAN VARIKOKELE SA OLIGOASTENOSPERMIJOM

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Uvod: Varikokela je plexus sa "melanholicnom" krvlju - Ambroise Parre, XVI vek. Patofiziološki model varikokele je sledeći: venski refluks dilatira pampiniformne venske plekse, podiže hidrostatski pritisak, podiže temperaturu testisa i smanjuje ukupnu funkcionalnost testisa.

Cilj rada: Cilj rada je ispitati uticaj operacija koje imaju za cilj eliminaciju varikokele na broj željenih trudnoća partnerki. Ispitati uspešnost zahvata u smislu dužine trajanja operativnog zahvata, anestezije i hospitalizacije kao i javljanja eventualnih komplikacija.

Materijal i metode: Tretirali smo 16 pacijenata UHB "Simonida" u Gračanici. Pacijenti su randomizovani po kriterijumu - mima za infertilne parove i muški infertilitet-subfertilitet: prisustvo varikokele, abnormalan spermogram, ginekološki status partnerke (uredan), minimum godinu dana zajedničkog života bez začeća.

Rezultati: Svi pacijenti su na kontrolnim spermogramima (3 nedelje posle operacije i odmah po medikamentoznom tretmanu, u slučajevima kada je bio pridodat) pokazali povećanje broja spermatozoida i povećanje normalnih oblika semenih ćelija.

Zaključak: Varikokela se nalazi u osnovu mnogo subfertilnih i infertilnih muškaraca. Ona se smatra mogućim uzrokom muške neplodnosti a sigurno je precipitirajući faktor. U većini slučajeva tretman varikokele dovodi do poboljšanja ili uklanjanja muških faktora fertiliteta i povećanja broja trudnoća. Tretman varikokele je jeftiniji i uspešniji nego metoda arteficalne fertilizacije. Tačna patofiziologija varikokele nije sasvim razjašnjena. Smatramo da je subingvinalna ligatura spermaticne vene minimalno invazivan i isplativ početni tretman "inferilnih parova".

Ključne reči: varikokela, oligoastenospemija, sterilitet, subingvinalna ligature.

OPERATIVE TREATMENT WITH VARICOCELE OLIGOASTHENOSPERMIA

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Introduction: Varicocele is a plexus with "melancholic" blood – Ambroise Parre XVI century. Pathophysiological model of varicocele is the following: venous reflux dilates pampiniform venous plexuses, raises the hydrostatic pressure, raises the temperature of the testicles and reduce the overall functionality of the testis.

The Aim: The aim of this paper is to examine the impact of operations aimed at the elimination of varicocele on pregnancy desired partner. Examine the success of interventions in terms of duration of surgery, anesthesia and hospitalization as well as occurrence of any complications.

Materials and Methods: We treated 16 patients UHB "Simonida" in Gracanica. Patients were randomized according to the criteria for infertile couples and male infertility-subfertility: the presence of varicocele, abnormal spermogram, gynecological status partner (neat), at least one year without the coexistence of conception.

Results: All patients in the control spermograms (3 weeks after surgery and immediately after drug treatment, in cases when it was appended) showed an increase in sperm count and increase cells of normal forms.

Conclusion: Varicocele is the basis of many subfertile and infertile men. It is considered a possible cause of male and certainly the precipitating factor. In most cases, the treatment of varicocele leads to the improvement or removal of male fertility factor and increase the number of pregnancies. Varicocele treatment is cheaper and more successful than the method of artificial fertilization. The exact pathophysiology of varicocele is not completely clarify. We find that subinguinal ligation of spermatic veins is minimally invasive and cost-effective initial treatment "infertile pairs".

Keywords: varicocele, oligoasthenospermia, sterilite, subinguinal ligation.

UTICAJ INTRAOPERATIVNIH PARAMETARA NA POJAVU KOMPLIKACIJA NAKON CEFALICNE DUODENOPANKREATEKTOMIJE KOD BOLESNIKA SA TUMORIMA PERIAMPULARNE REGIJE

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Uvod: Periampularni karcinomi uključuju adenokarcinom glave, vrata i unkinatnog nastavka pankreasa, Vaterove ampule, distalnog hloedoha i duodenuma. Duodenopankreatektomija je standardna operacija u hirurgiji periampularnih karcinoma. Učestalost postoperativnih komplikacija je i dalje visoka, i iznosi između 30% i 60%.

Cilj studije: Cilj naše studije je da se analizira uticaj intraoperativnih faktora (kvaliteta pankreasa, promer glavnog pankreasnog kanala, dužina trajanja operacije i intraoperativna transfuzija krvi) na učestalost pojave postoperativnih komplikacija.

Materijali i metode: Prospektivno je analizirano 159 bolesnika, od 2008 - 2011 godine, kod kojih je uradjena cefalčna duodenopankreatektomija na Klinici za digestivnu hirurgiju KCS. Analizirani su pojedinačno intraoperativni faktori koji bi mogli imati uticaj na pojavu postoperativnih komplikacija: kvalitet pankreasa (mek, tvrd, umereno tvrd), promer glavnog pankreasnog kanala, dužina trajanja operacije i intraoperativna transfuzija krvi.

Rezultati: Prosečna starost pacijenta iznosila je 65.7 ± 10.3 godina starosti, od kojih je 61% muškog pola. Nakon operacije pankreasa navedene komplikacije su se desile u 67 slučajeva (42.1%). Značajno najčešća komplikacija je pankreasna fistula (73.1%), dok su ostale komplikacije u značajno manjem procentu (8-10 % slučajeva). Prosečna vrednost promera glavnog pankreasnog kanala kod pacijenata sa komplikacijama značajno je manji od promera kod pacijenata koji nisu imali komplikacije. Kvalitet pankreasa – mek, je sa signifikantno većom verovatnoćom zastupljen kod pacijenata sa komplikacijama. U grupi pacijenata bez komplikacija manji broj pacijenata primio je transfuziju.

Zaključak: Naši rezultati pokazuju da su niži promer pankreasnog kanala i kvalitet pankreasa – mek, primarni faktori rizika za nastanak postoperativnih komplikacija bilo koje vrste, prvenstveno pankreasne fistule.

Ključne reči: Pankreatikoduodenektomija, pankreasna fistula, postoperativna hemoragija

EFFECT OF INTRAOPERATIVE PARAMETERS ON THE OCCURRENCE OF COMPLICATIONS AFTER CEPHALIC DUODENOPANCREATECTOMY IN PATIENTS WITH TUMORS OF PERIAMPULARE REGION

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Introduction: Duodenopancreatectomy is a standard operation for periampullary cancers of pancreas. The incidence of postoperative complications is still high, between 30% and 60%.

Objective: We analysed the influence of different intraoperative factors (quality of the pancreas, diameter of main pancreatic duct, duration of the procedures and intraoperative blood loss) in the incidence of postoperative complications.

Materials and Methods: 159 patients were prospectively analysed from 2008. to 2011. To all patients a standard cephalic duodenopancreatectomy was performed at the Department of Digestive Surgery, Clinical Centre of Serbia. Intraoperative factors that could affect the occurrence of postoperative complications were analysed separately: the quality of the pancreas (soft, hard, moderately hard), the main pancreatic ductal diameter, duration of the procedures and intraoperative blood loss.

Results: The average patients age was 65.7 ± 10.3 years, 61% were men. After surgery procedures, complications were occurred in 67 cases (42.1%). Significantly, the most common complication was pancreatic fistula (73.1%), while other complications had significantly lower percentage (8-10% per cases). The average value of the diameter of the main pancreatic duct in patients with complications was significantly smaller than the diameter in patients who had no complications ($p < 0.05$). The quality of the pancreas - soft, was significantly presented in a the group of patients with complications. In the group of patients without complications, less patients received transfusions ($p < 0.05$).

Conclusion: Our results show that the lower diameter of the pancreatic duct and pancreas quality - soft, are the primary risk factors for postoperative complications of any kind, especially pancreatic fistula.

Key words: Duodenopancreatectomy, pancreatic fistula, postoperative haemorrhage

ULOGA I ZNAČAJ PROCEDURALNE SEDACIJE I ANALGEZIJE KOD ENDOSKOPSKE RETROGRADNE HOLANGIOPANKREATOGRAFIJE

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Uvod: Proceduralna sedacija (PSA) je tehnika aplikacije sedativa i disocijativnih lekova sa ili bez opioida. Ona predstavlja važan element kod kompleksnih gastrointestinalnih endoskopskih procedura, kao što je endoskopska retrogradna holangiopankreatografija (ERCP). Pored toga što smanjuje bol, neprijatnost i stres, proceduralna sedacija omogućava optimalne uslove za izvođenje ovako zahtevne endoskopske metode.

Cilj: Naglasiti krucijalnu ulogu proceduralne sedacije i analgezije kod endoskopske retrogradne holangiopankreatografije, radi uspešnosti intervencije i subjektivnog zadovoljstva bolesnika koji se podvrgavaju ERCP metodi.

Materijal i metode: Prospektivnom studijom, ispitano je 165 bolesnika koji su se podvrgnuli endoskopskoj retrogradnoj holangiopankreatografiji, u Urgentnom Centru, Kliničkog Centra Vojvodine, u Novom Sadu, u periodu od septembra 2010. do aprila 2011. godine. Statistički su obrađeni sledeći podaci: pol, starosna dob, indikacija za ERCP, postavljanje bilijarne endoproteze i postoperativne komplikacije. Bolesnici su popunjavali individualnu listu stepena zadovoljstva u kojoj su, zaokružujući brojeve 1-10, ocenili osećaj zadovoljstva i subjektivnog komfora primenjenom vrstom anestezije kao i celokupan rad anesteziologa, gastroenterologa i zdravstvenog osoblja.

Rezultati: Od ukupnog broja bolesnika, 52% su bili muškog pola i 48% ženskog pola. Na osnovu zastupljenosti po životnoj dobi, 29% bolesnika je bilo starosne dobi 60 do 70 godina. 55% bolesnika se podvrgnulo proceduri zbog benignih uzroka. Maligni uzroci su nađeni kod 13% bolesnika. Kod preostalih 32% bolesnika uzroci za izvođenje ERCP su bili neokluzivna holocholelitijaza i dilatacija hepatoholedoha. Kod 13% je postavljena bilijarna endoproteza. Kod 81% postoperativni period je bio bez komplikacija.

Zaključak: Celokupan rad anesteziologa, gastroenterologa, zdravstvenog osoblja kao i subjektivni osećaj, bolesnici su ocenili sa najvišom ocenom broj 10. Svetska zdravstvena organizacija kao i podaci svetske literature ukazuju na ekspanziju i značajan porast broja bolesnika koji se podvrgavaju PSA tehnici u toku ERCP procedura.

Ključne reči: proceduralna sedacija i analgezija, endoskopska retrogradna holangiopankreatografija, komplikacije.

ROLE AND SIGNIFICANCE OF PROCEDURAL SEDATION AND ANALGESIA FOR ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY

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Introduction: Procedural sedation (PSA) is technique of administering sedatives and dissociative agents with or without analgesics. It is an important element in complex gastrointestinal endoscopic procedures, like endoscopic retrograde cholangiopancreatography (ERCP). Besides alleviating pain, discomfort and stress, procedural sedation provides optimal conditions for performing demanding endoscopic methods.

The Aim: Accentuate crucial role of procedural sedation and analgesia during endoscopic retrograde cholangiopancreatography, for the purpose of intervention successfulness and subjective satisfaction of patients undergoing ERCP method.

Materials and Methods: At the Emergency Center of the Clinical Center of Vojvodina in Novi Sad, 165 patients were analyzed in the period from September 2010 until April 2011 using a prospective study. Following data was analyzed statistically: gender, age, indication for ERCP, placement of biliary endoprosthesis, and postoperative complications. Patients filled out a satisfaction degree sheet, by circling numbers 1-10, in which they graded the level of satisfaction and subjective comfort with the administered type of anesthesia, as well as the entire work of the anesthesiologist, gastroenterologist and hospital staff.

Results: Out of total number of patients, 52% were males and 48% were females. Based on the age, 29% of patients were 60 to 70 years of age. 55% of patients underwent the procedure due to benign causes. Malignant causes were found in 13% of patients. Indications for performing ERCP in the remaining 32% of patients were nonocclusive choledocholithiasis and dilatation of hepatoholedochus. Biliary endoprosthesis was placed in 13% of patients. In 81% of patients, postoperative period was without complications.

Conclusion: Entire work of anesthesiologists, gastroenterologists and hospital staff, as well as their subjective feeling, patients evaluated with the highest grade of 10. World Health Organization and data from world literature suggest expansion and significant increase in number of patients undergoing PSA technique during ERCP procedures.

Key words: procedural sedation and analgesia, endoscopic retrograde cholangiopancreatography, complications.

ETIOLOŠKA DISTRIBUCIJA I INICIJALNA PROCENA FORME AKUTNOG PANKREATITISA

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Uvod: Akutni pankreatitis (AP) je akutni inflamatorni proces pankreasa, kojih zahvatao stala regionalna tkiva i udaljene organske sisteme. Klinički prezentacija varira od lake forme (MP-Mild Pancreatitis)-intersticijalnog edema, u najvećem broju slučaja vezan za *Savarestitucioadintegram*; do teške forme (SP-Severe Pancreatitis)-multiorganskoštećenja i lileo-kalnih komplikacija (nekrozepankreasa, apscesailipseudociste).

Cilj: Na osnovu Nacionalnog protokola za AP, utvrditi inicijalnu procenu najčešćih etioloških faktora AP (bilijarna kalkuloza i alkoholizam) i inicijalnu procenu kliničke forme AP (laka i teška).

Materijal i metode: Retrospektivnom analizom obuhvaćeno je 126 pacijenata, obapola, uzrasta iznad 18 godina, hospitalizovanih i lečenih u Urgentnom Centru i na Klinici za abdominalnu, endokrinu i transplantacionu hirurgiju KCV, u periodu 01.01.-31.12.2011. godine. Kod svih urgentno hospitalizovanih pacijenata sadržajom AP, analizirali smo učestalost najčešćih etioloških faktora AP i izvršili inicijalnu procenu kliničke forme AP.

Rezultati: Etiološka distribucija pacijenata sa AP pokazuje veću učestalost bilijarnog AP-79 (63%), u odnosu na alkoholni AP-47 (37%), sastatistički značajnom razlikom ($p < 0.05$). Na osnovu kliničke slike, laku formu bilijarnog AP ima 72 pacijenta (91%), tešku-7 (9%), dok kod alkoholnog AP laku formu ima 39 pacijenata (80%), tešku-8 (20%), sastatistički značajnom razlikom ($p < 0.05$).

Zaključak: Na našem materijalu, jedini etiološki faktor AP bio je ili bilijarna kalkuloza ili alkoholizam. Primenom Nacionalnog protokola, moguća je pravilna inicijalna procena kliničke forme AP. **Tendencije u budućnosti** – rana identifikacija teške forme AP, pravovremena dijagnoza i adekvatna terapija, sa ciljem smanjenja mortaliteta (veći od 70%), koji čini tešku formu AP kompleksnom bolešću sa nepredvidivim ishodom.

Ključne reči: Akutni pankreatitis; klinička forma; etiološka distribucija.

ETIOLOGICAL DISTRIBUTION AND INITIAL EVALUATION FORM OF ACUTE PANCREATITIS

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Introduction: Acute pancreatitis (AP) is an acute inflammation of the pancreas, involving other regional tissues or distant organic systems. The clinical presentation varies from Mild Pancreatitis (MP)-interstitial edema, which finally ends in the most cases as *Savarestitucioadintegram*; to Severe Pancreatitis (SP)-multiple organ injury and/or local complications (pancreatic necrosis, abscess or pseudocyst).

The Aim: Determine an initial evaluation of the most frequent etiological factors for AP (biliary calculus and alcoholism) and initial clinical evaluation form of AP (mild and severe), based on National Protocol for AP.

Materials and Methods: The retrospective analysis included 126 patients, male and female, age over 18 years old, who were hospitalized and treated in the Emergency Center and at the Clinics for Abdominal, Endocrine and Transplantation Surgery at the CCV, in the period 01.01.-31.12.2011. In all of emergency hospitalized patients with the diagnosis of AP, we analyzed the frequency of the most frequent etiological factors for AP and performed an initial evaluation of the clinical form of AP.

Results: The etiological distribution of patients with AP shows higher frequency of biliary AP-79 (63%), compared to the alcoholic AP-47 (37%), with statistically significant difference ($p < 0.05$). Based on clinical picture, MP of biliary etiology has 72 patients (91%) and SP-7 (9%), while MP of alcoholic etiology has 39 patients (80%) and SP-8 (20%), with statistically significant difference ($p < 0.05$).

Conclusion: In our clinical material, the only etiological factor of AP was biliary calculus or alcoholism. Using the National Protocol, it is possible to correct the initial clinical evaluation form of AP. **The tendencies in the future** - early identification of severe pancreatitis (SP), timely diagnosis and adequate treatment, aimed to reduce mortality rate (higher than 70%), which makes SP complex form of the disease with unpredictable outcome.

Key words: Acute Pancreatitis; clinical forms; etiological distribution.

PROCENA INFORMISANOSTI I STAVOVA MUŠKOG DELA POPULACIJE O KARCINOMU PROSTATE I MOGUĆNOSTIMA ZA NJEGOVO PRAVOVREMENO OTKRIVANJE I LEČENJE

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Uvod: Karcinom prostate (KP) je treći po učestalosti maligni tumor kod muškaraca širom sveta i drugi vodeći uzrok smrtni muškaraca obolelih od malignoma. U cilju rane detekcije KP potreban je određeni nivo informisanosti kod muškaraca, kako bi se na vreme obratili lekaru.

Cilj: Procena informisanosti i stavova muškaraca u Srbiji o KP i mogućnostima za pravovremeno otkrivanje i lečenje ove bolesti.

Materijal i metode: U studiju je uključeno 256 muškaraca različite životne dobi i nivoa obrazovanja, odabranih metodom slučajnog izbora. Ispitanici su podeljeni u 2 grupe prema godinama starosti (do 40 i preko 40). Procena informisanosti i stavova vršena je pomoću ankete sa 12 zatvorenih pitanja sa višestrukim izborom. Informisanost i stavovi analizirani su u ukupnom uzorku, kao i između posmatranih grupa ispitanika.

Rezultati: Grupe ispitanika značajno su se razlikovale prema informisanosti o uspešnosti lečenja KP ($p < 0.01$), fazi u kojoj se KP najčešće otkriva ($p < 0.01$) i stavu o sprovođenju akcije radi boljeg informisanja muškaraca o ovoj bolesti ($p < 0.01$). 61% ispitanika starijih od 50 godina nije uradilo preventivni pregled prostate, iako im je to preporučeno. Od ukupnog broja ispitanika, 40% nije znalo kakva je učestalost pojavljivanja KP, jedna trećina nije znala koje tegobe prate KP, dok 50% njih nije čulo za PSA kao marker za otkrivanje KP. 90% ispitanika smatra da bi u Srbiji trebalo sprovesti akciju u cilju boljeg informisanja muškaraca o KP.

Zaključak: Rezultati studije ukazuju na nedovoljnu informisanost muškaraca o obolevanju od KP, pri čemu postoji opšta saglasnost za boljim informisanjem.

Ključne reči: karcinom prostate, muškarci, informisanost, stavovi

THE EVALUATION OF KNOWLEDGE AND ATTITUDES OF MEN ABOUT PROSTATE CANCER AND POSSIBILITIES FOR ITS EARLY DETECTION AND TREATMENT

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Introduction: Prostate cancer (PC) is the third most common cancer in men worldwide and the second leading cause of death in men suffering from cancer. The early detection of PC requires a certain level of awareness among men to consult the doctor on time.

The Aim: Evaluation of knowledge and attitudes of men in Serbia about PC.

Materials and Methods: The study included 256 men of various ages and education levels, selected randomly. They were divided into 2 groups according to age (up to 40 and over 40 years). The assessment of knowledge and attitudes was based on survey made up of 12 multiple choice questions, in the total sample as well as between the groups.

Results: The patient groups significantly differed according to knowledge about PC treatment success ($p < 0.01$), the stadium in which the PC is most frequently revealed ($p < 0.01$) and attitudes to community-based interventions for increasing the awareness of PC ($p < 0.01$). 61% of respondents over 50 years haven't done preventive prostate examination, despite recommendations. Of all respondents, 40% didn't know the incidence of PC, one third didn't know which symptoms accompany PC, while 50% haven't heard of PSA as a marker for PC detection. 90% of respondents believe the community-based intervention should be implemented in Serbia to increase the men awareness of PC.

Conclusion: The study has shown the lack of men knowledge about PC, while there is general agreement on necessity of spreading more information among men.

Keywords: prostate cancer, men, knowledge, attitudes

ZASTUPLJENOST RAZLIČITIH BAKTERIJSKIH SOJEVA KOD UROLOŠKIH BOLESNIKA U PERIOPERATIVNOM PERIODU

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Uvod: Infekcije urinarnog trakta (UTI) su druge po učestalosti infekcije u populaciji, i razlog su propisivanja velike količine antibiotika, što potencira razvoj rezistentnih bakterijskih sojeva, koji otežavaju lečenje i produžavaju hospitalizaciju pacijenata. Faktor bitan za nastanak urinarne infekcije je urinarni kateter, koji je prisutan kod većine hospitalizovanih pacijenata na Klinici za urologiju.

Cilj: Utvrditi najčešće uzročnike bakterijskih urinarnih infekcija i analizirati najčešće korišćene antibiotike kod pacijenata hospitalizovanih na Klinici za urologiju radi izvođenja elektivnih hirurških procedura.

Materijal i metode: Ovom retrospektivnom studijom su obuhvaćeni pacijenti hospitalizovani na Klinici za Urologiju u periodu od 01.01.2011. do 31.03.2011. godine. Kod ispitivane populacije analizirali smo faktore rizika za nastanak urinarnih infekcija. Analizirani su rezultati preoperativno uzetih urinokultura i praćena je zastupljenost različitih bakterijskih sojeva. Pratili smo i najčešće korišćene antibiotike. Posmatrani su rezultati postoperativno uzetih urinokultura i ispitano je u kojoj meri urinarna infekcija produžava boravak u bolnici.

Rezultati: Od 136 hospitalizovanih pacijenata, najznačajniji faktor rizika bio je urinarni kateter, prisutan kod 79,4% pacijenata. Najčešći uzročnici urinarnih infekcija pre operaciji bili su *Klebsiella* i *Enterobacter*, kao mešovita infekcija kod 5 pacijenata. U postoperativnom nalazu urinokulture, samo kod jednog pacijenta su se zadržali isti uzročnici. Najčešće primenjavani antibiotici na klinici su *ceftriakson*, *gentamicin*, *ciprofloksacin* i *cefurkosim*.

Zaključak: Najčešći izolovani bakterijski uzročnici u perioperativnom periodu su *Klebsiella* i *Enterobacter*, koje pokazuju dobar terapijski odgovor na najčešće primenjavane antibiotike: ciprofloksacin, ceftriakson i gentamicin.

Ključne reči: bakterijski sojevi, urinokultura, antibiotici.

REPRESENTATION OF DIFFERENT BACTERIAL PATHOGENS IN UROLOGICAL PATIENTS IN THE PERIOPERATIVE PERIOD

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Introduction: Urinary tract infection (UTI) are the second most common infection in the population, and the reason for prescribing large amounts of antibiotics, which emphasizes the development of resistant bacterial strains and complicate treatment and prolong patients hospitalization. Important factor for the occurrence of urinary tract infection is a urinary catheter, which is present in most hospitalized patients at the Clinic of Urology.

The Aim: To determine the most common causes of bacterial urinary tract infections and analyze the most commonly used antibiotics for treating patients hospitalized for some surgical procedures.

Materials and Methods: The retrospective study included patients hospitalized at the Clinic of Urology in the period from 01.01.2011. to 31.03.2011. In the tested population, we analyzed risk factors for urinary tract infections. We analyzed the results of urine culture taken preoperatively and postoperatively, and examined which urinary tract infection prolonged hospital stay. In this study we also followed the most commonly used antibiotics.

Results: Of 136 hospitalized patients the most important risk factor was indwelling urinary catheter, present in 79,4% of patients. The most common causes of urinary tract infection before the operation were *Klebsiella* i *Enterobacter*, like combined infection in 5 patients. In postoperative urine culture, only one patient had remained with the same pathogen. Most frequently used antibiotics in the clinic are *ceftriakson*, *gentamicin*, *ciprofloksacin* i *cefurkosim*.

Conclusion: The most common bacterial pathogens isolated in the perioperative period as *Klebsiella* and *Enterobacter*, which show good therapeutic response to commonly applied antibiotics *ciprofloxacin*, *ceftriaxone* and *gentamicin*.

Keywords: bacterial pathogens, urine culture, antibiotics.

ANDROGENI STATUS I FERTILITETNA SPOSOBNOST KOD BOLESNIKA SA TUMOROM TESTISA

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Uvod: Karcinom testisa je bolest koja najčešće pogađa muškarce u drugoj i trećoj dekadi života. Simptomi najčešće uključuju uvećanje testisa, bol u slabinama, ginekomastiju, nelagodnost u testisu ili uvećanje koje može da sugerise na orhiepididimitis. Abnormalnost u spermogramu je čest nalaz kod ovih pacijenata, a zračenje i hemioterapija dodatno oštećuju reproduktivnu funkciju.

Cilj: Proceniti egzokrinu i endokrinu funkciju testisa kod bolesnika sa tumorom germinativnih ćelija pre radikalne orhiektomije, u cilju poboljšanja kliničkog lečenja infertiliteta i drugih androloških aspekata ovih bolesnika.

Materijal i metode: Ispitivanjem je obuhvaćeno 26 bolesnika sa karcinomom testisa. Prospektivno je kod svakog bolesnika određen nivo luteinizirajućeg (LH), folikulo stimulirajućeg (FSH) hormona i testosterona, kao i analiza spermograma, koji su potom analizirani u odnosu na histološki tip karcinoma i klinički stadijum bolesti.

Rezultati: Većina obolelih ima između 20 i 40 godina. Svi ispitani pacijenti pokazuju određeni stepen oštećenja spermatogeneze (smanjen broj spermatozoida, ili njihovu smanjenu pokretljivost), bez obzira na histološki tip karcinoma i stadijum bolesti. U hormonskom statusu nije registrovana značajnost.

Zaključak: Spermatogeneza je već oštećena kod obolelih od karcinoma testisa pre radikalne orhiektomije. Krioprezervacija sperme je najbolja metoda očuvanja plodnosti kod muškaraca koji se leče od karcinoma testisa.

Ključne reči: karcinom testisa, spermogram, krioprezervacija

ANDROGENIC STATUS AND FERTILITY CAPACITY IN PATIENTS WITH TESTICULAR TUMORS

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Introduction: Testicular cancer is a disease that mostly affects men in the second and third decade of life. Symptoms include testicular enlargement, flank pain, gynecomastia, or discomfort in the testicle, which may suggest the orhiepididimitis. Spermogram abnormality is a common finding in these patients, and radiation and chemotherapy further deplete the reproductive function.

Aim: Assess the exocrine and endocrine testicular function in patients with testicular germ cell tumor before radical orchiectomy in order to improve the clinical treatment of infertility and other andrological aspects of these patients.

Material and methods: Research included 26 patients with testicular cancer. Prospectively for each individual patient was determined a level of LH, FSH and testosterone, and also semen analysis, which are then analyzed in relation to the histological type and clinical stage of disease.

Results: Most patients are between 20 and 40 years. All patients tested showed a certain degree of damage to spermatogenesis (reduced sperm count and their reduced mobility), regardless of the histological type of cancer and clinical stage of disease. Any significance has not been registered in the hormonal status.

Conclusion: Spermatogenesis has been damaged in patients with testicular cancer before radical orchiectomy. Sperm cryopreservation is the most successful method of preserving fertility in men undergoing treatment for testicular cancer.

Keywords: testicular cancer, semen analysis, cryopreservation

PROMENE ACIDOBAZNOG STATUSA KOD ANESTEZIRANIH BOLESNIKA U TOKU IZVOĐENJA LAPAROSKOPKE I KLASIČNE HOLECISTEKTOMIJE

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Uvod: Laparoskopna holecistektomija uvodi nov metod lečenja koji se sastoji od dve operative tehnike: laparoskopije i holecistektomije. Sama tehnika izvođenja laparoskopskih intervencija iziskuje insuflaciju inertnog gasa u abdominalnu šupljinu i stvaranje većeg ili manjeg pneumoperitoneuma.

Cilj rada: Ovaj rad ima za cilj da prikaže promene u acidobaznom statusu bolesnika (pH, BE/BD, sHCO₃, aHCO₃ i ukupni CO₂) u različitim fazama laparoskopске i klasične (otvorene) holecistektomije.

Materijal i metode: Materijal za izradu rada prikupljen je na Hiruškom odeljenju Zdravstvenog centra u Leskovcu, gde se rutinski izvode operacije laparoskopске i klasične holecistektomije. Odabrano je 40 bolesnika različite starosne dobi i pola, koji pripadaju ASA klasifikaciji I i II. Kod 20 bolesnika (Grupa I, ispitivana grupa) urađena je laparoskopna, a kod ostalih 20 klasična holecistektomija (Grupa II, kontrolna grupa).

Rezultati: Monitoring acidobaznog statusa obuhvatao je određivanje vrednosti pH arterijske krvi, baznog deficita, koncentracije standardnih i aktuelnih bikarbonata i ukupnog CO₂. Uzimanje arterijske krvi za gasne analize je vršeno u sedam vremenskih faza (intervala). Statistička značajnost razlika srednjih vrednosti ove dve grupe testirana je primenom poznatog *Student-ovog t-testa srednjih vrednosti* u slučaju dva nezavisna uzorka. Komparativnom statističkom analizom vrednosti pH arterijske krvi, po vremenskim intervalima istraživanja kod laparoskopске i klasične holecistektomije dokazana je statistički visoko značajna razlika ($p < 0,001$) u četvrtj (T₄), petoj (T₅) i šestoj (T₆) vremenskoj fazi istraživanja.

Zaključak: Promene acidobaznog statusa kod laparoskopске holecistektomije se karakterišu postepenim smanjenjem pH arterijske krvi, i umerenim povećanjem baznog deficita, standardnih bikarbonata, aktuelnih bikarbonata i totalnog ugljen dioksida za vreme trajanja pneumoperitoneuma.

Ključne reči: acidobazni status, laparoskopija, holecistektomija.

CHANGES OF ACIDBASE STATE AT ANAESTHETIZED PATIENTS DURING LAPAROSCOPIC AND CLASSICAL CHOLECYSTECTOMY

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Introduction: Laparoscopic cholecystectomy introduces the new therapy method which consists of two operative techniques: laparoscopy and cholecystectomy. The technique of performing laparoscopic interventions requires the insufflations of the intern gas in abdominal cavity and making bigger or smaller pneumoperitoneum.

The Aim: This work has got the aim to show the changes in acidbase state of the patients (pH, BE/BD, sHCO₃, aHCO₃ and total CO₂) in the various stages of the laparoscopic and classical (open) cholecystectomy.

Materials and Methods: Material for the production of this work is collected in the Surgery Department of the Health Centre in Leskovac, where the surgeries of laparoscopic and classical cholecystectomy are done routinely. 40 patients of different age and sex, who belong to ASA classification I and II, were chosen. The patients were divided into two groups. 20 patients (Group I, examined group) were undergone laparoscopic cholecystectomy and the rest 20 (Group II, controlled group) were undergone the classical one.

Results: Monitoring of the acidbase state included determination of the value pH of arterial blood, base deficiency, concentration of the standard and actual bicarbonates and total CO₂. Taking of the arterial blood for gas analyses was done in seven periodical stages (intervals). Statistical importance of the differences of average values of these two groups was tested by the famous *Student t-test* of average value in the case of two undependant samples. By comparative statistic analysis of the value of pH arterial blood, according to period intervals of research at laparoscopic and classical cholecystectomy, statistically very important difference ($p < 0,001$) in the fourth (T₄), in the fifth (T₅) and in the sixth (T₆) examining period stage, was approved.

Conclusion: Changes of acidbase state at laparoscopic cholecystectomy are characterized by gradual decrease of pH arterial blood, and moderate increase of base deficiency, standard bicarbonates, actual bicarbonates and total carbon dioxide during the pneumoperitoneum.

Keywords: acid-base status, laparoscopy, cholecystectomy.

KOMPARATIVNA ANALIZA ALKOHOLNE SKLEROTERAPIJE I DRENAŽE KATETEROM U LEČENJU NE – PARAZITSKIH BENIGNIH CISTI JETRE

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Uvod: Ne – parazitske benigne ciste jetre su relativno česte i zastupljene su kod 5 % ljudi. Simptomi se javljaju zbog njihovog rasta i kompresije na susedne strukture.

Cilj rada: Cilj ovog rada je bio da se proceni i uporedi efikasnost alkoholne skleroterapije i produžene drenaže kateterom u lečenju ovih lezija.

Material i metode: 42 bolesnika sa cistama jetre su nasumično podeljena u dve grupe: 21 pacijent bio je tretiran aspiracijom i alkoholnom sklerozacijom ciste u jednom aktu (grupa A) i 21 pacijent aspiracijom i produženom drenažom kateterom sa negativnim pritiskom (grupa B). Upoređivani su parametri efikasnosti i invazivnosti ovih metoda.

Rezultati: Prosečan postignut procenat redukcije volumena je bio 92.9% u grupi A i 95.6% u grupi B. Prosečni zaostali prečnik ciste nakon perioda praćenja (CT sken 12 meseci nakon intervencije) bio je 1.9 cm u grupi A i 2.4 cm u grupi B. Prosečno trajanje drenaže kateterom je bilo 3 dana.

Diskusija: Obe procedure predstavljaju veoma efikasan način lečenja obzirom na veoma zadovoljavajući procenat redukcije volumena i prosečni rezidualni prečnik ciste nakon perioda praćenja kod svih naših pacijenata (1.9 i 2.4. odnosno za grupe A i B). Većina bolesnika sa simptomima bila je iz grupe B (16 naspram 9) skloni smo da smatramo drenažu kateterom više invazivnim zahvatom.

Zaključak: Duže vreme potrebno za izvođenje, veći troškovi i veća nelagodnost pacijenata, kao i veći rizik od kasnijih recidiva može da svrsta produženu drenažu kateterom kao manje poželjni metod lečenja ciste jetre.

Ključne reči: skleroterapija, kateter, cista.

UTICAJ OBIMA HIRURŠKE RESEKCIJE NA RANI ISHOD LEČENJA NAKON DUODENOPANKREATEKTOMIJE

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Uvod: Duodenopankreatektomija predstavlja resekcionu metodu za operativno lečenje bolesti pankreasa čiji se koncept temelji na "en block" resekciji distalnog segmenta (antruma) želuca, kompletnog duodenuma, glave pankreasa, zajedničkog žučnog voda, žučne kese i prve vijuge jejunuma. Od resekcioni procedura u lečenju maligniteta se danas koriste proksimalna ili cefalična duodenopankreatektomija i distalna splenopankreatektomija. U odnosu na uklanjanje pilorusa ove procedure mogu biti klasične (standardne) u kojima se uklanja antrum i pilorus (antrektomija) i predstavljaju originalnu Whipple-ovu tehniku i pilorus prezervirajuće (Longmire - Traverso).

Cilj rada: utvrđivanje da li povećanje obima resekcije pankreasa utiče na rane postoperativne rezultate.

Materijal i metode: Sprovedena je retrospektivna studija bolesnika operisanih na klinici za Abdominalnu, endokrinu i transplantacionu hirurgiju, Kliničkog centra Vojvodine u periodu od marta 1998 godine do decembra 2011. godine. Nakon deskriptivne analize kao kriterijumi obima resekcije su uzeti vrsta operacije, broj pregledanih limfnih čvorova i bolesnici koji su imali vaskularnu leziju. Bolesnici su potom analizirani po ovim grupama. Korišćene su standardne statističke metode za neparametarske i parametarske varijable za utvrđivanje značajnosti razlike.

Rezultati: U ispitivanom periodu bilo je ukupno 207 bolesnika sa resekcijom pankreasa i to metodama duodenopankreatektomije, ekscizije, subtotalne i totalne pankreatektomije.

Zaključak: Povećanje obima hirurške resekcije pankreasa u našoj grupi nije pokazalo značajnu statističku razliku u perioperativnom mortalitetu i ranom postoperativnom toku.

Ključne reči: Duodenopankreatektomija, resekcija vena, resekcija limfnih čvorova.

COMPARATIVE ANALYSIS OF ALCOHOL SCLEROTHERAPY VERSUS CATHETER DRAINAGE IN THE TREATMENT OF NON – PARASITIC BENIGN LIVER CYSTS

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Introduction: Non-parasitic liver cysts are common and are present in 5% of the people. Symptoms occur due to their growth and compression of adjacent structures.

Objective: The objective of this study was to evaluate and compare the effectiveness of alcohol sclerotherapy and drainage catheter in the treatment of these lesions.

Material and Methods: 42 patients were divided into two groups: 21 patients were treated with aspiration and sclerosing pure alcohol in one procedure (group A) and 21 patients aspiration and catheter drainage (group B). We compared parameters of efficacy and invasiveness.

Results: The average percentage reduction in volume achieved was 92.9% in group A and 95.6% in group B. The average diameter of the residual cyst after a follow-up period (CT scan 12 months) was 1.9 cm in group A and 2.4 cm in group B. The average duration of catheter drainage was 3 days.

Discussion: Both procedures are very effective treatment is very satisfactory considering the percentage reduction in residual volume and average diameter of the cyst after a follow-up period for all of our patients (1.9 and 2.4. or for groups A and B). Since the majority of patients with symptoms was in the group B (16 versus 9) we tend to consider more invasive catheter drainage procedure.

Conclusion: The longer the time required for performance, higher costs and greater patient discomfort and increased risk of subsequent recurrence may be extended to classify drainage catheter as a less desirable method of treatment.

Keywords: sclerotherapy, catheter, cysts.

INFLUENCE OF SURGICAL RESECTION ON EARLY TREATMENT OUTCOME AFTER DUODENOPANCREATOMETRY

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Introduction: Duodenopancreatectomy present a resection method for operative treatment diseases of pancreas which concept is based on "en block" resection of antrum, whole duodenum, head of pancreas, common bile duct, gallbladder and first loop of jejunum. For operative treatment pancreatic cancer, today we use proximal or cephalic duodenopancreatectomy and distal pancreatectomy with resection of spleen. Based on are we or not preserve pylorus this procedures divide on classic in which we remove antrum and pylorus (antrectomy) and they present classic Whipple procedure and pylorus preserve procedures (Longmire – Traverso).

The Aim: Define if increase in surgical resection of pancreas impress on early postoperative results.

Materials and methods: We conducted a retrospective study patients that were operated in clinic for abdominal, endocrine and transplantation surgery, clinical center of Vojvodina in period from march 1998. 'till December 2011. After descriptive analysis as criterium for extent of resection we use type of operation, number of lymph nodes and vascular lesion. Then we analysed patients by these groups. We use standard statistic methods for nonparametric and parametric variables to define statistical significance.

Results : In examine period there were in total 207 patients who had resection of pancreas using duodenopancreatectomy, excision, subtotal and total pancreatectomy.

Conclusion: Increase in surgical resection of pancreas in our study group didn't show important statistical significance in perioperative mortality and early postoperative course.

Keywords: Duodenopancreatectomy, resection of veins, resection of lymph nodes.

PERITONITIS APENDIKULARNOG POREKLA

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Uvod: Akutni apendicitis predstavlja jedno od najčešćih hirurških oboljenja uopšte, a zauzima vodeće mesto među abdominalnim oboljenjima koja zahtevaju hirurški tretman. Zapaljenje trbušne maramice je jedna od najtežih i najčešćih komplikacija akutnog zapaljenja apendiksa.

Cilj rada: Cilj rada je da ukaže kako teški uslovi života stanovništva, utiču na pojavu težih formi zapaljenja apendiksa a time i na pojavu njegovih komplikacija.

Materijal i metode: Za izradu rada korišćen je materijal Hirurške klinike KBC Priština u Gračanici za period januar – decembar 2007. godine. Peritonitis smo registrovali kod 33 (33%) bolesnika operisanih zbog akutnog zapaljenja apendiksa. Najčešće smo ga našli kod 25 (75,76%) bolesnika mlađih od 30 godina. Kod šest (18,18%) bolesnika sa difuznim fibropurulentnim peritonitisom našli smo apscese lokalizovane periapendikularno i interintestinalno.

Rezultati: Istraživanjem smo obuhvatili 100 (17,42 %) bolesnika koji su, u periodu od 01.01.2007. do 31.12.2007. godine, na Hirurškoj klinici KBC Priština u Gračanici operativno lečeni zbog akutnog apendicitisa, sa posebnim osvrtom na 32 (32 %) bolesnika kod kojih je došlo do pojave peritonitisa. U navedenom periodu na Hirurškoj klinici KBC Priština u Gračanici operativno je lečeno 574 bolesnika.

Zaključak: Akutni apendicitis je najzastupljenije oboljenje u patologiji stanovnika srpskih enklava centralnog Kosova, Siriničke župe i kosovskog Pomoravlja. Peritonitis je najčešća komplikacija akutnog apendicitisa koju smo zabeležili kod 33 (33 %) bolesnika. S obzirom na lošu prognozu bolesnika sa difuznim peritonitisom opravdana je težnja da se njegov razvoj i širenje spreči u samom početku, pravovremenom hirurškom intervencijom akutnog apendicitisa.

Ključne reči: apendicitis, peritonitis, apsces.

PERITONITIS APPENDICULARLY ORIGIN

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Introduction: Acute appendicitis is one of the most common surgical diseases and a leading position among abdominal diseases which require surgical treatment. Peritonitis is one of the most serious and common complication of acute appendicitis.

The Aim: The aim is to show how difficult living conditions, influence the occurrence of severe forms of appendicitis and thus the occurrence of complications.

Materials and Methods: For the preparation of the material used Surgical Clinic Hospital at Gračanica for the period January - December 2007. year. Peritonitis We registered 33 (33%) patients operated on for acute appendicitis. Frequently we found it in 25 (75.76%) patients younger than 30 years. Six (18.18%) patients with diffuse peritonitis was found fibropurulent localized abscesses and periappendicularly interintestinally.

Results: The study includes 100(17.42%) patients in the period from 01.01.2007 to 31.12.2007, at the Surgical Clinic Hospital at Gračanica surgically treated for acute appendicitis, with special reference to 32(32%) patients who had been peritonitis occurrence. During this period the Surgical Clinic Hospital at Gračanica operatively treated 574 patients.

Conclusion: Acute appendicitis is the most common disease in the pathology of the central population of the Serbian enclaves of Kosvo, Sirinicka region and Pomoravlje of Kosovo. Peritonitis is the most common complication of acute apendicitis, which we recorded in 33(33%) patients. Given the poor prognosis of patients with diffuse peritonitis is justified by the tendency to its development and spreading in the very beginning, and timely surgical intervention of acute apendicitis.

Keywords: apendicitis, peritonitis, abscess.

KAPNOMETRIJSKO ODREĐIVANJE UGLJEN DIOKSIDA KOD ANESTEZIRANIH BOLESNIKA U TOKU LAPAROSKOPSKE I KLASIČNE HOLECISTEKTOMIJE

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Uvod: Holecistektomija predstavlja najčešći operativni zahvat u savremenoj hirurgiji digestivnog sistema. Teoretski svaki pacijent, koji je kandidat za klasičnu holecistektomiju, može biti kandidat i za laparoskopsku. S obzirom da ispunjava sve uslove, ugljen dioksid je postao gas izbora za insuflaciju u laparoskopskoj hirurgiji.

Cilj rada: Cilj ovog rada je da se odrede vrednosti etCO₂ upotrebom kapnografije u različitim vremenskim fazama izvođenja laparoskopske i klasične holecistektomije.

Materijal i metode: Materijal za izradu rada prikupljen je na Hirurškom odeljenju Zdravstvenog centra u Leskovcu, gde se rutinski izvode operacije laparoskopske i klasične holecistektomije. Odabrano je 80 bolesnika različite starosne dobi i pola, koji pripadaju ASA klasifikaciji I i II. Pacijenti su podeljeni u dve grupe. Kod 40 bolesnika (Grupa I, ispitivana grupa) urađena je laparoskopiska, a kod ostalih 40 klasična holecistektomija (Grupa II, kontrolna grupa).

Rezultati: Analizom polne strukture ovog kliničkog materijala, kod laparoskopske holecistektomije, osoba ženskog pola bilo je 28 (70%), dok je muškaraca bilo 12 (30%). Kod klasične holecistektomije osoba ženskog pola je bilo 24 (60%), a muškaraca 16 (40%). Analizom starosne dobi u uzrastu do 40. godine uočen je povećan broj bolesnika operisanih laparoskopskom holecistektomijom, dok je u uzrastu od 41 godine uočen povećan broj operisanih klasičnom holecistektomijom.

Zaključak: Ključni momenat koji izaziva različite patofiziološke promene parcijalnog pritiska ugljen dioksida na kraju ekspirijuma (et CO₂) pri laparoskopskoj holecistektomiji u odnosu na klasičnu holecistektomiju je stvaranje pneumoperitoneuma insuflacijom CO₂ u trbušnu duplju i njegova apsorpcija iz trbušne duplje preko peritoneuma u sistemsku cirkulaciju.

Ključne reči: klasična holecistektomija, laparoskopiska holecistektomija, ugljen dioksid.

CAPNOMETRIC DETERMINATION OF CARBON DIOXIDE ANAESTHETIZED PATIENTS DURING LAPAROSCOPIC AND CLASSIC CHOLECYSTECTOMY

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Introduction: Cholecystectomy is the most common surgery in the modern surgery of the digestive system. In theory, any patient who is a candidate for classical cholecystectomy, may be a candidate for laparoscopic. Given that it meets all the conditions, carbon dioxide has become the choice of insufflation gas in laparoscopic surgery.

The Aim: The aim of this study was to determine the value of etCO₂ capnography use at different stages of the feasibility of laparoscopic and conventional cholecystectomy.

Materials and Methods: The material for making paper was collected at the Surgery department of the Health center, Leskovac, where they routinely perform laparoscopic and conventional cholecystectomy. Selection of the 80 patients of different ages and sexes, belonging to ASA classification I and II. Patients were divided into two groups. In 40 patients (Group I, study group) underwent laparoscopic and 40 by other conventional cholecystectomy (Group II, control group).

Results: Analysis of the gender composition of the clinical material, in laparoscopic cholecystectomy, in females was 28 (70%) while the men were 12 (30%). In conventional cholecystectomy in females was 24 (60%) and males 16 (40%). The analysis of age at the age to 40 years there has been an increased number of patients operated by laparoscopic cholecystectomy, and at the age of 41 years observed an increased number of operated conventional cholecystectomy.

Conclusions: A key factor that causes a variety of pathophysiological changes in the partial pressure of carbon dioxide in the end tidal (etCO₂) during laparoscopic cholecystectomy compared to traditional cholecystectomy is the creation of pneumoperitoneum insufflation of CO₂ into the abdominal cavity and its absorption from the abdominal cavity through the peritoneum into the systemic circulation.

Keywords: classical cholecystectomy, laparoscopic cholecystectomy, carbon dioxide.

EPIDEMIOLOŠKE KARAKTERISTIKE BOLESNIKA SA DEKUBITALNIM ULCERACIJAMA

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Uvod: Dekubitalne ulceracije predstavljaju čestu komplikaciju kod pacijenata koji su vezani za postelju, i one predstavljaju duboku ranu koja je nastala izumiranjem tkiva pod dejstvom prekomernog pritiska koji stvara telo svojom težinom na tačkama oslonca. Dekubitalne ulceracije se javljaju u najrazličitijim subpopulacijama pacijenata i u njihovom lečenju glavnu ulogu igraju epidemiološki i etiopatogenetski aspekti.

Cilj rada: Evaluacija epidemioloških karakteristika pacijenata sa dekubitalnim ulceracijama.

Materijal i metode: Izvedena je retrospektivna studija kojom su obuhvaćeni svi pacijenti, njih 72, sa dekubitalnim ulceracijama, koji su bili hospitalizovani na Klinici za opekotine, plastičnu i rekonstruktivnu hirurgiju Kliničkog Centra Srbije u Beogradu u period od januara 2009.godine do januara 2012.godine. U obradi i prikazu podataka korišćene su metode deskriptivne i analitičke statistike.

Rezultati i zaključak: Analizirane su epidemiološke karakteristike pacijenata sa dekubitalnim ulceracijama: pol, starost, uzrok nastanka i lokalizacija dekubitalnih ulceracija, stepen ulceracije, pridružene bolesti i nutritivni status. Dekubitalne ulceracije se najčešće javljaju kod pacijenata koji su nepokretni, a nepokretnost je heterogene etiologije, a u našoj sredini u tome posebno prednjače saobraćajni i ratni traumatizam.

Glavne reči: dekubitalna ulceracija, karakteristike bolesnika, uzrok nastanka dekubitalnih ulceracija.

EPIDEMIOLOGY CHARACTERISTICS PATIENTS WITH PRESSURE ULCERS

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Introduction: Pressure ulcers are most common complications of patients who can not move or paraplegic and long-term lying down and pressure ulcers are defined as deep lesions in the skin or soft tissue of ischemic etiology caused by pressure of body. We can find pressure ulcers in the most different subpopulations of patients and the major role in treatment play epidemiological and etiopathogenetic aspects of pressure ulcers.

Goal: Evaluation epidemiology characteristics patients with pressure ulcers.

Materials and methods: It was used retrospective study which included all hospitalized patients with pressure ulcers, 72 patients, on the Clinic for Burns, Plastic and Reconstructive Surgery Clinical Centre Serbia, Belgrade in the middle of January 2009 and January 2012. We used methods of analytic statistic.

Results and conclusion: We analyzed epidemiological characteristics of patients with pressure ulcers, gender, age, cause and localization of decubital ulcer, degree, contributing factors and disease and malnutrition. Pressure ulcers are the most common in patients who are paraplegic, by different causes, and especially causes by car or war traumatism.

Key words: pressure ulcers, characteristics of patients, causes of pressure ulcers.

PATOLOŠKE PROMENE INGVINALNE REGIJE KOD DECE I HIRURŠKO LEČENJE

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Uvod: Patološke promene ingvinalne regije kod dece nastaju kao rezultat nepotpune obliteracije (zatvaranja) procesus vaginalis peritonei. Javljaju se u nekoliko klinička oblika u vidu hernija, funikulocela, hidrocela i Nickove ciste kod devojčica.

Cilj rada: Cilj rada je da pokaže na učestalost patoloških promena ingvinalne regije, njihovo blagovremeno dijagnostikovanje i lečenje, kako bi se izbegle teške posledice njihovih komplikacija.

Materijal i metode: Za izradu rada korišćen je dvogodišnji materijal Urgentnog hirurškog centra „Simonida“ u Gračanici, gde smo analizirali 73 bolesnika, operisana u ovom centru, zbog patoloških promena ingvinalne regije.

Rezultat: Deca muškog pola zastupljena su sa 63 (86,30%), a ženskog pola sa 10 (13,70%) slučajeva. Hernije smo zabeležili kod 62 (84,93%), retenciju testisa kod devet (12,33%) i hidrocelu kod dva (2,74%) bolesnika. Hidrocelu smo još našli kod četiri, a funikulocelu kod dva bolesnika koja su operisana zbog hernije. Femoralna hernija kod dece je izuzetno retka i javlja se u oko 0,2% svih hernija dečje dobi. Reponibilne hernije smo registrovali kod 57 (91,94%) a uklještene kod pet (8,06%) bolesnika. Primarnu herniju imalo je 60 (96,77%) bolesnika, dok smo recidivnu herniju zabeležili kod dva (3,33%) bolesnika.

Zaključak: Hernije su najčešće anomalije ingvinalne regije kod dece. Pol ima znatan udeo u nastajanju patoloških promena i dečaci češće oboljevaju od devojčica. Hernije kod dece su češće lokalizovane na desnoj strani.

Glavne reči: hernije, retencija testisa, hidrocela

PATHOLOGICAL CHANGES AT CHILDRENS INGUINAL REGION AND SURGICAL TREATMENT

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Introduction: Pathological changes in the inguinal region at children, occurs as a result of incomplete obliteration (closure) procesus vaginalis peritonei. They occur in several clinical forms in the form hernia, funikulocela, hydrocel and Nick cysts in girls.

The aim: The aim of this study was to examine the incidence of pathological changes of the inguinal region, their timely diagnosis and treatment to avoid serious consequences of their complications.

Materials and methods: To create a work material used was a two-year Emergency surgical center “Simonida” in Gračanica, where we analyzed 73 patients, operated in this center because of the pathological changes of the inguinal region.

Results: Male children are represented by 63(86,30%) and female with 10(13,70%) cases. Hernias are noted at 62(84,93%) retention of the testes at 9(12,33%) and hidrocel at 2(2,74%) patients. Hydrocel we also found at four, and funikulocel at two patients which where operated because of hernia. Femoral hernia is exceptionally rare at children and occur in about 0,2% of all hernias of childhood. We registered reponhibil hernia at 57(91,94%) and trapped at 5(8,06%) patients. Primary hernia had 60(96,77%) patients, while we noted recurrent hernia at 2(3,33%) patients.

Conclusion: Hernias are most common anomalies inguinal region at children. Gender has a substantial part in emerging of pathological changes and boys are more often affected then girls. Hernias at children are more often localized at the right part.

Keywords: Hernias, retention testes, hydrocel.

POSTOJI LI VEZA IZMEĐU VOLUMENA PROSTATE I REDUKCIJE MAKSIMALNOG PROTOKA URINA KOD PACIJENATA SA BENIGNOM HIPERPLAZIJOM PROSTATE?

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Uvod: Benigna hiperplazija prostate (BPH) definiše se kao benigno povećanje prostate uzrokovano rastom novih ćelija prostate i smatra se najčešćom bolešću koja je zastupljena kod muškaraca starijeg doba.

Cilj: Cilj ove studije je da se ispita da li postoji povezanost između volumena prostate i redukcije maksimalnog protoka urina kod pacijenata sa benignom hiperplazijom prostate.

Materijal i metode: Istraživanje je sprovedeno na 36 pacijenata starosne dobi od 46 do 79 (prosek 65,81) sa dijagnozom benigne hiperplazije prostate. Kod svih pacijenata prethodno je urađen ultrazvučni (abdominalni ili transrektalni) pregled prostate, na osnovu kojeg je izračunavan volumen prostate. Uroflowmetrijom prikupljeni su podaci o maksimalnom protoku urina (Qmax) kod ispitivanih pacijenata.

Rezultati: Nije registrovana statistički značajna korelacija između volumena prostate i maksimalnog protoka ni u jednoj grupi ispitanika ($r < \pm 0,4$). Poređenjem maksimalnih protoka u dve grupe (formirane na osnovu dimenzija prostate) dobijena je statistički značajna razlika ($p < 0,05$ odnosno $p = 0,044$) u vrednostima protoka između grupa sa umerenim povećanjem volumena ($< 40 \text{ cm}^3$) i izraženim povećanjem volumena prostate ($> 40 \text{ cm}^3$).

Zaključak: Ne postoji povezanost između volumena prostate i redukcije maksimalnog protoka urina, kao dijagnostičkog parametra, kod pacijenata sa benignom hiperplazijom prostate. Volumen prostate kao samostalan parametar nije dovoljan u proceni ozbiljnosti bolesti.

Ključne reči: Benigna hiperplazija prostate (BPH), volumen prostate, uroflowmetry, maksimalni protok urina (Qmax).

IS THERE A CORRELATION BETWEEN PROSTATE VOLUME AND REDUCTION OF MAXIMUM FLOW RATE IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA?

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Introduction: Benign prostatic hyperplasia (BPH) is defined as benign prostate enlargement due to growth of new prostate cells and is considered the most common disease that is present in both older age.

The Aim: The aim of this study was to investigate whether there is a correlation between prostate volume and reduction of maximum flow rate in patients with benign prostatic hyperplasia.

Materials and methods: The study was conducted on 36 patients range 46-79 (average 65.81) with a diagnosis of benign prostatic hyperplasia. All patients had previously performed prostate ultrasound (abdominal or transrectal) on which basis was calculated prostate volume. Uroflowmetry was used to define data on the maximum flow rate (Qmax) of tested patients.

The statistical significance of differences in specific groups, with a probability $p < 0.05$ was tested with Student t-test for two samples.

Results: No significant correlation between prostate volume and maximum flow rate was found in either group of subjects ($r < \pm 0,4$). Comparison of maximum flow rate in the two groups (formed on the basis of prostate volume) obtained a statistically significant difference ($p < 0.05$ ie $p = 0.044$) in the values of the flow rate between the groups with moderate increase ($< 40 \text{ cm}^3$) and marked increase in prostate volume ($> 40 \text{ cm}^3$).

Conclusion: There is no correlation between prostate volume and reduction of maximum flow rate, as a diagnostic tool, in patients with benign prostatic hyperplasia. The prostate volume alone is not useful in the estimation of disease severity.

Key words: Benign prostatic hyperplasia (BPH), prostatic volume, uroflowmetry, maximum flow rate (Qmax).

UDALJENI REZULTATI MULTIVISCERALNIH RESEKCIJA KOD LOKALNO UZNAPREDOVALOG KOLOREKTALNOG KARCINOMA

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Uvod: Adekvatan hirurški tretman lokalno uznapredovalih kolorektalnih karcinoma podrazumeva primenu multivisceralnih resekcija (MVR) koje su definisane kao "en bloc" uklanjanje organa ili struktura infiltrisanih od strane primarnog tumora.

Cilj: Analiza broja i strukture reseciranih organa i verovatnoće petogodišnjeg preživljavanja pacijenata operisanih MVR.

Materijal i metode: Studija obuhvata 222 pacijenta operisana MVR, od 1995-2011. godine, sa patohistološkom dijagnozom adenokarcinoma, bez obzira na prisustvo metastaza u trenutku operacije. Uvidom u istorije bolesti analizirani su podaci o demografskim karakteristikama pacijenata, lokalizaciji tumora, postojanju lokalnog i udaljenog recidiva, TNM kalsifikaciji, zahvaćenosti limfnih čvorova, broju reseciranih organa i struktura i eventualnom smrtnom ishodu. Status pacijenata proveren je telefonskim putem januara 2012. god.

Rezultati: Od svih pacijenata, muškarci čine 55,4%, prosečna starost je 60,1 \pm 12,0 godine, a dužina praćenja 32,4 \pm 29,3 meseci. U 50,5% karcinom je lokalizovan na kolonu. Sa T2 karcinomom prisutno je 2,7% pacijenata, T3 ima 38,3% a preostalih 59% su T4. Procenat pacijenata bez tumorom zahvaćenih limfnih čvorova (N0) iznosi 44,1 dok je od zahvaćenih 23% N1 a 32,9% N2 tipa. Maligne adhezije potvrđene su u 56,1% reseciranih organa. Pokazana je statistički značajna razlika u verovatnoći petogodišnjeg preživljavanja T3 u odnosu na T4 grupu pacijenata ($p = 0.033^*$) i visoko statistički značajno veća verovatnoća petogodišnjeg preživljavaju N0 pacijenata poredeći pacijente sa N1 i N2 zahvaćenošću limfnih čvorova, pojedinačno ($p = 0.008^{**}$, $p = 0.000^{**}$).

Zaključak: Multivisceralna resekcija lokalno uznapredovalih kolorektalnih karcinoma, posebno kod pacijenata sa manjim stepenom zahvaćenosti zida organa i pacijenata bez zahvaćenih limfnih čvorova, pruža statistički značajno veće dugotrajno preživljavanje i daje mogućnost izlečenja.

Ključne reči: kolorektalni karcinom, multivisceralne resekcije

LONG-TERM RESULTS OF MULTIVISCERAL RESECTION OF LOCALLY ADVANCED COLORECTAL CARCINOMA

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Introduction: Appropriate surgical management of locally advanced colorectal carcinomas (LACC) should include multivisceral resection (MVR), in which the cancerous and adherent structures are removed en bloc.

Aim: To analyse the number and structure of resected organs and the five-year survival probability in patients operated by MVR.

Materials and methods: The study included 222 patients operated by MVR during the period 1995-2012, with histopathologically diagnosed adenocarcinoma, regardless metastasis presence at surgery. Demographic characteristics data, tumor localization, local and distant recurrences existence, TNM classification, lymph nodes infiltration, the number of resected organs and structures as well as the possible death were overviewed in patient's records and analyzed. The patient's status was checked telephonically in January 2012.

Results: Among 222 patients, 55,4% are male, with average age 60,1 \pm 12 years, and the follow-up period lasted for 32,4 \pm 29,3 months. In 50,5% the cancer was localized in colon. 2,7% of patients had T2 cancer, 38,3% had T3, and the remaining 59% had T4. The percentage of patients without lymph nodes infiltration (N0) was 44,1, while 23% of patients with infiltrated lymph nodes was of N1 type and 32,9% of the N2 type. Malignant adhesions were confirmed in 56% of resected organs. Statistically significance in the five-year survival probability of T3 compared with the T4 group of patients is shown ($p = 0.033^*$). Also, statistically significantly probability of NO five-year survival is shown, compared to the patients with N1 and N2 lymph nodes infiltration, individually ($p = 0.008^{**}$, $p = 0.000^{**}$).

Conclusion: MVR of LACC, especially among the patients with lower degree of the organ wall infiltration and patients without lymph nodes infiltration, provides statistically significantly higher long-term survival and gives the possibility of cure.

Key words: colorectal carcinoma, multivisceral resections

HERNIJE PREDNJEG TRBUŠNOG ZIDA

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Uvod: Hernija predstavlja izbočenje peritoneuma kroz urođeni ili stečeni otvor na trbušnom zidu u koji kao u neku kesu ulaze organi abdominalne duplje. Incizionalna (postoperativna-ventralna) hernija je ona vrsta hernije koja nastaje na mestu ranije učinjene hirurške incizije kroz celu debljinu trbušnog zida.

Cilj rada: Cilj rada je da ukaže na učestalost incizionalnih, epigastričnih i umbilikalnih hernija, kao i na validnost pojedinih metoda koje se primenjuju u hirurškom lečenju.

Materijal i metode rada: Za izradu rada korišćen je materijal Hirurške klinike KBC Priština u Gračanici. Ovom studijom obuhvatili smo 58 (3,90%) bolesnika, sa hernijama prednjeg trbušnog zida, koji su na Hirurškoj klinici operisani u periodu od 2009.-2011. godine.

Rezultati: Hernije prednjeg trbušnog zida, zabeležili smo kod 29 (50%) bolesnika muškog i kod 29 (50%) bolesnika ženskog pola. Najveći broj hernija 39 (67,24%) je kod osoba starijih od 51 godine. Slobodne hernije našli smo kod 40 (68,97%) a uklještene kod 18 (31,03%) bolesnika. Incizionalne hernije smo našli kod 26 (44,83%), umbilikalne kod 26 (44,83%) i epigastrične kod šest (10,34%) bolesnika. Postoperativne hernije smo registrovali kod 12 (46,15%) bolesnika sa infraumbilikalnom, kod osam (30,77%) sa supraumbilikalnom, kod tri (11,54%) sa subkostalnom laparotomijom, kod dva (7,69%) posle pararektalne incizije.

Zaključak: Vrednost hirurške metode, kada je u pitanju herniotomija, u direktnom je odnosu sa brojem postoperativnih recidiva. Implantacija mrežica je našla svoje mesto i pravo je otkrovenje u rešavanju hernija trbušnog zida.

ključne reči: incizionalna, umbilikalna, epigastrična hernija.

HERNIAS OF FRONT ABDOMINAL WALL

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Introduction: Hernias present protruding peritoneum thru congenital, or acquired hatch on abdominal wall in which, like in some bag, enters organs of abdominal cavity. Incisional (postoperative-ventral) hernia is the kind of hernia which occurs at the site before surgical incision made through the entire thickness of the abdominal wall.

The aim: The aim is to show frequency of incisional, epigastric and umbilical hernia, and the validity of certain methods used in surgical treatment.

Materials and methods: For the preparation it was used material from Surgical Clinic KBC Pristina in Gračanica. With this prospective study we included 58(3,90%) patients with front abdominal wall hernias, who underwent surgery at the Surgical Clinic in the period from 2009th-2011th year.

Results: Hernias of front abdominal wall, we noted at 29(50%) male patients and at 29(50%) female patients. The highest number of hernia 39(67,24%) we recorded at patients older than 51 years. We found free hernia at 40(68,97%) and trapped at 18(31,03%) patients. Incisional hernias were found at 26(44,83%), umbilical at 26(44,83%) and epigastric at 6(10,34%) patients. Postoperative hernia are registered at 12(46,15%) patients with infraumbilical, at 8(30,77%) with supraumbilical, with subcostal laparotomy, with 2(7,69%) after the incision pararectal.

Conclusion: The value of surgical methods, when it comes to herniotomy, is in direct relation to the number of postoperative recurrences. Implantation of mesh has found its place and it is a revelation in the resolution of the abdominal wall hernia.

Keywords: Incisional, umbilical, epigastric hernia.

UTICAJ SEZONSKIH VARIJACIJA NA RUPTURU ANEURIZME ABDOMINALNE AORTE

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Uvod: Bolesnici sa dijagnozom rupture aneurizme abdominalne aorte (RAAA) i dalje predstavljaju grupu sa visokim rizikom od fatalnog ishoda. Poslednjih godina, uloga klimatskih sezonskih varijacija se razmatra kao faktor u nastanku RAAA.

Cilj: Ispitali smo eventualni uticaj atmosferskog pritiska (AP) i temperature vazduha (T) na pojavu RAAA.

Materijal i metode: U radu su retrospektivno analizirani podaci o pacijentima sa RAAA Klinike za vaskularnu i endovaskularnu hirurgiju Kliničkog Centra Srbije (KCS) u periodu od septembra 2008. do oktobra 2011. godine, kao i podaci Republičkog Hidrometeorološkog Zavoda Srbije (RHMZS) o vrednostima AP i T na teritoriji Srbije u istom periodu. Analiza podataka je urađena korišćenjem Studentovog t-testa i metodom deskriptivne statistike.

Rezultati: Studentovim t-testom za vezane uzorke pokazano je da ne postoji statistički značajna razlika između očekivanih vrednosti T i AP (računatih kao prosečne vrednosti istog datuma prethodnih i potonjih godina) i izmerenih vrednosti T i AP za datume kada su se RAAA desile ($t=1.576$, $df=99$, $p=0.118$) i ($t=-0.41$, $df=99$, $p=0.967$), kao i da ne postoji statistički značajna razlika između vrednosti T i AP izmerenih na dan RAAA i vrednosti T i AP izmerenih dan pre no što će se RAAA desiti ($t=0.312$, $df=99$, $p=0.756$) i ($t=-0.468$, $df=99$, $p=0.641$).

Zaključak: Rezultati našeg rada nisu doveli u vezu promene T ili AP sa pojavom RAAA. Takođe, ispostavilo se da se dani u kojima su se RAAA desile ni po AP ni po T ne razlikuju od proseka za taj dan u godini.

ključne reči: RAAA, sezonske varijacije

INFLUENCE OF SEASONAL VARIATIONS IN ABDOMINAL AORTIC ANEURYSM RUPTURE

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Introduction: Patients with the diagnosis of ruptured abdominal aortic aneurysm (RAAA) remain as group at high risk of fatal outcome. For the last few years, the role of seasonal climate variations is considered as a factor in the development of RAAA.

The aim: We investigated the possible influence of atmospheric pressure (AP) and air temperature (T) on the occurrence of RAAA.

Material and Methods: This study retrospectively analyzed data on patients with RAAA in the Department of Vascular and Endovascular surgery of Clinical Center of Serbia (CCS) in the period from September 2008. until October 2011. year, and the data of the Republic Hydrometeorological Service of Serbia (RHSS) on the values of AP and T in Serbia at the same period. Data analysis was performed using Student's t-test and descriptive statistics method

Results: Student's t-test for related samples showed that there was no statistically significant difference between the expected value of T and AP and the measured values of T and AP for the dates when the RAAA occurred ($t=1.576$, $df=99$, $p=0.118$) and ($t=-0.41$, $df=99$, $p=0.967$). The same method showed that there was no statistically significant difference between the values of T and AP measured at the day of the rupture and the values of T and AP measured the day before the RAAA will occur ($t=0.312$, $df=99$, $p=0.756$) and ($t=-0.468$, $df=99$, $p=0.641$).

Conclusion: The results of our research haven't associated changes of T or AP with the display of the RAAA.

Keywords: RAAA, seasonal variations

TERAPIJSKE OPCJE I PROGNOZA KOD POROĐAJNE POVREDE BRAHIJALNOG PLEKSUSA

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Uvod: Porođajna paraliza brahijalnog plexusa značajna je sa aspekta mehanizma nastanka, dijagnostičkih procedura, mogućnosti terapije i prognoze. Zbog toga je terapijski pristup i praćenje lečenja ovih bolesnika veliki izazov.

Cilj rada: Cilj rada je da sagledamo terapijske mogućnosti i ishode lečenja pacijenata sa porođajnom povredom brahijalnog plexusa.

Materijal i metode: Obradeno je 50 pacijenata sa porođajnom povredom brahijalnog plexusa, uzrasta od 2 dana do 7 meseci, koji su u periodu od januara 2007. do decembra 2011. lečeni na Univerzitetskoj dečjoj klinici. Podaci su dobijeni retrospektivno, uvidom u istorije bolesti ispitanih.

Rezultati: U grupi je bilo 66% devojčica i 34% dečaka. Sa zahvaćenim desnim ekstremitetom bilo je 58%, a sa levim 42%. Parezu je imalo 54% dece, a paralizu 46%. Gornji tip lezije bio je prisutan u 66% slučajeva, donji u 2%, a kompletna lezija kod 32% dece. Tešku kliničku sliku imalo je 40% dece, srednju 44%, a blagu 16%. Trajanje terapije je u proseku iznosilo 8,3 meseca u bolničkim uslovima. Nije bilo hirurški lečenih pacijenata. Dobar oporavak zapažen je kod 24%, poboljšanje kod 68%, a terapijskog napretka nije bilo u 8% ispitivane dece.

Zaključak: Značaj pravovremene dijagnostike, kao i odabira, započinjanja i trajanja terapije i rehabilitacije kod porođajne povrede brahijalnog plexusa je veliki. Individualni pristup lečenju je veoma važan. Hirurške tehnike daju brojne mogućnosti za napredak u terapiji i bolji ishod lečenja i kvaliteta života.

Ključne reči: brahijalni plexus, porođaj, paraliza, pareza

THERAPEUTIC POSSIBILITIES AND PROGNOSIS OF OBSTETRIC BRACHIAL PLEXUS INJURY

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Introduction: Obstetric brachial plexus palsy is significant in terms of pathogenesis, diagnostic procedures, treatment options and prognosis. Therefore, the therapeutic approach and treatment monitoring of these patients are a major challenge.

Aim: The aim of this study was to analyze the therapeutic options and treatment outcomes of patients with obstetric brachial plexus injury.

Materials and methods: We reviewed 50 patients with obstetric brachial plexus injury, aged 2 days to 7 months, treated at the University Children's Hospital. Data were obtained retrospectively examining the medical charts of patients.

Results: The group consisted of 66% female and 34% male children. The right extremity was affected in 58%, and the left in 42% of the patients. Paresis was present in 54% of the patients, while 46% presented with paralysis. The upper lesion was present in 66%, lower at 2%, and complete lesion in 32% of children. 40% of children had severe clinical presentation, intermediate 44%, and 16% mild. The duration of therapy was on average 8,3 months of our hospitalized patients. We didn't have any surgically treated patients. Good recovery was observed in 24% of the examined, improvement in 68%, and there was no improvement in 8%.

Conclusion: The importance of timely diagnosis, and selection, initiation and duration of treatment and rehabilitation of brachial plexus birth injuries is high. Individual approach to treatment is very important. Surgical techniques provide many opportunities for progress in treatment, better treatment outcomes, and quality of life.

Key words: brachial plexus, delivery, paralysis, paresis

HIRURGIJA METASTATSKE BOLESTI CENTRALNOG NERVOG SISTEMA

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Uvod: Metastaze centralnog nervnog sistema (CNS) su neoplazme, primarno lokalizovane van nervnog sistema, a koje se sekundarno šire u CNS. Uglavnom se javljaju između 50. i 70. godine života. Metastaze nastaju kod 10-30% svih pacijenata sa malignim tumorima. Najčešći primarni tumori koji daju metastaze na mozgu su karcinom pluća, karcinom dojke i melanom.

Cilj: Upoređivanje podataka o pacijentima operisanim od metastatske bolesti CNS-a na Klinici za neurohirurgiju 2005. i 2010. godine i evaluiranje eventualnih prognostičkih faktora.

Materijal i metode: U ovom radu analizirani su podaci o 234 pacijenata operisanih 2005. i 2010. godine. U dijagnostici je korišćena kompjuterizovana tomografija (CT), nuklearna magnetna rezonanca (NMR) i patohistološka analiza tumorskog tkiva uzetog tokom operacije. Pacijenti su nakon operacije gradirani prema ECOG PS skali za procenu kvaliteta života bolesnika sa metastazama, stepenima od 0 do 5. Za statističku obradu podataka korišćene su metode deskriptivne statistike i Pirsonov hi kvadrat test za nezavisne uzorke.

Rezultati: Najveći broj pacijenata (71%) bilo je u šestoj i sedmoj deceniji života. Muškaraca je bilo 131, a žena 103. Nije nađena statistička značajnost razlike među navedenim grupama ni u jednoj godini. Najčešći primarni tumor je karcinom pluća. Postoji statistički značajna razlika u vremenu od dijagnostikovanja primarnog tumora do dijagnostikovanja metastaze između karcinoma pluća i dojke, kao i između karcinoma pluća i melanoma u obe godine. Uočen je bolji ECOG performans status kod pacijenata sa solitarnim metastazama operisanih 2010. godine.

Zaključak: Ne postoje bitne razlike u posmatranim parametrima za 2005. i 2010. godinu.

Ključne reči: mozak, metastaze, ECOG, hirurgija

SURGERY OF CENTRAL NERVOUS SYSTEM METASTATIC DISEASE

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Introduction: Metastases of the central nervous system (CNS) are neoplasms primarily localized outside nervous system, which can secondarily spread to the CNS. They generally occur between age of 50 and 70 years. Metastases occur in 10-30% of all patients with malignant tumors. The most common primary tumors giving metastases to the brain are lung cancer, breast cancer and melanoma.

The Aim: Comparison of data on patients who underwent surgery for metastatic disease to the CNS at Department of Neurosurgery in 2005. and 2010. and the evaluation of possible prognostic factors.

Materials and Methods: This paper has analyzed data on 234 patients operated in year 2005 and 2010. For diagnosis was used computed tomography (CT), nuclear magnetic resonance (NMR) and histopathological analysis of tumor tissue. Patients are graded according to ECOG PS scale for assessing quality of life, levels of 0 to 5. Statistical analysis was performed using methods of descriptive statistics and Pearson's chi-square test.

Results: There were 131 men and 103 women. There was no statistically significant differences among these groups in any year. The most common primary tumor was lung cancer. There was a statistically significant difference in the time between diagnosed primary tumor and diagnosis of metastasis from the lung and breast cancers, and between lung cancer and melanoma in both years. There was a better ECOG performance status in patients with solitary metastases operated in year 2010.

Conclusion: There are no significant differences in observed parameters for years 2005. and 2010.

Key words: brain, metastases, ECOG, surgery

AKUTNA FIZIOLOŠKA I HRONIČNA PROCENA TEŽINE BOLESTI I LETALITETA U JEDINICAMA INTEZIVNE TERAPIJE

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Uvod: U cilju boljeg i bržeg zbrinjavanja kritično obolelih i povređenih postoji tendencija uvođenja i korišćenja bodovnih sistema u proceni težine zdravstvenog stanja i praćenju ishoda lečenja. Procena zdravstvenog stanja bolesnika putem bodovnog sistema prilikom urgentnog prijema može unaprediti tretman i biti novo oruđe u trijaži obolelih i povređenih u prehospitarnim uslovima.

Cilj: Cilj našeg istraživanja je akutna fiziološka i hronična procena, težine bolesti i letaliteta bolesnika u jedinici intenzivne terapije.

Materijal i metode rada: Prospektivnom studijom ispitano je 249 kritično povređenih bolesnika hospitalizovanih u Urgentnom centru Klinički centar Vojvodine, u periodu od 1. januara 2011. do 1. januara 2012. godine. Kao metodu smo koristili APACHE II bodovni sistem koji pokazuje stopu mortaliteta od ukupnog broja pacijenata. APACHE III nam je koristio za procenu rizika od intrahospitalnog mortaliteta.

Rezultati: U jedinici intenzivne terapije lečeno je 150 bolesnika (60%) muškog i 99 (40%) ženskog pola. Distribucija po godinama je pokazala da su kritično povređeni bolesnici bili najčešće zastupljeni u dobu od 45 godina (26,10%). Kod 14% je dijagnostikovano SAH. Letalni ishod kod ispitivanih kritično obolelih i povređenih iznosio je 17%.

Zaključak: Na osnovu sprovedenog istraživanja u našoj ispitivačkoj populaciji, utvrdili smo značaj akutne fiziološke i hronične procene težine bolesti i letaliteta kritično obolelih i povređenih u jedinici intenzivne terapije primenom APACHE II i III bodovnog sistema. Intrahospitalni mortalitet na osnovu APACHE III bodovnog sistema, u našoj studiji je iznosio 17%, što se slaže sa literaturnim podacima, svetskih istraživanja.

Ključne reči: APACHE II i III, akutni fiziološki skor (APS)

ACUTE PHYSIOLOGICAL AND CHRONIC SEVERITY ASSESSMENT AND CASE FATALITY IN INTENSIVE CARE UNIT

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Introduction: In order for better and faster care for critically ill and injured patients there is a tendency for introduction and use of scoring systems in assessing severity and monitoring of health outcomes. Assessment of health state using the scoring system during the urgent admission could improve the treatment and be a new tool in the triage of ill and injured in the pre hospital conditions.

The Aim: The aim of our study is the acute physiological and chronic assessments, disease severity and mortality of patients in the intensive therapy unit.

Materials and Methods: This prospective study included 249 patients hospitalized in the Emergency center, Klinički centar Vojvodine, between January 1. 2011 until 1 January 2012.

As the method we used the APACHE II scoring system that shows the mortality rate of all patients. APACHE III we used for assessing the risk of hospital mortality.

Results: In the intensive therapy unit were treated 150 patients (60%) male and 99 (40%) female. Distribution by age showed that critically injured patients were most frequent in the age of 45 years (26.10%). In 14% of critically ill patients diagnosed with SAH. On the basis of lethal outcome in the studied critically ill and injured was 17%.

Conclusion: Based on the research in our questioning population, we determined the significance of acute and chronic physiological assessment of disease severity and mortality of critically ill and injured in the intensive care unit using APACHE II and III scoring system. Hospital mortality based on APACHE III scoring system, in our study was 17%, which agrees with literature data, global research.

Key words: APACHE II and III, acute physiological score (APS)

ANALIZA PODATAKA DOBIJENIH MIKROBIOLOŠKIM ISPITIVANJEM VRHOVA CENTRALNIH VENSKIH KATERA UZETIH U PERIODU OD ČETIRI GODINE NA KLINICI ZA ANESTEZIJU I INTENZIVNU TERAPIJU KLINIČKOG CENTRA VOJVODINE

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Uvod: Primena centralnih venskih katetera (CVK) nezaobilazna je u lečenju kritično obolelih. Najčešća i najznačajnija komplikacija povezana sa prisustvom centralne venske linije je infekcija.

Cilj: Ispitivanje karakteristika bolesnika, kojima je vrh CVK uzet na mikrobiološku analizu, kao i analiza podataka dobijenih mikrobiološkim ispitivanjem istih.

Materijal i metode: Retrospektivno je praćeno 46 bolesnika, hospitalizovanih na Klinici za anesteziju i intenzivnu terapiju Kliničkog Centra Vojvodine, kojima je vrh CVK uzet na mikrobiološko ispitivanje, u periodu 01.01.2008.-31.12.2011. godine. Analizirane su istorije bolesti i praćene su karakteristike bolesnika, kao i svi podaci dobijeni mikrobiološkim ispitivanjem uzoraka CVK: vrsta i broj izolovanih uzročnika, osetljivost i rezistencija na antibiotike. Kultivacija, izolacija i identifikacija mikroorganizama vršena je semikvantitativnom metodom.

Rezultati: Analiziran je 51 CVK, od kojih je 42 (82%) bilo kolonizovano, a 9 (18%) sterilno. Rezultati našeg istraživanja pokazali su statistički značajnu razliku u kolonizaciji katetera u odnosu na anatomsko mesto insercije ($p<0,05$) ali ne i u odnosu na dužinu stajanja ili mesto postavljanja. Najzastupljeniji mikroorganizmi izolovani sa vrha CVK bili su *Acinetobacter spp* (35,7%), *koagulaza negativni stafilokoki* (31%) i *Klebsiella pneumoniae* (26,2%). Empirijska antibiotska terapija se u 45,2% slučajeva poklapala sa rezultatima dobijenim iz antibiograma vrhova CVK.

Zaključak: Kao značajan faktor rizika za kolonizaciju CVK potvrđeno je jedino anatomsko mesto insercije. Najčešće izolovani patogeni bili su *Acinetobacter spp*, *koagulaza negativni stafilokoki* i *Klebsiella pneumoniae*.

Ključne reči: centralni venski kateteri, kolonizacija, infekcija, faktori rizika, mikroorganizmi

ANALYSIS OF DATA GATHERED BY MICROBIOLOGICAL EXAMINATION OF CENTRAL VENOUS CATHETER TIPS OVER A FOUR YEAR PERIOD AT THE CLINIC FOR ANESTHESIA AND INTENSIVE CARE THERAPY, CLINICAL CENTER OF VOIVODINA

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Introduction: Use of central venous catheters (CVC) is indispensable in treatment of critically ill patients. Most frequent and most severe complication associated with central venous access is infection.

The Aim: To analyze patients' characteristics, whom CVC tips were taken, and data gathered by microbiological examination of CVC specimens.

Material and methods: Retrospectively analyzed were 46 patients, hospitalized at the Clinic for Anesthesia and Intensive Therapy, Clinical Center of Voivodina, whose CVCs were sent to microbiological examination over the period January 1, 2008-December 31, 2011. Medical documentation was analyzed and patients' characteristics, as well as all data received from microbiological examination were recorded: species and number of isolated pathogens, antimicrobial sensitivity and resistance. Culture, isolation and identification of causative microorganisms were performed using semiquantitative methods.

Results: A total of 51 CVCs were analyzed, out of which 42 (82%) were colonized while 9 (18%) were sterile. A statistically significant difference was found with respect to anatomical insertion site ($p<0,05$), but not to CVC dwell time nor location of CVC placement. Most common microorganisms isolated from catheter tips were: *Acinetobacter spp* (35,7%), *coagulase-negative staphylococci* (31%) and *Klebsiella pneumoniae* (26,2%). Empiric antimicrobial therapy was equivalent to antibiogram results of CVC tips in 45,2%.

Conclusion: The insertion site only was recognized as a significant risk factor for CVC colonization. Most common isolated causative pathogens were *Acinetobacter spp*, *coagulase-negative staphylococci* and *Klebsiella pneumoniae*.

Key words: central venous catheter, colonisation, infection, risk factors, microorganisms

RUPTURA ANEURIZME ABDOMINALNE AORTE KOD PACIJENATA STARIJIH OD OSAMDESET GODINA

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Uvod: Ruptura aneurizme abdominalne aorte (rAAA) predstavlja najtežu, a često i prvu manifestaciju aneurizmske bolesti abdominalne aorte (AAA). rAAA je i najčešći uzrok smrti pacijenata sa nelečenom AAA. Isto važi i za pacijente starije od osamdeset godina uprkos prisustvu značajnih komorbiditeta.

Cilj rada: Procena ishoda i rizika kod pacijenta starijih od osamdeset godina podvrgnutih otvorenom hirurškom zbrinjavanju rAAA.

Materijal i metode: Za period januar 2006 – jul 2011. godine, retrospektivno je analizirano 340 bolesnika operisanih zbog rAAA. Ispitivanu grupu je činilo 35 bolesnika starijih od osamdeset godina. U kontrolnoj grupi je bilo 305 bolesnika mlađih od osamdeset godina.

Rezultati: Pacijenti stariji od osamdeset godina su češće bolovali od apsolutne aritmije ($p<0,01$), hronične srčane insuficijencije ($p<0,05$), kao i cerebrovaskularnih bolesti ($p<0,05$). Takođe su češće bili opterećeni hroničnom bubreznom insuficijencijom ($p<0,05$) i hroničnim opstruktivnim bolestima pluća ($p<0,05$). U kontrolnoj grupi je bilo više pušača ($p<0,01$) i obolelih od dijabetes melitusa ($p<0,05$). Ispitivani laboratorijski parametri su bili značajno lošiji kod starijih pacijenata (hematokrit, hemoglobin, eritrociti i trombociti). Visoka incidenca respiratornih komplikacija je zabeležena kod starijih pacijenata (42,86%). Stariji pacijenti su imali veću smrtnost u odnosu na kontrolnu grupu (30,82% vs. 80,00%, $p<0,01$).

Zaključak: Pacijenti stariji od osamdeset godina imaju značajno lošiji ishod nakon otvorenog hirurškog zbrinjavanja rAAA. Doprinos tome verovatno imaju brojni komorbiditeti i smanjenje adaptacionih mehanizama samog organizma. U cilju smanjenja smrtnosti kod ove grupe visokorizičnih pacijenata neophodno je uvođenje novih terapijskih procedura kao što su rana traheostomija, urgentni endovaskularni tretman i sl.

KLjučne reči: ruptura aneurizme abdominalne aorte, hirurgija, stariji od osamdeset godina

RUPTURED ABDOMINAL AORTIC ANEURYSM IN OCTOGENARIANS

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Introduction: Rupture of abdominal aortic aneurysm (rAAA) is the most serious complication, and often the first symptom of aortic aneurysmal disease. rAAA is the most often cause of death in patients diagnosed with abdominal aortic aneurysm (AAA). The same applies to octogenarians despite their significant comorbidities.

The Aim: Overview of the outcome and risk evaluation of octogenarians diagnosed with rAAA undergone open surgery.

Material and Methods: For the period January 2006 - July 2011th retrospective analyze of 340 patients operated for rAAA was done. The examined group was consisted of 35 octogenarians. In the control group was 305 younger patients.

Results: Octogenarians more often had arrhythmia absoluta ($p<0.05$), chronic heart failure ($p<0.05$), and cerebrovascular disease ($p<0.05$). They also more often had chronic renal failure ($p<0.05$) and chronic obstructive pulmonary disease ($p<0.05$). In control group was more tobacco smokers ($p<0.01$) and diabetic patients ($p<0.05$). Examined laboratory parameters were worse in elderly (hematocrit, hemoglobin, erythrocytes and platelets). High incidence of respiratory complications in older patients was detected (42.86%). Octogenarians had higher mortality rates than the control group (80.00% vs. 30.82%, $p<0.01$).

Conclusion: Octogenarians have substantially worse outcome after open management of rAAA. Contribution to that probably has numerous comorbidities and insufficient adaptation mechanisms. In order to decrease mortality rate in those high risk patients introduction of particular types of treatment such as early tracheostomy, urgent endovascular treatment of rAAA etc. is obligatory.

Key words: ruptured abdominal aortic aneurysm, surgery, octogenarians

STEPEN SIGURNOSTI PRIMENE PAMUČNIH ZAVOJA

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Uvod: Zavoji u najužem smislu su trakaste tkanine, namotane u obliku valjka ili ploče. U pamučne zavoje spadaju: mul, kaliko i pamučni elastični zavoji. Zavoji imaju široku primenu u različitim oblastima medicine i izuzetno je značajno da budu maksimalno bezbedni za primenu.

Cilj rada: Cilj našeg istraživanja bio je utvrditi sigurnost pamučnih zavoja i odrediti koje karakteristike zavoja utiču na sigurnost primene.

Materijal i metode: Ispitani su pamučni zavoji 26 proizvođača iz 14 država sa Evropskog i Azijskog kontinenta. U cilju procene bezbednosti zavoja ispitana je jačina zavoja metodom statičke dinamometrije. Od ostalih tehničkih karakteristika analizirane su: rastegljivost, metodom statičke dinamometrije; finoća prediva, prema standardu iz Farmakopeje 6; gustina tkanja prema standardu iz Farmakopeje 6, način tkanja, metodom svetlosne mikroskopije i debljina prediva, merena debljinometrom.

Rezultati: U prometu, na teritoriji Republike Srbije pretežno se nalaze bezbedni pamučni zavoji, čije vrednosti kontrapritisaka su u rasponu 0,3 - 2,052 N/cm². Najniža vrednost kontrapritiska, ustanovljena analizom zavoja u prometu na teritoriji Republike Srbije iznosi 0,103N/cm².

Zaključak: Kaliko i mul zavoji i dalje spadaju u sigurna i kvalitetna medicinska sredstva, ali njihove karakteristike treba poboljšavati i težiti ka zavojima boljih karakteristika u cilju poboljšanja kvaliteta.

KLjučne reči: Zavoj, bezbednost.

SAFETY RATE OF USING COTTON BANDAGES

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Introduction: Bandages, in general meaning, are strips – rolled in the shape of roller or panel. Sorts of cotton bandages are: mul calico and cotton elastic bandages. Bandages are widely used in various fields of medicine and it is very important to be maximal safe for use.

The Aim: The aim of our study was to determine the safety of cotton bandages and determine what characteristics of bandages is correlate with safety of using.

Material and methods: We tested cotton bandages of 26 manufactures from 14 European and Asian countries. In order to assess the safety, fracture strength was analyzed, using method of static dynamometry. Among other technical characteristics, we tested: elasticity, using method of static dynamometry; numeration, via standard of pharmacopoeia VI; material density, via standard of pharmacopoeia VI; type of texture, using light microscopy and fullness of skein.

Results: In trade, on the area of Republic Serbia safety cotton bandages, are predominantly found which rang of contra pressure is 0.3 – 2.052 N/cm². The lowest value of the counter pressure is 0.103N/cm².

Conclusion: Calico and mul bandages are still safe and quality medical equipment, but their characteristics need improvement and making better characteristics in order to improve quality.

Key words: Bandage, Safety.

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Uvod: I pored napretka u istraživanju, farmakološkog i tehnološkog razvoja, neadekvatno zbrinjavanje akutnog postoperativnog bola, više je pravilo nego izuzetak. Neadekvatno tretiran, akutni postoperativni bol predstavlja ne samo etički problem, već ima i posljedice koje se mogu odraziti na postoperativni morbiditet i oporavak. Malo je poznato, međutim, koja su očekivanja, iskustva i zadovoljstvo hirurških pacijenata podvrgnutih terapiji akutnog postoperativnog bola.

Cilj: Cilj ove studije je da se identifikuju očekivanja i informisanost pacijenata u vezi sa akutnim postoperativnim bolom, da se procijene iskustva pacijenata u vezi sa jačinom njihovog bola, kao i zadovoljstvo pacijenata sa liječenjem istog.

Materijal i metode: Studija je urađena prospektivno u periodu od januara 2011. do juna 2011. godine, i obuhvatila je 93 odraslih pacijenata. Uпитnik se sastojao iz pitanja grupisanih u nekoliko djelova, a popunjavan je podacima dobijenim tokom intervjuisanja kao i iz istorije bolesti.

Rezultati: U našoj studiji, 94,6% pacijenata su očekivali postoperativni bol. Nasuprot prisustvu bola kod 96,8% pacijenata, 66,7% njih bili su kompletno zadovoljni sa otklanjanjem bola.

Zaključak: Visoka prevalentnost akutnog postoperativnog bola ukazuje da njegovo liječenje još uvijek nije adekvatno. Očekivana jačina bola u našem ispitivanju (78,5%) kao jedan od ključnih faktora, koji može uticati na jačinu aktuelnog bola (77,4%) poslije operacije nameće potrebu preoperativne evaluacije i pravilne informisanosti pacijenata. Preoperativna očekivanja jakog ili neizdrživog bola i jači intenzitet aktuelnog postoperativnog bola, nađeni su kao faktori povezani sa vjerovatnoćom nezadovoljstva.

Ključne riječi: akutni postoperativni bol, očekivanja, iskustva, liječenje.

ACUTE POSTOPERATIVE PAIN – EXPECTATIONS AND EXPERIENCES OF PATIENTS

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Introduction: Despite of advances in research, pharmacological and technological development, inadequate management of acute postoperative pain, is more the rule than the exception. Inadequately treated, acute postoperative pain is not only an ethical problem, but it also has consequences that can affect the morbidity and recovery. It is barely known, however, what the expectations, experiences and satisfaction of patients undergoing surgical treatment of acute of postoperative pain are.

The Aim: The aim of this study was to identify the expectations and information about patients with acute postoperative pain, to assess patients' experience related to the intensity of their pain, and patients' satisfaction with the treatment of their pain.

Materials and Methods: The study was performed prospectively in the period from January of 2011. by June 2011., and included 93 adult patients. The poll consisted of several parts of questions, and filled the data obtained during the interview and from medical records.

Results: In our study, 94,6% of patients expected postoperative pain. In contrast to the presence of pain in 96,8% of patients, 66,7% of them were completely satisfied with pain relief.

Conclusion: High prevalence of acute postoperative pain indicates that it's treatment is still not adequate. The expected intensity of pain in our study (94,6%) as one of the key factors that can affect the intensity of current pain (96, 8%) after surgery, imposes a need for preoperative evaluation and proper information to the patients. Preoperative expectations of strong or unbearable pain and higher intensity of the current postoperative pain, were found as factors associated with the probability of dissatisfaction.

Key words: Acute postoperative pain, expectations, experiences, treatment.

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Uvod: Centralni veski kateteri su uredjaji koji se koriste za tretman različitih bolesti. Uprkos njihovoj korisnosti plasiranje CVK je povezano sa potencijalno opasnim komplikacijama, koje ponekad mogu biti fatalne. Mehaničke komplikacije su važne zato što su neposredne i nakon samog plasiranja praćene visokom stopom mortaliteta. Najčešća mehanička komplikacija udružena sa pokušajem kanulacije unutrašnje jugularne vene jeste punkcija karotidne arterije zbog njene neposredne blizine.

Cilj rada: Veze između određenih faktora rizika za nastanak punkcije karotidne arterije kao rana mehanička komplikacija koja prati kanulacije unutrašnje jugularne vene su procenjavani.

Materijal i metode: U ovoj jednogodišnjoj retrospektivnoj studiji gde je bilo sprovedeno 86 pokušaja punkcije unutrašnje jugularne vene od strane 4 kompetentna anesteziologa su evaluirani. Godine starosti, pol, strana punkcije, broj pokušaja kanulacije, okolnosti procedure, incidenca punkcije karotidne arterije su preuzeti iz medicinskog protokola.

Rezultati: Od 86 pokušaja kanulacije unutrašnje jugularne vene (PKUJV) izvedenih na pacijentima od 18 do 75 godina punkcija karotidne arterije (PKA) nastala u 8 (9.3%); 5 (5.8%) u pacijenata starijih od 65 godina i 3 (3.5%) mlađih od 65 godina. PKA nije bila povezana sa godištem pacijenata ($p=0.11$) i polom ($p=0.76$). Multipli pokušaji kanulacije ($OR=26.25$; $95\% CI=4.52-152.51$; $p<0.001$) i postavljanje centralnog venskog katetera pod hitnim uslovima ($OR=14.84$; $95\% CI=1.73-127.22$; $p=0.014$) je značajno povećalo rizik za punkciju karotidne arterije. PKA se češće javljao za vreme levostrane nego desnostrane PKUJV ($OR=5.98$; $95\% CI=1.29-27.59$; $p=0.022$).

Zaključak: Naši rezultati snažno sugerišu da levostrani višestruki PKUJV izvedeni u hitnim uslovima predstavljaju rizik za moguću punkciju karotidne arterije.

Ključne reči: Centralna venska kanulacija, komplikacije, anestezija.

COMPLICATIONS ASSOCIATED WITH LANDMARK GUIDED CENTRAL VENOUS CANNULATION ATTEMPT

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Introduction : Central venous catheters (CVCs) are indwelling devices for daily clinical practice for treatment of several diseases. Despite their utility, placement of CVCs is associated with potentially severe complications, which at time can be fatal. Generally they are divided into mechanical, infectious and thromboembolic complications. The most common mechanical complication associated with internal jugular vein cannulation attempts (IJVCA) is carotid artery puncture (CAP).

The aim: The relationship between certain risk factor and carotid artery puncture (CAP) as an early mechanical complication following internal jugular vein cannulation attempts (IJVCA) was evaluated.

Materials and methods: In a retrospective 1-year observational single-center study, 86 IJVCA conducted in the operating room by 4 competent anesthesiologists were evaluated. Age, gender, puncture side, number of cannulation attempts, circumstances of the procedure and incidence of CAP were obtained from medical records.

Results: Of the 86 IJVCA performed in the patients aged 18-75 years, CAP occurred in 8 (9.3%); 5 (5.8%) in patients >65 years and 3 (3.5%) in patients <65 years of age. CAP was not associated with patient's age ($p=0.11$) and gender ($p=0.76$). Multiple cannulation attempts ($OR=26.25$; $95\% CI=4.52-152.51$; $p<0.001$) and placement of CVC under emergency conditions ($OR=14.84$; $95\% CI=1.73-127.22$; $p=0.014$) increased the risk for CAP significantly. CAP was more likely to happen during left-sided IJVCA ($OR=5.98$; $95\% CI=1.29-27.59$; $p=0.022$).

Conclusions: Our results strongly suggest that left-sided, multiple IJVCA, performed under emergency conditions in conscious patients in the operating room, represent considerable risks for possible CAP.

Key words: Central venous cannulation, complications, anesthesia, operating room.

PROMENA ORALNE FLORE KOD PACIJENATA NA MEHANIČKOJ VENTILACIJI NA ODELJENJU INTENZIVNE NEGE

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Uvod: Usna duplja poseduje vrlo bogatu normalnu mikrofloru. Čini je oko 350 različitih vrsta bakterija, gljivice i protozoje. Oralna flora može biti autohtona, saplementna i tranzitna. Normalna flora: Staphylococcus (epidirmidis), Streptococcus (vestibularis, salivarius, mitis), Peptostreptococcus, Neisseria, Corynebacterium, Fusobacterium, Candida, Actinomyces. Mehanička ventilacija je način disanja koji se ostvaruje pomoću specijalnog aparata. Podrazumeva privremenu meru podrške plućnoj funkciji.

Cilj rada: Utvrditi promenu oralne flore kod pacijenata koji su na mehaničkoj ventilaciji na odeljenju intenzivne nege.

Materijal i metode: Ispitivanjem je obuhvaćeno 35 pacijenata (20 žena i 15 muškaraca) prosečne starosti od 65 godina. Vreme provedeno na respiraciji: od 1 do 8 dana. Svi ispitanici su bili na antibiotičima širokog spektra zbog potreba za lečenjem osnovne hirurške bolesti. Kontrolni bris je rađen dan po prestanku mehaničke ventilacije.

Rezultati: Dobjijena je raznolika zastupljenost mikroorganizama (aerobi, anaerobi i gljivice). Najveću zastupljenost imaju: Acinetobacter spp (33%), Klebsiella (20%), Streptococcus alfa haemolyticus (20%), Candida (30% bez makroskopskih kliničkih manifestacija, 20% sa kliničkom manifestacijom).

Zaključak: Promena oralne flore zavisi od broja dana provedenih na mehaničkoj ventilaciji i od dugotrajne primene antibiotika. Dugotrajna primena antibiotika remeti normalnu oralnu floru. Svi pacijenti na respiratoru su već imali patološku oralnu floru, a pod dejstvom antibiotika došlo je do redukcije patogenih mikroorganizama.

Ključne reči: normalna oralna flora, mehanička ventilacija, antibiotici, redukcija patogenih mikroorganizama.

CHANGE ORAL MICROORGANISM AT PATIENT OVER AUTOMATIC VENTILATION OVER REMOVE INTENSE CARE

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Introduction: Cavitas oris gray far affluent of normal microorganism. Spell had about 350 different type of bacteria, fungi and protocam. Oral microorganism may be autochthonous, saplement and transit. Normal microorganism : Staphylococcus epidirmidis, Streptococcus vestibularis, salivarius , Peptostreptococcus, Neisseria, Corynebacterium, Fusobacterium, Candida, Actinomyces. Automatic ventilation had kondicional respiration that yourself achieving via especially contrivance.

The Aim: Determine change microorganism oral at patient that are on automatic ventilation over remove intense care.

Materials and Methods: Reasearching had coverage 35 patient (20 women and 15 men) fairly age with 65 year. Globiti executed over respiration with 1 until 8 date. All examinee were over antibiotics broadly spectral because of necessary after treatment element surgical disease. Control erasure had done light according to cessation automatic ventilation.

Results: Had diverse representation microorganism aerobs, anaerobs and fungui). The most representation having :Acinetobacter spp, Klebsiella, Streptococcus alfa haemolyticus, Candida (30% devoid macroscopic clinically display , 20% down clinically display).

Conclusion: Change oral microorganism depend with thick date executed over automatic ventilation plus with long application antibiotic. Long application antibiotic interrupter normal oral gauze. All patient over automatic ventilation are already occupant pathologically oral gauze , and with antibiotic had until reduction pathogenic microorganism.

Keywords: normal oral microorganism, automatic ventilation , antibiotic , reduction pathogenic microorganism.

ZNAČAJ KOMPRESIVNIH SREDSTAVA U PREVENCIJI VENSКИH OBOLJENJA KOD STOMATOLOGA

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Uvod: Proširene vene nogu spadaju u grupu najučestalijih oboljenja kod ljudi. Profesije koje zahtevaju dugo stajanje značajan su faktor rizika za raniju pojavu i brže napredovanje oboljenja. Pravovremeno preduzimanje preventivnih mera može da odloži indikaciju za hirurškim lečenjem.

Cilj rada: Utvrditi incidencu i stepen oboljenja kod studenata stomatologije, predložiti preventivne mere i ispitati efikasnost primene kompresivnih čarapa u prevenciji u smanjenju simptoma oboljenja vena.

Materijal i metode: U studiju je bilo uključeno 30 ispitanika. Ispitivanje je realizovano u vidu anketnog upitnika sa relevantnim anamnestičkim podacima i fizikalnim pregledom. Kod 10 studenata koji su imali simptome oboljenja vena primenjene su kompresivne čarape po meri.

Rezultati: Dobjijeni rezultati na osnovu anketnog lista su pokazali da je bez simptoma bilo 8 studenata, osećaj težine u nogama imalo je 21 student, bolove u nogama 18, otoke stopala i potkolenica 6, proširene vene 5 studenata. Prema CEAP kliničkoj klasifikaciji: Co imalo je 8 studenata (26,67%), C1 imalo je 17 ispitanika (56,67%), troje ispitanika je pripadalo C2 (10%), a C3 kod 2 ispitanika (6,67%).

Zaključak: Od 30 ispitanika 70% ima neki simptom venskog oboljenja nogu. U grupi od 10 studenata koja je dobila kompresivne čarape, pre terapije njih 9 je navodilo osećaj teških nogu (90%), 9 bolove u nogama (90%), 4 otoke (40%), a 4 proširene vene (40%).

Ključne reči: bolesti vena nogu, prevencija.

THE IMPORTANCE OF COMPRESSION MEANS FOR VENOUS DISEASE PREVENTION AT THE DENTIST

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Introduction: Venous diseases of legs are among the most common group of diseases of menikid. They are particulary pertain to a professions that require long time standing.

Materials and Methods: The study included 30 patients. The examination was conducted in a form of a questionnaire with the relevant medical history and physical examination. At 10 students who had symptoms of venous compression stockings were applied to measure.

Results: The results based on the questionnaire showed that without symptoms were 8 students, feeling of heaviness in the legs had 21 students, 18 of them had leg pains, swelling of feet and lower legs 6, varicose veins 5 students. According to the CEAP clinical classification Co had 8 students (26.67%), C1 had 17 subjects (56.67%), three patients belonged to the C2 (10%), and C3 was present in 2 subjects (6.67%).

Conclusion: Of the 30 respondents, 70% had some symptoms of venous leg diseases. In the group of 10 students who had received compression stockings before the treatment, nine of them alleged the feeling of heavy legs (90%), 9 leg pains (90%), 4 bulge (40%), and 4 varicose veins (40%). After two weeks of treatment 4 students had alleged leg heaviness (40%) and pain in legs 3 (30%).

Key words: venous diseases of the legs, students.

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Uvod: Rekurentna diskus hernija predstavlja ponovnu hernijaciju diskusa na istom nivou gde je prethodno bila obavljena hirurška diskektomija, sa iste ili kontralateralne strane, kod pacijenta koji je bio bez bolova 6 meseci nakon prethodnog operativnog lečenja.

Cilj: Cilj našeg rada je analiza kliničkih, radioloških parametara kao i postoperativnog ishoda rekurentne diskus hernije, sa posebnim osvrtom na lokalizaciju i tip diskus hernije na prvoj operaciji.

Materijal i metode: Naše istraživanje bazira se na retrospektivnoj studiji. Podaci su prikupljeni iz istorija bolesti kod 58 pacijenata operisanih zbog rekurentne diskus hernije na Klinici za neurohirurgiju KCS u periodu Januar 2009. - Decembar 2010.

Rezultati: Prikazano je da je kod 39 (67,2%) pacijenata dominirao bol, kod 10 (17,2%) bol i pareza peronealnog a kod 9 (15,6%) pacijenata bol i pareza tibijalnog nerva. Smanjenje bola je postignuto kod 84,9% pacijenata gde je postojao samo bol. U neposrednom postoperativnom toku slabiji je bio oporavak funkcije peronealnog nerva, kod 20% pacijenata, dok se pareza tibijalnog nerva oporavila kod 55,6% pacijenata. Na prvoj operaciji kod 38 (65,5%) pacijenata diskus hernija je bila u protruziji, kod 18 (31%) u ekstruziji a tek kod 2 (3,5%) pacijenta u sekvestraciji.

Zaključci: Hirurgija rekurentne diskus hernije je sigurna i efikasna metoda lečenja. Neophodan je MRI sa i bez kontrasta kojim razlikujemo rekurentnu diskus herniju od postoperative fibroze. Najbolji rezultati se postižu kod pacijenata bez neurološkog ispada, kao i kod pacijenata gde je prilikom prve operacije diskus hernija bila u ekstruziji ili sekvestraciji.

Ključne reči: diskus hernija, recidiv, operacija, ishod

RECURRENT DISC HERNIATION: CLINICAL, RADIOLOGICAL FINDINGS AND OUTCOME OF SURGICAL TREATMENT

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Introduction: Recurrent disc herniation represents a re-herniation of the disc at the same level where it was before the initial discectomy, on the same or contralateral side after the patient was postoperatively pain free for 6 months.

The Aim: The aim of our study is to analyze the clinical, radiological parameters and the outcome of surgical treatment, with special reference to localization and type of herniation on the first operation.

Materials and Methods: Our research is based on a retrospective study. Data were collected from the medical records of 58 patients operated on for recurrent disc herniation at the Clinic of neurosurgery, KCS, January 2009. - December 2010.

Results: It was established that 39(67.2%) patients had pain as a dominating symptom and in this group pain reduction was achieved in 84.9%, 10 (17.2%) patients had pain and paresis of the peroneal nerve and 9(15.6%) patients had pain and paresis of the tibial nerve. There was a slight recovery of peroneal nerve function in 20% of patients, while the tibial nerve paresis recovered in 55.6% of patients. At the first operation in 38(65.5%) patients disc herniation was in protrusion, in 18(31%) in extrusion and only in 2(3.5%) patients in sequestration.

Conclusion: Surgery is an effective treatment. An MRI with and without contrast is necessary in order to distinguish re-herniation from postoperative fibrosis. Best results are achieved in patients without neurological deficits, and in patients where during the first surgery the disc was in extrusion or in sequestration.

Keywords: disc herniation, recurrence, surgery, outcome

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Uvod: Akutne disekcije aorte tip A su praćene visokim mortalitetom, čak 40% pacijenata umire u momentu nastanka disekcije a ako se ne leči 1% na sat odnosno 90% bolesnika umire unutar mesec dana od momenta nastanka disekcije.

Cilj rada: Evaluacija kliničkih karakteristika, operativnog lečenja i ranog postoperativnog morbiditeta i mortaliteta kod bolesnika obolelih od akutne disekcije aorte tipa A po Stanfordu.

Materijal i metode: U periodu od januara 2003. do decembra 2010. godine na Klinici za Kardiohirurgiju KCS-e u Beogradu operisano je 325 konsekutivnih pacijenata zbog disekcije aorte, a u studiju je uključeno 308 bolesnika operisanih zbog akutne disekcije tipa A (klasifikacija po Stanfordu). Prosečna starost bolesnika bila je 56 godina uz predominaciju muškog pola (72%).

Rezultati: U većini slučajeva primenjena je rekonstrukcija ascendentne aorte 57.8%, a tehnika „otvorene“ distalne anastomoze kod 16.9% bolesnika. Rekonstrukcije luka aorte učinjena je kod 23% bolesnika: totalna u 5.2% i parcijalna u 17.8% slučajeva. Neurološke komplikacije (17.2%), sindrom malog udarnog volumena (13.6%) i krvavljenje (10.0%) su najučestalije postoperative komplikacije. Ukupni rani mortalitet iznosio je 24.0%.

Zaključak: Upkos napretku u razumevanju kliničkih i patomorfoloških korelacija uz istovremeno poboljšanje u preoperativnoj evaluaciji, rekonstruktivnoj tehnici, strategiji perfuzije i protekcije, smrtnost kod akutnih disekcija aorte ostaje visoka

Ključne reči: aorta, disekcija, evaluacija parametara

ACUTE AORTIC DISSECTION TYPE A

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Introduction: Acute aortic dissection type A is accompanied by high mortality, even 40% of patients die at the moment the dissection appear, and if it is untreated 1% per hour apropos 90% of patients die within a month from the moment of appearing the disease.

The Aim: Evaluation of clinical characteristics, operative treatment, and early postoperative morbidity and mortality in case of patients suffering from aortic dissection type A by Stanford.

Materials and Methods: In the period from January 2003. to December 2010. at the Department of Cardiac Surgery, Clinical Center of Serbia in Belgrade were operated 325 consecutive patients because of aortic dissection type A, and the study includes 308 patients operated. The average age of patients was 56 years with a predominance of males (72%).

Results: In most cases was applied reconstruction of ascending aorta (57,8%), and technique of "open" distal anastomosis to 16,9% of total patients. Reconstruction of the aortic arch was done to 23% of patients: total in case of 5.2% and partial in case of 17,8% of the whole number of patients. Neurological complications (17,2%), syndrome of the small stroke volume (13,6%), bleeding (10.0%) are the most common postoperative complications. Total early mortality was 24.0%.

Conclusion: In spite of improvement comprehension for clinical and pathomorphological correlation and also progress in preoperative evaluation, reconstructive techniques, preferential and perfusion strategy, mortality in cases of acute aortic dissection remains high.

Key words: aorta, dissection, evaluation of parameters

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Uvod: Subarahnoidalno krvarenje (SAH) pripada grupi hemoragijskih cerebrovaskularnih bolesti i označava ekstrasvazaciju krvi u subarahnoidalni prostor.

Cilj: Proceniti uspešnost hirurške intervencije kod pacijenata sa subarahnoidalnom hemoragijom i zaključiti u kojoj meri ona utiče na postoperativni oporavak i preživljavanje pacijenata.

Materijal i metode: Studija je retrospektivnog karaktera. Podaci su prikupljeni iz protokola i istorije bolesti 70 pacijenata, koji su operisani na Klinici za neurohirurgiju Kliničkog centra Srbije. Pacijenti su razvrstavani u podgrupe na osnovu godina, udruženih bolesti, lokalizacije krvarenja, vremena operacije i kliničkog gradusa.

Rezultati: 48.6% pacijenata sa subarahnoidalnom hemoragijom je imalo udružene kardiovaskularne bolesti. Ispitanici sa udruženim bolestima su pokazali lošiji postoperativni oporavak. Primena odgovarajuće hirurške metode rezultuje značajnim poboljšanjem kliničke slike ispitanika sa gradusom I, II i III, nakon intervencije, što je potvrđeno statističkom obradom podataka. ($p < 0.05$)

Zaključak: Na osnovu dobijenih rezultata možemo zaključiti da postoji statistički opravdana osnova primene hirurške terapije kod subarahnoidalnog krvarenja, posebno kod pacijenata sa gradusom I, II i III.

Ključne reči: subarahnoidalna hemoragija, ishod, rizik

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Uvod: Klinička slika kod pacijenata sa intrakranijalnim tumorima zavisi od vrste i stepena malignosti tumora, njegove veličine, lokalizacije, te prisustva eventualnih komplikacija.

Cilj: Cilj našeg istraživanja je komparativna analiza epidemioloških karakteristika, najčešćih tegoba, dužine trajanja tegoba i kliničke slike kod pacijenata sa intrakranijalnim tumorima.

Materijal i metode: Istraživanje retrospektivnog karaktera sprovedeno je na Klinici za neurohirurgiju, Kliničkog centra Vojvodine. Obradeno je 115 hirurški lečenih pacijenata sa intrakranijalnim tumorom u periodu od 01.01. do 31.12.2010. godine, kod kojih je određen patohistološki tip tumora.

Rezultati: Najčešće tegobe koje su pacijenti imali bili su glavobolja (56%). Epileptične napade je imalo (28%) pacijenata, a promene u mentalnom statusu (24%) pacijenata. Najučestaliji objektivni znaci u pregledu pacijenata su fokalni neurološki znaci, koji su registrovani kod (65%) pacijenata. Klinička slika se brže razvija kod tumora visokog stepena maligniteta i metastatskih tumora. Kod neuroepitelijalnih tumora niskog stepena maligniteta se statistički značajno češće javljaju epileptički napadi u odnosu na druge tumore. Fokalni neurološki znaci se u znatno većem procentu javljaju kod pacijenata sa tumorima visokog stepena maligniteta, meningeomima i metastatskim tumorima u odnosu na tumore niskog stepena maligniteta i tumore selarne regije.

Zaključak: Najčešće tegobe pacijenata sa intrakranijalnim tumorima su glavobolja, epileptični napadi i promene u mentalnom statusu. Najučestaliji objektivni znaci u pregledu pacijenata su fokalni neurološki znaci. Neuroepitelijalne tumore visokog stepena maligniteta i metastatske tumore karakteriše brži razvoj kliničke slike i pojava znatno većeg procenta fokalnih neuroloških znakova, a neuroepitelijalne tumore niskog stepena maligniteta češća pojava epileptičnih napada, u odnosu na druge intrakranijalne tumore.

Ključne reči: intrakranijalni tumori, simptomi, klinička slika.

TREATMENT RESULT ESTIMATION ON THE PATIENTS WITH SUBARACHNOID HEMORRHAGE

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Introduction: Subarachnoid hemorrhage (SAH) is a kind of hemorrhagic cerebral-vascular disease and indicates blood inflow into the subarachnoid area.

The Aim: Estimation of success of surgical intervention on patients with subarachnoid hemorrhage and conclusion of the scale of its efficiency on post surgical recovery and patient survival.

Material and Methods: Study has a retrospective character. Data were collected from the protocol and case histories of 70 patients who underwent surgery at the Clinic for Neurosurgery at the Clinical Center of Serbia. Patients were classified into subgroups based on age, associated diseases, hemorrhagic localization, surgery time, and clinical gradation.

Results: 48.6% of patients with subarachnoid hemorrhage had associated cardiovascular disease. Patients with combined hemorrhage had lower level of post-operative recovery. Usage of appropriate surgical therapy significantly supports the improvement of clinical patients with PC grade I, II and III, after the intervention, which was confirmed by statistical analysis of data. ($p < 0.05$)

Conclusion: Based on results summary it can be concluded that there is justified statistical base for usage of surgical therapy for treating subarachnoid hemorrhage, especially on patients with clinical grade I, II and III.

Key words: subarachnoid hemorrhage, result, risk

COMPARATIVE ANALYSIS OF SYMPTOMS AND OBJECTIVE FINDINGS IN PATIENTS WITH INTRACRANIAL TUMORS

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Introduction: The clinical picture in patients with intracranial tumors depend on the type and degree of malignancy of the tumor, its size, location, and the presence of possible complications.

The Aim: The aim of our research is a comparative analysis of epidemiological characteristic, the most common symptoms, duration of symptoms and clinical features in patients with intracranial tumors.

Materials and Methods: The retrospective research was conducted at the Clinic for Neurosurgery, Clinical Center of Vojvodina. Total of 115 surgically treated patients with intracranial tumors, in the period from 01.01. to 31.12.2010., where the histopathological tumor type determined.

Results: The most common complaints that patients had were headache (56%). Seizured had (28%) of patients, a change in mental status (24%) of patients. The most common objective signs in examination of patients have focal neurological signs, which are registered with (65%) patients. Clinical picture of the rapid development of tumors of high grade malignancy and metastatic tumors. At the tumors of low grade malignancy significantly more epilepsy occur in relation to other tumors. Focal neurological signs are in a much higher percentage occurring in patients with the tumors of high grade malignancy, meningeoms and metastatic tumors compared to tumors of the seller region and the tumors of low grade malignancy.

Conclusion: The most common symptoms of patients with intracranial tumors are headache, seizures and changes in mental status. The most common objective signs in examination of patients have focal neurological signs. The tumors of high grade malignancy and metastatic tumors characterized by the rapid development of clinical features and a considerably higher percentage of focal neurological signs, and the tumors of low grade malignancy more frequent seizures, compared to other intracranial tumors.

Key words: intracranial tumors, symptoms, clinical picture.

ISHOD HIRURŠKOG LEČENJA BOLESNIKA SA LUMBALNOM DISKUS HERNIJOM U ODNOSU NA INTENZITET BOLA I MOTORNI DEFICIT

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Uvod: Diskus hernija je najčešći uzrok kompresivnih lumbalnih radikulopatija degenerativne geneze. Indikacije za hirurško lečenje su sindrom kaude ekvine, naglo nastala slabost važne grupe mišića koja učestvuje u hod u bol koji perzistira nakon sprovedenog konzervativnog lečenja.

Cilj: Procena intenziteta bola pre operacije i nakon završenog hirurškog lečenja, kao i procena oporavka motornog deficita nakon operativnog lečenja.

Materijal i metode: Na Neurohirurškoj klinici u Novom Sadu izvršena je retrospektivna analiza 251 bolesnika u odnosu na intenzitet bola i status motornog deficita nakon hirurškog lečenja. Bolesnici su operisani zbog lumbalne diskus hernije na jednom ili dva nivoa. Praćeni parametri su bili intenzitet bola i status motornog deficita preoperativno i devetog dana nakon operacije. Intenzitet bola je kvantifikovan vizuelno analognom skalom bola, dok je mišićna slabost dorzalnih i plantarnih pregibača stopala ocenjivana manualnim mišićnim testom (ocene 0-5).

Rezultati: Rezultati ispitivanja pokazuju da je lumbalni ili radikularni bol, u grupi bolesnika sa akutnim bolom, devetog postoperativnog dana, statistički značajno manji nego preoperativno. Takođe, dokazano je statistički značajno povećanje grube mišićne snage kod bolesnika kod kojih je motorni deficit trajao do 3 nedelje.

Zaključci: Lumbalna mikrodisektomija načinjena na jednom ili dva nivoa se pokazala kao odlična metoda lečenja u smislu statistički značajnog smanjenja intenziteta bola. Nakon lumbalne mikrodisektomije usledio je rani i statistički značajan oporavak preoperativno prisutnog motornog deficita, u grupi bolesnika kod kojih je motorni deficit preoperativno trajao do tri nedelje.

Ključne reči: lumbalna diskus hernija, lumbalni ili radikularni bol, motorni deficit

OUTCOME OF SURGICAL TREATMENT OF PATIENTS WITH LUMBAR DISC HERNIATION IN THE INTENSITY OF PAIN AND MOTOR DEFICITS

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Introduction: Disc herniation is the most common cause of compressive lumbar radiculopathy of degenerative genesis. Indications for surgery are cauda equina syndrome, sudden weakness of the important muscle groups that participate in walking and pain that persist after completion of conservative treatment.

The Aim: Assessment of intensity of pain before surgery and after completion of surgical treatment, and evaluation of repair of motor deficit after surgery.

Materials and Methods: A retrospective study was performed at the Neurosurgical Clinic in Novi Sad on 251 patients related to the intensity of pain and motor deficit status after surgical treatment. The patients were operated for lumbar disc herniation on one or two levels. The monitored parameters were the intensity of pain and motor deficit before the operation and on the ninth day after surgery. The intensity of pain was graded by visual analog pain scale, and muscle weakness of the dorsal and plantar foot flexors was graded by manual muscle test (grades 0-5).

Results: Study showed that lumbar or radicular pain was significantly lower on the ninth day after surgery, in group of patients with acute pain. It also demonstrated a statistically significant increase of muscle strength in patients with motor deficit that lasted up to three weeks.

Conclusions: Lumbar microdiscectomy made on one or two levels proved to be an excellent method of treatment in terms of a statistically significant reduction of pain intensity. An early and statistically significant recovery of preoperative motor deficit was seen in group of patients in which motor deficit lasted up to three weeks, after lumbar microdiscectomy.

Keywords: lumbar disc herniation, low back or radicular pain, motor deficit

POREĐENJE EFIKASNOSTI SEMI-FOWLER I BOČNOG POLOŽAJA PACIJENTA TOKOM IZVOĐENJA TORAKOSKOPSKE SIMPATEKTOMIJE U LEČENJU PRIMARNE FOKALNE HIPERHIDROZE

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Uvod: Primarna hiperhidroza je poremećaj nepoznatog uzroka koji se karakteriše prekomernim znojenjem koje prevazilazi fiziološke potrebe. Torakoskopska simpatektomija je opšte poznata minimalno invazivna hirurška procedura u lečenju primarne hiperhidroze.

Cilj: cilj ovoga rada je da se uporedi efikasnost semi-Fowler i bočnog položaja pacijenta tokom izvođenja torakoskopske simpatektomije u lečenju primarne hiperhidroze.

Materijal i metode: Od januara 2009. do januara 2010 operisano je 263 pacijenta zbog primarne hiperhidroze dlanova i pazušnih jama. Pacijenti su bili podeljeni u dve grupe: grupa A (n=133) pacijenti operisani u bočnom položaju koristeći dvolumenski endotrahealni tubus i grupa B (n=130) pacijenti operisani u semi-Fowler položaju koristeći jednolumenski endotrahealni tubus, bez insuflacije CO₂, ali uz kratak period apneje.

Rezultati: Operisano je 107 osoba muškog pola i 156 osoba ženskog pola prosečne starosti 30.31±8.35 godina. Pacijenti u obe grupe su bili približno istog intenziteta znojenja. Kod svih pacijenata operacija je uspešno izvedena, bez komplikacija i perioperativnog morbiditeta. Za grupu A prosečno vreme trajanja operacije bilo je 31.2±3.87min., a za grupu B 14.19±4.98min. U grupi B period apneje trajao je prosečno 2.86±1.15min i tokom tog perioda saturacija kiseonika je bila 92.65±5.66%, bez kardiorespiratornih poremećaja, a u grupi A saturacija je bila 100% bez perioda apneje.

Zaključak: Na osnovu dobijenih rezultata kraće trajanje operacije, nekompletan kolaps pluća, zadovoljavajuća saturacija kiseonika, kratak period apneje i bolja reekspanzija pluća, zaključujemo da je torakoskopska simpatektomija u semi-Fowler poziciji visoko efektivna i lako izvodljiva hirurška procedura za rešavanje primarne hiperhidroze.

Ključne reči: primarna hiperhidroza, torakoskopska simpatektomija, minimalno invazivna hirurgija, semi-Fowler položaj

SEMI-FOWLER VS LATERAL DECUBITUS POSITION FOR THORACOSCOPIC SYMPATHECTOMY IN TREATMENT OF PRIMARY FOCAL HYPERHIDROSIS

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Introduction: Primary hyperhidrosis is a disorder with an unknown cause characterized by excessive sweating beyond physiological needs. Thoracoscopic sympathectomy is well known minimal invasive surgical procedure for treatment of severe primary hyperhidrosis.

The Aim: to compare usefulness of semi-Fowler position vs. lateral decubitus position for thoracoscopic sympathectomy in treatment of primary focal hyperhidrosis

Materials and Methods: From January 2009 to January 2010, 263 consecutive patients with palmar and axillar hyperhidrosis underwent thoracoscopic sympathectomy Th2-Th4. Patients were divided into two groups: group A (n=133) underwent thoracoscopic sympathectomy through lateral decubitus using double lumen endotracheal intubation, and group B (n=130) underwent thoracoscopic sympathectomy through semi-Fowler supine position (semi sitting with arm abducted) using single lumen endotracheal intubation without insufflation of CO₂, but with short apnea period.

Results: There were 107 males and 156 females with median age 30.31±8.35 years. Two groups were comparable in gender, age, severity of sweating. All operations were successfully performed with no complications or perioperative morbidity. For group A average operation time for both sides was 31.2±3.87min and for group B average time was 14.19±4.98min. In group B apnea period per one lung lasts 2.86±1.15min and during that period observed saturation was 92.65±5.66% without significant cardiorespiratory disturbances, and in group A saturation was 100% without apnea period.

Conclusion: Based on shorter operating time, lack of incomplete lung collapse, insignificant apnea and better reexpansion of lungs, we concluded that thoracoscopic sympathectomy through semi-Fowler supine position is highly effective and easy to perform for primary hyperhidrosis.

Key words: primary hiperhidrosis, thoracoscopic sympathectomy, minimal invasive surgery, Semi-Fowler position

POREDNJE FAKTORA RIZIKA KOD PACIJENATA SA PATOLOŠKIM ELONGACIJAMA I ATEROSKLEROTSKOM STENOZANTNOM BOLEŠĆU KAROTIDNIH ARTERIJA

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Uvod: Procenjivanje faktora rizika i kliničkih manifestacija bolesti karotidnih arterija je od izuzetne je važnosti u kliničkoj praksi. Ateroskleroza, kao i elongacije karotida mogu uzrokovati organske i funkcionalne lezije mozga (cerebrovaskularnu insuficijenciju).

Cilj rada: Cilj rada je uporediti i proceniti kliničke karakteristike i faktore rizika između pacijenata sa stenozantnom aterosklerotskom bolešću i elongacijama karotidnih arterija.

Materijal i metode: Retrospektivnom studijom obuhvaćeno je 80 pacijenata i to 40 pacijenata sa patološkim elongacijama i 40 sa stenozom unutrašnjih karotidnih arterija (ICA), koji su lečeni u Klinici za vaskularnu i endovaskularnu hirurgiju tokom 2011.god. Na osnovu kolor duplex sken (CDS) nalaza upoređivani su procenat stenozne ICA kao i lokalizacija patološkog procesa, dok su iz istorija bolesti poređene razlike po prisustvu moždanih udara, dijabetesa, akutnog koronarnog sindroma, simptomatologije, pušenja kao i demografske karakteristike između grupa.

Rezultati: Statistički značajne razlike pronađene su po polu, godinama starosti, stepenu stenozne ICA, prisustvu cerebrovaskularnog insluta (CVI) i hiperlipidemiji. Pacijenti sa stenozantnom bolešću ICA predominantno su bili muškog pola (77.5%) i starije životne dobi (68.85 god.). CVI ređe je dijagnostikovano u grupi elongacija karotida, dok je hiperlipidemija značajno veći faktor rizika za nastanak stenozantne bolesti ICA ($p < 0.01$). Po pitanju, dijabetesa, hipertenzije, pušenja grupe se nisu značajno razlikovale.

Zaključak: Ispitivanje ističe razliku među grupama, pokazujući da su starije životno doba, muški pol, hiperlipidemija kao i CVI više povezani sa nastankom stenozantne bolesti karotida, dok su patološke elongacije ICA češće dijagnostikovane kod žena mlađe dobi.

Ključne reči: pacijenti, stenozna, elongacije, karotide

COMPARISON OF RISK FACTORS IN PATIENTS WITH ABNORMAL ELONGATION AND ATHEROSCLEROTIC DISEASE OF CAROTID ARTERY STENOSIS

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Introduction: The assessment of risk factors and clinical features of carotid artery disease is extremely important for clinical practice. Carotid stenosis can cause the morphological and functional lesions of the brain (cerebrovascular ischaemia).

The aim: To compare risk factors and clinical features between patients with carotid stenosis and carotid elongation.

Materials and Methods: The retrospective study included 80 patients: 40 patients with carotid elongations and 40 patients with carotid stenosis. During last year (2011) they were operated on. The carotid color duplex ultrasound examinations were used to compare levels of stenosis and the site of lesions. Presence of stroke, diabetes, acute coronary syndromes, symptoms, smoking and demographic characteristics between the groups, were recorded from case-history.

Results: Carotid stenosis was more frequent in men (77.5%) and in older age (68.85yr). Also, the patients with carotid stenosis had higher levels of lipids compared to those with carotid elongations. The patients with carotid stenosis more suffered from cerebrovascular insults (CVI), as well. ($p < 0.01$) Diabetes, hypertension, smoking were not statistically different between the groups.

Conclusions: Older age, male gender, CVI and higher levels of lipids were directly connected to the carotid stenosis, while women were more likely to develop elongations of the carotid arteries.

Keywords: patients, stenosis, elongation, carotid arteries

MEHANIZAM NASTANKA, KLINIČKA SLIKA I DIJAGNOSTIKA POROĐAJNE POVREDE PLEKSUSA BRAHIJALISA

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Uvod: Pleksus brahijalis predstavlja splet nerava koji inervišu gornje ekstremitete. Većina povreda nastaje na rođenju, najčešći faktori nastanka su velika porođajna težina ploda, prezentacija ploda, distocija ramena. Porođajnu povredu pleksusa brahijalisa karakterišu dve vrste lezije (pareza i paraliza) i tri tipa (gornji, donji, kompletni). Dijagnoza se postavlja na osnovu kliničke slike, a potvrđuje elektromiografijom (EMG). Terapija se započinje odmah po rođenju, fizikalnom terapijom.

Cilj: Cilj studije je da se ispita distribucija porođajne povrede pleksusa brahijalisa, otkriju faktori nastanka i dijagnostikuje težina oštećenja.

Materijal i metode: 50 pacijenata (33 ženskog i 17 muškog pola) sa dijagnozom porođajne povrede pleksusa brahijalisa lečenih na Univerzitetskoj dečjoj klinici u Beogradu u periodu od 01.01.2007. do 31.12.2010. godine je uključeno u studiju.

Rezultati: Nađeno je da porođajna težina preko 4000 grama češće utiče na stepen kliničke slike ($p < 0,05$). Poređenjem prema polu i Apgar skor u odnosu na vrstu i tip lezije, nije nađena statistički značajna razlika ($p > 0,05$). Razmatranjem izveštaja EMG-a o vrsti, tipu i težini lezije nije nađena statistički značajna razlika ($p > 0,05$).

Zaključak: Najznačajniji faktor rizika je porođajna težina ploda preko 4000 grama koja dovodi do pojave porođajne povrede. U našem istraživanju kao rizični faktor Apgar skor nije statistički dokazan. Porođajni faktor rizika na Univerzitetskoj dečjoj klinici u Beogradu koji dovodi do porođajne povrede pleksusa brahijalisa predstavlja porođajna telesna težina preko 4000 grama.

Ključne reči: pleksus brahijalis, porođajna povreda, telesna težina, EMG.

MECHANISM RISK, CLINICAL FEATURES AND DIAGNOSTIC OF OBSTETRICAL BRACHIAL PLEXUS INJURIES

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Introduction: Brachial plexus is a network of nerves that innervates the upper extremities. Most injuries occur at birth, the most common factors are excessive fetal birth weight, presentation, dystocia. Brachial plexus birth injuries are characterized by two types of lesion (paresis and paralysis) and three types (upper, lower, complete). Diagnosis is based on the clinical picture and confirmed by electromyography (EMG). Therapy begins immediately after birth, using conservative methods.

The Aim: This study was to investigate the distribution of brachial plexus birth injuries, to identify the pathogenetic factors and to diagnose the severity of the damage.

Materials and Methods: 50 patients (33 female and 17 male), who were diagnosed with brachial plexus birth injuries and treated at the University Children's Hospital in Belgrade during 01.01.2007 to 31.12.2010, were included in the study.

Results: It was found that birth weight over 4000 grams often affects the degree of the clinical picture ($p < 0.05$). Comparing by gender in relation to the kind and type of lesion did not reveal a significant statistical difference ($p > 0.05$). A review of the EMG report is also not statistically significant ($p > 0.05$).

Conclusion: The most significant risk factor is fetal birth weight over 4000 grams, which leads to injuries during birth. Apgar score as a risk factor was not statistically proven. Birth weight over 4000 grams is a birth risk factor in the University Children's Hospital in Belgrade.

Keywords: brachial plexus, birth injury, body weight, EMG.

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Uvod : Sepsa predstavlja sistemski odgovor bolesnika na infekciju. Savremena svetska literatura ističe značaj i ulogu biohemijskih markera, naročito prokalcitonina u cilju što ranijeg otkrivanja infektivnog procesa. Takođe nam ukazuje na rutinsku primenu prokalcitonina, laktata i interleukina kao sigurnih i najranijih markera sepse.

Cilj rada : Cilj rada je bio ispitati značaj i ulogu biohemijskih markera (PCT, CRP, laktata) u ranoj dijagnostici sepse .

Materijal i metode : Prospektivnom studijom obuhvaćeno je 987 bolesnika, hospitalizovanih u periodu od 01.01-31.12. 2011. godine, u Urgentnom centru Kliničkog centra Vojvodine u Novom Sadu. Od ukupnog broja lečenih, na osnovu biohemijskih markera evidentirano je 18 bolesnika sa dijagnozom sepse ili septičnog šoka. Od laboratorijskih parametara praćeni su C-reaktivni protein (CRP), prokalcitonin (PCT), laktati, broj leukocita, sedimentacija, temperatura.

Rezultati : Od 18 septičnih bolesnika, 67% je bilo ženskog pola. Najčešći uzročnici sepse izolovani iz hemokulture bili su E. coli, Staphylococcus koagulaza - i difteroidi. Kod svih pacijenata zabeležena je ubrzana sedimentacija , leukocitoza , višestruko povišene vrednosti PCT i CRP, laktata, kao i povišena telesna temperatura. U našem Urgentnom centru letalitet od sepse je iznosila 45%.

Zaključak : CRP je superiorniji za dijagnozu sepse, dok je PCT superiorniji za težinu sepse kao i za prognozu i ishod lečenja. Prokalcitonin je važan dijagnostički parametar u pogledu diferentovanja infektivnih od neinfektivnih pokretača SIRS-a, ARDS-a, MODS-a, pankreatitisa. C- reaktivni protein je važan za razlikovanje virusnih od bakterijskih upala. Povišene koncentracije serumskih laktata javljaju se u stanjima teške sepse i septičnog šoka i imaju prognostičku vrednost.

Gljučne reči : sepsa, septični šok, biohemijski markeri za sepsu

THE ROLE OF BIOCHEMICAL MARKERS IN EARLY DIAGNOSTICS OF SEPSIS

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Introduction : Sepsis is a systemic response to infection of patients. The modern world literature emphasizes the importance and role of biochemical markers, particularly PCT purpose of early detection of infectious process. It also indicates the routine use of procalcitonin, lactate and interleukin as a safe and early markers of sepsis.

The Aim : The aim of this study was to examine the importance and role of biochemical markers (PCT,CRP,lactate) in the early diagnosis of sepsis.

Materials and Methods : This prospective study included 987 patients hospitalized in the period from 01.01 - 31. 12 2011th year, in the Emergency Center, Clinical Center of Vojvodina in Novi Sad. Of the total number of treated patients, based on biochemical markers recorded were 18 patients diagnosed with sepsis or septic shock. From laboratory measured the sedimentation rate, leukocyte count, procalcitonin (PCT), lactate, C-reactive protein (CRP) and temperature.

Results : Of the 18 septic patients, 67% were female. The most common will cause sepsis, which were isolated from blood cultures were E. coli, Staphylococcus coagulase - and difteroidi. All patients were recorded sedimentation, leukocytosis, multiple elevated PCT and CRP, lactate, and fever. In our Emergency Center the lethality of sepsis was 45%.

Conclusion : CRP is superior for the diagnosis of sepsis, while PCT is superior to the weight of sepsis as well as prognosis and treatment outcome. Procalcitonin is an important diagnostic tool in terms of differentiation of infectious from noninfectious triggers SIRS, ARDS, MODS, a pancreatitis. C-reactive protein is important to differentiate viral from bacterial infection. Elevated levels of serum lactate occur in conditions of severe sepsis and septic shock and have prognostic value.

Key words : sepsis, septic shock, biochemical markers of sepsis

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Uvod: Primitan je sve veći broj pacijenata sa kardiovaskularnim bolestima. Metabolički sindrom (MetS) je skup poremećaja koji obuhvata abdominalni tip gojaznosti, povišen krvni pritisak, povećanje serumskih vrednosti triglicerida i glukoze, a smanjenje HDL-holesterola i definiše se, prema poslednjoj definiciji Internacionalne Dijabetesne Federacije, postojanjem abdominalne gojaznosti i dva ili više preostala navedena kriterijuma. Bolesnici sa MetS imaju povećan rizik za razvoj kardiovaskularnog morbiditeta i mortaliteta.

Cilj: Ispita učestalost metaboličkog sindroma kod bolesnika sa različitom distribucijom i manifestacijama aterosklerotskog procesa.

Materijal i metode: Kriterijumi za uključene u studiju su bili prisustvo karotidne okluzivne bolesti, aneurizme aorte ili periferne okluzivne arterijske bolesti u stadijumu koji zahteva hirurški tretman. Aneurizmska i karotidna bolest su procenjavani ultrasonografskim pregledom, a periferna arterijska bolest je procenjavana na osnovu dopler indeksa.

Rezultati: Nije bilo statistički značajnih razlika u vrednostima krvnog pritiska, HDL-holesterola, triglicerida i obima struka između grupa pacijenata sa MetS i bez njega. Primitna je statistički značajna razlika u broju pacijenata sa povišenom vrednosti serumske glukoze između dve grupe pacijenata. Takođe je postojala statistički značajna razlika u broju primljenih pacijenata sa MetS i bez njega.

Zaključci: Značajno veći broj vaskularnih bolesnika sa ugrožavajućim stepenom aneurizmske, periferne i karotidne bolesti nije imao MetS. Potrebna su dalja ispitivanja koja će ispitati učestalost MetS na nastanak navedenih podgrupa vaskularnih oboljenja, kao i ispitivanja koja će odrediti uticaj MetS na ishod hirurškog lečenja ovih bolesti kod određenih podgrupa bolesnika, u cilju sprečavanja hirurških komplikacija.

Gljučne reči: metabolički, sindrom, karotidna, aneurizma

EFFECT OF THE PRESENCE OF THE DISTRIBUTION OF METABOLIC SYNDROME ATHEROSCLEROTIC PROCESS

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Introduction: There has been an increasing number of patients with cardiovascular diseases. Metabolic syndrome (MetS) is a set of disorders that includes abdominal obesity, high blood pressure, increased serum triglycerides and glucose values, decreased serum HDL-cholesterol and is defined according to the latest definition of the International Diabetic Federation, the presence of abdominal obesity and the remaining two or more specified criteria. Patients with metabolic syndrome have an increased risk of cardiovascular morbidity and mortality.

The Aim: Examine the prevalence of the MeS in patients with different distribution and manifestations of the atherosclerotic process.

Materials and Methods: Criteria for inclusion in this study were the presence of carotid occlusive disease, aortic aneurysm or peripheral arterial occlusive disease in stage requiring surgical treatment. Aneurysmal and carotid disease were evaluated ultrasonographic examination, and peripheral arterial disease was assessed based on Doppler indexes.

Results: There was no statistically significant difference in the values of blood pressure, HDL-cholesterol, triglycerides and waist circumference between groups of patients with MetS and without. There was statistically significant difference in the number of patients with elevated serum glucose values between the two groups of patients. There was also a statistically significant difference in the number of admitted patients with and without MetS.

Conclusion: A significantly higher number of vascular patients with the compromising aneurysmal, peripheral and carotid disease did not have MetS. Further studies are required to investigate the prevalence of MetS in the development of these vascular diseases subgroup, as well as tests to determine the impact of MetS on the outcome of surgical treatment of this disease in certain subgroups of patients, to prevent surgical complications.

Keywords: metabolic, syndrome, carotid, aneurysm

PRIMENA ANATOMSKOG BODOVNOG SISTEMA KOD KRITIČNO PОВРЕĐENIH БОLESNIKA

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Uvod: Politrauma je sindrom višestrukih povreda. Sistem skorova predstavlja pokušaj objektivizacije procene stanja teško povređenih bolesnika i sastoji se u bodovanju povreda. U kliničkoj praksi se najviše koriste Injury Severity Score (ISS) i Abbreviated Injury Scale (AIS).

Cilj: Cilj istraživanja bila je primena i značaj anatomskog bodovnog sistema kod kritično povređenih bolesnika, u proceni težine traume kao i ishoda lečenja.

Materijal i metode: Prospektivnom studijom ispitano je 75 politraumatizovanih, lečenih u Urgentnom Centru Kliničkog centra Vojvodine u periodu od 20. avgusta 2010. do 31. decembra 2011. Na osnovu anamnestičkih podataka o mehanizmu povrede, fizikalnog nalaza, rendgenološke i laboratorijske dijagnostike, donet je zaključak o težini povrede i daljem terapijskom tretmanu. Po prijemu je određen AIS a zatim izračunat i ISS.

Rezultati: Od 75 kritično povređenih, najveći broj činile su osobe muškog pola (70,1%), koje su u proseku bile stare 40 godina (raspon: 17-87 godine). Tokom lečenja egzistirala je 31 osoba. Saobraćajne nesreće su bile vodeći uzrok povređivanja (57%). Vrednost ISS kod preživelih ispitanika bila je u proseku 30 (raspon: 22-50), a kod bolesnika sa letalnim ishodom 53 (raspon: 22-59). Razlika u vrednostima AIS skora između ispitanika sa različitim ishodom bila je značajna samo za AIS glave i vrata.

Zaključak: Rezultati ove studije ukazuju da ISS kao i AIS imaju prognostički dijagnostički značaj u lečenju politraumatizovanih bolesnika, što se slaže sa podacima svetske literature. Što je veći anatomski skor na prijemu to je ishod po kritično povređene nepovoljniji.

Ključne reči: politrauma, ISS, AIS, letalitet.

APPLICATION OF ANATOMIC SEVERITY SCORE IN CRITICALLY INJURED PATIENTS

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Introduction: Polytrauma is a syndrome of multiple injuries. The system scores an attempt to assess the state of objectification severely injured patients, and include the scoring of injuries. In clinical practice, the most in use, are Injury Severity Score (ISS) and Abbreviated Injury Scale (AIS).

Goal: The aim of this study was to use and the importance of anatomical scoring system in critically injured patients, assessing trauma severity and outcome of treated.

Material and methods: This prospective study included 75 polytraumatized, treated at the Emergency Center, Clinical Center of Vojvodina in the period of August 20th 2010 to December 31st 2011. On the basis of medical history data on the mechanism of injury, physical findings, radiographic, and laboratory diagnostics adopted a conclusion on the severity of injury and further therapeutic treatment. Upon receipt of the designated AIS and then calculated the ISS.

Results: Of the 75 critically injured, the majority consisted of males (70.1%), and the average age was 40 years old (range 17-87 years). 31 persons died during treatment. Traffic accidents were the leading cause of injury (57%). The value of ISS in the surviving patients was on average 30 (range: 22-50), and the deaths 53 (range: 22-59). The difference in the values of AIS scores between patients with different outcome was significant only for AIS head and neck region.

Conclusion: The results of this study indicate that the ISS and AIS have prognostic significance in the diagnostic treatment of patients with multiple traumas, which agrees with the data of world literature. The higher the score on admission anatomically to the outcome of the critically injured a less favorable.

Key words: polytrauma, ISS, AIS, mortality.

UTICAJ FENTANILA NA SMANJENJE BOLA PRI INTRAVENSKOJ INJEKCIJI PROPOFOLA

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Uvod: Uprkos mnogobrojnim prednostima, prilikom intravenske primene propofola, kod određenog broja pacijenata, javlja se bol na mestu gde je plasirana intravenska kanila.

Cilj: Cilj ove studije je da dobitim rezultatima pokaže koliki je uticaj fentanila na smanjenje bola prilikom intravenske primene propofola.

Materijal i metode: Četrdeset pacijenata, uzrasta od 20 do 75 godina, nasumično je raspoređeno u dve grupe. Pacijenti u prvoj grupi dobijali su iv 1% propofol u dozi 2mg/kg brzinom 0,3ml/sec (3mg/sec), dok su pacijenti u drugoj grupi prvo primili iv bolus fentanila u dozi 0,1mg, a zatim, nakon pauze od 60 sekundi dobili i 1% propofol u dozi 2mg/kg brzinom 0,3ml/sec (3mg/sec).

Rezultati: Među grupama I i II nije nađena statistički značajna razlika u pogledu prosečne starosti, polne razlike, indeksa telesne mase, organskog statusa po Američkom društvu anesteziologa, doze primljenog propofola i osetljivosti na bol pri plasiranju venske kanile. Nije pronađena statistički značajna razlika u intenzitetu bola među pacijentima iz različitih grupa.

Zaključak: Upotrebom fentanila u prevenciji, propofolom izazvanog bola, ne postižu se zadovoljavajući rezultati.

Ključne reči: propofol, bol, fentanil

AN INFLUENCE OF FENTANIL ON PAIN REDUCTION DURING INJECTION OF PROPOFOL

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Introduction: Despite its many advantages, usage of propofol is, beside some others adverse effects, also associated with pain in patients.

Aim: The aim of this study is to show an influence of fentanil on pain reduction during injection of propofol.

Material and Methods: Forty patients aged between 20-75 years old were allocated randomly into one of two groups (n = 20, in each). The patients in the first group (control group) received 2mg/kg propofol 1% intravenously, (3mg/sec). The patients in the second group received 0,1mg fentanil (diluted with normal saline) intravenously, and at 60 sec later patients received 2mg/kg propofol 1% intravenously, (3mg/sec).

Results: There weren't statistically significant differences between groups considering age, gender, body mass index, American Society of Anesthesiologists (ASA) physical status, dosage of propofol and pain sensitivity during a cannula insertion. There wasn't a significantly lower intensity of propofol injection pain in the second group in comparison to the first.

Conclusions: The usage of fentanil doesn't affect pain reduction during injection of propofol.

Key Words: propofol, pain, fentanil

PATIENTS WITH TRACHEOSTOMY

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Introduction: tracheostomy is an artificial opening in the front of the trachea. Performed in patients with mechanical obstruction of the larynx, prolonged mechanical ventilation, central or peripheral neurological deficits, trauma to the head and facial area. Patients with tracheostomy require specific care. **Objective:** To ascertain and prove that the maximum support to the patient for quick and safe Weaning, maksimaleniot commodity in the same komplikacij prevention of prolonged mechanical ventilation and finding a way to komnukacija patient is a prerequisite for rapid and successful treatment.

Material and methods: This paper presents retrospective show for 2011, which included 20 patients with a tracheostomy placed. For dolgolezhechki patients in intensive care must prepare an individual care plan. Care includes: standing continuously raise upper body to prevent VAP, full mobilization of the patient in bed and out of bed, swallowing training, use of oral valve, professional psychological support, including close people in care.

Results: From 2011 to the intensive care unit had 20 patients with percutaneously placed tracheostomy. With intensive individual care strive to maximum comfort for the patient and return to the previous quality of life in order to avoid analgosedacija and faster weaning from the respirator. Conclusion: For quick and successful treatment of critically ill, all activities are not seen but from a functional point of view that it is individual in a difficult life crisis.

Keywords: tracheostomy, VAP, mechanical ventilation.

INCIDENCE OF PATIENTS WITH ACUTE AORTIC DISSECTION

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Introduction: Acute aortic dissection (AAD) e life-threatening condition that characterizes the high mortality worldwide (7-8%). When AAD is split in the wall of the aorta where the blood circulates between layers of the wall which can lead to its rupture. Early recognition of symptoms and appropriate response to the medical team is crucial to the outcome of the patient. On receipt of a patient with chest pain to bear in mind the possibility of AAD. Standard diagnostics when fasting suspected AAD include: ECG, NIBP to the left and right hand the puts 2 venous lines, laboratory, echocardiography, placement of patient in hospital for daily monitoring of ECG, tension, oxygenation, diuresis through a urinary catheter, application of oxygen, light analgosedacija after clue 64 sliced CT or TEE, transport in the intensive care unit for preoperative preparation.

Objectives: To show that the timely placement of proper diagnosis, collecting all medical data that are relevant for the surgeon to decide on the type of operation, alerting operational team in the shortest amount of time, early recognition and adequate response to the destabilization of the patient are prerequisites for reducing mortality among patients.

Material and methods: Labour's retrospective account of the period from 2000 to 2011, which included patients 101 patients with AAD.

Results: From 2000-2011 year treated 101 patients with AAD, the average age of 40 to 60 years.

Keywords: aortic dissection, fasting suspected.

IMPACT OF LANGUAGE BARRIERS ON PATIENT COMPLIANCE AND OUTCOME IN HEALTHCARE

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Introduction: Lack of evidence - based transcultural knowledge makes it difficult for healthcare providers to deliver, and for clients to experience, high - quality cost -effective care. Differences in language, culture, religion and individual or group experiences impact on values, behaviours and both clients' and practitioners' expectations of each other. Data from industrial countries show that immigrants are in poorer health and receive less medical care than natives. This study addresses the problem of partial or complete language barrier between client and caregiver which may lead to a communication gap resulting in reduced client compliance with therapeutic measures and eventually weaker outcome.

Goals: Comparative evaluation of quality of care for native Macedonian speakers and patients of different ethnic origin who cannot directly communicate with their caregivers, in order to provide an evidence base for the implementation of standards for culturally appropriate care in our institution.

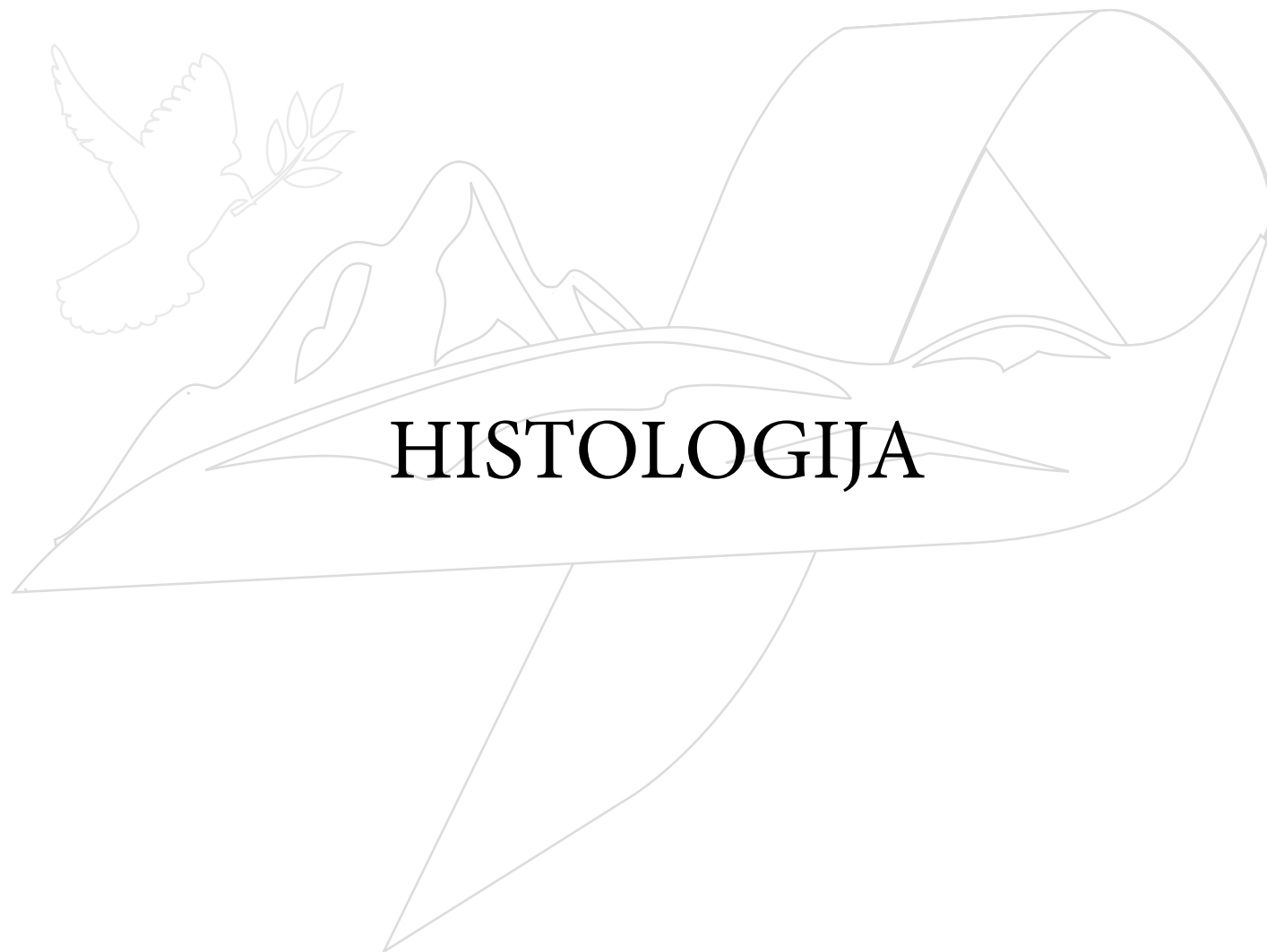
Methods: A retrospective comparative study is currently being conducted among 500 Macedonian - and non - Macedonian - speaking cardiosurgic patients, excluding patients with cognitive dysfunctions. Medical documentation is reviewed for complications directly connected to patient compliance (postoperative respiratory problems, sternal instability), ventilator time, ICU time and overall hospital stay.

Results: expected by April 15.

Conclusion and outlook: While a conclusion cannot be drawn from the study at this point, we will develop strategies to adapt to the demographic characteristics of our patient population to ensure equally excellent care to all our patients.

Keywords: language, culture, barrier, cardiosurgic patients.





HISTOLOGIJA

DA LI SU ACIDOFILNI NEURONI SAMO ACIDOFILNI?

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Uvod: Neuroni se boje katjonskim bojama, pri čemu tipičan, "svetao" neuron ima intenzivno obojen perikarion u vidu bazofilnih granula ili strija (Nisslova supstanca), jako obojen nukleolus, a slabo obojenu, "bledu", tj. euhromatičnu nukleoplazmu. Neuroni se boje i kiselim bojama, pri čemu je citoplazma acidofilnih neurona difuzno obojena, dok je jedro takođe acidofilno i tamno. Ovakva neuronska acidofilija je pokazatelj raznih patoloških stanja u kojem tkivo može da se nađe. "Dark" neuroni su ćelije koje se, usled povećane gustine citoplazme, vrlo intenzivno boje katjonskim i anjonskim bojama, pa je jedna od njihovih odlika hiperhromatofilnost. Ovaj rad je u vezi sa dugotrajnom dilemom da li su acidofilni neuroni istovremeno tamni neuroni ili ne.

Materijal i metodi: Mužjaci Wistar pacova fiksirani su puferisanim formaldehidom. Moždani slajsovi tretirani su rastvorima kalijum-fosfata i kalijum-hromata, zatim srebro-nitrata, i dovedeni do parafinskih kalupa. Isečci tkiva debljine 10 µm bojani su različitim anjonskim ili katjonskim bojama, i analizirani.

Rezultati: Kvalitativna analiza tako obojenih preparata pokazala je da su jako acidofilni neuroni istovremeno i jako bazofilni sa identičnim obrascem bojenja citoplazme i nukleoplazme. Time je pokazano da se u suštini radi o jako zgusnutim, tamnim neuronima, odnosno da je proces sticanja acidofilije deo procesa kompakcije ćelije. Preliminarna kvantitativna analiza podataka pokazala je da su *dark* neuroni znatno manjeg prosečnog dijametra, kao i da imaju značajno manji nukleus, tj. da su generalno hiperkondenzovani.

Zaključak: Acidofilni neuroni su populacija *dark* neurona.

Ključne reči: *dark* ćelije, acidofilne ćelije, bazofilne ćelije, piramidalni neuroni, cerebralni korteks

ARE THE ACIDOPHILIC NEURONS JUST ACIDOPHILIC?

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Introduction: Neurons are usually stained with the cationic dyes. Typical, "light" neurons have intensively stained perikarion, due to highly basophilic Nissl bodies, strongly stained nucleolus, and pale, euchromatic nucleoplasm. Neurons can be stained with anionic dyes, but the cytoplasm is diffusely colored and the nucleus is also acidophilic and dark. Such neuronal acidophilia is an indicator of brain/neuron damage. "Dark" neurons are cells that have condensed cytoplasm, being related to both intense acidophilia and basophilia. This paper refers to experimental resolving of long-term dilemma whether acidophilic neurons are "dark" cells or not.

Materials and methods: Anesthetized male Wistar rats were fixed with buffered formaldehyde. After fixation, coronal brain slices were treated with potassium-phosphate or potassium-chromate solutions, immersed in silver-nitrate, and processed for paraffin embedding; 10 µm thick sections have been stained with several anionic or cationic dyes, and analysed.

Results: Qualitative analysis of the preparations showed that acidophilic neurons are also highly basophilic, moreover exhibiting the same staining patterns and high compaction degree of both the cytoplasm and nucleoplasm. We found that those were condensed i.e. dark neurons, whereas process of their acidophilic transformation is a part of the cell compaction process. Preliminary quantitative analysis showed that "dark" acidophilic neurons express much lower cross diameter value of the cell body and nucleus in respect to "light" neurons, meaning that highly acidophilic neurons are hyper-condensed cells.

Conclusion: The acidophilic neurons are population of dark neurons.

Key words: dark cells, acidophilic cells, basophilic cells, pyramidal neurons, cerebral cortex

MEHANIZAM NEURONSKE GOLDŽI IMPREGNACIJE: PROBLEM DIFERENCIJALNE IMPREGNABILNOSTI CITOPLAZME I NUKLEOPLAZME

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Uvod: Goldži metod ("stain") je glavna mikroanatomska i histološka procedura koja omogućava vizualizaciju i analizu morfologije neurona. Iako je metod odavno uveden u upotrebu, određeni bitni aspekti neuronske Goldži impregnacije još nisu razjašnjeni.

Cilj istraživanja: U ovom radu, usresredili smo se na nerazjašnjen problem diferencijalne impregnabilnosti citoplazme i nukleoplazme, polazeći od pretpostavke da je izmenom određenih parametara u standardnoj Goldži proceduri moguće proizvesti citološki inverzne, atipične impregnacije (npr. impregnisana nukleoplazma, a neimpregnisana citoplazma).

Materijal i metode: Koronalni isečci fiksiranih mozгова Wistar pacova inkubirani su u rastvorima kalijum fosfata ili kalijum dihromata pod različitim uslovima (pH, jonska snaga, temperatura, vreme), i tretirani srebro nitratom radi dobijanja različitih tipova Goldži impregnacija.

Rezultati: Uočena su dva osnovna tipa neuronskih Goldži impregnacija: (a) "standardni" tip kod kojeg je citoplazma impregnisana, dok je nukleoplazma neimpregnisana; i (b) "inverzni" tip kod kojeg je situacija obrnuta: citoplazma je slabo impregnisana ili neimpregnisana, a nukleoplazma jako impregnisana. Takođe, utvrdili smo da uslovi inkubacije koji pogoduju prezervaciji citoplazme neurona favorizuju standardni tip impregnacije, dok uslovi inkubacije koji favorizuju kiselu hidrolizu organskih konstituenata citoplazme indukuju "tešku" nuklearnu impregnaciju.

Zaključak: Ovaj nalaz je u skladu sa našom pretpostavkom da se kod standardnih, visoko kvalitetnih Goldži impregnacija citoplazma neurona ponasa kao snažna barijera koja sprečava impregnaciju ćelijskog nukleusa, obzirom da se ona prva "dekorirše" i zasićuje hromatnim ili fosfatnim anjonima, koji će zatim biti precipitirani radi dobijanja "srebrnih" soli i impregnacije neuronske citoplazme.

Ključne reči: Goldži metod, tipične i atipične impregnacije, diferencijalna impregnabilnost citoplazme i nukleoplazme

MECHANISM OF NEURAL GOLGI IMPREGNATION: PROBLEM OF DIFFERENTIAL GOLGI IMPREGNABILITY BETWEEN THE CYTOPLASM AND NUCLEOPLASM

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Introduction: Golgi method is the major microanatomical and histological procedure enabling visualization and analysis of the neuron morphology. Although the method have been introduced more than century ago, some essentials of the impregnation are still obscure.

The aim: In this study, we have focused on problem of differential impregnability between cytoplasm and nucleoplasm, starting from an assumption that certain variations in the standard procedure might result in production of the inverse, atypical impregnations (impregnated nucleoplasm, and non-impregnated cytoplasm).

Material and methods: Coronal slices of the fixed Wistar rat brains were incubated in solutions of potassium dichromate or potassium phosphate under various conditions (pH, ionic strength, temperature, time), and treated with silver nitrate to produce different types of impregnations.

Results: Two basic types of Golgi impregnations have been observed: (a) "standard type" exhibiting impregnated cytoplasm, and non-impregnated nucleoplasm; (b) "inverse type" with opposite features. We have found that incubation conditions suitable for neuronal cytoplasm preservation favorize standard type, whereas incubation conditions favorizing acidic hydrolysis of the organic cytoplasmic constituents induce "heavy" nuclear impregnation.

Conclusion: This finding is in accordance with our hypothesis that, in standard high-quality impregnations, cytoplasm acts as powerful barrier preventing impregnation of the nucleus. This is based on assumption the cytoplasm must be first "decorated" and saturated with chromate or phosphate anions, that would be subsequently precipitated to produce "silverous" salts and impregnation of the neural cytoplasm.

Key words: Golgi method, atypical and typical impregnations, differential impregnability between the cytoplasm and nucleoplasm

UTICAJ THIOACETAMIDA NA TKIVO JETRE

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Uvod: Jetra je najveća žlezda u organizmu koja ima važnu ulogu u digestiji, metabolizmu i detoksikaciji. Hronično izlaganje toksičnim supstancama, kao i akutno izlaganje visokim dozama istih, mogu značajno oštetiti normalnu strukturu, a samim tim i funkciju jetre. To oštećenje toksičnim supstancama ispoljava se najčešće u formi toksične nekroze parenhima. Jedna od supstanci koja dovodi do oštećenja jetre je i tioacetamid (TAA).

Cilj rada: Cilj ovog rada bio je da se utvrdi kako izgleda tkivo jetre pod uticajem različitih doza tioacetamida i da pokaže efekat višekratne primene ove supstance.

Materijal i metode: Pacovi su podeljeni u četiri grupe i intraperitonealno su im aplikovane različite doze tioacetamida (kontrola, 300mg/kg, 2x300mg/kg, 3x300mg/kg). Nakon žrtvovanja jetre su fiksirane u 4% puferisanom formalinu, dehidrirane, ukalupljene u parafinu i sečene na rezove debljine 5µm koji su bojeni hematoxilinom i eozinom, i analizirani svetlosnim mikroskopom.

Rezultati: Sve primenjene doze pokazale su toksično oštećenje jetrinog parenhima. Step en oštećenja je u korelaciji sa primenjenom dozom tioacetamida, rastuće doze pokazuju veći step en oštećenja. Manje doze dovode do oštećenja u vidu centro-centralne, bridging nekroze, dok sa povećanjem doze dolazi i do akumulacije inflamatornog infiltrata i hemoragije.

Zaključak: Tioacetamid je toksična supstanca koja pokazuje dozno-zavisno oštećenje jetre. Višekratna primena tioacetamida pokazuje aditivni efekat. Promene nastale posle višekratne primene manjih doza tioacetamida slične su promenama koje su posledica jednokratne primene većih doza.

Ključne reči: jetra, tioacetamid, nekroza

THIOACETAMIDE EFFECT ON LIVER TISSUE

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Introduction: Liver is the largest gland in the body. It is essential to the processes of digestion, metabolism and detoxification. Chronic or acute exposure to toxic substances could cause serious damage of hepatic parenchyma, and consequent damage of liver function. The most frequent morphological manifestation of liver injury is toxic necrosis. Thioacetamide (TAA) is one of the substances which could have toxic influence to the liver parenchyma.

The Aim: The aim of this study was to investigate influence of different doses of TAA on morphological changes of the liver parenchyma, and to show changes that occur after repeated doses.

Material and methods: Rats were divided into four groups and intraperitoneally treated with different doses of thioacetamide (control, 300mg/kg, 2x300mg/kg, 3x300mg/kg). After sacrifice livers were collected, fixed in 4% buffered formaldehyde, dehydrated, embedded in paraffin. Sections, 5 µm thick, were stained with hematoxylin and eosin and analyzed by light microscopy.

Results: All of applied doses showed toxic damage of liver parenchyma. Level of damage correlates with used doses of thioacetamide, higher doses produce more damage. Low dose induce centro-central, bridging necrosis. After increasing doses in necrotic areas can be noticed inflammatory infiltrate and hemorrhage.

Conclusion: Thioacetamide is toxic substance which shows dose dependant liver damage. Repeated application of thioacetamide has additive effect. Changes shown after repeated application of smaller doses of thioacetamide are similar to changes which appeared after single higher dose.

Key words: liver, thioacetamide, necrosis

REGENERATIVNI ODGOVOR TKIVA JETRE NAKON TOKSIČNOG DEJSTVA THIOACETAMIDA

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Uvod: Jetrino tkivo ima veliku moć regeneracije. Osnovu procesa regeneracije čini proliferacija hepatocita, kao reakcija na oštećenje i gubitak funkcionalnog parenhima. Jedna od posebno interesantnih supstanci jeste tioacetamid (TAA), koji u kratkom vremenskom intervalu može dovesti do teške nekroze tkiva jetre, a njegova intraperitonealna aplikacija eksperimentalnim životinjama koristi se za izazivanje eksperimentalnog modela hepatične encefalopatije.

Cilj rada: Ideja nam je bila da, kroz praćenje mitotske aktivnosti hepatocita, a na osnovu karakteristika pojedinih faza mitoze, utvrdimo u kojoj je meri moguća regeneracija tkiva nakon dejstva toksičnog tioacetamida.

Materijal i metode: Mužjaci pacova podeljeni su u tri eksperimentalne grupe, kontrolnu grupu, kojoj je je dato 0,5ml 0,9% NaCl, TAA₆₀₀ grupu kojoj je intraperitonealno data doza od 600mg/kg i TAA₃₀₀ grupa kojoj je data doza od 900mg/kg TAA. Životinje su žrtvovane 24, 72 i 96h od poslednje aplikacije TAA. Sečeni su rezovi debljine 5 µm i bojeni hematoxilinom i eozinom (H/E).

Rezultati: Mitotska aktivnost hepatocita na H/E bojenim preparatima, izražavana kao broj mitozu/1mm² tkiva. Nakon 24h od poslednje aplikacije TAA, u TAA₆₀₀ grupi uočeno je 2,67 mitozu/mm² tkiva, a u TAA₃₀₀ grupi prosečan broj mitozu po mm² bio je 1,78. U okviru TAA₆₀₀ eksperimentalne grupe 72h od poslednje TAA aplikacije zabeležena je maksimalna mitotska aktivnost koja je iznosila 13,42/mm² a nakon 96h prosečan broj mitozu je iznosio nula.

Zaključak: Nakon primene subletalne doze TAA parenhim jetre pokazuje snažan regenerativni odgovor koji je dovoljan da već nakon 96h dovede do oporavka tkiva.

Ključne reči: jetra, pacov, tioacetamid, mitozu

THE REGENERATIVE RESPONSE OF THE HEPATIC TISSUE AFTER TOXIC APPLICATION OF THIOACETAMIDE

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Introduction: Liver tissue has a great power of regeneration. The basic process of regeneration is proliferation of the hepatocytes, in a response to the damage and loss of the functional parenchyma.

The aim: The idea was to determine regenerative capacity of the liver parenchyma after the application of toxic substance TAA, by analysing hepatocytes in different phases of mitosis.

Material and methods: Male rats were divided into three experimental groups, the control group, which was given 0,5ml 0,9% NaCl, TAA₆₀₀ group which was given TAA intraperitoneally dose of 600mg/kg and TAA₃₀₀ group which was given dose of 900mg/kg. Animals were sacrificed 24, 72 and 96h after the last application of TAA. The tissue sections 5 µm thick were stained with hematoxylin and eosin (H&E).

Results: The mitotic activity of the hepatocytes in the H&E stained slides was expressed as the number of mitosis per mm² of tissue. After 24h of the last application of TAA, the group noted as TAA₆₀₀ had 1.78 mitosis per mm² of tissue. In the experimental group TAA₆₀₀ 72h after the last TAA application were recorded the maximum of the mitotic activity, which amounted 13.42 per per mm² of tissue and after 96h the average of mitosis were zero.

Conclusion: After the application of the sublethal dose of TAA, liver parenchyma show a strong regenerative response, and 96h after the last application of toxic substance recovery of the liver tissue can be noticed.

Key words: liver, rat, mitosis, thioacetamide

RETENCIJA ZNANJA HISTOLOGIJE STUDENATA DRUGE GODINE STUDIJA MEDICINE

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Uvod: Elektronsko učenje predstavlja svaku upotrebu informaciono-komunikacionih tehnologija u procesu nastave/učenja, dok je online učenje užu pojam i podrazumeva učenje koje se sprovodi uz pomoć Interneta. Hibridno učenje je kombinacija tradicionalnog oblika nastave sa onlajn učenjem i ovakav vid nastave se primenjuje na Katedri za histologiju i embriologiju Medicinskog fakulteta u Beogradu.

Cilj: Cilj rada bio je da se ispita retencija znanja histologije kod studenata druge godine Medicinskog fakulteta u Beogradu nakon položenog ispita histologije i ustanovi da li postoji statistički značajna razlika između studenata koji su nastavu pohađali na hibridan način (eksperimentalna grupa) i studenata koji su nastavu slušali na tradicionalan način (kontrolna grupa).

Materijal i metode: Studentima eksperimentalne i kontrolne grupe ($n_{exp}=35$ i $n_{con}=34$) je dat test od 30 pitanja, koji je obuhvatao celokupno gradivo histologije.

Rezultati: Prosečan broj poena ostvaren na testu u eksperimentalnoj grupi iznosi $15,74 \pm 4,96$, dok je prosečan broj poena u kontrolnoj grupi $13,34 \pm 4,13$. Analizom pitanja koja su bila postavljena u obliku kliničke vignetke, eksperimentalna grupa je ostvarila prosečan broj poena od $7,2 \pm 2,54$ od 14 poena, dok su studenti u kontrolnoj grupi ostvarili $6,12 \pm 1,92$. U oba parametra je pronađena statistički značajna razlika.

Zaključak: Istraživanje je pokazalo da studenti koji su nastavu pohađali na hibridan način beleže znatno bolje rezultate po svim ispitivanim parametrima u odnosu na studente koji su slušali nastavu na tradicionalan način. Međutim, za izvođenje konačnih zaključaka, potrebno je vršiti veći broj istraživanja u ovom polju i uključiti veći broj ispitanika.

Ključne reči: onlajn učenje, hibridno učenje, interaktivno učenje, retencija znanja.

HISTOLOGY KNOWLEDGE RETENTION OF SECOND YEAR MEDICAL STUDENTS

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Introduction: E-learning represents any use of ICT in teaching/learning, while the online learning is learning carried out via the Internet. Blended learning is traditional learning combined with online learning and this teaching method is implemented on the Department of Histology and Embryology at Medical Faculty in Belgrade.

The aim: The aim of this study was to examine histology knowledge retention among the second year students of the Medical Faculty in Belgrade after they passed their histology exam and determine if there was any difference between students who attended blended course (experimental group) and students who attended traditional course (control group).

Material and methods: Students of experimental and control group ($n_{exp}=35$ and $n_{con}=34$) were assigned a test with 30 questions. The test included the entire histology curriculum.

Results: The average points achieved on the test in the experimental group was 15.74 ± 4.96 , while the average points in the control group was 13.34 ± 4.13 . Analysing the questions created in the form of clinical vignettes, the experimental group achieved an average score of 7.2 ± 2.54 out of 14, while students in the control group achieved 6.12 ± 1.92 . Statistically significant differences were found in both parameters ($p < 0.05$).

Conclusion: Study showed that students who attended blended course achieved notably better results in all examined parameters than students who took classes in the traditional way. However, in order to reach definitive conclusions, it is necessary to conduct more research in this area and to include more participants.

Key words: online learning, blended learning, interactive learning, knowledge retention.

MORFOMETRIJSKA ANALIZA NEZAHVAĆENE SLUZNICE REKTUMA UDALJENE OD MALIGNOG TUMORA

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Uvod: Sluznica rektuma je često zahvaćena malignim bolestima. Tokom ove bolesti dolazi do uspostavljenja veoma složenih odnosa tumora sa domaćinom, koji su uzajamni i različiti sa smerom i karakterima u zavisnosti od stadijuma bolesti. Međutim, nedostaju podaci o interakcijama tumorskog tkiva i okolnih elemenata afektiranog organa.

Cilj: Cilj našeg rada bio je sprovođenje histokvantitativne analize svih elemenata nezahvaćene mukozne rektuma udaljene 20 cm od tumora i poredenje dobijenih rezultata sa normalnom rektalnom mukozom.

Materijal i metode: Uzorci sluznice rektuma udaljeni 20 cm od primarne tumorske lezije uzimani su prilikom dijagnostičkog pregleda osoba obolelih od adenokarcinoma ovog organa. Kao kontrola korišćeni su uzorci sluznice rektuma zdravih osoba dobijeni biopsijom prilikom endoskopskog skrininga zdravih osoba sa familijarnim opterećenjem za malignitet creva. Morfometrijska analiza tkiva vršena je uz pomoć posebnog kompjuterskog softvera. Određivani su morfometrijski parametri svih elemenata sluznice rektuma.

Rezultati: Na udaljenosti 20 cm od primarne tumorske lezije postoji značajno manji broj ćelija na $0,1 \text{ mm}^2$ površine lamine proprije sluznice rektuma i kod obolelih muškaraca i žena u odnosu na zdrave. Ni kod muškaraca ni žena nije registrovana statistički značajna razlika između zdravih i obolelih ni za jedan strukturni element sluznice rektuma.

Zaključak: Morfometrijska analiza otkriva značajne promene zastupljenosti vezivno-tkivnih stromalnih elemenata nezahvaćene sluznice rektuma ne samo u neposrednoj blizini, već i na nešto većoj udaljenosti od malignog tumora ovog organa.

Ključne reči: rektum, sluznica, morfometrija, adenokarcinom

MORPHOMETRIC ANALYSIS OF UNAFFECTED MUCOSA OF THE RECTUM AWAY FROM MALIGNANT TUMOR

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Introduction: The rectal mucosa is frequently affected by malignant diseases. During the disease, the complex mutual relations between the tumor and the host are established, which differ in direction and character depending on the stage of disease. However, the information on the interactions between the tumor and adjacent elements of the affected organ are lacking.

The Aim was to perform a histoquantitative study of all elements of unaffected rectal mucosa 20 cm away from the malignant tumor and make comparison with normal rectal mucosa.

Material and methods: The samples of rectal mucosa were taken 20 cm away from the primary tumor lesion during the diagnostic examination of patients with adenocarcinoma of this organ. The samples of rectal mucosa collected upon routine endoscopy screening of healthy persons with familial history of intestinal malignancy were used as control. Morphometric analysis was performed using computer-aided image analysis software. The morphometric parameters were determined for all elements of the rectal mucosa.

Results: 20 cm away from the primary tumor lesion the significant reduction in the number of cells per $0,1 \text{ mm}^2$ of lamina propria in the rectal mucosa were registered both in male and female patients in comparison with healthy persons. No significant differences for any structural element of the rectal mucosa were found.

Conclusion: Morphometric analysis reveals the significant changes in the representation of the connective-tissue stromal elements of unaffected rectal mucosa not only in close vicinity, but also at further distance from the malignant tumor of this organ.

Key words: Rectum, Mucosa, Morphometry, Adenocarcinoma

UPOTREBLJIVOST VIZUALIZACIJE KORTIKALNIH KOLUMNI U PROCENI OČUVANOSTI TKIVA

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Uvod: Kortikalne mikrokolumne („minikolumne“) su jedne od osnovnih histofizioloških jedinica cerebralnog korteksa, a sastoje se od snopova apikalnih dendrita piramidarnih neurona. Pored mikrokolumni, postoje i makrokolumne koje predstavljaju funkcionalno udružene mikrokolumne.

Cilj istraživanja: Cilj je histološka vizualizacija mikrokolumni cerebralnog korteksa korišćenjem metoda Goldži impregnacije kao polazne tehnike, i proverena mogućnosti date tehnike za procenu očuvanosti kortikalnog tkiva.

Materijal i metod: Formaldehidom fiksirani, koronalni iseći moždanog tkiva pacova inkubirani su u rastvorima kalijum hlorida (probe) i nitrata (kontrola). Tkivo je zatim tretirano rastvorom srebrno nitrata radi dobijanja intracelularnog AgCl precipitata, a obrađeno je za analizu svetlosnim mikroskopom.

Rezultati: Sve hloridne probe ispoljile su naglašeno prisustvo granularnog precipitata srebrno-hlorida unutar apikalnih dendrita i njihovih kolumnarnih snopova u lamini II i III korteksa. Uočeno je nekoliko načina obrazaca obeležnosti apikalnih dendrita srebrnim precipitatom, u zavisnosti od očuvanosti citoplazme neurona. Nitratne kontrole („slepe probe“) nisu imale nikakve Goldži impregnacije, niti globularne precipitate.

Zaključak: Pokazano je da se kortikalne mikrokolumne mogu pouzdano i reproducibilno vizualizovati srebrno-hloridnom modifikacijom tehnike Goldži impregnacije, i da se ceo postupak može razviti u jedan od načina procene očuvanosti/oštećenja kortikalnog tkiva.

KLjučne reči: Cerebralni korteks, piramidalni neuroni, kortikalne kolumne, apikalni dendriti, Goldži metod.

UTICAJ PONAVALJANOG IMOBILIZACIONOG STRESA KOD MIŠA NA HISTOLOŠKE KARAKTERISTIKE NADBUBREŽNE ŽLEZDE

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Uvod: Nadbubrežna žlezda predstavlja jedan od ključnih organa u procesu stresa naročito ako se radi o hroničnom stresu. Pored hormonskih pokazatelja znači hroničnog stresa se ogledaju i kroz histološke promene samog tkiva.

Cilj: Ispitati uticaj ponavljano imobilizacionog stresa kod miša na histološke karakteristike nadbubrežne žlezde.

Materijal i metode: Eksperiment je obuhvatao 15 zdravih miševa soja NMRI, muškog i ženskog pola, 3 meseca starosti. Životinje su podeljene u dve grupe: eksperimentalnu (10 miševa) i kontrolnu (5 miševa). Eksperimentalna je podeljena na 2 podgrupe po 5 miševa, gde je prva tretirana ponavljanim imobilizacionim stresom 10 uzastopnih dana po 2 sata dnevno, dok je druga podgrupa tretirana po istom principu 20 dana. Nakon kompletne obdukcije i fotografisanja makroskopski vidljivih promena nadbubrezi su fiksirani, dehidrirani, kalupljeni u parafin, i sečeni na mikrotomu, i bojeni standardnom histološkom metodom hematoksilin i eozin. Rezultati su prikazani grafički.

Rezultati: Hronični stres dovodi do sledećih promena na nadbubregu kod eksperimentalne u odnosu na kontrolnu grupu miševa: 1. Povećanja volumena organa u celosti; 2. Povećanja volumena korteksa i smanjenja volumena medularnog dela nadbubrega; 3. Povećanja zone glomeruloze i zone fascikulate, i smanjenja zone retikularis.

Zaključak: Hronični ponavljani imobilizacioni stres dovodi do jasnih histoloških promena na kortikalnom i medularnom segmentu nadbubrega miša.

KLjučne reči: stres, nadbubreg, miš.

THE APPLICABILITY OF CORTICAL COLUMNS IN ESTIMATION OF CORTICAL TISSUE PRESERVATION

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Introduction: Cortical microcolumns („minicolumns“) are basic histophysiological units of the cerebral cortex. They consist of the bundles of apical dendrites originating from cortical pyramidal neurons. In addition to microcolumns, there are also macrocolumns comprised of functionally associated microcolumns.

Aim: Goal of the study was histological visualization of the cortical microcolumns by the means of silver-chloride Golgi-like technique, claiming to investigate its applicability in estimation of the cortical tissue damage or preservation.

Material and methods: Coronal slices of the rat brain fixed with buffered formaldehyde were incubated in the solutions consisting of potassium chloride (probes) or nitrate (controls). Slices were then treated with silver nitrate to produce intracellular AgCl precipitate, and processed for light microscopical analysis.

Results: Chloride probes exhibited particular presence of the granular silver chloride precipitate within apical dendrites and their columnar bundles in cortical lamina II/III. Several patterns of the apical dendrites labeling with the AgCl precipitate have been observed, and these were dependent on the neuronal cytoplasm preservation. Nitrate controls („blank probes“) were devoid of any Golgi impregnation or globular precipitate.

Conclusion: These results proved cortical microcolumns to be reliable and reproducible visualised with silver-chloride modification of the Golgi impregnation; the procedure can be developed into a method of estimating the cortical tissue damage or preservation.

Key words: Cerebral cortex, pyramidal neurons, cortical columns, apical dendrites, Golgi method.

THE INFLUENCE OF REPEATED IMMOBILIZATION STRESS ON THE HISTOLOGICAL FEATURES OF THE ADRENAL GLAND IN MICE

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Introduction: The adrenal gland is one of the main organs in the process of stress, especially when it comes to chronic stress. In addition to hormonal signs of chronic stress indicators are reflected in and through the histological changes of the tissues.

The aim: The aim of study was to examine the influence of repeated immobilization stress on the histological features of the adrenal gland.

Material and methods: Experiment included 15 healthy NMRI mice, male and female, 3 months of age. Animals were divided into two groups: the experimental (10 mice) and the control (5 mice). Experimental group was divided into 2 subgroups of 5 mice, where the first group was treated by repeated immobilization stress for 10 consecutive days for 2 hours a day, while the second subgroup was treated by the same principle for 20 days. After the complete autopsies, the adrenals were fixed, dehydrated, mold in paraffin, cut on the microtome and stained using standard histological method of hematoxylin and eosin. The results were graphically shown.

Results: Chronic stress leads to the following changes in the adrenal gland in the experimental compared to the control group: 1. Volume increase in the whole body; 2. Cortex volume increase and the volume of the adrenal medullary decrease; 3. The increase of the glomeruloze zone and the zone fasciculate, and the reduction of the reticularis zone.

Conclusion: Chronic repeated immobilization stress leads to histologic changes in cortical and medullary segment of the mouse adrenal.

Keywords: stress, adrenal, mouse

UTICAJ PONAVLJANOG IMOBILIZACIONOG STRESA KOD MIŠA NA HISTOLOŠKE KARAKTERISTIKE TIMUSA

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Uvod: Upotreba animalnih modela u izučavanju mehanizma nastanka i prirode stresa danas je široko zastupljena. Poznato je da stres utiče na imuni sistem, a jedan od organa na kome se uočavaju promene predstavlja timus.

Cilj: Ispitati uticaj ponavljano imobilizacionog stresa kod miša na histološke karakteristike timusa.

Materijal i metode: Eksperiment je obuhvatao 15 miševa podeljenih u dve grupe: kontrolnu (5 miševa) i eksperimentalnu (2x5 miševa). Eksperimentalna grupa je podeljena u dve podgrupe, gde je prva izlagana ponavljano imobilizacionom stresu 10 uzastopnih dana po 2 sata dnevno, dok je druga eksperimentalna grupa tretirana po istom principu 20 dana. Četiri nesusedna isečka timusa su fotografisana na mikroskopu i obrađena u kompjuterskom programu *ImageJ* u kome je određena volumenska frakcija kortikalnog i medularnog dela timusa.

Rezultati: Kod kontrolne grupe timus je bio karakteristične građe sačinjen od dva lobusa koji su prekrivali prednje 2/3 strane srca, dok su kod eksperimentalne grupe zakržljali lobusi bili locirani samo u predelu *coronae cordis*. Stereološkom analizom i statističkom obradom dobijenih podataka histoloških preseka korteksa i medule kontrolne i eksperimentalnih grupa uočeno je statistički značajno smanjenje debljine kortikalog dela timusa kod jedinki izlaganih 20 dana stresu.

Zaključak: Makroskopski se uočava atrofija timusa kod jedinki izlaganih 10 i 20 dana stresu i smanjenje debljine kortikalog dela timusa kod jedinki izlaganih 20 dana stresu.

Ključne reči: stres, imobilizacija, timus.

THE INFLUENCE OF REPEATED IMMOBILIZATION STRESS ON THE HISTOLOGICAL FEATURES OF THE THYMUS IN MICE

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Introduction: The animal model is widely represented in our studies of the pathogenesis of stress and its characteristics. It is well known that stress affects the immune system and the changes can be observed on the thymus.

The Aim: The aim of this study was to examine the influence of repeated immobilization stress on the histological features of the thymus.

Material and Methods: The research included 15 mice separated into two groups: the control group (5 mice) and the experimental group (2x5 mice). Experimental group was divided into two smaller groups. The first group has been put under stress for 10 consecutive days, and the second group for 20 days. Four nonadjacent parts of the thymus were photographed by the microscope and then we determined volume fraction of thymic cortex and medulla in *ImageJ* computer program.

Results: The thymus in the control mice group had a specific structure, composed of two lobes covering 2/3 of the anterior side of heart, while the stunted lobes in the experimental mice group were located just in *corona cordis*. Significant reduction in thickness of the cortical thymic part was noticed in the experimental group which were influenced by stress for 20 days after stereological and statistical analyses of the histological cortical and medullary sections in the control and the experimental group.

Conclusion: (Grossly) thymic involution in mice stressed for 10 and 20 days and the reduction in thickness of the cortical thymic part was noticed in the experimental group stressed for 20 days.

Keywords: stress, immobilization, thymus.

REGENERATIVNA SVOJSTVA BETA ĆELIJA U ALOKSANOM INDUKOVANOM DIJABETESU KOD PACOVA

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Uvod: Jedan od vidova indukovanja veštačkog dijabetes melitusa jeste upotreba hemijskih sredstava kao što je aloksan. U današnjim studijama se veliki značaj pridaje procesima regeneracije beta ćelija Langerhansovih ostrvaca putem procesa transdiferencijacije i neogeneze.

Cilj rada: Ispitati imunohistohemijske karakteristike regenerativnog svojstva beta ćelija u aloksanom indukovanom dijabetesu.

Materijal i metode: Eksperimentom je obuhvaćeno 18 jedinki pacova soja Wistar podeljenih u tri grupe (kontrolnu i dve eksperimentalne). Jedinke eksperimentalne grupe žrtvovane su drugog i dvadeset prvog dana od aplikacije aloksana. Nakon kompletne obdukcije uzeti su isečci spleničnog dela pankreasa, fiksirani, dehidrirani i ukalupljeni u parafin, te sečeni na rotacionom mikrotomu. Isečci su bojani imunohistohemijskom metodom na insulin. Od svake jedinke analizirano je 30-50 Langerhansovih ostrvaca i utvrđeni su sledeći parametri: dijametar ostrvca, volumen ostrvca, numerička gustina beta ćelija po ostrvcetu i broj beta ćelija po ostrvcetu.

Rezultati: Primena aloksana dovela je do potpune destrukcije beta ćelija Langerhansovog ostrvca nakon dva dana od aplikacije. Nakon dvadeset prvog dana uočena je i morfološki utvrđena regeneracija beta ćelija kao i vidljivi znaci transdiferencijacije.

Zaključci: Imunohistohemijskom analizom aloksanom indukovano dijabetesa sa različitim periodima žrtvovanja u odnosu na njegovu aplikaciju utvrđena je spontana regenerativna sposobnost beta ćelija Langerhansovih ostrvaca.

Ključne reči: beta ćelije, aloksan, transdiferencijacija, imunohistohemija, morfološka.

REGENERATIVE CHARACTERISTICS OF BETA CELLS IN ALLOXAN INDUCED DIABETES IN RATS

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Introduction: One of the ways to induce artificial diabetes is the use of chemicals such as alloxan. In current studies great importance is given to the regenerative processes of beta cells in islets of Langerhans by transdifferentiation and neogenesis.

The Aim: To examine beta cells regenerative characteristics and its immunohistochemical properties in chemically induced diabetes.

Materials and Methods: The experiment included 18 Wistar rats that were divided in three groups (control and two experimental). Experimental group specimens were sacrificed on the second and the twenty-first day after alloxan application. After complete autopsies, tissues samples from splenic pancreas were taken, fixated, dehydrated, embedded in paraffin and cut on rotary microtome. Sections were stained using immunohistochemical method for insulin. From each specimen 30-50 islets of Langerhans were analyzed. Following parameters were determined: islet diameter, islet volume, numerical density of beta cells per islet and the number of beta cells per islets.

Results: Application of alloxan resulted in complete destruction of beta cells two days after it was administered. On the twenty first day regeneration was observed and proved with morphometry with visible signs of transdifferentiation.

Conclusions: Using immunohistochemical analysis for alloxan induced diabetes, with different times of sacrifice, we have determined spontaneous regenerative capabilities of beta cells in islets of Langerhans.

Key words: beta cells, alloxan, transdifferentiation, immunohistochemistry, morphometry.

UTICAJ HRONIČNE PRIMENE ETIL ALKOHOLA NA BROJ HIPERACIDOFILNIH ČELIJA SRŽI NADBUBREŽNE ŽLEZDE PACOVA

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Uvod: Hronična primena 15% etanolnog rastvora dovodi do jasnog uvećanja nadbubrežne žlezde. U sastavu srži nadbubrega nalaze se svetle ili hromofobne ćelije i tamne ili hromafine ćelije. U sastavu medule nalaze se i pojedinačne žlezdane ćelije. Ove ćelije su izdužene, odnosno spoljštene, i veoma podsećaju na hiperacidofilne ćelije, koje se nalaze u sastavu adenohipofize.

Cilj: Ispitati uticaj hronične primene etil alkohola na pojavu hiperacidofilnih ćelija srži nadbubrežne žlezde kod pacova.

Materijal i metode: Ispitivanje uticaja etil alkohola na nadbubrežnu žlezdu izvedeno je na polno zrelim mužjacima belog laboratorijskog soja Wistar. Uslovi smeštaja i ishrane su bili istovetni za ogledne i kontrolne grupe životinja. Ogledne životinje su kao jedinu ponuđenu tečnost dobijale 15% rastvor etil-alkohola. Kontrolne životinje su pojele vodom ad libitum. Životinje su žrtvovane nakon dva meseca od započinjanja eksperimenta.

Rezultati: Morfometrijskom analizom debljine kore nadbubrežne žlezde uočeno je minorno povećanje prosečne debljine svih zona kore nadbubrežne žlezde kod ogledne grupe ali bez ustanovljene statistički značajne razlike u odnosu na kontrolnu grupu. Morfometrijskom analizom i prebrojavanjem ustanovljena je visoko statistički značajna razlika u broju hiperacidofilnih ćelija kod jedinki koje su bile izložene alkoholu nego kod kontrolne grupe

Zaključak: Hronična primena etil alkohola kod pacova dovodi do blagog povećanja debljine zone glomerulose, zone fasciculatae i zone reticularis, a dolazi i do povećanja broja hiperacidofilnih ćelija u srži nadbubrega.

Ključne reci: nadbubrežna žlezda, kora, srž, alkohol, pacov;

INFLUENCE OF CHRONICAL ETHANOL ABUSE ON THE NUMBER OF HYPERACIDOFIL CELLS IN MEDULLA OF THE RAT'S SUPRARENAL GLAND

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Introduction: Chronical abuse of 15% ethanol leads to enlargement of the suprarenal gland. In medulla of suprarenal gland there are light or chromofob cells and dark or chromafine cells. In medulla, there are also separate gland cells. These cells are elongated and flattened and they look like hyperacidofil cells which are contained in adenohipophysis.

Goal: Examine the influence of chronical ethanol abuse on appearance of hyperacidofil cell in medulla of suprarenal gland in rats.

Matherial and methods: Examination of the influence of etil alcohol on suprarenal gland is performed on sexually maturated males white laboratory breed called Wistar. Experimental group of animals had 15% ethanol solution as the only offered liquid. Control animals drank water at one's pleasure. Animals were sacrificed 2 months after the beginning of the experiment.

Results: Morphometrical analysis of the cortex layer's thicknesses in suprarenal gland, minor enlargement of the average thickness has been detected for all zones in the cortex in experimental group, but without establishing statistically significant difference in regards to the control group. By morphometric analysis and counting high, statistically significant, difference in number of hyperacidofil cells in animals which has been exposed to alcohol comparing to the control group, has been established.

Conclusion: Chronical abuse of alcohol at rats leads to minor increasing of thickness at zona glomerulosa, zona fasciculata and zona reticularis, and also comes to increasing the number of hyperacidofil cells in medulla.

Keywords: suprarenal gland, cortex, medulla, alcohol, rat;

„SEMI-THIN“ ANALIZA BUBREGA MIŠA U AKUTNOJ I HRONIČNOJ INTOKSIKACIJI VUČJOM STOPOM (ARISTOLOCHIA CLEMATITIS)

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Uvod: Vučja stopa je tipičan predstavnik genusa *Aristolochia* za koji je dokazano da sadrži u sebi aristolohičnu kiselinu koja je izuzetno toksična i kancerogena.

Cilj: Cilj istraživanja je da se uz pomoć „semi-thin“ analize ispita uticaj akutne i hronične toksičnosti biljke *Aristolochia clematitidis* na bubrege laboratorijskog miša soja NMRI.

Materijal i metode: Eksperimentalne životinje su podeljene u tri grupe sa po 10 jedinki: Grupe E1 i E2 – koje su dobijale infuz vučje stope u koncentraciji od 40g/1000ml vode kao i kontrolna grupa koja je dobijala vodu. Iseći tkiva bubrega dimenzije 2x2mm fiksirani su u smeši glutaraldehida. Nakon fiksacije i adekvatne dehidracije, tkivo je kalupljeno u Durcupan smolu i sečeno na ultramikrotomu. Iseći su bojeni histološkim metodama Toluidin blue i hematoksilin-eozin. Morfologija bubrežnih glomerula sprovedena je uz pomoć kompjuterskih programa ImageJ i ImageTool 3.00. Statistička značajnost rezultata je testirana studentovim t-testom.

Rezultati: Kvalitativno se razlike između kontrolne i grupe E1 uočavaju u vidu blago oštećenih tubula, dok se kvantitativno može uočiti bitna statistička razlika u procentualnoj zastupljenosti kapilara i mezangijuma unutar glomerula. Razlike između kontrolne grupe i grupe E2 su očigledne kvalitativno usled infiltracije limfocita u, i oko glomerula; vidljiva je oštećenost tubula sa hijalnim cilindrima unutar lumena. Kvantitativno je uočljiva bitna statistička razlika u zastupljenosti kapilara, intrakapsularnog prostora, podocita i mezangijuma.

Zaključak: Usled akutne i hronične toksičnosti biljke vučja stopa dolazi do promene u izgledu tubulskog parenhima kao i do izmene u kvantitativnom sadržaju pojedinih ćelija glomerula, koja ima bitnu statističku značajnost.

Ključne reči: miševi, *Aristolochia clematitidis*, semi-thin analiza, glomerul, tubul

„SEMI-THIN“ ANALYSIS OF MOUSE KIDNEY IN ACUTE AND CHRONIC INTOXICATION WITH VUCJA STOPA (ARISTOLOCHIA CLEMATITIS)

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Introduction: Birthwort is representative of genus *Aristolochia* which main toxin is aristolochic acid, and it is very toxic and cancerogenic.

The Aim: The aim was to investigate with „semi-thin“ analysis, acute and chronic toxicity of plant birthwort in kidneys of NMRI mice.

Materials and Methods: Experimental animals were divided in three groups of ten species: Groups E1 and E2 that got infuse of birthwort in concentration of 40g/1000ml of water; control group got only water. The fragments of kidneys (dimension 2x2mm) were taken and placed in mixture of glutaraldehyde. After fixation and dehydration, tissue was molded in Durcupan resin and cut on ultramicrotome. The tissue was histologically analysed using Toluidine blue and hematoxylin-eosin stain. Determination of morphology in renal glomeruli was performed using computer programs ImageJ and ImageTool 3.00. The statistical significance of results was tested by student's t-test.

Results: Qualitative differences between control group and group E1 are seen only in form of slightly damaged tubules, while quantitatively there is significant difference in percentage distribution of capillaries and mesangium in glomeruli. Differences between control group and E2 group are obvious qualitatively, due to the infiltration of lymphocytes into/around the glomeruli; there is visible damage of tubules with hyaline cylinders within lumen. Quantitatively there is significant statistical difference in presence of capillaries, Bowman's space, podocytes and mesangium.

Conclusion: Due to the acute and chronic toxicity of birthwort there is a change in the appearance of tubules as well as changes in the quantitative content of individual cells in glomeruli, which has important significance.

Keywords: mice, *Aristolochia clematitidis*, „semi-thin“ analysis, glomeruli, tubuli

UTICAJ FORMALINA NA SLUZNICU NOSNE DUPLJE MIŠA

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Uvod: Formaldehid koji ima široku primenu u medicini u vidu rastvora različite koncentracije (posebno kao fiksativ u histologiji i sredstvo za čuvanje organa na anatomiji) opšte je poznat kao iritant. Primarni uticaj ostvaruje na gornje delove respiratornog trakta, a prva u kontaktu s njim je nosna duplja koja je kompleksne građe i kod čoveka i kod miša.

Cilj: Ispitati uticaj inhalacije radnog rastvora formaldehida na histološke karakteristike respiratorne i olfaktivne sluznice nosne duplje.

Materijal i metode: Eksperimentom je obuhvaćeno 15 miševa soja NMRI (5 kontrolnih i 10 eksperimentalnih) Eksperimentalni su izlagani isparenjima 1,5 ml rastvora distribuiranog u podlogu terarijuma- 6 sati dnevno tokom 15 dana. Nakon adekvatne fiksacije, dekalifikacije i sečenja njuške na četiri regiona izradni su preparati za histopatološku analizu.

Rezultati: Promene se nisu odvale u prvom regionu prekrivenom pločastoslojevitim epitelom bez orožavanja. Ostatak nosnih hodnika su zatvoreni gnojnim infiltratom, a došlo je i do erozije i ulceracije respiratornog i olfaktivnog epitela sa odstanjenjem cilija ili čitavih ćelija. Uz metaplazije sa displazijama epitela, prisutna je proliferacija fibroblasta u edematoznoj lamini propriji.

Zaključak: Radni rastvor formalina ima snažan uticaj na sluznicu nosne duplje gde dolazi do histopatoloških promena respiratornog i olfaktivnog epitela kao i laminae propriae mucosae.

Ključne reči: formalin, nosna sluznica, miš.

INFLUENCE OF FORMALIN ON NASAL MUCOSA OF A MOUSE

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Introduction: Formaldehyde, which is widely used in medicine in a solution (especially in histology as a fixative and in anatomy for organ preservation) is a well-known irritant. Its prime target is the upper respiratory tract, and the first in contact with the inhaled formaldehyde is the nasal cavity. The nasal cavity is a complex organ in human and in mice.

The Aim: Examine the influence of inhaled formaline on the histological characteristics of nasal mucosa of a mouse.

Materials and methods: In experiment were used 15 mice of NMRI type divided in experimental group of 10, and control group of 5 mice. The experimental group was exposed to the vapour of 1.5 ml of formaline distributed in the grounds of terrarium they were in, 6 hours per day, during the 15 days. After the proper tissue fixation, decalcification and cutting the nose into the four regions, slices were made for histopathological analysis.

Results: There were no changes detected in the region with squamous epithelium. The rest of the nasal passages are congested by a pus infiltrate. The erosions and ulcerations of respiratory and olfactory epithelium were also detected, with a visible loss of cilia or even the whole cells. Beside the metaplasia and displasia of the epithelium, fibroblasts of swollen lamina propria have proliferated.

Conclusion: 10% solution of formaline has a great impact on the nasal mucosa of a mice, leading to histopathological changes of respiratory and olfactory epithelium and a lamina propria.

Keywords: formaline, nasal mucosa, mouse

HISTOMORFOLOŠKE KARAKTERISTIKE TANKOG I DEBELOG CREVA

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Uvod: Digestivni sistem se razvija od primitivnog creva. Pored jednjaka, sastoji se od tankog creva koje ima sledeće delove: duodenum, jejunum i ileum, kao i debelo crevo sa crvuljkom. Digestivni sistem ima ulogu u resorpciji hranjivih materija. Brunerove žlezde iz duodenuma su zadužene za produkciju sluzi. Debelo crevo učestvuje u resorpciji vode i elektrolita, a crvuljak služi za sazrevanje B- limfocita i učestvuje u humoralnom imunitetu.

Cilj: Ispitivanje histomorfoloških karakteristika tankog i debelog creva kod ispitanika oba pola, starosti između 20 i 70 godina.

Materijal i metode: Rad je obuhvatio ispitivanje 28 pacijenata, oba pola, starosti između 20 i 70 godina. Grupe su formirane na osnovu posmatranih regija digestivnog sistema, a zatim su komentarisane različite osobine te regije. Biopsijski uzorci su fiksirani u 4% formalinu, kalupljeni u parafinu, a zatim sečeni na histološke rezove debljine 5-7 mikrona. Nakon toga, rezovi su bojeni standardnom histološkom tehnikom sa hematoksilinom i eozinom i analizirani na standardnom svetlosnom mikroskopu.

Rezultati: Na osnovu histološke analize uzetih uzoraka, tunica mucosa je najizraženija u jejunumu, a najmanja u duodenumu. Rezultati istraživanja pokazali su da je tunica submucosa i broj Liberkinovih kripti najveći u ileumu, a najmanji u apendiksu i jejunumu digestivne cevi.

Zaključak: Iz ovog istraživanja pokazalo se sledeće: u jejunumu je najzastupljenija tunica mucosa, dok se u duodenumu dokazalo suprotno. Istraživanjem je ustanovljeno da su tunica submucosa i broj Liberkinovih kripti najveći u ileumu, a najmanji u apendiksu i jejunumu.

Ključne reči: tanko crevo, debelo crevo, Liberkinove kripte, tunica mucosa, tunica submucosa.

HISTOMORPHOLOGICAL CHARACTERISTICS OF SMALL AND LARGE INTESTINE

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Introduction: The digestive system is developed from the primitive gut. Beside the esophagus and stomach, it is composed of small intestine, which consists of: duodenum, jejunum and ileum, and colon with appendix. The digestive system is takes part in resorption of nutrients. The duodenal Brunner glands are responsible for the production of mucus. Colon participates in the resorption of water and electrolytes, and the appendix is in charged for maturation of B-lymphocytes and also have participation in humoral immunity system.

The Aim: The examination of the histomorphological characteristics of the digestive system in different location of persons of twenty to seventy nine years old.

Materials and methods: For determination histomorphological characteristics of the small and large intestine, it was observed 28 biopsy samples from five different locations.

Results: From taken samples tunica mucosa is most pronounced in the jejunum and lowest in the duodenum. The results showed that the tunica submucosa and most of intestinal glands are the most numerous in the ileum.

Conclusion: This study had showed the following: the tunica mucosa of the jejunum is most prevalent, while in the duodenum showed opposite. Conclusion is that, the tunica submucosa and a number of intestinal cripts, are the largest in the ileum, but the lowest in the appendix and jejunum of the digestive tube.

Key words: small intestine, colon, intestinal crypts, tunica mucosa, tunica submucosa.

ANALIZA MIJELINIZACIJE DORZALNOG FUNIKULUSA KIČMENE MOŽDINE KOD ZAMORCA PRIMENOM POLUTANKIH REZOVA

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Uvod: Jedan od najpečatljivijih podataka sazrevanja mozga predstavlja proces gliogeneze i posleđične mijelinizacije. Zahvaljujući dužoj gestaciji kod zamorca ovaj proces se dešava intrauterino.

Cilj: Cilj našeg istraživanja bio je analiza mijelinizacije dorzalnog funikulusa kičmene moždine kod zamorca primenom polutankih rezova.

Materijal i metode: Eksperimentom je obuhvaćeno 12 plodova zamorca starosti 35 dana (3 jedinke), 45 dana (3 jedinke), 50 dana (3 jedinke) i 55 dana (3 jedinke). Jedinke su fiksirane transkardijalnom perfuzijom, uzeti isečci cervikalnog regiona kičmene moždine kalupljeni su za elektronsku mikroskopiju od kojih su načinjeni polutanki isečci. Zadnji funikulus kičmene moždine uzet je u razmatranje, odrediti njegovu površinu kao i broj gljalnih ćelija po jedinici površine kičmene moždine.

Rezultati: U periodu od 35-og do 55-og dana gestacije uočava se jasan porast površine preseka kičmene moždine cervikalnog regiona C7. Gustina gliogeneze dostiže svoj maksimum 45-og dana dok sa napredovanjem gestacije njihov broj eksponencijalno opada.

Zaključak: Zahvaljujući prenatalnom procesu gliogeneze zamorac kao model mijelinizacije predstavlja dobar animalni modelu izučavanju ovog procesa.

Gljučne reči: mijelinizacija, oligodendrociti, zamorac.

ANALYSIS OF MYELINATION OF DORSAL FUNICULUS IN THE GINEA PIG SPINAL CORD USING SEMI-TIN CUTS

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Introduction: One of the most striking facts about brain maturation is certainly the process of gliogenesis and myelination as a consequence. This process happens intrauterine thanks to longer gestation at guinea pig.

The Aim: The aim of our research was the analysis of the dorsal funiculus myelination applying half thin slices.

Material and methods: The experiment included 12 fetuses of guinea pigs, 35-days-old (3 fetuses), 45-days-old (3 fetuses), 50-days-old (3 fetuses) and 55-days-old (3 fetuses). Specimens were fixed by transcardial perfusion, and half thin slices taken from cervical part of the spinal cord were used for electron microscopy. Dorsal funiculus was studied and its surface needed to be calculated as well as number of glial cells per surface unit.

Results: Between 35th and 55th day of the gestation obvious increase of the cross section of spinal cord it the C7 level is evident. Density of gliogenesis reaches its maximum during 45th day while with the gestation progress the number of cells decreases exponentially.

Conclusion: Thanks to prenatal process of gliogenesis guinea pig as a myelination model represents a good animal model for this study.

Key words: myelination, oligodendrocytes, guinea pig

HISTOMORFOLOŠKE KARAKTERISTIKE FETALNE I ADULTNE NADBUBREŽNE ŽLEZDE

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Uvod: Nadbubrežna žlezda se sastoji iz dva dela, korteksa i medule. Ova dva dela imaju dvojako embrionalno poreklo. Korteks se razvija od mezoderma proliferacijom celomskog epitela prema niželežućem mezenhimu, koji daje vezivnotkivnu podlogu sa sinusoidnim krvnim sudovima. Medula se razvija od ektoderma neuralnog grebena, u procesu migracije ćelija, koje prvo obrazuju simpatikusne ganglije.

Cilj rada: Cilj ovog rada je da prikažu histomorfološke karakteristike nadbubrežne žlezde različitog uzrasta.

Materijal i metode: Posmatrali smo 10 preparata fetalnog nadbubrega od IV do IX meseca intrauterinog razvoja i 8 preparata adultnog nadbubrega od 30 do 70 godina. Preparate smo posmatrali pod svetlosnim mikroskopom sa različitim uvećanjima: 5x10, 10x10, 20x10, 40x10. Preparati su obojeni standardnim hemotaksilin-eozin (H&E) bojenjem.

Rezultati: Zona glomerulosa i zona fasciculata prisutne od 20 nedelje intrauterinog razvoja, dok se zona reticularis stvara nakon rođenja. Medula se formira migracijom i proliferacijom neuroblasta takodje tokom 20 nedelje intrauterinog razvoja.

Zaključak: Zona glomerulosa i fasciculata su prisutne u ranom periodu razvika, dok je zona reticularis konačno formirana postnatalno. Nadbubrežna žlezda predstavlja dobro vaskularizovan organ, čije su ćelije u bliskom kontaktu sa sinusoidnim kapilarima i venskim sinusima.

Gljučne reči: zona glomerulosa, zona fasciculata, zona reticularis, medula, neuroblasti.

HISTOMORPHOLOGICAL CHARACTERISTICS OF FETAL AND ADULT ADRENAL GLAND

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Introduction: The adrenal gland consists of two parts, the cortex and medulla. These two parts have dual embryonic origin. The cortex develops from mesodermal mesenchyme, which gives tissue surface with sinusoidal blood vessels. Medulla develops from neural crest ectoderm, in the process of cell migration.

The Aim: The aim of this paper is to present the histomorphological characteristics of adrenal glands of various ages.

Materials and methods: We have tested 10 preparations of the fetal adrenal gland from the fourth to ninth month of intrauterine development and 8 adult adrenal preparations from 30 to 70 years. Products are observed under the microscope with different magnification: 5x10, 10x10, 20x10, 40x10. Preparations were stained with standard H & E staining.

Results: Zona glomerulosa and zona fasciculata are present from 20 weeks of intrauterine development, whereas the zona reticularis appears after birth. Medulla is formed by migration and proliferation of neuroblastoma during 20 weeks of intrauterine development.

Conclusion: Zona glomerulosa and fasciculata are present in the early period of development, while the zona reticularis finally formed postnatally. The adrenal gland is well vascularized organ, whose cells are in close contact with the sinusoidal capillaries and venous sinuses.

Key words: zona glomerulosa, zona fasciculata, zona reticularis, medulla, neuroblastoma.

VITRO I IN VIVO ANALIZA UTICAJA KOMPLEKSA KRISTALA [Cu(TSCPL-H)₂O]Br·H₂O NA RAST ČELIJSKE KULTURE BHK

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Uvod: Pri ispitivanju antitumorskog potencijala supstance neophodno je uključiti in vitro i in vivo studiju. Do danas nije istraživano antitumorski potencijal [Cu(TSCPL-H)₂O]Br·H₂O.

Cilj rada: Ispitati in vitro i in vivo histološke karakteristike uticaja [Cu(TSCPL-H)₂O]Br·H₂O na rast BHK čelijske kulture.

Materijal i metode: In vitro studija: Model I: dodatak 100μl vodenog rastvora [Cu(TSCPL-H)₂O]Br·H₂O na 12ml podloge sa 1 ml čelija BHK. Model II: dodatak 100μl vodenog rastvora [Cu(TSCPL-H)₂O]Br·H₂O na smešu 12ml podloge sa 1 ml čelija BHK nakon uspostavljanja 100% izraslog sloja čelija. In vivo studija: obuhvata 10 hrčaka subkutano inokulisanih sa kulturom čelija BHK. Pet jedinki je u periodu od 21 do 26-og dana od inokulacije tumora aplikovano vodenim rastvorom [Cu(TSCPL-H)₂O]Br·H₂O u dozi od 12mg/kg. Nakon tretmana jedinke kontrolne i eksperimentalne grupe su žrtvovane, fotografisane, uzorci tumora su fiksirani i obrađeni standardnom histološkom metodom(H&E). Analizom pet vidnih polja po jedinki određen je prosečan broj mitozu u eksperimentalnoj i kontrolnoj grupi.

Rezultati: In vitro primena kompleksa kristala [Cu(TSCPL-H)₂O]Br·H₂O dovodi do citotoksičnog efekta kod preko 90% čelija kulture BHK. Preživele ćelije nakon 72h su morfološki znatno izmenjene. Primenom kompleksa kristala [Cu(TSCPL-H)₂O]Br·H₂O na subkutano inokulisani tumor čelijske kulture BHK dovodi do povećanja broja mitozu kod ogleđnih u odnosu na grupu jedinki bez tretmana supstancom nakon 5 dana od primene supstance.

Zaključak: Ispitivana supstanca poseduje citotoksični efekat ali u posledičnu mutaciju izvesnih čelija zabeleženu kako u in vitro tako i u in vivo studiji.

Ključne reči: in vivo, in vitro, BHK, bakar bromid- tiosemikarbazon.

IN VITRO AND IN VIVO ANALYSIS OF EFFECT OF CRYSTAL COMPLEX [Cu(TSCPL-H)₂O]Br·H₂O ON GROWTH OF BHK CELL CULTURE

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Introduction: Researching antitumor potential of certain substance needs to include in vitro as well as in vivo studies. [Cu(TSCPL-H)₂O]Br·H₂O has never been subject of these kind of studies.

The Aim: Examine in vitro and in vivo histological characteristics of effect of [Cu(TSCPL-H)₂O]Br·H₂O on growth of BHK cell culture.

Materials and Methods: In vitro study: Model I: adding water solution of [Cu(TSCPL-H)₂O]Br·H₂O(100 μl) to mixture of growth medium(12ml) and BHK cells(1ml). Model II: adding water solution of [Cu(TSCPL-H)₂O]Br·H₂O(100μl) to mixture of growth medium(12ml) and BHK cells(1ml) after establishing 100% grown layer of cells. In vivo study: 10 hamsters were subdermally inoculated with BHK cells. Water solution of [Cu(TSCPL-H)₂O]Br·H₂O was applied(dose 12 mg/kg) to five hamsters during period between 21st to 26th day after inoculation of tumor. After treatment all hamsters were sacrificed, photographed, tumor samples were fixated and stained with H&E. Average of mitosys in control and experimental group was determined through analysis of 5 microscopic fields per hamster.

Results: In vitro use of [Cu(TSCPL-H)₂O]Br·H₂O leads to cytostatic effect at over 90% of BHK cells. After 72h survived cells were significantly altered. After 5 days the use of [Cu(TSCPL-H)₂O]Br·H₂O on subdermally inoculated tumor of BHK cell culture leads to increase of number of mitosis in treated hamsters contrary to the untreated group.

Conclusion: [Cu(TSCPL-H)₂O]Br·H₂O possess a cytostatic effect with consequent mutation of certain cells noted in in vivo and in vitro study.

Key words: in vivo, in vitro, BHK, copper bromide-thiosemicarbazone.

MORFOMETRIJSKA ANALIZA PRENATALNOG RAZVOJA KORE MALOG MOZGA KOD ZAMORCA

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Uvod: Kod zamorca gestacija traje oko sezdesetpet dana, tri puta duže nego kod pacova i miševa. Takodje se jedinke rađaju sa potpuno izdiferenciranim strukturama malog mozga. Model razvoja mozga u zamorca bi na taj način predstavljao najkompatibilniji model u izučavanju ljudskog mozga.

Cilj: Predmet našeg istraživanja su bile histološke karakteristike razvoja malog mozga.

Materijal i metode: Eksperimentom je obuhvaceno ukupno dvanaest jedinki zamorca gestacijske starosti 50, 55, 60 i 65 dana. U skladu sa tim zenke su žrtvovane uz pomoć etarske anestezije u 50, 55, 60 i u 65-tom danu gestacije. Nakon adekvatne fiksacije, dehidratacije, strukture malog mozga su kalupljene u parafin i bojene standardnim histološkim tehnikama.

Rezultati: Tokom poslednje trećine gestacije uočava se jasan porast volumena malog mozga. Analizom linearne gustine Purkinjeovih čelija uočen je porast broja čelija prvog dana po okotu dok se kasnije intenzitet linearne gustine znatno smanjuje u adultnm periodu. Uočava se progresivan pad broja čelija granuloznog sloja. Jasno se uočava i porast površinske gustine čelija molekularnog sloja kod jedinki prvog dana okota, dok se broj čelija po jedinici površine tokom života rapidno smanjuje.

Zaključak: Možemo da zaključimo da je razvoj malog mozga kod zamorca znatno kompatibilniji model razvoju kod čoveka u odnosu na istraživanja koja su vršena na drugim eksperimentalnim životinjama.

Ključne reči: mali mozak, razvoj, zamorca

MORPHOMETRIC ANALYSIS OF PRENATAL DEVELOPMENT OF THE CEREBELLAR CORTEX AT GUINEA PIGS

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Introduction: In guinea pigs gestation lasts about 65 days, three times longer than in rats or mice, causes that individuals are born with fully differentiated structures of the cerebellum. Development model in guinea pig brain is represented a more compatible model in studying the human brain.

The Aim: The subject of our study was analysis of histological features in the development of the cerebellum in guinea pigs.

Material and methods: The experiment included a total of twelve individual guinea pig with gestational ages 50, 55, 60 and 65 days. Females were sacrificed using ether anesthesia at 50, 55, 60 and the 65-day gestation. After adequate fixation, dehydration, the structure of the cerebellum were embedded in paraffin and stained by standard histological techniques.

Results: During the last third of gestation, we can see a clear increase in the volume of the cerebellum. The analysis of linear density of Purkinje cells was observed an increase in cell number on the first day after litter, but later linear density significantly reduces during the adult period. It may be observed a progressive decrease in the number of cell in granular layer. In molecular layer we can see increase of surface density of molecular cell layer in animals first day after litter, while the number of cells decreases rapidly during life.

Conclusion: We can conclude that the development of the guinea pig cerebellum is much better model for comparison with humans than in other experimental animals.

Key words: The cerebellum, development, guinea pig

MORFOMETRIJSKE KARAKTERISTIKE KORE MALOG MOZGA PACOVA U HRONIČNOM ALKOHOLIZMU

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Uvod: Mali mozak (cerebellum) je deo centralnog nervnog sistema, odgovoran za kontrolu položaja, održavanje ravnoteže i koordinaciju i planiranje pokreta. Poremećaji stabilnog hoda, gubitak ravnoteže i ataksija, uočavaju se kao vrlo česti pokazatelji cerebelarne disfunkcije, kod hroničnih alkoholičara. Etanolom indukovana apoptoza je osnovni patofiziološki mehanizam, koji uzrokuje gubitak ćelija pri hroničnom alkoholizmu.

Cilj: Cilj našeg istraživanja bio je ispitati morfometrijske karakteristike kore malog mozga pacova, nakon hronične peroralne primene 15% etanola.

Materijal i metode: Ispitivanje uticaja etil-alkohola na mali mozak izvedeno je na 12 zrelih pacova. Ogladne životinje su konzumirale 15% rastvor etil-alkohola, koji im je tokom celog dana i noći bio na raspolaganju. Nakon preparisanja mozga, analizirane su fotografije, svakog od 3 sloja korteksa malog mozga. Morfometrijske analize podrazumevale su pojedinačno izračunavanje linearne gustine Purkinjeovih ćelija (LIN), numeričke gustine ćelija granuloznog sloja (NG) i površinske gustine ćelija molekularnog sloja (PG).

Rezultati: LIN tretiranih jedinki u proseku iznosi $0,020 \pm 0,003 \mu\text{m}^{-1}$, dok kod kontrolne grupe iznosi $0,027 \pm 0,004 \mu\text{m}^{-1}$. Prosečna NG tretiranih jedinki iznosi $0,013 \pm 0,0013 \mu\text{m}^{-2}$, a kod kontrolne grupe $0,021 \pm 0,0036 \mu\text{m}^{-2}$. Srednja PG tretiranih jedinki je $1359,5 \pm 171,5 \text{ mm}^{-1}$, dok je kod kontrolne grupe $1438,3 \pm 280,0 \text{ mm}^{-1}$.

Zaključak. Uočeno je statistički značajno smanjenje linearne gustine Purkinjeovih ćelija i numeričke gustine ćelija granuloznog sloja kod eksperimentalne grupe u odnosu na kontrolnu. Površinska gustina molekularnog sloja tretiranih jedinki se nije statistički značajno promenila u odnosu na kontrolnu grupu.

Ključne reči: cerebellum, etanol, hronična intoksikacija, morfometrija.

MORPHOMETRIC CHARACTERISTICS OF RAT CEREBELLAR CORTEX IN CHRONIC ALCOHOLISM

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Introduction: Cerebellum is a part of central nervous system. It plays an important role in functions like maintaining balance, coordination and planning of movement. Gait disturbances, lack of balance and ataxia are common clinical symptoms of cerebellar dysfunction in chronic alcoholics. In chronic alcoholism, ethanol-induced apoptosis is one of the basic pathophysiological mechanisms, that results in with loss of neurons.

The Aim: In this paper, we will determine morphometric characteristics of cerebellar brain cortex of rats, who consumed 15% ethanol for 2 months.

Material and methods: This research was done on 12 adult rats. The animals constantly consumed 15% ethanol, during night and day. After preparation of the brains, photographs were made and analyzed, for every one of the layers of the cortex. Morphometric analyzes considered measuring linear density of Purkinje cells (LIN), numerical density of granule cells (NG) and area density of molecular cells (PG).

Results: LIN of treated animals was $0,020 \pm 0,003 \mu\text{m}^{-1}$, and control was $0,027 \pm 0,004 \mu\text{m}^{-1}$. Average NG of experimental group was $0,013 \pm 0,0013 \mu\text{m}^{-2}$, thou the control group was $0,021 \pm 0,0036 \mu\text{m}^{-2}$. Average value of PG in treated animals was $1359,5 \pm 171,5 \text{ mm}^{-1}$, while control group had $1438,3 \pm 280,0 \text{ mm}^{-1}$.

Conclusion: There was statistically significant reduction of cells in Purkinje and granule layer of cerebellar cortex between treated and control group of rats. PG did not show significant difference between results in mentioned groups.

Key words: cerebellum, ethanol, chronic intoxication, morphometrics.

MORFOLOŠKE PROMENE PERIKORONARNOG MASNOG TKIVA U TOKU STARENJA

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Uvod: Izučavanjem uzrastnog i polnog remodelovanja koronarnog perivaskularnog (KPV) masnog tkiva humanih koronarnih arterija nije se bavio veliki broj naučnika, uprkos činjenici da početak i progresija mnogih vaskularnih bolesti posreduje "od spolja ka unutra".

Cilj: Cilj istraživanja bio je određivanje vrednosti površine i volumenske gustine adipocita KPV masnog tkiva, kao strukturne komponente zida prednje interventrikularne grane leve koronarne arterije (LAD), da bi se istražilo smanjenje ovih vrednosti sa starenjem i postojanje razlika u toku procesa uzrastnog i polnog remodelovanja.

Materijali i metode: Istraživanje je vršeno na uzorcima LAD-a dobijenim tokom obdukcije neselektovane serije autopsijskih subjekata strositi od 37 do preko 70 godina. Svi uzorci (36) su podeljeni u tri uzrastne grupe: Mlada, Stara A i Stara B. Tkivni preseći, prosečne debljine $4 \mu\text{m}$, bojeni su hematoksilin-eozinom i metodom po Spajseru, a zatim slikani na mikroskopu. Morfometrijska analiza adipocita je urađena pomoću programa *ImageJ*.

Rezultati: Prosečne vrednosti površina (μm^2) adipocita KPV masnog tkiva LAD-a pokazuju smanjenje sa starenjem kod muških subjekata, dok kod ženskih dolazi do porasta u Staroj B grupi. Prosečne vrednosti broja adipocita po jedinici zapremine (mm^3) KPV masnog tkiva ne pokazuju veće smanjenje sa starenjem kod muških subjekata, za razliku od ženskih kod kojih je prisutan konstantan pad vrednosti.

Zaključak: Prisutna je uzrastna razlika u površini i volumenskoj gustini adipocita KPV masnog tkiva, koja se karakteriše povećanjem površine adipocita nakon šeste decenije života kod ženskih subjekata i postojanjem razlika volumenskih gustina adipocita u sve tri uzrastne grupe.

Ključne reči: koronarno perivaskularno masno tkivo, remodelovanje, adipociti, morfometrija

MORPHOLOGICAL CHANGES PERICORONARY ADIPOSE TISSUE DURING AGING

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Introduction: Studying age-related and gender remodeling coronary perivascular adipose tissue (CPVAT) of human coronary arteries hasn't dealt with number of scientists, despite fact that initiation and progression of many vascular diseases are mediated "from outside to inside".

The Aim: Objective was to determine values of adipocyte surface and volume density of CPVAT, the structural component of wall, of left anterior descending coronary artery (LAD), to investigate changing these values with age and existence differences during process of age-related and gender remodeling.

Materials and methods: Study was performed on LAD's samples obtained during unselected series of autopsy subjects from 37 to over 70 years old. All samples (36) were divided into three age groups: Young, Old-A and Old-B. Tissue sections, $4 \mu\text{m}$ average thickness, were stained with hematoxylin-eosin and method by Spicer, and then snapped on microscope. Morphometric adipocyte analysis was performed using *ImageJ*.

Results: Average values of adipocyte surface (μm^2) of CPVAT of LAD showed decrease with age in male subjects, while in females, there is increase in old B group. Average values of adipocyte number per unit volume (mm^3) doesn't show greater change with age in male subjects, unlike females in whom there is continuing decline in value.

Conclusion: There is difference in adipocyte surface and volume density of CPVAT, which is characterized by increasing adipocyte surface after the sixth decade of life in female subjects and existence of differences in adipocyte volume density of all three age groups.

Key words: coronary perivascular adipose tissue, remodeling, adipocytes, morphometry

EPITELNI MUCINI I NEUROENDOKRINE ČELIJE U KARCINOMU ENDOMETRIJUMA

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Uvod: Brojne uloge epitelnih mucina su poznate, ali je veza između ekspresije mucina i neurohormona u karcinomu endometrijuma nedovoljno ispitana.

Cilj rada: Komparativno ispitivanje ekspresije mucina i distribucije neuroendokrinih ćelija u odnosu na histološki gradus endometrijalnih karcinoma.

Materijal i metode: Korišćen je operativni materijal karcinoma endometrijuma, arhiviran u parafinske blokove. Mucini i neuroendokrine ćelije su ispitivani u dobro (n=20), srednje (n=20) i loše (n=20) diferentovanim karcinomima. Na preseccima debljine 5 µm su primenjene klasična HE, histoheimska AB-PAS pH 2,5 i imunohistoheimska ABC metoda sa antitelima na hromogranin A, bombesin, insulin, gastrin, somatostatin, glukagon i serotonin.

Rezultati: U dobro diferentovanih tumorima je prisutna hipersekrecija neutralnih i hiposekrecija kiselih mucina. U srednje diferentovanim karcinomima zapažena je hypo- i asekrekcija kiselih mucina, dok su neutralni mucini prisutni fokalno. U tumorima slabije diferencijacije nastaje asekrekcija mucina.

Hromogranin A- sekretujuće ćelije su nađene u 39 karcinoma. Nekada je epitel žlezdi jako pozitivan na hromogranine, kada ćelije grade solidne plaže, dok su u nekih tumorima hromogranin A pozitivne ćelije retke, veće, cilindrične ili poligonalne. Pojedinačne, sitne, insulin imunoreaktivne ćelije su verifikovane u dobro ili srednje diferentovanim tumorima. Perinuklearni depoziti bombesina, perimembranozni depoziti gastrina i anularni depoziti serotonina su nađeni u loše diferentovanih tumorima. Retke, polimorfne somatostatinske ćelije su verifikovane u dobro i srednje diferentovanih tumorima. Ekspresija glukagona je nađena jedino u makrofagima i mastocitima strome.

Zaključak: Proporcionalno stepenu maligniteta endometrijalnih karcinoma nastaje redukcija sekrecije epitelnih mucina i upadljiva hiperplazija neuroendokrinih ćelija koje pokazuju morfološki i funkcionalni polimorfizam.

Ključne reči: endometrijum, adenokarcinom, epitelni mucini, neuroendokrine ćelije

EPITHELIAL MUCINS AND NEUROENDOCRINE CELLS IN ENDOMETRIAL CARCINOMA

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Introduction: Epithelial mucins' functions are well-known, but the connection between mucin and neurohormone expression in endometrial carcinoma is insufficiently studied.

The Aim: Examination of endometrial adenocarcinomas for the presence of epithelial mucins and neurohormone-containing cells, particularly in relation to histological tumour grade.

Materials and Methods: Operative material archived in paraffin blocks was used. Neuroendocrine cells were examined in well (n=20), moderately (n=20) and poorly differentiated adenocarcinomas (n=20). On 5 µm sections, classical HE, histochemical AB-PAS pH 2.5 and immunohistochemical ABC method with chromogranin A, bombesin, insulin, gastrin, somatostatin, glucagon and serotonin antibodies were applied.

Results: In well differentiated tumours hypersecretion of neutral and hyposecretion of acid mucins was present. In moderately differentiated adenocarcinomas hypo- and asecretion of acid mucins was verified, while neutral mucins were present focally. In poorly differentiated tumours mucous asecretion occurs.

Chromogranin A-containing cells were detected in 39 adenocarcinomas. Sometimes these cells formed solid structures, other times cylindrical, solitary cells were found. Well differentiated tumors contained small, round insulin-immunoreactive cells. In poorly differentiated carcinomas there were numerous and formed solid structures. Perinuclear bombesin deposits, perimembranous gastrin deposits and annular serotonin deposits were found in poorly differentiated tumours. Polymorphous somatostatin-containing cells were present in well and moderately differentiated tumours. Glucagon activity was detected only in stromal macrophages and mast cells.

Conclusion: According to the grade of endometrial carcinoma, a reduction of epithelial mucins secretion occurs, as well as a striking hyperplasia of neuroendocrine cells that show morphological and functional polymorphism.

Key words: endometrium, adenocarcinoma, epithelial mucins, neuroendocrine cells

INTERSTICIJUMSKE ČELIJE KAHALA U APENDIKSU DECE

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Uvod: Terminom Intersticijalne ćelije Kahala (IČK) označeno je više tipova ćelija prisutnih u muskulaturi organa digestivne cevi (od jednjaka do anusa), koje su morfološki i funkcionalo "umetnute" između elemenata enteričnog nervnog sistema i glatkih mišićnih ćelija. Određene grupe IČK predstavljaju izvore spontanih električnih talasa odgovornih za peristaltičke kontrakcije muskulature ("pejsmekeri"), dok su druge grupe IČK uključene u modulaciju enteričke neurotransmisije.

Materijal i metode: Materijal je činilo 12 apendiksa dece starosti od 1 do 15 godina koji su uklonjeni nakon različitih abdominalnih operacija (icidentalnih apendektomija), i koji na patohistološkom nalazu nisu pokazivali znake zapaljenja. IČK su dokazivane imunohistoheimijskim ispitivanjem pomoću antitelana Kit receptor (C-kit imunoreaktivnost), na materijalu koji je fiksiran u formalinu i kalupljen u parafinu.

Rezultati: C-kit imunoreaktivne ćelije dokazane su u mišićnom sloju zida apendiksa i to: unutar kružnog sloja – IČK kružnog sloja, unutar uzdužnog sloja – IČK uzdužnog sloja i oko gangliona mijenteričnog plexusa – IČK mijenteričnog plexusa. Unutar mišićnih slojeva IČK su uglavnom vretenastog oblika, sa dva duga produžetka koji polaze sa suprotnih krajeva ćelije, dok su ćelije oko mijenteričnog gangliona pleomorfne i često sadrže i veći broj produžetaka.

Zaključak: C-kit imunoreaktivne IČK sud okazane u zidu apendiksa dece unutar mišićnih slojeva i oko gangliona mijenteričnog plexusa. Za razliku od ostatka debelog creva, u apendiksu nisu prisutne IČK submukoznog plexusa i manje su brojne IČK mijenteričnog plexusa.

Ključne reči: Intersticijalne ćelije Kahala, C-kit, apendiks.

INTERSTITIAL CELLS OF CAJAL IN THE APPENDIX

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Background. The term Interstitial cells of Cajal (ICC) indicates to several types of cells located in the musculature of the digestive tube (from esophagus to anus) and, morphologically and functionally, intercalated between the segments of the enteric nervous system and smooth muscle cells. Some ICC groups act as source of spontaneous, electric slow waves responsible for paced contractions of the musculature ("pacemakers"), whereas other ICC groups are involved in the modulation of enteric neurotransmission.

Methods. Material was constructed of 12 vermiform appendixes of children 1 - 15 years old, removed during various abdominal operations (incidental appendectomies) which didn't show signs of inflammation on histopathology examination. ICCs were identified by immunohistochemical analyses with antibodies to the kit- receptor, on material fixed in formalin and embedded in paraffin.

Results. Immunoreactive cells of Cajal were evidenced in muscular layer of appendix: inside circular muscle layer - ICC-CM, inside longitudinal muscle layer - ICC-LM and around myenteric plexus ganglions - ICC-MP. In muscular layers ICCs are predominantly spindle-shaped, with two long processes projecting from opposing ends of cell body, while cells around myenteric plexus are pleomorphic and often has several processes.

Conclusions. C-kit immunoreactive cells are present in the wall of appendix in children, inside muscular layers and around myenteric plexus. In contrast to the other parts of colon, ICC of submucous plexus were not present at all, and ICC-MP were less numerous in the appendix.

Keywords: Interstitial cells of Cajal, C-kit, appendix.

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Uvod: Ispitivanje stomatoloških materijala u regeneraciji koštanog tkiva na laboratorijskim životinjama, kao jedno od esencijalnih istraživanja u stomatologiji, mora biti u skladu sa zakonskim regulativama (GLP).

Cilj: Cilj nam je bio odabir odgovarajuće eksperimentalne životinje za pretkliničko ispitivanje koštanih supstituenata praćenjem dostupne literature.

Materijal i metode: Analizirano je 45 (obrađeno 32) publikovanih radova u poslednjih 10 godina, na servisnoj mreži Kobson (baze Springer/Kluwer, Science Direct i Free Medical), kao i na Medline bazi podataka.

Rezultati: Sledeći definisane kriterijume koji su zadovoljeni u 32 rada, otkrili smo da se za intraosealnu implantaciju materijala koriste pas (33,33%), pacov (20%), zec (20%), ovca (13,33%), svinja (6,67%) i majmun (6,67%), za intramuskularnu pacovi (80%) i miševi (20%), a za subkutanu pacov (38,1%), pas (23,81%), zec (14,29%), ovca (9,52%), miš (4,76%), patuljasta svinja (4,76%) i majmun (4,76%). Prednost pacova i zečeva su niska cena, brzina razmnožavanja i rasta, izdržljivost, tolerancija, a nedostaci su veličina i različitost tkiva. Prednosti psa su mogućnost dresure, sastav kostiju, a nedostatak je etičnost. Veliku sličnost kostiju sa ljudskom, kao i težinu tela, imaju svinje, ovce i koze. Primati su najpodesniji, ali su skupi, teško je pratiti kontrolne varijable i njihovo korišćenje je etički problem, pa se retko koriste.

Zaključci: Zaključili smo da je najčešće korišćena životinja u ispitivanju stomatoloških materijala u regeneraciji koštanog tkiva pacov zbog niske cene čuvanja, lake dostupnosti, brzog razmnožavanja, tolerancije na operativne zahvate, fizioloških karakteristika i zakonskih regulativa, ali sam izbor životinje prvenstveno zavisi od specifičnosti samog istraživanja.

Ključne reči: biokompatibilnost, stomatološki materijali, životinje, regeneracija.

SELECTION OF EXPERIMENTAL ANIMAL IN RESEARCH IN DENTISTRY

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Introduction: Testing of dental materials in the regeneration of bone tissue in laboratory animals, as one of the essential research in dentistry, must be in accordance with GLP.

The Aim: Our aim was selection the most appropriate experimental animal for pre-clinical testing of bone substitutes following the available literature.

Materials and Methods: Total of 45 (32 analyzed) published articles in the last 10 years, at the Kobson and at the Medline database are processed.

Results: We found the intraosseous implants are used for dog (33.33%), rat (20%), rabbit (20%), sheep (13.33%), pig (6.67%) and monkey (6.67%), intramuscular for rat (80%) and mouse (20%), and subcutaneous for rat (38.1%), dog (23.81%), rabbit (14.29%), sheep (9.52%), mouse (4.76%), mini pig (4.76%) and monkey (4.76%). The advantages of rats and rabbits are low cost, fast propagation and growth, endurance, tolerance, and disadvantages are the size and diversity of tissues. The advantages of dogs are the possibility of disciplining, bone structure etc. Similarities with human bones, and body weight, have pigs, sheep and goats. The primates are the most appropriate, but are expensive, difficult to monitor and their use is ethical problem.

Conclusion: We concluded that the most commonly used in animal testing of dental materials in the regeneration of bone tissue is rat due to low maintenance, easy availability, rapid reproduction, tolerance to surgical procedures, physiological characteristics and regulatory requirements, but the choice depends primarily on the animal specifics of the research itself.

Keywords: Biocompatibility, dental materials, animals, regeneration.

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Uvod: U histologiji CNS predstavlja poseban izazov, jer je proces uzimanja tkiva komplikovan, priprema materijala složena, a sama bojenja metodološki zahtevna.

Cilj: Komparativno ispitivanje morfoloških odrednica magnocelularnih neurona hipotalamične regije upotrebom različitih metoda bojenja.

Materijal i metode: Uzorci velikog mozga 10 mužjaka pacova Wistar soja. Pacovi su žrtvovani, materijal podvrgnut standardnoj histološkoj proceduri pripreme do nivoa parafinskog kalupa. Uzorci su isečeni, postavljeni na pločice, parafin uklonjen i isečci su hidratirani. Korišćeno je rutinsko bojenje (HE; hematoksilin i eozin), i specijalne metode bojenja kojima se tkivo mozga najčešće boji.

Rezultati: Komparativnom analizom ove četiri metode bojenja uočene su morfološke odrednice ovog regiona sa sigurnošću, kao i kompozicija ćelijskih struktura koje ove regije karakterišu. Analizom subcelularne građe magnoneurona paraventrikularnog nukleusa, kao i uočavanje parvocelularnih neurona u ovoj regiji, ističe se krezil fast kao najkvalitetnija metoda bojenja koja nam obezbeđuje najviše informacija o morfološkom i funkcionalnom stanju nervne populacije u ovoj zoni. Takođe, krezil fast metodom se nervne strukture u ovom regionu mozga najbolje diferentuju i to kako na nivou određene zone, tako i po subcelularnom sadržaju koji ćelije ove zone poseduju.

Zaključak: Primenom različitih metoda bojenja nervnog tkiva u CNS-u, prednost dajemo krezil fast metodi bojenja, jer nam ona obezbeđuje najveći broj informacija o histološkoj građi i funkcionalnom stanju magnocelularnih neurona hipotalamusa.

Ključne reči: hipotalamus, magnocelularni neuroni.

COMMON AND SPECIFIC STAINING OF CNS STRUCTURES

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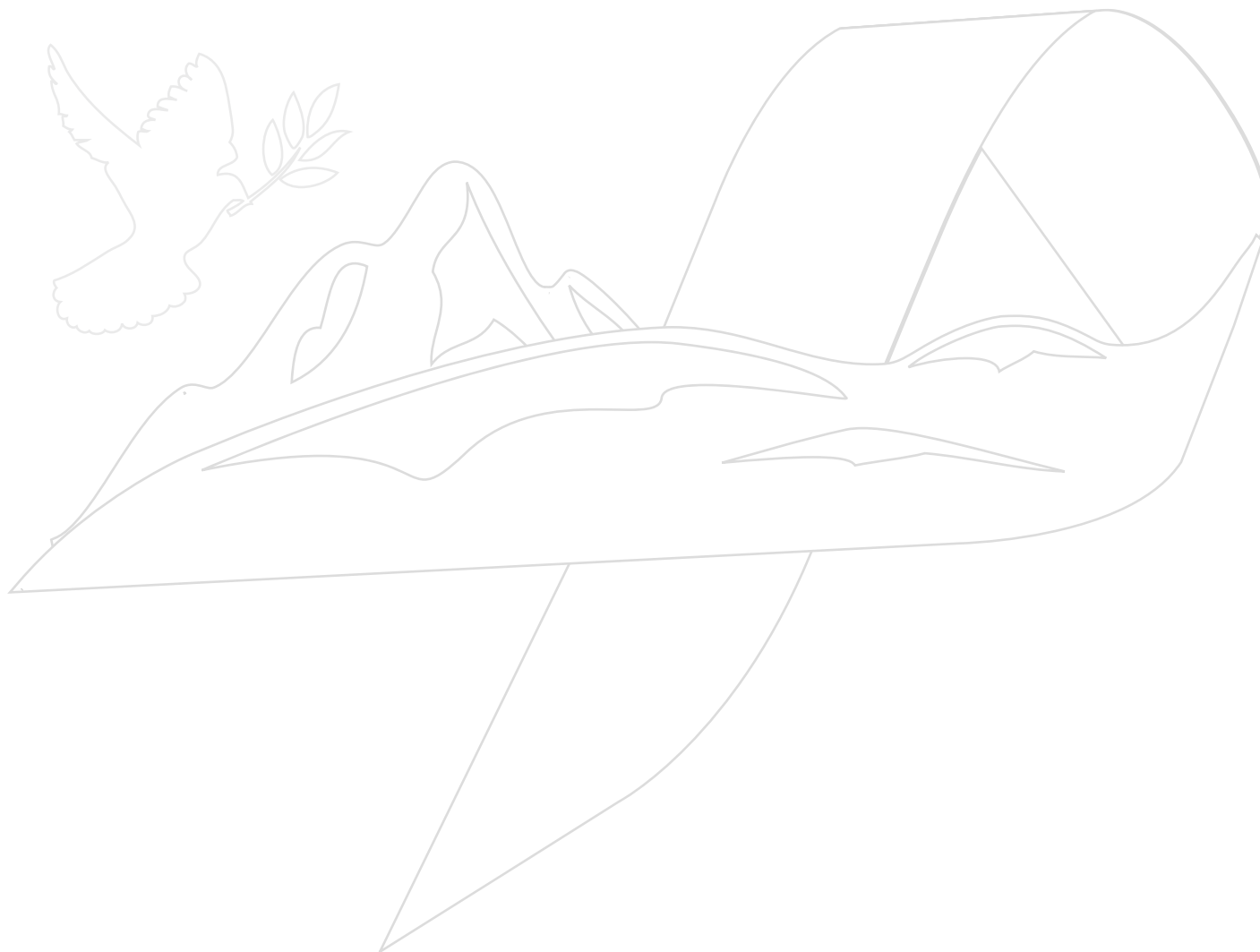
Introduction: In histology, CNS presents a particular challenge, because the process of obtaining tissue is complicated, preparation of materials is complex, and the staining methodology is demanding.

Aim: A comparative study of morphological determinants of the magnocellular neurons in the hypothalamic region using various staining methods.

Material and Methods: Samples of the brain were taken from 10 male Wistar rats. The rats were sacrificed, the material subjected to standard histological procedures to prepare and obtain paraffin molds. The samples were cut, placed on the pads, paraffin sections were removed and the samples were hydrated. Routine staining was used (HE, hematoxylin and eosin), and special staining methods which brain tissue are usually stained with.

Results: With comparative analysis of these four methods of staining, morphological determinants of this region were observed with certainty, as well as the composition of cellular structures that are characteristic of this region. Analysis of the subcellular structure of the magnoneurons in the pre-ventricular nucleus, as well as spotting parvocellular neurons in this region, led us to the conclusion that crezil fast is the highest quality method of staining. This method provides us with the most information about the morphological and functional state of the neural populations in this zone.

Key words: hypothalamus, magnocellular neurons.





HUMANA GENETIKA I BIOLOGIJA

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Uvod: U današnje vreme, posebna pažnja posvećena je mogućnostima trombocita u regeneraciji koštanog tkiva jer je dokazano da koncentrisani trombociti poseduju osteokonduktivne karakteristike dok njihove osteoinduktivne karakteristike trombocita još uvek nisu dovoljno ispitane.

Cilj istraživanja: Cilj našeg istraživanja bio je ispitivanje da li i u kojoj meri koncentracija trombocita u kombinaciji sa mineralnim matriksom kosti imaju uticaja na indukciju ektoپیčne osteogeneze.

Materijal i metode: Istraživanje je izvedeno na Singenim miševima Balb/c soja, muškog pola, starosti 10-12 nedelja. Implantati su dobijeni mešanjem mineralnog matriksa kosti i trombocita različitih koncentracija resuspendovanih u autolognoj plazmi. Kontrolni implantati predstavljali su mešavinu mineralnog matriksa kosti i fiziološkog rastvora. Implantacija je obavljena subkutano interskapularno, a životinje su žrtvovane posle 1, 2 i 4 nedelje od implantacije. Za histološku evaluaciju korišćeno je hematoksilin-eozin bojenje.

Rezultati: Sva tri tipa implantata pokazala su hemotaksično delovanje na različite ćelije vezivnog tkiva i osteoklaste i induktivno delovanje na angiogenezu i osteogenezu. Implantati koji su sadržali više koncentracije trombocita u kompoziciji sa mineralnim matriksom kosti pokazali su izraženije stimulatorno dejstvo na navedene procese u odnosu na implantate koji su predstavljali kompoziciju mineralnog matriksa kosti i niže koncentracije trombocita, a naročito u odnosu na sam mineralni matriks kosti.

Zaključak: Dobijeni rezultati ukazuju na to da je koncentracija trombocita bitan faktor koji utiče na intenzitet angiogeneze, ali i početak i intenzitet osteogeneze.

Ključne reči: mineralni matriks kosti, koncentracija trombocita, ektoپیčna osteogeneza

THE ASSESSMENT OF INFLUENCE OF CONCENTRATION PLATELETS ON THE INDUCTION OF ECTOPIC OSTEOGENESIS

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Introduction: Nowadays, special attention was given to the possibilities of platelets in the regeneration of bone tissue. It is proven that concentrated platelets have osteoconductive properties, but its osteoinductive properties are incompletely investigated.

Aim of study: The aim of our research was to examine whether and to what extent different concentrations of platelets in combination with the bone mineral matrix have an impact on the induction of ectopic osteogenesis.

Material and methods: The study was conducted on syngene BALB/c mice, male, 10-12 weeks old. Implants were obtained by mixing the bone mineral matrix with different concentrations of platelets which were resuspended in autologous blood plasma, and physiological solution. Subcutaneous interscapular implantation was performed and the animals were sacrificed after 1, 2 and 4 weeks after implantation. Hematoxylin-eosin staining was used for histological evaluation.

Results: All three types of implants showed chemotaxis effect on connective tissue cells and osteoclastic and inductive effect on angiogenesis and osteogenesis. The implants, which contained a higher concentration of platelets in the composition with the bone mineral matrix showed more pronounced stimulatory effect on these processes in comparison to the implants which were composed of the bone mineral matrix and a lower concentration of platelets, and particularly in comparison to the bone mineral matrix alone.

Conclusion: The obtained results showed that the platelet concentration is important factor that influences the intensity of the angiogenesis and the beginning and the intensity of osteogenesis.

Key words: bone mineral matrix, platelet concentration, ectopic osteogenesis

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Uvod: Aneuploidija predstavlja numeričku aberaciju hromozoma, koja dovodi do uvećanja ili smanjenja pojedinačnih hromozoma u diploidnoj garnituri. Najčešće aneuploidije X hromozoma su: monozomija X (žene kariotipa 45,X0) – Tarnerov sindrom i dizomija X hromozoma (muškarci kariotipa 47,XXY) – Klinefelterov sindrom.

Cilj: Cilj ovog istraživanja je procena uticaja ovih hromozomskih anomalija na položaj maksile i mandibule prema bazi lobanje i promena u međuviličnim odnosima.

Materijal i metode: Urađeni su profilni radiogrami i izvršena antropometrijska merenja 28 odraslih muškaraca sa Klinefelterovim sindromom i 15 odraslih žena sa Tarnerovim sindromom.

Rezultati: Ispitivanjem je utvrđen smanjen rast i izmenjen oblik i položaj kraniofacijalnih struktura kod osoba sa Tarnerovim i Klinefelterovim sindromom. Dobijeni rezultati pokazuju da nedostatak i višak X hromozoma utiče na međuvilične odnose i inklinacije maksile i mandibule prema prednjoj kranijalnoj bazi. Dok dodatni X hromozom utiče na promenu položaja vilica u sagitali, nedostatak X hromozoma dovodi do promene oblika mandibule.

Zaključci: Razlike u vrednostima dobijenim antropometrijskim merenjem ukazuju da maksilarna i mandibularna inklinacija u odnosu na kranijalnu bazu može biti povezana sa aneuploidijom X hromozoma. Na maksimalnu inklinaciju utiče višak X hromozom; obrnuto, položaj mandibule je značajnije izmenjen nedostatkom X hromozoma.

Ključne reči: aneuploidija X hromozoma, Tarnerov sindrom, Klinefelterov sindrom, kraniofacijalna morfologija, antropometrijska merenja, maksimalna inklinacija, mandibularna inklinacija.

IMPACT OF X-CHROMOSOME ANEUPLOIDY ON PROGNATHISM

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Introduction: Aneuploidy is a numerical aberration in terms of increase or decreases the basic sets of chromosomes in one or more chromosomes. The most common X-chromosome aneuploidy are Turner syndrome (45, X0) and Klinefelter syndrome (47, XXY). The phenotypic characteristics of these syndromes, include changes in craniofacial morphology.

The Aim: The aim of this research is to evaluate the impact of these chromosomal abnormalities on maxillary and mandibular position in relation to the cranial base and consequent changes in jaw relations.

Material and Methods: Profile radiographs have been done and performed anthropometric measurements of 28 adult males with Klinefelter's syndrome and 15 adult females with Turner's syndrome.

Results: The results showed that lack of or an extra X chromosome produced opposite effects on jaw relations and the inclination of both the maxilla and mandible to the anterior cranial base. While the additional X chromosome affects deviation in sagittal jaw relation, the lack of an X chromosome influenced mandibular shape.

Conclusion: The study indicates that the maxillary and mandibular inclination in to the cranial base can be related to the sex-chromosome. Maxillary inclination was more affected by an extra X chromosome; conversely, the mandibular position was more significantly altered by X chromosome deficiency.

Key words: X-chromosome aneuploidy, Turner syndrome, Klinefelter syndrome, craniofacial morphology, anthropometric measurements, maxillary inclination, mandibular inclination.

UTVRĐIVANJE STEPENA GENETIČKE HOMOZIGOTNOSTI I VARIJABILNOSTI KOD UČENIKA SREDNJE MUZIČKE ŠKOLE IZ BEOGRADA

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Uvod: Polazeći od činjenice da je muzikalnost genetički određena, pretpostavili smo da neke promene u genetičkoj homozigotnosti i varijabilnosti mogu predstavljati izvesnu predispoziciju za bavljenje muzikom.

Cilj: Uzimajući u obzir iskustva mnogih istraživača koji su proučavali prirodu nasleđivanja niza monogenetskih i oligogenetskih kvalitativnih osobina kod ljudi, kao cilj rada postavljeno je utvrđivanje stepena genetičke homozigotnosti (koristeći HRO-test) i zastupljenosti krvnih grupa ABO sistema kod učenika srednje muzičke škole u odnosu na kontrolni uzorak školske dece u Beogradu.

Materijal i metode: Ispitivanje je vršeno primenom testa za utvrđivanje homozigotno-recesivnih osobina kod ljudi (stepena homozigotnosti), HRO testa, koji obuhvata niz pretežno kvalitativnih morfoloških i funkcionalnih odlika.

Rezultati: Poređenjem zastupljenosti 20 HRO kod kontrolne grupe (N=100) i muzičkih talenata (N=100) utvrđeno je da je prosečan broj HRO 3.8 ± 0.2 , odnosno 4.0 ± 2 . Posmatrajući zastupljenost pojedinačnih homozigotno-recesivnih karakteristika primećuje se da 18 od 20 pokazuje razliku u procentualnoj zastupljenosti, od kojih 3 karakteristike statistički značajno odstupaju. U grupi muzičkih talenata 8 karakteristika pokazuje veću procentualnu zastupljenost u odnosu na kontrolu od čega 2 osobine značajno odstupaju. U kontrolnoj grupi ispitanika 11 osobina pokazuje veću procentualnu zastupljenost, pri čemu samo jedna osobina statistički značajno odstupaju.

Zaključak: Ovo populacionogenetičko istraživanje je pokazalo razlike u načinu raspodele ispitanih osobina, kao i postojanje specifičnih kombinacija HRO karakteristične za ispitivane grupe. Značajne razlike u prosečnim vrednostima genetičke homozigotnosti i varijabilnosti nisu utvrđene.

Glavne reči: muzički talenti, HRO test, genetička homozigotnost, genetička varijabilnost.

POLIMORFIZAM GENA ZA 3-FOSFOGLICERAT DEHIDROGENAZU KOD PACIJENATA SA KARCINOMOM DEBLOG CREVA

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Uvod: Kolorektalni kancer (CRC) je jedan od najčešćih karcinoma u muškoj populaciji, a u Srbiji se nalazi na 2. mestu po učestalosti. Novija istraživanja su pokazala uticaj sredinskih i naslednih faktora na nastanak ovog oboljenja. Povećana ekspresija gena za 3 fosfoglicerat-dehidrogenazu (3-PHGDH) je jedan od faktora koji doprinose onkogenezi tako što povećava proliferaciju malignih ćelija.

Cilj: Cilj rada je da se uporedi učestalost polimorfizma rs541503 gena za 3-PHGDH kod pacijenata sa kolorektalnim kancerom u odnosu na genotip zdravih muškaraca.

Materijal i metode: Istraživanje je rađeno na Institutu za Humanu genetiku Medicinskog fakulteta Univerziteta u Beogradu. Studija je obuhvatila 60 muškaraca sa karcinomom debelog creva koji su lečeni na I hiruškoj klinici Kliničkog centra Srbije i 85 zdravih muškaraca-dobrovoljaca. Genomska DNK je izolovana metodom izolovanja. Genotip pacijenata je određen metodama: reakcijom lančanog umnožavanja (PCR) i RFLP metodom (polimorfizam dužine restrikcionih fragmenata) i gel-elektroforezom.

Rezultati: Rezultati istraživanja su pokazali da postoji statistički značajna razlika između obolelih od karcinoma debelog creva i kontrolne grupe zdravih muškaraca kod rs541503 polimorfizma gena za 3-PHGDH ($p=0.0041$, $p<0.01$).

Zaključak: Kod pacijenata sa kolorektalnim kancerom i u kontrolnoj grupi, najčešći genotip je TT, a alel C bi mogao da predstavlja faktor rizika za nastanak kolorektalnog kancera. Zbog malog uzorka i velike međusobne različitosti među ispitivanim grupama, neophodno je izvršiti dodatne analize na adekvatnim uzorcima.

Glavne reči: gen za PHGDH, kolorektalni kancer, PCR, RFLP

GENETIC HOMOZYGOSITY AND VARIABILITY AMONG STUDENTS GOING TO MUSIC SCHOOL IN BELGRADE

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Introduction: Based on fact that music abilities are genetically determined, we assumed that some changes in genetic homozygosity and variability may be predisposition to engage with music.

The aim: Taking into account the experience of many researchers who have studied inheritance of a series monogenetic qualitative traits in human, our goal is to determine the degree of genetic homozygosity (using HRC-test) and the distribution of ABO blood group system in students going to music school comparing to control sample of students from Belgrade.

Materials and methods: Study was conducted using test for determining homozygously recessive characteristics in human, HRC test, which includes a series of qualitative morphophysiological and functional characters.

Results: Comparisons results of 20 HRC representation in control group (N= 100) and music talents (N= 100) showed that the average number of HRC is 3.8 ± 0.2 , and 4.0 ± 0.2 . Looking at the representation of single homozygously recessive characteristics is observed that 18 out of 20 shows difference in the percentage of representation, which 3 properties differ significantly. In group of musical talents 8 characteristics shows significant increase in comparison to control of which 2 characteristics differ significantly. In control group 11 characteristics showed a significant increase, with one trait statistically significantly different.

Conclusion: This study showed differences in distribution of surveyed traits, and existence of specific combinations of HRC in tested groups of individuals. Significant differences in mean values of genetic homozygosity and variability has not been demonstrated.

Keywords: musical talents, HRC test, genetic homozygosity, genetic variability.

3- PHOSPHOGLYCERATE DEHYDROGENASE POLYMORPHISM IN PATIENTS WITH COLORECTAL CARCINOMA

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Introduction: Colorectal cancer (CRC) is one of the most common malignant tumors and the second leading cancer in Serbia. Recent studies suggest important role of both environmental and genetic factors in cancerogenesis. 3-Phosphoglycerate dehydrogenase (3-PHGDH) gene overexpression is associated with patogenesis of human cancer and contributes to cell proliferation.

Aim: The objective of our study was to assess the association of PHGDH gene polymorphism (rs541503) in group of patient with colorectal cancer and control group of healthy men.

Material and Methods: The survey was carried out in the Department of Human Genetics-Medical School, University of Belgrade. The study has encompassed 60 man diagnosed with colorectal cancer in The First Surgical Clinic, Clinical Center of Serbia and 85 health males volunteers. The DNA was isolated from the peripheral blood with solting out method. The genotypes 3-PHGDH polymorphism were determined by Polimerase Chain Reaction (PCR) and Restriction Fragment Length Polymorphism (RFLP). Gel-electrophoresis was used to separate DNA fragments.

Results: There was a statistically significant difference between frequencies for genotypic distribution of rs541503 polymorfism in patiens with colorectal carcinoma and healthy volunteers ($p=0.0041$, $p<0.01$).

Conclusion: In the present study we found TT genopype as the most frequent in both of group of patients with colorectal carcinoma and control group. The results of our study also suggest that C allele might be factor of risk associated with colorectal cancer. It is necessary to undergo futher testing with more adequate test groups in order to get firm results.

Key words: PHGDH gene, colorectal cancer, PCR, RFLP

ANALIZA VAL34LEU POLIMORFIZMA GENA ZA FXIII KOD PACIJENATA SA VENSKOM TROMBOZOM

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Uvod: Faktor koagulacije XIII (FXIII) je heterotetramerni proenzimski molekul, protransglutaminaza koji omogućava umrežavanje fibrinskih monomera čime povećava stabilnost krvnog ugruška i njegovu otpornost na fibrinolizu. Polimorfizam A subjedinice FXIII Val34Leu analiziran je u brojnim studijama ali rezultati o njegovoj protektivnoj ulozi u nastanku arterijskih i venskih tromboza i dalje su kontradiktorni.

Cilj: Cilj naše studije je da odredimo učestalost polimorfnog alela FXIII Val34Leu, kao i odgovarajućih genotipova i ispitamo povezanost ovog polimorfizma sa nastankom venskih tromboza.

Materijal i metode: Ispitivanjem je obuhvaćeno 85 pacijenata sa venskom trombozom prosečne starosti 39,26 (17-72) godina dok je kontrolnu grupu činilo 67 ispitanika bez istorije venskih tromboza prosečne starosti 34,15 (25-54) godina. Polimorfizam Val34Leu detektovan je metodom PCR-RFLP. Ispitivanje razlike učestalosti genotipova Val34Leu i učestalosti mutiranog alela u grupi pacijenata i kontrolnoj grupi vršena je Fisherovim testom tačne verovatnoće.

Rezultati: Učestalost genotipova GG, GT i TT je 55,29% , 36,47% i 8,24% u grupi pacijenata, a 52,24% i 40,30% i 7,46% u kontrolnoj grupi. Nije uočena statistički značajna razlika učestalosti polimorfizma Val34Leu gena za FXIII kod pacijenata sa venskom trombozom i ispitanika u kontrolnoj grupi ($P = 0,424$). Analiza učestalosti genotipova i alela kod pacijenata i kontrola mlađih od 30 godina ukazala je na moguću protektivnu ulogu Val34Leu polimorfizma ali bez statističke značajnosti.

Zaključak: Polimorfizam Val34Leu nije u asocijaciji sa pojavom venskih tromboza u našoj ispitivanoj grupi pacijenata.
Ključne reči: Faktor XIII, Val34Leu polimorfizam, venska tromboza, protektivna uloga

VAL34LEU POLYMORPHISM OF FXIII GENE IN PATIENTS WITH VENOUS THROMBOSIS

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Introduction: The coagulation factor XIII (FXIII) is a transglutaminase of tetrameric structure which cross-links between fibrin monomers and increases the clot stability and resistance to fibrinolysis. The Val34Leu polymorphism of the FXIII A subunit has been widely investigated but the results about its effect on venous thrombotic risk still remain contradictory.

The Aim: Our aim was to determine allele and genotype frequencies of Val34Leu polymorphism in a group of patients with venous thrombosis and a control group, and to assess the effect of Val34Leu polymorphism against venous thrombosis.

Materials and Methods: Our study included 85 patients with a history of venous thrombosis and 67 healthy control subjects. The PCR-RFLP method was used to genotype FXIII Val34Leu polymorphism. Investigation of difference between Val34Leu genotypes frequency and mutated allele frequency in the group of patients and the control group was done by Fisher's test of exact probability.

Results: Frequencies of GG and GT and TT genotypes in the group of patients were 55,29% , 36,47% and 8,24% and in the control group 52,24% i 40,30% i 7,46% respectively. There was no statistically significant difference in the frequency of Val34Leu polymorphism between patients and the control group ($P=0,424$). However, frequency of mutated allele in the group of patients 30 years and younger was much lower when compared with the age matched control group but still without statistical significance.

Conclusion: No association of FXIII Val34Leu polymorphism was found with venous thrombosis.

Key Words: Factor XIII, Val34Leu polymorphism, venous thrombosis, protective effect

ANALIZA UDRUŽENOSTI POLIMORFIZMA G915C U GENU ZA TGF-β SA POJAVOM ANTIFOSFOLIPIDNOG SINDROMA

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Uvod: Faktor transformacije rasta β (TGF- β) je citokin uključen u regulaciju mnogobrojnih funkcija ćelija: proliferaciju, apoptozu, mehanizam imunosupresije i dr. Polimorfizam G915C u genu za ovaj citokin dovodi do smanjenja izvoza TGF- β molekula iz endoplazmatičnog retikula. Antifosfolipidni sindrom (AFS) je autoimuno oboljenje čije su odlike rekurentna tromboza i komplikacije u toku trudnoće.

Cilj: Cilj rada je bila analiza udruženosti polimorfizma G915C u genu za TGF- β sa pojavom antifosfolipidnog sindroma.
Materijal i metode: Korišćena je DNK izolovana iz leukocita periferne krvi 50 pacijenata sa AFS, kao i DNK 50 zdravih osoba koje su činile kontrolnu grupu. Genska analiza je sprovedena u sledećim koracima: izolovanje DNK metodom izolovanja, alel-specifična PCR reakcija i gel elektroforeza koja je služila za proveru uspešnosti PCR reakcije.

Rezultati: Rezultati našeg istraživanja su bili sledeći: genotip GG je utvrđen kod 59% obolelih, genotip GC kod 18%, a genotip CC kod 23% obolelih. U kontrolnoj grupi su utvrđene sledeće učestalosti genotipova: GG kod 64%, GC kod 24%, a genotip CC kod 12% zdravih ljudi. Poređenje učestalosti TGF- β 915 genotipova u grupi obolelih od AFS i kontrolnoj grupi zdravih ljudi izvršeno je χ^2 (Hi kvadrat) testom. Statistička analiza je pokazala da je učestalost 915 CC genotipa značajno veća u grupi obolelih od AFS, nego u kontrolnoj grupi zdravih ljudi ($p < 0,05$).

Zaključak: Naši rezultati pokazuju da TGF- β 915CC genotip predstavlja mogući faktor predispozicije za pojavu antifosfolipidnog sindroma.

Ključne reči: Faktor transformacije rasta β (TGF- β), polimorfizam G915C, antifosfolipidni sindrom.

ANALYSIS OF ASSOCIATION BETWEEN TGF-β G915C POLYMORPHISM AND ANTIPHOSPHOLIPID SYNDROME

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Introduction: Transforming growth factor β (TGF- β) is a cytokine that regulates many cell functions: proliferation, apoptosis, immunosuppression and etc. Polymorphism G915C in gene coding this cytokine leads to decreased export of TGF- β molecule from endoplasmic reticulum. Antiphospholipid syndrome (APS) is autoimmune disease leading to recurrent thrombosis and complications during pregnancy.

The Aim: Analysis of TGF- β G915C polymorphism association with antiphospholipid syndrome.

Materials and Methods: DNA was extracted from leukocytes of peripheral blood of 50 patients with APS, and DNA of 50 healthy people who's results were used as control. Genetic analysis was done using these methods: 'salting out' method for DNA extraction, allele-specific PCR and gel electrophoresis.

Results: Our results showed that GG genotype was found in 59% of APS patients, GC genotype in 18%, and CC genotype in 23% of patients. In control group of healthy people results were: GG genotype was found in 64% of people, GC in 24%, and CC genotype in 12% of healthy people. Comparison of results of patients and control group was done using χ^2 test. Statistic analysis showed that frequency of TGF- β 915CC genotype is significantly higher in the group of APS patients, then it was in the group of healthy people ($p < 0,05$).

Conclusion: Our results are pointing that TGF- β 915CC genotype is factor that may lead to development of antiphospholipid syndrome.

Keywords: transforming growth factor β , polymorphism G915C, antiphospholipid syndrome.

ANALIZA BROJ CAG PONOVAKA NA GENU ZA ANDROGENI RECEPTOR KOD OSOBA SA DEMENCIJOM

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Uvod: Broj CAG ponovaka na genu za androgeni receptor, koji se nalazi na X hromozomu, normalno varira u rasponu 9-36. Obzirom da se ovaj gen eksprimira u različitim delovima CNS, i da su varijacije u broju CAG ponovaka zapažene u različitim neurodegenerativnim bolestima, postavlja se pitanje moguće uloge ovog regiona u nastanku demencije.

Cilj: Analiza broja CAG ponovaka u genu za AR kod pacijenata sa demencijom.

Materijal i metode: Ispitivanjem je obuhvaćeno 50 pacijenata sa demencijom i 50 zdravih osoba odgovarajućih po životnom dobu i polu.

Primenom PCR metode, uz upotrebu fluorescentno obeleženih prajmera, i potom fragmentne analize, određivan je broj CAG ponovaka u ispitivanim grupama. Rezultati su statistički obrađeni u SPSS statističkom paketu.

Rezultati: Ni u grupi muškaraca ni u grupi žena sa demencijom nije nađena značajna razlika u srednjoj vredosti CAG ponovaka, u odnosu na kontrolne grupe. Kod obolelih žena utvrđena je značajno češća pojava alela sa 19 ili manje ponovaka, u odnosu na kontrolu, dok kod muškog pola ta razlika nije pokazana. Kod muškaraca sa demencijom bila je značajno češća pojava alela sa 19 do 23 CAG ponovaka, a kod žena sa demencijom bila je značajno češća zbirna vrednost CAG ponovaka u rasponu 40-45, u odnosu na odgovarajuće kontrolne grupe.

Zaključak: Kod pacijenata sa demencijom utvrđena su značajna odstupanja u učestalosti CAG alela, u odnosu na kontrolnu grupu. Planiramo da proširimo istraživanje na veću grupu ispitanika, i da izvršimo korelaciju sa APOE genotipom, koji je dokazani faktor rizika za nastanak demencije.

Ključne reči: AR gen, CAG ponovci, demencija.

ANALIZA UČESTALOSTI GENSKOG POLIMORFIZMA rs973117 KOD PACIJENATA SA MOŽDANIM UDAROM

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Uvod: Homocistein predstavlja toksični intermedijarni produkt metabolizma metionina. Povišene vrednosti ukupnog homocisteina pospešuju ateroskleroze i povezane su sa većim rizikom od moždanog udara, bolesti koronarnih arterija i venskim tromboembolizmom. Uzroci hiperhomocisteinemije mogu biti različiti, a među njima je i genski polimorfizam rs973117.

Cilj rada: Analiza učestalosti genskog polimorfizma rs973117 kod pacijenata sa moždanim udarom i korelacija dobijenih rezultata sa homocisteinemijom ispitanika.

Materijal i metode: Ispitivanje je vršeno kod 32 pacijenta sa ishemijskim moždanim udarom. Polimorfizam rs973117 je detektovan metodom lančane reakcije polimerizacije u realnom vremenu (real time PCR). Nivo ukupnog homocisteina u plazmi je meren tečnom hromatografijom visokih performansi sa detekcijom fluorescencije (HPLC).

Rezultati: Utvrđeno je da se učestalost alela A i C u rs973117 lokusu ne razlikuje značajno između pacijenata sa moždanim udarom i kontrolne grupe. Takođe, genotip AA je bio značajno manje zastupljen kod pacijenata u odnosu na kontrolnu grupu. Prosečne vrednosti homocisteina u plazmi pacijenata sa moždanim udarom se povećavaju sa prisustvom C alela (AA<AC<CC) ali ova razlika nije statistički značajna.

Zaključak: Ovi rezultati su delimično u suprotnosti sa rezultatima međunarodne studije koja je i identifikovala udružnost polimorfizma rs973117 i homocisteinemije. Razlog tome može biti relativno mali broj ispitanika ali i populaciono-genetička specifičnost našeg uzorka.

Ključne reči: homocistein, genski polimorfizam, moždani udar.

ANALYSIS OF CAG REPEATS IN THE ANDROGEN RECEPTOR GENE IN PATIENTS WITH DEMENTIA

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Introduction: The number of CAG repeats in the androgen receptor gene, located on the X chromosome, normally varies in the range 9-36. Given that this gene expresses in different parts of the CNS, and that the variation in the number of CAG repeats observed in various caps neurodegenerative diseases, the question of the possible role of this region in the development of dementia.

Goal: Analysis of the number of CAG repeats in the AR gene in patients with dementia.

Material and methods: The study included 50 patients with dementia and 50 healthy persons the appropriate age and gender.

PCR, using fluorescent labeled primers, and then fragment analysis, determined the number of CAG repeats in the questioned groups. The results were statistically analyzed by the SPSS statistical package.

Results: No group of men or women in the group with dementia, no significant difference in the mean of values CAG repeats, compared to the control group. In women patients had significantly more frequent allele with 19 repeats or changes, in relation to the Controllers, while in males the difference is not shown. In men with dementia were significantly more common alleles with 19 to 23 CAG repeats, and in women with dementia was significantly higher cumulative value of CAG repeats in the range 40-45, compared to the corresponding control group.

Conclusion: In patients with dementia showed significant differences in the frequency of CAG alleles, compared to the control group. We plan to expand the research to a larger group of patients, and to perform correlation with APOE genotype, which is a proven risk factor for dementia.

Keywords: AR gene CAG repeats, dementia.

ANALYSIS OF THE FREQUENCY OF GENETIC POLYMORPHISM rs973117 IN PATIENTS WITH STROKE

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Introduction: Homocysteine is toxic intermediary product of methionine metabolism. Elevated levels of total homocysteine promote atherosclerosis and are associated with increased risk of stroke, coronary artery disease and venous thromboembolism. Causes of hyperhomocysteinemia are different, and among them is the genetic polymorphism rs973117.

The Aim: Analysis of the frequency of genetic polymorphism rs973117 in patients with stroke and correlation of obtained results with homocysteine levels in the subjects.

Materials and methods: The test was performed in 32 patients with ischemic stroke. rs973117 polymorphism was detected with real-time polymerase chain reaction method (PCR). Levels of total homocysteine in plasma were measured with high-performance liquid chromatography with fluorescence detection (HPLC).

Results: It was found that the frequency of alleles A and C in rs973117 locus does not vary considerably between patients with stroke and the control group. Also, the AA genotype was considerably less frequent in patients than in the control group. Average levels of plasma homocysteine in patients with stroke increased with the presence of C allele (AA<AC<CC) but this difference was not statistically significant.

Conclusion: These results are partly in contradiction with the results of an international study that identified the association between rs973117 polymorphism and homocysteinemia. This may be due to a relatively small number of subjects in our tests, but also due to population-genetic specificity of our sample.

Key words: homocysteine, genetic polymorphism, stroke.

UTICAJ POLIMORFIZMA GENA ZNF366 NA NIVO HOMOCISTEINA U PLAZMI PACIJENATA NA DIJALIZI

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Uvod: Hiperhomocisteinemija predstavlja nezavistan factor rizika za razvoj kardiovaskularnih oboljenja. Povišene vrednosti ukupnog homocisteina (Hcy) u plazmi mogu biti posledica genetičkih defekata u produkciji enzima uključenih u metabolizam Hcy, ili stečenog deficita vitamina B12, B6 i folata kako kod zdravih osoba tako i kod osoba sa uremijom.

Cilj rada: Cilj našeg rada je da se utvrdi frekvencija alela i genotipova polimorfizma rs 7445013 gena ZNF366 kod pacijenata na hemodijalizi i analizira asocijacija ZNF366 genotipova i koncentracije Hcy u plazmi.

Materijal i metode: Ispitivanjem je obuhvaćeno 60 pacijenata na programu hronične hemodijalize. Među njima 22 (36,67%) primalo je suplementacionu terapiju folata i vitamina B12 u uobičajenim dozama. Genotip ZNF366 gena je određen PCR-RFLPS metodom a nivo homocisteina HPLC metodom.

Rezultati: Učestalosti ZNF 366 genotipova su bile: AA=30%, AG =56.67%, a GG =13.33%. Prosečne vrednosti ukupnog Hcy pacijenata koji nisu primali suplementacionu terapiju u zavisnosti od genotipa su bile AA:26,99 $\mu\text{mol/l}$, AG: 32,13 $\mu\text{mol/l}$ i GG:35,71 $\mu\text{mol/l}$. Može se uočiti trend rasta nivoa homocisteina u zavisnosti od genotipa AA<AG<GG međutim razlika srednjih vrednosti nivoa Hcy u ispitivanim grupama nije statistički značajna.

Zaključak: Nosioci polimorfog alela (GG) ZNF366 gena imaju više koncentracije Hcy u plazmi iako bez statistički značajne razlike.

Cljučne reči: homocistein, ZNF366, polimorfizam, hemodijaliza

EFFECT OF ZNF366 POLYMORPHISM GENOTYPE ON PLASMA HOMOCYSTEINE CONCENTRATION

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Introduction: Hyperhomocysteinemia represents an independent risk factor for cardiovascular diseases. Elevated total plasma levels of homocysteine (Hcy) can result from genetic defects of enzymes necessary to Hcy metabolism and acquired vitamin B12, B6 and folate deficiency in healthy and in uremic patients.

Aim: The aim of our study was to evaluate allele and genotype frequencies of rs 7445013 polymorphism in ZNF366 gene and to establish the association of genotypes and total plasma homocystein levels in the group of hemodialysis patients.

Material and methods: The study included 60 patients maintained by hemodialysis. Among them 36,67% were supplemented with usual doses of folate and vitamin B12. Identification of genotypes was performed by PCR-RFLPS method while plasma concentrations of total Hcy were determined by HPLC method.

Results: The frequencies of ZNF366 genotypes were: AA=30%, AG =56.67%, and GG =13.33%. The mean Hcy values in the group of patients who were not supplemented with folate and vitamin B12 according to ZNF366 genotype were: AA:26,99 $\mu\text{mol/l}$, AG: 32,13 $\mu\text{mol/l}$ i GG:35,71 $\mu\text{mol/l}$. We noticed that the Hcy concentration increased according to the genotype AA<AG<GG although the difference of mean Hcy levels was not statistically significant.

Conclusion: Carriers of the polymorphic GG allele of ZNF366 gene have higher total Hcy concentrations although the difference was not statistically significant.

Key words: homocysteine, ZNF366, polymorphism, hemodialysis

ANALIZA APO-E GENOTIPA KOD PACIJENATA SA ALCHAJMEROVOM I FRONTOTEMPORALNOM DEMENCIJOM

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Uvod: Demencije su oboljenja uglavnom vezana za stariju životnu dob. Najčešći oblici su Alchajmerova demencija (AD) i Frontotemporalna demencija (FTD). Kao glavni genetski faktor rizika navodi se gen za apolipoprotein E (ApoE). Cilj ove studije bio je da se ispita razlika u učestalosti alelne forme $\epsilon 4$ gena za apolipoprotein E između pacijenata sa AD i FTD kao i njihovo poređenje u odnosu na opštu populaciju.

Materijal i metode: U ispitivanje je uključeno 69 pacijenata sa AD i 34 pacijenata sa FTD. Kontrolnu grupu je činio uzorak od 548 ispitanika iz opšte populacije. ApoE polimorfizam je detektovan metodom lančane reakcije polimerizacije u realnom vremenu (Real Time Polymerase Chain Reaction, RT PCR).

Rezultati: Utvrđeno je da se učestalost ApoE- $\epsilon 4$ alela značajno razlikuje između grupa obolelih, međutim oboleli od FTD nisu pokazali statistički značajnu razliku u učestalosti ApoE alela u odnosu na kontrolnu grupu.

Zaključak: Rezultati našeg istraživanja su u skladu sa većinom međunarodnih studija ali i u suprotnosti sa nekim drugim. Razlozi za ovo mogu biti relativno mali uzorak ispitanika, kao i populaciono-genetičke razlike.

Cljučne reči: Alchajmerova demencija (AD), Frontotemporalna demencija (FTD), Apolipoprotein E (ApoE)

THE APO-E GENOTYPE ANALYSIS BETWEEN PATIENTS WITH ALZHEIMER'S AND FRONTOTEMPORAL DEMENTIA

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Introduction: Dementia diseases are mainly related to old age people. The most common forms are Alzheimer's dementia (AD) and frontotemporal dementia (FTD). A major genetic risk factor is considered to be the gene for apolipoprotein E (apoE).

The Aim: The objective of this study was to examine the differences in frequency of allelic forms of apolipoprotein E- $\epsilon 4$ between patients with AD and FTD and their comparison with the general population.

Material and methods: The study included 69 patients with AD and 34 patients with FTD. The control group consisted of 548 respondents from the general population. ApoE polymorphism was detected by using the polymerase chain reaction in real time (Real Time Polymerase Chain Reaction, RT PCR).

Results: It was found that the frequency of apoE- $\epsilon 4$ alleles were significantly different between the groups of patients, however, people with FTD showed no statistically significant difference in the frequency of ApoE alleles in relation to the control group.

Conclusion: Our findings are consistent with most international studies, but in contrast to some other. Reasons for this may be a small sample or the population-genetic differences.

Keywords: Alzheimer's dementia (AD), Frontotemporal dementia (FTD), apolipoprotein E (ApoE)

GENETIČKA VARIJABILNOSTI KOD VRHUNSKIH MUZIČARA SRBIJE

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Uvod: Kako su muzikalnost i apsolutni sluh genetički određeni, pretpostavili smo da promene u genetičkoj homozigotnosti i varijabilnosti mogu predstavljati izvesnu predispoziciju za bavljenje muzikom.

Cilj: Kao cilj rada postavljeno je utvrđivanje stepena genetičke homozigotnosti (koristeći HRO-test) i zastupljenosti krvnih grupa ABO sistema kod vrhunskih muzičara u odnosu na kontrolni uzorak ispitanika.

Materijal i metode: Ispitivanje je vršeno primenom testa za utvrđivanje homozigotno-recesivnih osobina kod ljudi (stepena homozigotnosti), HRO testa, koji obuhvata niz pretežno kvalitativnih morfoloških i funkcionalnih odlika.

Rezultati: Poređenjem zastupljenosti 20 HRO kod kontrolne grupe (N=100) i vrhunskih muzičara (članovi Beogradske filharmonije, Radio-televizije Srbije, Narodnog pozorišta, slobodni muzičari; N=100) utvrđeno je da je prosečan broj HRO jednak (3.9 ± 0.2). Prateći zastupljenost pojedinačnih homozigotno-recesivnih karakteristika primećuje se da 19 od 20 pokazuje razliku u procentualnoj zastupljenosti, od kojih 2 karakteristike statistički značajno odstupaju. U grupi muzičkih talenata 8 karakteristika pokazuje veću procentualnu zastupljenost u odnosu na kontrolu od čega 1 osoba značajno odstupa. U kontrolnoj grupi ispitanika 11 osoba pokazuje veću procentualnu zastupljenost, pri čemu samo jedna osoba statistički značajno odstupa.

Zaključak: Relativno visoka individualna varijabilnost u prisustvu ispitivanih HRO (0-10) kao i specifične kombinacije gena izgleda da mogu predstavljati važan preduslov za specifičan tip genetičko-fiziološke homeostaze koji uslovljava bavljenje određenim aktivnostima (muzički talenti). Takođe korelacije između različitih grupa gena možda imaju uticaja izražavanje i na neke procese razvoja predispozicije za bavljenje muzikom

Glavne reči: vrhunski muzičari, apsolutni sluh, HRO test, genetička homozigotnost, genetička varijabilnost.

GENETIC VARIABILITY AMONG ELITE MUSICIANS IN SERBIA

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Introduction: As musicality and absolute pitch is genetically determined, we assumed that changes in the genetic homogeneity and variability may be certain predisposition to engage with music.

The aim: The aim of work was to determine the level of genetic homozygosity (using HRC-test) and the distribution of ABO blood group system in elite musicians compared to control sample.

Materials and methods: Study was conducted using test for determining the homozygously recessive characteristics in human, HRC test, which includes a series of qualitative morphophysiological and functional characters.

Results: Comparisons of results 20 HRC representation in control group (N= 100) and music talents (N= 100) showed that the average number of HRC is the same (3.9 ± 0.2). Looking at the representation of single homozygously recessive characteristics is observed that 19 out of 20 shows difference in the percentage of representation, which 2 properties differ significantly. In group of musical talents 8 characteristics shows significant increase in comparison to the control of which 1 characteristics differ significantly. In the control group 11 characteristics showed a significant increase, with one trait statistically significantly different.

Conclusion: The relatively high individual variability in the distribution of tested HRC (0-10) and certain combination of genes may enable easier expression of predisposition for musical achievements.

Keywords: elite musicians, absolute pitch, HRC test, genetic homozygosity, genetic variability.

MOLEKULARNA DIJAGNOSTIKA K-RAS MUTACIJA U UZORCIMA KOLEREKTALNOG KARCINOMA

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Uvod: Somatske mutacije K-ras gena predstavljaju nezavisni prognostički marker kod pacijenata sa kolorektalnim karcinomom. K-ras se aktivira tačkastom mutacijom na jednom od predilekcionih lokusa ("hot spots") u 12, 13, i 61. kodonu, što ima za posledicu nastanak mutiranog proteina koji neprekidno šalje mitogeni signal, nezavisno od stimulacije faktorom rasta. Najčešće mutacije K-ras gena u karcinomima debelog creva nađene su u kodonima 12 i 13 (~ 40%).

Cilj: Hipoteza našeg rada se zasniva na pretpostavci da je primena PCR metode optimalna metoda za detekciju mutacija K-ras gena. Cilj našeg istraživanja je bila detekcija mutacija K-ras gena primenom PCR metode reverzne hibridizacije.

Materijal i metode: Za realizaciju ovog cilja analizirali smo uzorke tkiva kolorektalnog karcinoma obolelih pacijenata u cilju detekcije mutacija K-ras gena primenom PCR metode reverzne hibridizacije.

Rezultati: Naši rezultati pokazuju istovremeno javljanje G u A tranzicije na kodonu 13 i G u T tranzicije na kodonu 12, što je značajno u svetlu učestalosti navedenih mutacija kod tumora, gde je G12D mutacija, zamena „wild-type“ glicinske (Gly) rezidue sa aspartatom (Asp), prisutna kod 35,5% pacijenata, dok je zamena glicinske rezidue cisteinskom prisutna u 9% uzoraka kolorektalnog karcinoma.

Zaključak: Na osnovu naših rezultata detekcije mutacija u uzorcima kolorektalnog karcinoma, možemo istaći zaključak da je PCR metoda izbora za detekciju K-ras mutacija, neophodnih biomarkera u izboru terapije kolorektalnog karcinoma.

Glavne reči: kolorektalni karcinom; K-ras mutacija; detekcija mutacija.

MOLECULAR DIAGNOSTICS OF K-RAS MUTATIONS IN COLORECTAL CANCER SAMPLES

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Introduction: Somatic mutations of K-ras gene represent the independent prognostic marker in colorectal cancer patients. K-ras is activated upon the point mutation in one of the "hot spots", within the codons 12, 13, and 61, resulting in mutated protein production, enabling the continuous mitogen signaling, that is growth-factors independent. Most frequent K-ras gene mutations in colorectal cancer samples are within the codons 12 and 13 (~ 40%).

The Aim: Our study is based on hypothesis that PCR method is optimal for the detection of K-ras mutations. The main aim of our study was to detect the K-ras mutations by means of PCR method of reverse hybridization.

Materials and Methods: In order to achieve this goal, we analyzed the colorectal cancer tissue samples on mutations of K-ras gene by means of PCR method of reverse hybridization.

Results: Our results, showing the concomitant occurrence of G to A transition in codon 13 and G to T transition in codon 12, are important from the aspect of the G12D mutation frequency, where the „wild-type“ glycine (Gly) residue mutation into aspartate (Asp), is present in 35,5% of patients, while Gly into Cys mutation is present in 9% of colorectal cancer samples.

Conclusion: According to our results, we may conclude that PCR method of reverse hybridization is the method of choice to identify mutations in K-ras gene, as necessary biomarkers in colorectal cancer therapy planning and selection.

Key words: colorectal carcinoma; K-Ras mutations; mutation detection.

ГАЛЕКТИН-3 НА ЂЕЛИЈАМА ДОМАЋИНА ОЛАКШАВА ФОРМИРАЊЕ ХЕМАТОГЕНИХ МЕТАСТАЗА МИШЉЕГ МАЛИГНОГ МЕЛАНОМА СМАЊУЉУЋИ САЗРЕВАЊЕ И ЦИТОТОКСИЧНОСТ НК ЂЕЛИЈА

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Увод: Галектин-3, лектин са високим афинитетом за β -галактозиде је експримиран на бројним ћелијама. Претпоставља се да галектин-3 у туморским ћелијама игра значајну улогу у успостављању и прогресији метастаза. Улога галектина-3 исказаног на соматским ћелијама домаћина у метастатским процесима није испитивана.

Циљ: Циљ овог истраживања био је да се испита да ли експресија галектина-3 на ћелијама домаћина утиче на метастазирање меланома миша.

Материјал и методе: Као експерименталне животиње користили смо C57BL/6 мишеве и Gal-3^{-/-} мишеве на C57BL/6 подлози, којима смо интравенски у репну вену убризгали 5x10⁴ ћелија B16-F1. Магнетном сепарацијом су изоловане НК ћелије и CD8⁺ Т лимфоцити, којима је одређивана цитотоксичност. Проточном цитометријом је одређивана процентуална заступљеност мононуклеарних ћелија и функционални фенотип НК ћелија у слезини.

Резултати: Gal-3^{-/-} мишеви су отпорнији на метастазирање меланома, узимајући као параметар просечан број и целуларност метастатских колонија у плућима. Процент CD4⁺Foxp3⁺ Т лимфоцита у слезини Gal-3^{-/-} мишева није измењен после убризгавања туморских ћелија. Убилачка способност цитотоксичних Т лимфоцита је иста, док НК ћелије Gal-3^{+/+} мишева конститутивно испољавају већу цитотоксичност у односу на НК ћелије Gal-3^{+/+} („вилд типе“ C56BL/7) мишеве. Gal-3^{-/-} мишеви конститутивно имају значајан пораст туморицидних CD11b^{high}CD27^{high}CD11b^{low}HK и незрелих CD11b^{low}CD27^{high}HK НК ћелија, што указује на њихову појачану активност и убрзано обнављање. Gal-3^{+/+} мишеви имају знатно повећан проценат „истрошених“ CD11b^{high}CD27^{low}HK НК ћелија, као и инхибиторних KLRG1 рецептора на NK1.1⁺ ћелијама.

Закључак: Галектин-3 учествује у модулацији антитуморског имунског одговора, ометајући sazревање и цитотоксичност НК ћелија и на тај начин олакшава формирање хематогених метастаза малигног меланома у плућима.

Кључне речи: Галектин-3, B16F-1 мишији меланом, метастазе, НК ћелије.

GALECTIN-3 IN THE HOST FACILITATES THE ESTABLISHMENT OF HEMATOGENOUS METASTASIS OF MURINE MELANOMA BY REDUCING THE MATURATION AND CYTOTOXICITY OF NK CELLS

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Introduction: Galectin-3 a β galactoside-binding lectin is expressed in numerous cells. It is assumed that Galectin-3 expression in tumor cells have important role in the establishment and progression of metastasis. The role of Galectin-3 expression in the host isn't completely understood.

Aims: We have investigated whether Galectin-3 expression in the host affects the metastasis of B16-F1 malignant melanoma.

Methods and materials: We used Galectin-3-deficient (Gal-3^{-/-}) on C57BL/6 background mice and "wild-type" (Gal-3^{+/+}) C57BL/6 mice. Mice were intravenously injected (tail vein) with 5x10⁴ of B16-F1 murine melanoma cells. NK and CD8⁺ cells were isolated from spleen by magnetic cell sorting and we estimated their cytotoxicity. The percentage of mononuclear cells and NK cell functional phenotype in the spleen was analyzed using flow cytometry.

Results: Gal-3^{-/-} mice are more resistant to metastatic malignant melanoma as evaluated by incidence, number and size of metastatic colonies in the lung. The percentage of CD4⁺Foxp3⁺ T regulatory cells in Gal-3^{-/-} mice was not significantly affected by tumor cell inoculation. While CD8⁺ T cell cytotoxicity were similar, we found greater cytotoxicity of splenic NK cells in Gal-3^{-/-} mice compared with Gal-3^{+/+} mice. Gal-3^{-/-} mice constitutively have a significantly higher percentage of effective cytotoxic CD27^{high}CD11b^{high} NK cells as well as the percentage of immature CD27^{high}CD11b^{low} NK cells. CD27^{low}CD11b^{high} less functionally exhausted NK cells and NK cells bearing inhibitory KLRG1 receptor were more numerous in Gal-3^{+/+} mice.

Conclusion: Galectin-3 participates in modulation of anti-tumor immune response by affecting maturation and cytotoxic activity of NK cells, and this way facilitate hematogenous metastasis of melanoma in the lungs.

Key words: Galectin-3, B16-F1 murine melanoma, metastasis, NK cells.

ISPITIVANJE EFEKTA SUSPENZIJE MATERIJALA N-CP/DLPLG NA RAST HELA ЂЕЛИЈА IN VITRO

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Uvod: Biomaterijali su neaktivne supstance čije uključivanje u biološke sisteme može dovesti do povećavanja ili zamene funkcije tkiva ili organa. Nanomaterijal kalcijum-fosfat poli (D-l-laktid-ko-glikolid) (N-CP/DLPLG) je kompozitni biomaterijal sintetisan od čestica kalcijum fosfata prekrivenih biodegradabilnim poli(dl-laktidom-ko-glikolidom).

Cilj: Ispitivanje efekta suspenzije N-CP/DLPLG na proliferaciju HeLa ćelija *in vitro*.

Materijal i metode: Proliferativna sposobnost HeLa ćelija ispitivana je pri rastu u suspenzijama nanomaterijala N-CP/DLPLG koncentracija 0,5 mg/ml, 5 mg/ml i 50 mg/ml. Ćelije su zasejane u sterilne ploče sa 96 mesta u volumenu 2, 5 x 10⁴ /100 μ l i podeljene u 5 grupa. Nakon 3 i 6 dana inkubacije rađen je MTT test i očitavana apsorbancija MTT-a.

Rezultati: Tokom trodnevne inkubacije, najviši procenat apsorbance u odnosu na kontrolu dobijen je pri inkubaciji ćelija sa 50 mg/ml N-CP/DLPLG. Pri šestodnevnoj inkubaciji gubi se efekat ispitivanog materijala u nižim koncentracijama. Nakon inkubacije 3 dana u materijalu i još 3 dana u medijumu vrednost apsorbance blago pada u koncentracijama N-CP/DLPLG od 5 i 50 mg/ml. Nakon 3 dana inkubacije ćelija u medijumu i 3 dana u N-CP/DLPLG, najnižu vrednost apsorbance indukuje 50 mg/ml N-CP/DLPLG.

Zaključak: Efekat suspenzije nanomaterijala N-CP/DLPLG na rast HeLa ćelija zavisi od dužine inkubacionog perioda i tipa tretmana. Sa produženjem inkubacionog perioda gubi se dozna zavisnost koncentracije primenjenog materijala i procenta apsorbance redukovano MTT-a. Vrednosti apsorbance redukovano MTT-a u većini slučajeva su u nivou ili blago iznad kontrole što ukazuje na dobru biokompatibilnost.

Ključne reči: nanomaterijal N-CP/DLPLG, HeLa ćelije, *in vitro*, rast ćelija

EXAMINATION OF EFFECT OF THE MATERIAL N-CP/DLPLG SUSPENSION ON THE GROWTH OF HELA CELLS IN VITRO

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Introduction: Biomaterials are inactive substances whose inclusion to biological systems may cause enhancement or replacement of tissue or organ function. Nanomaterial calcium-phosphate poly (D-l-lactid co-glycolid) (N-CP/DLPLG) is composed of calcium phosphate particles coated with biodegradable poly (D-l-lactid co-glycolid).

Aim: Examination of effect of N-CP/DLPLG on HeLa cells growth *in vitro*.

Materials and Methods: Proliferative properties of HeLa cells was examined during growth in 0,5; 5 and 50 mg/ml suspension of N-CP/DLPLG. The cells were seeded into 96 well plates (2, 5 x 10⁴ /100 μ l) and divided in 5 groups. After 3- and 6- day incubation period, MTT test was applied and the absorbance was scanned.

Results: During 3-day incubation, the highest percent of absorbance in compare to a control was in 50 mg/ml N-CP/DLPLG. During 6-day incubation, effect of the material in lower concentrations was lost. After 3 days of incubation in the material plus 3 days in media, absorbance slightly decreased in 5 and 50 mg/ml N-CP/DLPLG. After 3 days of incubation in media and 3 days in N-CP/DLPLG, value of absorbance was the lowest in 50 mg/ml N-CP/DLPLG.

Conclusion: Effect of the N-CP/DLPLG suspension on the growth of HeLa cells depends on the length of incubation period and type of treatment. Prolongation of incubation period causes losing of dose dependency between material and percent of absorbance of reduced MTT. Absorbance of reduced MTT is mostly in the level of control or slightly increases which indicates good biocompatibility.

Key words: nanomaterial N-CP/DLPLG, HeLa cells, *in vitro*, cell growth

ДЕЛЕЦИЈА СТ2 ГЕНА УКЛАЊА ГЕНЕТСКУ РЕЗИСТЕНЦИЈУ БАЛБ/Ц МИШЕВА НА РАУВОЈ ЕКСПОНИРАНОГ АУТОИМУНСКОГ ЕНЦЕФАЛОМИЈЕЛИТИСА (ЕАЕ)

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Увод: Активација СТ2 молекула, рецептора за ИЛ-33, је повезана са Тх2 имунским одговором. Недавно је показано да СТ2 делеција погоршава ЕАЕ у осетљивих Ц57Бл/6 мишева.

Циљ: Испитивање ефеката делеције СТ2 гена на развој експерименталног аутоимунског енцефаломијелитиса (ЕАЕ) у резистентних БАЛБ/ц мишева.

Метод: БАЛБ/ц милд типе (WT) и СТ2 кноцк-аут мишеви на БАЛБ/ц подлози (СТ2^{-/-}) су имунизовани мешавином МОГ35-55 пептида и адјуванса. Пасивни трансфер је обављен интравенском апликацијом WT и СТ2^{-/-} мишевима 107 ћелија изолованих из WT и СТ2^{-/-} мишева. Испљивање болести је свакодневно праћено процентом клиничког скорa. Мононуклеарне ћелије изоловане из регионалних лимфних чворова су анализирани методом проточне цитометрије.

Резултати: СТ2^{-/-} мишеви развијају у поређењу са осетљивим Ц57Бл/6 мишевима нешто блажу форму ЕАЕ. Пасивни трансфер СТ2^{-/-} лимфоцита индукује болест како у СТ2^{-/-} тако и у WT мишева. СТ2^{-/-} мононуклеарне ћелије способне да пасивно индукују ЕАЕ садрже, у поређењу са мононуклеарним ћелијама WT мишева, већи проценат инфламаторних Т лимфоцита. Из лимфних чворова СТ2^{-/-} мишева којима је активно индукован ЕАЕ изолован је већи проценат CD4+ лимфоцита који садрже проинфламаторне цитокине. Проинфламаторни фенотип Т лимфоцита у регионалним лимфним чворовима у раној фази болести прати већа експресија маркера активације на дендритним ћелијама. Већи проценат мијелоидних ћелија СТ2^{-/-} мишева у поређењу са СТ2^{-/-} мишевима садржи проинфламаторне цитокине ИЛ-1, ИЛ-6 и ИЛ-12.

Закључак: Показали смо да резистентни БАЛБ/ц мишеви са делецијом гена за СТ2 молекулу развијају ЕАЕ и да СТ2/ИЛ-33 осовина има важну улогу у фази индукције болести.

Кључне речи: ЕАЕ, БАЛБ/ц мишеви, СТ2/ИЛ-33 осовина.

ST2 DELETION OVERCOMES GENETIC RESISTANCE TO EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS (EAE) IN BALB/C MOUSE

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Background: ST2 molecule is receptor for IL-33 and its activation leads to Th2 immune response. Recently it has been reported that ST2 deletion aggravates EAE in susceptible C57Bl/6 mice.

Objective: Investigation the effects of ST2 deletion on EAE development in EAE resistant BALB/c mice.

Methods: EAE was induced in BALB/c wild type mice and ST2 knock-out mice on BALB/c background (ST2^{-/-}) by immunization with mixture of MOG₃₅₋₅₅ peptide and adjuvants. EAE was passively induced by adoptive transfer of 10⁷ cells from WT and also from ST2^{-/-} mice into ST2^{-/-} and WT mice. Clinical signs of EAE were assessed daily. Mononuclear cells from draining lymph nodes were analyzed using flow cytometry.

Results: ST2^{-/-} mice develop milder form of EAE in comparison with C57Bl/6 mice. Adoptive transfer of ST2^{-/-} lymphocytes induced clinical signs of the disease in ST2^{-/-} as well as in WT mice. ST2^{-/-} mononuclear cells, able to transfer EAE, contained higher frequency of inflammatory T lymphocytes in compare to mononuclear cells from WT mice. Lymph nodes of ST2^{-/-} mice contained higher percentages of CD4⁺ cells containing pro-inflammatory cytokines. Pro-inflammatory phenotype of T helper cells is accompanied with higher expression of markers of activation on dendritic cells in lymph nodes in the early phase of disease. Higher percentages of myeloid cells from ST2^{-/-} mice contained pro-inflammatory cytokines, IL-1, IL-12 and IL-6.

Conclusion: Here we show that resistant BALB/c mice, develop the disease after deletion of ST2 molecule and that ST2/IL-33 axis has an important role in the inductive phase of the disease.

Key words: EAE, BALB/c mice, ST2/IL-33 axis.

ЦИТОХЕМИЈСКА ПРОЦЕНА ОСТЕОГЕНОГ ПОТЕНЦИЈАЛА МЕЗЕНХИМСКИХ ЧЕЉИЈА МАСНОГ ТКИВА БАЛБ/Ц МИШЕВА

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Увод: Stem ћелије су популација ћелија способна да обезбеди замену ћелија некоег ткива специфичним диференцираним типом ћелија. Адипозно ткиво садржи различите ћелије међу којима су мезенхимске stem ћелије.

Циљ: Цитохемијска процена остеогеног потенцијала мезенхимских ћелија масног ткива БАЛБ/Ц мишева индукованих на остегену диференцијацију у култури.

Материјал и метод: Изоловано је супраепидидимално масно ткиво Балб/ц мишева. Након digestije, мезенхимске ћелије су засејане, пасажирание након недељу дана и паралелно гајене у standardном хранљивом (kontrola) и osteogenom medijumu. Rast ћелија је праћен три недеље. Ћелије су бојене Alizarin red, Von Kossa i Burstonovom metodom.

Резултати: Након 14 дана, ћелије у контроли су биле конфлуентне, са lamelipodičним nastavcima. Ћелије у osteogenom medijumu су биле osteoblastolike, fokalno grupisane, а у extracelularnom matriksu су уочени kristali. Ћелије у контроли су после 3 недеље ушле у apoptozu, а vijabilne zadobile krpast izgled. Osteogeno diferencirane ћелије су добиле osteoklastolike nastavke, izgubili су се fokusi ћелија, а medijum је bio ispunjen matriksom bogatim kolagenolikim vlaknima i kristalima. Ћелије су биле позитивне на Alizarin red, Fon Kosa i Burstonovo bojenje.

Закључци: Produžen period izlaganja mezenhimskih ћелија adipoznog tkiva ligandu за receptor glukokortikoida (dexametazon) uz vitamin C i β-glicerolfosfat rezultuje mineralizacijom ECM-a u tronedeljnom periodu. Fon Kosa i Alizarin red bojenja potvrdila су prisustvo depozita kalcijum fosfata, а Burstonovo bojenje је pokazalo da postoji aktivnost alkalne fosfataze. Osteoblasti mogu biti diferencirani iz mezenhimskih ћелија у prisustvu osteogenog medijuma *in vitro*, što је procedura koja се може primenjivati у tkivnom inženjerstvu.

Кључне речи: mezenhimске ћелије, epididimalno masno tkivo, BALB/C, ћелијска kultura, osteogeneza

CYTOCHEMICAL EVALUATION OF OSTEOGENIC POTENTIAL OF MESENCHYMAL CELLS FROM BALB/C MICE ADIPOSE TISSUE

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Introduction: Stem cells are population of cells capable of providing replacement of cells of certain tissue with specific differentiated type of cells. Adipose tissue consists of various cells including mesenchymal stem cells.

Aim: Cytochemical evaluation of osteogenic potential of BALB/C mice adipose tissue derived mesenchymal cells (ADSC) from induced to osteogenic differentiation in cell culture.

Materials and Methods: Supraepididymal adipose tissue was isolated and after digestion, mesenchymal cells were seeded, passaged after 1 week and cultivated parallelly in standard nourishing (control) and osteogenic media. Cell growth was observed for 3 weeks. The cells were stained with Alizarin red, Von Kossa and Burstone's AP.

Results: After 14 days cells in the control were confluent, with lamellipodia-like protrusions, those in osteogenic media were osteoblast-like, grouped in foci, and with crystals in extracellular matrix. After 3 weeks, cells in control were locally apoptotic, viable ones were cloth-like. Osteogenic differentiated cells gained osteoclast-like protrusions, cell foci were lost, medium filled with matrices enriched with collagen-like fibers and crystals. The cells were Alizarin red, Von Kossa and Burstone AP positive.

Conclusion: Prolonged exposition period of ADSC to glucocorticoid receptor ligand (dexametazone), together with vitamin C and β-glycerolphosphate resulted in mineralization of ECM. Von Kossa and Alizarin red confirmed presence of calcium-phosphate deposits and Burstone's AP indicate the activity of alkaline phosphatase. Osteoblast can be differentiated from mesenchymal cells in presence of osteogenic media *in vitro*. This procedure can be applied in tissue engineering.

Key words: mesenchymal cells, epididymal adipose tissue, BALB/C, cell culture, osteogenesis

PROCENA ULOGE ČELIJA KOSTNE SRŽI U OKRUŽENJU PUNE KRVI U INDUKCIJI EKTOPIČNE OSTEOGENEZE

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Uvod: Aktuelne strategije u rešavanju koštanih defekata podrazumevaju primenu autograftova, alograftova, ksenograftova, sintetskih i prirodnih supstituenata kosti i sintetskih materijala. Primena prethodno opisanih prirodnih graftova poseduje značajna ograničenja. Najčešći problemi koji se javljaju su njihova dostupnost, mogućnost infekcije, efikasnost njihove primene i imunološke reakcije. Jedan od smerova u kome se razvija tkivno inženjerstvo jeste primena stem ćelija kostne srži i ispitivanje osteogenog potencijala ćelija periferne krvi.

Cilj istraživanja: Procena uloge ćelija kostne srži u okruženju pune krvi u indukciji ektopične osteogeneze.

Materijal i metode: Istraživanje je izvedeno na singenim miševima Balb/c soja, muškog pola, starosti 10-12 nedelja. Implantati su dobijeni mešanjem mineralnog matriksa kosti i fiziološkog rastvora, mineralnog matriksa kosti i pune krvi kao i mineralnog matriksa kosti, pune krvi sa ćelijama kostne srži. Implantacija je obavljena subkutano interskapularno, a životinje su žrtvovane posle 1, 2 i 4 nedelje od implantacije. Za histološku evaluaciju korišćeno je hematoksilin-eozin bojenje.

Rezultati: Sva tri tipa implantata pokazuju hemotaksično delovanje na različite ćelije vezivnog tkiva, stimulišu angiogenezu, stimulišu hemotaksu i diferencijaciju mezenhimalnih ćelija ka ćelijama osteoblastnog fenotipa i indukuju stvaranje mlade kosti. Uočena je razlika u intenzitetu navedenih procesa kod različitih kompozicija implantata.

Zaključak: Puna krv u kompoziciji samo sa mineralnim matriksom kosti usporava angiogenu i osteogenu aktivnost.

Ključne reči: mineralni matriks kosti, puna krv, kostna srž, ektopična osteogeneza.

THE ASSESSMENT OF THE ROLE OF BONE MARROW CELLS IN THE ENVIRONMENT OF WHOLE BLOOD IN THE INDUCTION OF ECTOPIC OSTEOGENESIS

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Introduction: Current strategies in resolving bone defects include the use of autografts, allografts, xenografts, synthetic and natural bone substitutes, and synthetic materials. Application of the previously described natural bone grafts has significant limitations. The most common problems that occur are their availability, the possibility of infections and recipient immune reactions. One of the directions in which the development of tissue engineering is the application of stem cells, bone marrow examination and osteogenic potential of human peripheral blood.

The Aim: The assessment of the role of bone marrow cells in the environment of whole blood in the induction of ectopic osteogenesis. **Materials and methods:** The study was conducted in Balb/c mice, male, age 10-12 weeks. The implants were obtained by mixing the bone mineral matrix with physiological fluid, the bone mineral matrix and whole blood as well as the bone mineral matrix, whole blood and bone marrow cells. Subcutaneous interscapular implantation was performed and the animals were sacrificed after 1, 2 and 4 weeks after implantation. Hematoxylin-eosin staining was used for histological evaluation.

Results: All three types of implants showed chemotactic effects on different connective tissue cells, stimulate angiogenesis, chemotaxis and differentiation of mesenchymal cells toward the osteoblasts and induce young bone growth. There was a difference in the intensity of these processes in different compositions of the implants.

Conclusion: Whole blood in the composition of the bone mineral matrix slows angiogenic and osteogenic activity.

Key words: bone mineral matrix, whole blood, bone marrow, ectopic osteogenesis.

ANALIZA EFEKATA ORGANSKIH RASTVARAČA TIPa ALKOHOLA NA VIJABILNOST ČELIJA U KULTURI

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Uvod: Za ekstrakciju biološki aktivnih supstanci iz biljnog materijala često se koriste organski rastvarači tipa alkohola, metanol i etanol. Značajan problem u ispitivanjima efekata različitih vrsta ekstraktata na ćelijskim kulturama jeste izbor maksimalne netoksične koncentracije rastvarača.

Cilj rada: Cilj istraživanja je bio da se ispita uticaj metanola i etanola na vijabilnost ćelija različitih linija u kulturi sadenih u različitim gustinama.

Materijal i metode: Efektivne koncentracije za svaki ispitivani rastvarač bile su: 0.025%, 0.1%, 0.25%, 0.5%, 1.25% i 2.5%. Ispitivanja su rađena na ćelijskim linijama MDCK i HeLa. Ćelije su u medijumu DMEM posađene u sterilne ploče sa 96 bunarčića sa gustinama: 5×10^4 i 1×10^5 MDCK ćelija, a 1×10^5 i 2×10^4 HeLa ćelija po bunarčiću. Posle 24h kultivacije u atmosferi sa 5% CO_2 i zasićenoj vlažnošću na 37°C u svaki bunarčić je dodat isti volumen rastvora ispitivanih rastvarača u jednoj od koncentracija i ćelije su pod istim ostalim uslovima inkubirane naredna 24 h, nakon čega je urađen MTT test.

Rezultati: Naši rezultati pokazuju da postoji razlika u delovanju na ćelijsku vijabilnost etanola i metanola i da su efekti različiti na MDCK i HeLa ćelijama, kao i da zavise od gustine zasadenih ćelija. Koncentracije oba rastvarača do 0,5% su bezbedne za ćelije, bez obzira na njihov tip i gustinu, citotoksični efekti se mogu pojaviti u određenim uslovima na koncentracijama 1.25% i većim.

Zaključak: Za ispitivanje efekata biljnih ekstraktata bitno je poznavanje specifičnosti efekata rastvarača na određeni tip ćelija i određenu ćelijsku gustinu.

Ključne reči: metanol, etanol, vijabilnost, MTT test, ćelijska kultura

ANALYSIS OF THE EFFECTS OF ALCOHOLIC ORGANIC SOLVENTS ON CELL VIABILITY IN CULTURE

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Introduction: Alcoholic organic solvents, methanol and ethanol, are often used for the extraction of substances from plants. Significant problem in testing the effects of these extracts on cell cultures is knowing maximal non-toxic concentration of solvent.

The Aim: Was to examine the effects of methanol and ethanol on the viability of different cell lines in culture, planted at different densities.

Materials and Methods: The effective concentrations for each examined solvent were: 0.025%, 0.1%, 0.25%, 0.5%, 1.25% and 2.5%. The tests were done on MDCK and HeLa cells. Cells were planted in 96 well plates with densities: 5×10^4 and 1×10^5 MDCK cells, and 1×10^5 and 2×10^4 HeLa cells per well. After 24h of cultivation in an atmosphere with 5% CO_2 at 37°C, the same volume of examined solvents was added in each well and cells were incubated for 24h under the same conditions, and then MTT test was performed.

Results: Our results show that there is a difference in the effect of ethanol and methanol on cell viability on both cell lines, as well as that depends on the density of planted cells. Concentration of 0.5% of both solvents is safe for the cells, regardless of their type and density, but cytotoxic effects may occur in certain conditions on concentration of 1.25% and higher.

Conclusion: For examine the effects of plant extracts it is important to understand the specific effects of solvents on the certain cell type and cell density.

Key words: methanol, ethanol, cell viability, MTT test, cell culture

ISPITIVANJE GENOTOKSIČNOSTI CEMENTATA NA BAZI SMOLA MIKRONUKLEUSNIM TESTOM *IN VITRO*

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Uvod: Osnovna namena cementnih materijala je nadoknađivanje izgubljene i oštećene zubne supstance. Preparati cementa na bazi smola sastoje se iz matriksa-smole, punila koje je predstavljeno mikro ili hibridnim česticama i lepka.

Cilj rada: Cilj ovog rada bio je ispitivanje genotoksičnosti cementnih materijala na bazi smola Variolink i Nexus na ćelijskoj liniji (MDCK) mikronukleusnim testom *in vitro*.

Materijal i metode: Ekstrakti ispitivanih polimerizovanih i nepolimerizovanih cementata su dobijeni trodnevnom inkubacijom uzoraka u medijumu RPMI na sobnoj temperaturi, a sakupljeni nakon 3, 14 i 24 dana. Materijali su ispitivani na ćelijskoj liniji (MDCK), koje su gajene u medijumu RPMI. Čelije su sađene u sterilne ploče za kultivaciju sa 24 bunara. U pojedinačne bunare sađeno je 2×10^4 ćelija u 500 μ l RPMI- a. Nakon 24 sata, u svaki bunar su dodati citohalazin B i ispitivani ekstrakti. Sve koncentracije rađene su u duplikatu. Nakon kultivacije ćelije su bojene Gimzom. Obojeni preparati su posmatarni mikroskopom na uvećanju 10x40, pri čemu je analizirana morfologija ćelije i brojeni su mikronukleusi.

Rezultati: Ekstrakti ispitivanih cementata nemaju genotoksičan efekat jer je broj mikronukleusa u ćelijama, bio manji od 3 puta u odnosu na kontrolu. Više mikronukleusa imaju ćelije koje su rasle u višim koncentracijama ekstrakata materijala Variolink, nego na istim koncentracijama ekstrakta Nexus, izuzev nepolimerizovanog trodnevnog ekstrakta Nexus koji pokazuje najveći genotoksični efekat

Zaključak: Ekstrakti polimerizovanog Variolink-a i Nexus-a, kao i komponenti njihovog kita, u najvećim efektivnim koncentracijama ne pokazuju genotoksičan efekat.

Ključne reči: Cementi, MDCK ćelije, mikronukleus, genotoksičnost.

EXAMINATION OF GENOTOXICITY OF CEMENT MATERIALS BASED ON RESINS VIA MICRONUCLEUS TEST *IN VITRO*

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Introduction: The main purpose of cementitious materials is compensation of lost and damaged tooth structure. Preparations based on resin cement consists of matrix resins, fillers based on micro or hybrid particles and glue.

The Aim: Examination of genotoxicity of cement-based materials and resins Variolink and Nexus on MDCK cell line via micronucleus test *in vitro*.

Materials and Methods: The extracts of polymerized and nonpolymerized cements were obtained by incubating the samples in media RPMI at room temperature for 3 days, and collected after 3, 14 and 24 days. Materials were examined on MDCK cells, which grown in RPMI. The cells were seeded in 24-well sterile plates at the density 2×10^4 in 500 μ l RPMI. After 24 hours of cultivating passed, cytochalasin b and the extracts were added. All concentrations were performed in duplicate. After incubation, the cells were stained with Giemsa. Stained preparations were observed on microscope at magnification 10x40, the cell morphology was analyzed and micronuclei were counted.

Results: The extracts of tested cements didn't showed genotoxicity because the number of micronuclei in cells was 3 times smaller in compare to a control. More micronuclei had cells which grown in higher concentrations of the extracts of Variolink in compare to Nexus, with exception of nonpolymerized three-day extract of Nexus, which showed genotoxicity in the highest doses.

Conclusion: The extracts of polymerized Variolink and Nexus, as well as components of their kit, in the highest effective concentrations haven't showed genotoxic effect.

Key words: Cements, MDCK cells, micronucleus, genotoxicity.

EKTOPIČNA OSTEOGENEZA POTPOMOGNUTA BIOMATERIJALIMA U KOMBINACIJI SA PERITONEALNIM MAKROFAGIMA NA MODELU SUPKUTANE IMPLANTACIJE KOD MIŠA

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Uvod: Frakture kosti najčešće tokom zarastanja prolaze kroz 3 faze: fazu inflamacije, obnove i remodeliranja. Važan faktor u fazi inflamacije su makrofagi koji migriraju do mesta frakture. Poznati su po tome što oslobađaju supstance i za resorpciju i za formiranje kosti.

Cilj rada: Cilj istraživanja je bio da se pokaže da li i kako peritonealni makrofagi izazvani tioglikolatom u kombinaciji sa mineralnim zamenikom kosti deluju na ektopični osteogeni proces u supkutanim implantima kod miša.

Materijal i metode: U eksperimentu su korišćeni singeni miševi soja Balb/c, muškog pola, starosti 10-12 nedelja. Tioglikolatom aktivirani peritonealni makrofagi su izolovani lavažom hepariniziranim RPMI medijumom. Napravljene su dve vrste implantata: sa peritonealnim makrofagima (tip M) i bez peritonealnih makrofaga tj. kontrolni implantati (tip K). Implantacija je bila supkutana, a implantati su uneti u interskapularni region miševa. Ekstrakcija implantata je vršena nakon 2 i 8 nedelja. Nakon standardne obrade, preparati su bojani tehnikom hematoksilin-eozin.

Rezultati: Nakon 2 nedelje od implantacije u implantatima tipa M nema mnogo fagocitoze, krvni sudovi su slabo zastupljeni, a implantat prožima gusto organizovano vezivno tkivo. Nakon 8 nedelja u implantatima tipa M je fagocitoza mnogo izraženija nego u kontrolnim implantatima. Smanjuje se količina vezivnog tkiva, a krvni sudovi su приметно većeg dijametra.

Zaključak: Nakon 2 nedelje se pokazalo da tioglikolatom izazvani makrofagi nemaju stimulatorni efekat na proces osteoreparacije. Međutim, nakon 8 nedelja je registrovan veliki broj novopridošlih fagocitnih ćelija i veći broj krupnih krvnih sudova. Zato ovakva kompozicija implantanata može imati povoljan efekat na osteogenezu.

Ključne reči: makrofagi, inflamacija, biomaterijal, implant, osteogeneza

EKTOPIC OSTEOGENESIS ASSISTED WITH BIOMATERIAL IN COMBINATION WITH PERITONEAL MACROPHAGES ON SUBCUTANEOUS IMPLANTATION MODEL

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Introduction: Bone fractures during the healing process usually go through three phases: inflammatory phase, renovation and remodeling. An important factor in the phase of inflammation are macrophages, which migrate to the site of fracture. They are known to release substances both for absorption and bone formation.

The aim: The aim was to demonstrate whether and how thioglycollate elicited peritoneal macrophages in combination with biomaterial act on ectopic osteogenic process in subcutaneous implants in mice.

Materials and methods: We used syngene strain Balb/c mice, male, age 10-12 weeks. Thioglycollate elicited peritoneal macrophages were isolated in heparinized RPMI medium. We made: M-type implants with peritoneal macrophages and control K-type implants. Implantation was subcutaneous, and implants were placed into the interscapular region of mice. Implants extraction was performed after 2 and 8 weeks. After standard processing, preparations were stained by hematoxylin-eosin staining technique.

Results: 2 weeks after implantation, M-type implant doesn't have a lot of phagocytosis, blood vessels are poorly represented, and the implant permeates densely organized connective tissue. 8 weeks after implantation in M-type implants phagocytosis is much more pronounced than in the control implants. Amount of connective tissue is reduced and blood vessels are noticeably larger in diameter.

Conclusion: After 2 weeks thioglycollate elicited peritoneal macrophages caused no stimulatory effect on the osteoreparation. However, after 8 weeks a large number of phagocytic cells was incorporated and a number of major blood vessels. Therefore, this implants composition can have a beneficial effect on osteogenesis.

Key words: macrophages, inflammation, biomaterial, implant, osteogenesis

ГАЛЕКТИН 3 ПОДСТИЧЕ АКТИВАЦИЈУ Т ЛИМФОЦИТА У КОНКАНАВАЛИН А ИНДУКОВАНОМ ХЕПАТИТИСУ

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Увод: Галектин 3 (Gal 3) је лектин који има имуномодулаторна својства и важан је у патогенези инфламаторних обољења јетре. Хепатитис индукован конканавалином А (Кон А) је експерименталан модел фулминантног хепатитиса посредованог Т лимфоцитима. Користећи овај експериментални модел испитали смо улогу и значај галектина 3 за активацију Т лимфоцита.

Циљ: Испитати да ли Галектин 3 подстиче активацију Т лимфоцита у Конканавалин А индукованом хепатитису.
Материјал и методе: Као експерименталне животиње коришћени су Ц57Б/6 вилд тупе (WT) и галектин 3 дефицијентни мишеви (Gal-3^{-/-}). Мишевима је Кон А апликован интравенски (12мг/кг ТТ). У циљу испитивања ефекта селективног инхибитора галектина 3 (ТД139), Ц57Б/6 вилд тупе мишевима је превентивно дат ТД139. Анализирани су ензими јетре, хистологија и интрацелуларна продукција цитокина Т лимфоцита у јетри експерименталних животиња.

Резултати: Gal-3^{-/-} мишеви су били резистентнији на Кон А индуковано оштећење јетре. Уз то, у јетри Gal-3^{-/-} мишева уочен је значајно мањи број активираних Т лимфоцита. Делеција гена за Галектин 3 узроковала је знатно мању продукцију про-инфламаторних цитокина TNF алфа, ИФН гамма, ИЛ-17 и ИЛ-4 и пораст продукције протективног ИЛ-10 у ЦД4+Т ћелијама. Превентивна примена селективног инхибитора галектина 3 (ТД139) редуквала је оштећење хепатоцита и узроковала смањену инфилтрацију, ИФН гамма, ИЛ-17 и ИЛ-4 продукуюћу Т лимфоцита и пораст броја протективних ИЛ-10 продукуюћу ЦД4+Т ћелија у јетри.

Закључци: Галектин 3 подстиче активацију, индукује продукцију и секрецију проинфламаторних цитокина у Т лимфоцитима и има важну улогу у патогенези Конканавалин А индукованом хепатитису.

Кључне речи: Галектин 3, селективни инхибитор галектина 3, Галектин 3 дефицијентни мишеви, Конканавалин А индуковани хепатитис, Т лимфоцити.

GALECTIN 3 FAVORS ACTIVATION OF T LYMPHOCYTES IN CONCAVALIN A INDUCED HEPATITIS

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Introduction: Galectin-3 (Gal-3) is a member of the β -galactoside-binding lectin family that modulates immune and inflammatory responses playing an important role in the pathogenesis of inflammatory liver diseases. Concanavalin A (Con A)-induced liver injury is a well-established murine model of T cell mediated fulminant hepatitis. We studied and presented here the role of Galectin 3 in activation and polarization of T lymphocytes in Con A induced hepatitis.

Aim : The aim of this study was to examine whether Galectin 3 promotes activation of T lymphocytes in Concanavalin A-induced hepatitis.

Materials and methods: We tested susceptibility to Con A induced hepatitis in Galectin 3 deficient (Gal-3^{-/-}) mice and C57BL/6 wild type (WT mice). Con A was injected intravenously (12mg/kg TT). We also analyzed the effects of pre-treatment with selective inhibitor of Galectin 3 (TD139) in wild type (WT) C57BL/6 mice as evaluated by liver enzyme test, histology, infiltration and cytokine production of intrahepatic T cells.

Results: Gal-3^{-/-} mice were less sensitive to Con A induced hepatitis and had significantly lower number of activated T cells in the liver. The total number of TNF alpha, IFN gamma, IL-17 and IL-4 producing CD4+ cells were lower while number of IL-10 producing CD4+ T cells were significantly higher in liver of Gal-3^{-/-} mice. Pre-treatment of WT C57BL/6 mice with TD139 led to attenuation of liver injury and milder infiltration of IFN gamma, IL-17 and IL-4 producing CD4+ T cells and increase in total number of IL-10 producing CD4+ T cells.

Conclusion: Gal-3 favors activation of T lymphocytes and induces secretion of pro-inflammatory cytokines in T cells playing an important pro-inflammatory role in Con A induced hepatitis.

Key words: Galectin 3, Galectin 3 inhibitor, Gal3 deficient mice, Con A hepatitis, T cells.

KARAKTERISTIKE EKTOPIČNE OSTEOGENEZE POTPOMOŽNUTE HIDROKSIAPATITNIM BIOMATERIJALOM U KOMBINACIJI SA MEZENHIMSKIM MATIČNIM ĆELIJAMA NA MODELU SUPKUTANE IMPLANTACIJE MIŠU

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Uvod: Velike povrede, kongenitalne malformacije ili bolesti uzrokuju velike koštane defekte koji predstavljaju veliki izazov za ortopedsku hirurgiju. Poslednjih godina se sve više razmatra mogućnost korišćenja biomaterijala u kombinaciji sa matičnim ćelijama u cilju postizanja dobre osteoreparacije. U tu svrhu se mogu koristiti i mezenhimске матичне ћелије (MMC) адипозног tkiva.

Cilj rada: Cilj istraživanja je bio da se ispita da li i kako MMC адипозног tkiva u kombinaciji sa mineralnim zamenikom kosti utiču na ectopičnu osteogeni proces u supkutanim implantatima kod miša.

Materijal i metode: U eksperimentu su korišćeni singeni miševi soja Balb/c, muškog pola, starosti 10-12 nedelja. Za izolaciju MMC je korišćeno epididimalno адипозно tkivo. Napravljene su dve vrste implantata: sa MMC (tip A) ili bez MMC tj. kontrolni implantati (tip K). Implantacija je bila supkutana, a implantati su uneti u interskapularni region miševa. Ekstrakcija implantata je vršena nakon 2 i 8 nedelja. Nakon standardne obrade, preparati su bojeni hematoxilin-eozin tehnikom bojenja.

Rezultati: Naši rezultati pokazuju bolju fagocitozu u implantatima tipa K nakon oba perioda. Međutim, vaskularizacija implantata tipa A je neuporedivo veća nego u kontrolnim implantatima, ćelije se raspoređuju po površini materijala, a na nekim mestima infiltriraju u materijal. Mestimično se mogu zapaziti strukture koje podsećaju na organizaciju osteona.

Zaključak: Mezenhimске матичне ћелије адипозног tkiva iako inhibitory deluju na fagocitozu, dobro podržavaju razvoj vaskulature. Ћелије се, reklo би се, organizuju kao one u kostima. Zato možemo reći da ovakva kompozicija implantanata može imati povoljan efekat na proces osteogeneze.

Ključne reči: matične ćelije, адипозно tkivo, biomaterijal, implant, osteogeneza

CHARACTERISTICS OF ECTOPIC OSTEOGENESIS ASSISTED WITH HYDROXYAPATITE BIOMATERIAL IN COMBINATION WITH MESENCHYMAL STEM CELLS ON SUBCUTANEOUS IMPLANTATION MOUSE MODEL

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Introduction: Great injury, congenital malformations or disease can cause large bone defects that pose a challenge for orthopedic surgery. In recent years, the use of biomaterials in combination with stem cells is increasingly considering. For this purpose can be used mesenchymal stem cells (MSCs) from adipose tissue.

The aim: The aim of this study was to examine whether and how MSCs from adipose tissue in combination with biomaterial affect the ectopic osteogenic process in subcutaneous implants in mice.

Materials and methods: We used syngene strain Balb/c mice, male, age 10-12 weeks. For isolation of MSCs was used epididymal adipose tissue. We made two types of implants: A-type with MSCs and control K-type implants. Implantation was subcutaneous and interscapular. Implants extraction was performed after 2 and 8 weeks. After standard processing, samples were stained with hematoxylin-eosin staining technique.

Results: Our results showed better phagocytosis in the K-type implants after both periods. However, vascularization of the A-type implants was much higher than in the control implants, the cells were distributed over the surface of the material and in some places infiltrated material. Sometime we could see structures that resemble the organization of osteon.

Conclusion: Mesenchymal stem cells from adipose tissue, although the inhibitory effect on phagocytosis, support the development of blood vessels. The cells seems to be organized as one in the bones. So we can say that such implants compositions can have a beneficial effect on the process of osteogenesis.

Key words: stem cells, adipose tissue, biomaterial, implant, osteogenesis



INFEKTIVNE BOLESTI

PSIHIJATRIJSKI NEŽELJENI EFEKTI PEGILOVANOG INTERFERONA ALFA I RIBAVIRINA U TOKU TERAPIJE HRONIČNOG HEPATITISA C

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Uvod: Savremenom terapijom hroničnog hepatitisa C (HHC) pegilovanim interferonom- α i ribavirinom (PegIFNalfa+Rbv), postiže se eradikacija virusa u 50 do 80% slučajeva. Međutim, tokom terapije dolazi do ispoljavanja brojnih neželjenih efekata u čak preko 60%. Iako ne spadaju u grupu najčešćih, psihijatrijski neželjeni efekti predstavljaju jedan od najtežih problema sa kojima se lekari susreću.

Cilj: Istraživanje ima za cilj da se ispita: kvantitet i kvalitet psihijatrijskih neželjenih efekata terapije HHC PegIFN+Rbv i da se proceni uspeh terapije u odnosu na njihovu pojavu.

Materijal i metode: Istraživanje je obuhvatilo 339 obolelih od HHC lečenih PegIFNalfa+Rbv-om u Klinici za infektivne bolesti KC Vojvodine, u periodu od 2000. do 2011. godine. Među ispitivanim bolesnicima bilo je 121 žena i 218 muškaraca. Obrada podataka je izvršena u programu Microsoft Excel verzija XP standardnim statističkim metodama (aritmetička sredina (\bar{X} bar), apsolutna i relativna frekvencija, Hi-kvadrat test).

Rezultati: Neželjeni efekti nakon primene antivirusne terapije HHC su zabeleženi kod 219 (64.60%) bolesnika. Neuropsihijatrijska neželjena delovanja su primećena kod 10 (2.95%) bolesnika, i čine 4.5% svih neželjenih efekata terapije PegIFNalfa+Rbv. Klinički oblici psihijatrijskih neželjenih efekata kod ispitivanih bolesnika su bili sledeći: kod 7 (2.06%) bolesnika depresija, kod 2 (0.59%) psihoza i kod 1 (0.29%) bolesnika došlo je do pokušaja suicida.

Zaključak: I pored manifestacije psihijatrijskih neželjenih efekata, uspeh terapije PegIFN alfa+Rbv, nije umanjen. Manifestacija ovih neželjenih efekata ukazuje na značaj multidisciplinarnog pristupa u lečenju hroničnog hepatitisa C.

Ključne reči: neželjeni efekti, pegilovani interferon, ribavirin, hronični hepatitis C

ADHERENCA I DRUGI PREDIKTORI USPEŠNOG LEČENJA HEPATITISA C PEGILOVANIM INTERFERONOM I RIBAVIRINOM

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Uvod: Procenjuje se da je trenutno na svetu zaraženo oko 170 miliona ljudi virusom hepatitisa C, odnosno da sa hroničnim hepatitisom C živi 2-3% svetske populacije.

Cilj: Cilj rada jeste dokazati da su dobra aderenza, mlađa starosna dob pacijenta, ženski pol, niži BMI, niži stepen fibroze i genotip virusa 2 i 3 dobri pokazatelji uspešnog odgovora lečenja hroničnog hepatitisa C pegilovanim interferonom i ribavirinom.

Materijal i metode: Istraživanje je obuhvatilo 93 pacijenta sa dokazanom hroničnom hepatitis C virusnom infekcijom koji su bili lečeni antivirusnom terapijom u toku 2010. i 2011. godine. Sprovedena je retrospektivna, kohortna studija. Analizirani su sledeći faktori: aderenza, starost, pol, BMI, fibroza jetre, genotip virusa na uticaj odgovora na terapiju. Pacijenti su ispunili anketu koja se ticala njihovog pridržavanja terapiji.

Rezultati: Od 93 pacijenta 83 (89,2%) je postiglo dobar terapijski odgovor. Dobru adherencu je imalo 83 pacijenta od kojih je 91% (81/73) imalo dobar terapijski odgovor, dok je to učinilo 0% (0/2) pacijenata sa lošom adherencom ($p=0.008$). Mlađa starosna dob je dokazana da predstavlja dobar prediktor ($p=0.033$), 92,6% najmlađe, 92,6% srednje i 70,58% najstarije starosne grupe je postiglo dobar odgovor. Nije dokazano da je pol statistički značajan faktor ($p=0.454$). Niži stepen fibroze je dokazan kao statistički značajan ($p=0.005$). Niži BMI se nije pokazao kao statistički značajan faktor, a nisu ni genotip 2 i 3 ($p=0.537$).

Zaključak: Dobra aderenza, mlađa starosna dob, niži stepen fibroze i genotip virusa 2 i 3 su dobri prediktori uspešnog terapijskog odgovora.

Ključne reči: hronični hepatitis C, lečenje, dobri prediktori, aderenza

PSYCHIATRIC SIDE EFFECTS OF PEGYLATED INTERFERON ALPHA AND RIBAVIRIN DURING THERAPY OF CHRONIC HEPATITIS C

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Introduction: With the modern treatment of chronic hepatitis C (HHC) with the Pegylated interferon- α and Ribavirin (PegIFNalfa+Rbv), eradication of the virus is accomplished in 50 to 80% of the cases. However, during the treatment numerous side effects occur, more than in 60% of the cases. Even though they are not considered as the most frequent, psychiatric side effects present one of the most difficult problems physicians need to deal with.

Goal: The goal of the research is to determine the quantity and the quality of psychiatric side effects of the HHC PegIFN+Rbv treatment and to assess the success of the therapy regarding their occurrence.

Materials and methods: The research included 399 patients suffering from HHC, treated with PegIFNalfa+Rbv in the Infectious Diseases Clinic in the Clinical Center of Vojvodina, during the period from 2000. until 2011. The patients included 121 women and 218 men. Data analysis was performed using Microsoft Excel program, XP version, with the standard statistical methods (mean (\bar{X} bar), absolute and relative frequency, Chi square test).

Results: Side effects after the use of antiviral therapy for HHC were recorded with 219 (64.60%) patients. Neuropsychiatric side effects were noticed for 10 (2.95%) patients, and they present 4.5% of all side effects of the PegIFNalfa+Rbv treatment. Clinical forms of the psychiatric side effects with the examined patients were: depression for 7 (2.06%) patients, psychosis for 1 (0.29%) patient and attempt of suicide for 1 (0.29%) patient.

Conclusion: Even with the psychiatric side effect manifestation, the success of PegIFNalfa+Rbv treatment was not diminished. The manifestation of these side effects points out the significance of multidisciplinary approach to the treatment of chronic hepatitis C

Key words: Side effects, Pegylated interferon, Ribavirin, chronic hepatitis C

ADHERENCE AND OTHER PREDICTORS OF SUCCESSFUL THERAPY OF CHRONIC HEPATITIS WITH PEGYLATED INTERFERON PLUS RIBAVIRIN

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Introduction: It is estimated that currently in world there are 170 million people infected by Hepatitis C Virus, meaning that 2-3% of world population lives with chronic hepatitis C infection.

The Aim: The aim of this study is to prove that good adherence, younger age, female gender, lower BMI, lower grade of fibrosis and genotype 2 and 3 are good predictors of successful therapy of chronic hepatitis C with pegylated interferon plus ribavirin.

Materials and Methods: 93 patients, who were treated with antiviral therapy during 2010. and 2011. were included in this study. Cohort retrospective study was conducted. The effect of following factors on treatment response was analyzed: adherence, age, gender, BMI, fibrosis and genotype.

Results: From 93 patients 83 (89,2%) has achieved good response to therapy. Good adherence had 81 patients from which 91% (81/73) achieved good response, which achieved 0% (0/2) patients who had bad adherence ($p=0.008$). Younger age has proven to be a good predictor ($p=0.033$), 92,6% of youngest, 92,6% of middle-aged i 70,58% of oldest group has achieved good response. It has not been proven that gender is statistically significant factor ($p=0.454$). Lower grade of fibrosis is proven to be a good predictor ($p=0.005$). Lower BMI has not been proven to be statistically significant factor, nor did genotype ($p=0.537$).

Conclusion: Good adherence, younger age, lower grade of fibrosis and genotype 2 and 3 are good predictors of successful response to therapy.

Key words: Chronic hepatitis C, treatment, good predictors, adherence

STAVOVI LEKARA U KLINIČKOM CENTRU VOJVODINE U ODNOSU NA TESTIRANJE NA HIV

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Uvod: Srbija je zemlja sa niskom prevalencijom HIV infekcije, ali isto tako i sa niskom stopom testiranja na ovaj virus, od svega 7,7 testiranih na 1000 stanovnika. To dovodi do kasne prezentacije i hospitalizacije u gotovo svih novootkrivenih pacijenata.

Cilj: Definirati stavove lekara Kliničkog centra Vojvodine u pogledu testiranja na HIV i najčešće razloge netestiranja.

Materijal i metode: Kratka anketa lekara Kliničkog centra Vojvodine tokom novembra 2011. godine.

Rezultati: Anketirano je ukupno 124 lekara, uglavnom uzrasta od 40-49 godina (44%). Glavni razlog za nudenje testiranja na HIV bili su podaci o rizičnom ponašanju pacijenta (77,2%), ređe simptomi (31,7%), a najređe rutinsko virusološko testiranje (6,5%). Polovina lekara vidi saglasnost pacijenta kao prepreku za testiranje (48,8%). Petina lekara obuhvaćenih istraživanjem nisu nikada tražili testiranje na HIV (19,2%) ili ga nisu tražili u poslednjih 12 meseci (44,7%). Kao specifičan razlog netestiranja na HIV naveden je nepristanak pacijenta na testiranje. Na Klinici za dermatovenerologiju, internu medicinu, neurologiju i psihijatriju glavni razlog netestiranja pacijenata na HIV je percepcija lekara o tome da njihovi pacijenti čine deo populacije sa niskim rizikom (redom po 50%, 32%, 27%, 35%). Lekari Klinike za ginekologiju i akušerstvo su priznali da testiranje na HIV nije prioritet u njihovom svakodnevnom radu (29%) i da čak retko i razmišljaju o tom testiranju (24%). Mlađi lekari mnogo češće krive nedostatak vremena i češće smatraju da HIV nije deo njihove odgovornosti ($p < 0.001$; $p < 0.05$).

Zaključak: Potrebno je više edukacije na temu pretest savetovanja i same HIV infekcije, posebno među mladim lekarima.

Ključne reči: anketa, AIDS, HIV

ATTITUDES OF PHYSICIANS IN THE CLINICAL CENTRE OF VOJVODINA RELATED TO HIV TESTING

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Introduction: Serbia is a low prevalence country with poor testing rates of only 7.7 test per 1000 population. This causes late presentations and hospitalizations in the Clinical center of almost all of the newly discovered patients.

The Aim: Define the attitudes of physicians in the Clinical center of Vojvodina regarding HIV testing and the common reasons of not doing it.

Materials and Methods: A short survey on physicians in Clinical center of Vojvodina done during November 2011.

Results: 124 physicians were surveyed, mainly aged 40-49 years (44%). The main reason for offering HIV test was an assessment of risky behavior of a patient (77.2%), less frequently symptoms (31.7%) or routine testing (6.5%). Half of the doctors see mandatory patients' consent as an obstacle to test (48.8%). Fifth of the doctors have never asked for an HIV test (19.2%), or at didn't ask for it the last 12 months (44.7%). The main argument for not testing was patients' unwillingness to test. In dermatology, neurology, internal medicine and psychiatric clinic the main reason for not testing was their perception of low risk population of patients (50%, 32%, 27%, 35% respectively). Gynecology and obstetrics clinic doctors admitted they don't prioritize HIV testing in their everyday work (29%) and rarely think about test (24%). Younger physicians were more like to blame the lack of time and also believe HIV is not their responsibility ($p < 0.001$; $p < 0.05$).

Conclusion: More education for pretest counseling and about HIV is needed, especially of young physicians.

Key words: survey, AIDS, HIV.

NEURORADIOLOŠKA ANALIZA SUPKORTIKALNE MOŽDANE ATROFIJE KOD HIV POZITIVNIH PACIJENATA

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Uvod: Prodor virusa humane imunodeficijencije (HIV) u CNS dešava se u početnom stadijumu infekcije i kao posledica toga dolazi do kortikalne i supkortikalne moždane atrofije. Moderna antiretroviralna terapija (HAART) dovela je do značajnog smanjenja oštećenja moždanog parenhima, ali pojedine studije navode da do atrofije i dalje dolazi.

Cilj: Cilj rada bio je da se uporede HIV pozitivni i HIV negativni pacijenti u odnosu na neuroradiološke parametre supkortikalne moždane atrofije.

Materijal i metode: Studija je obuhvatila 25 HIV pozitivnih i 25 HIV negativnih pacijenata. Svi pacijenti imali su MRI glave. Korišćen je transversalni presek u kom su frontalni rogovi bočnih komora najširi i morfometrijski je izračunato 5 indeksa supkortikalne moždane atrofije za svakog pacijenta. Vrednost $p < 0,05$ smatrana je statistički značajnom.

Rezultati: Prosečna starost pacijenata iznosila je 40 godina, 90% su bili muškarci. Dva parametra supkortikalne atrofije statistički značajno su se razlikovala poredeći dve grupe – Evanov i bifrontalni indeks ($p = 0,013$, odnosno $p = 0,042$). Indeks treća komora/Silvijeva fisura značajno je korelirao sa dužinom uzimanja terapije ($r = 0,515$, $p < 0,01$) i dužinom HIV+ statusa ($r = 0,441$, $p < 0,05$).

Zaključak: HIV infekcija, čak i pored efikasne terapije, dovodi do supkortikalne moždane atrofije, a morfometrija je pouzdan način za dokazivanje postojanja i vrste atrofije.

Ključne reči: HIV, supkortikalna moždana atrofija, morfometrija

NEURORADIOLOGICAL ANALYSIS OF SUBCORTICAL BRAIN ATROPHY IN HIV-INFECTED PATIENTS

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Introduction: Penetration of human immunodeficiency virus (HIV) in the CNS occurs in the early stages of infection and leads to cortical and subcortical brain atrophy. Modern antiretroviral therapy (HAART) has led to a significant decrease in the brain parenchyma damage, but certain studies suggest that brain atrophy does not stop.

The Aim: The aim of the study was to compare neuroradiological parameters of subcortical brain atrophy between HIV-positive and HIV-negative patients.

Materials and Methods: The study included 25 HIV-positive and 25 HIV-negative patients. All patients had MRI of the head. The transverse cut, in which the frontal horns of the lateral chambers were widest, was used, and subcortical brain indices were calculated morphometrically for each patient. P value < 0.05 was considered statistically significant.

Results: The average age of patients was 40 years, 90% were males. Two indicators of subcortical atrophy, Evan's and bifrontal ratio, were significantly different when comparing two groups of patients ($p = 0.013$ and $p = 0.042$, respectively). The third ventricle/Sylvian fissure ratio was significantly correlated with duration of the therapy ($r = 0.515$, $p < 0.01$) and duration of HIV-positive status ($r = 0.441$, $p < 0.05$).

Conclusion: Even with the effective treatment, HIV still leads to subcortical brain atrophy, and morphometry is a reliable way to prove its existence.

Keywords: HIV, subcortical brain atrophy, morphometry

ANEMIA KOD BOLESNIKA KOJI PRIMAJU HIGHLY ACTIVE ANTIRETROVIRAL THERAPY

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Uvod: Do sada SIDA je ubila preko 25 miliona ljudi i dalje nastavlja da bude uzrok smrti u oko 2 miliona ljudi godišnje. Visoko aktivna antiretroviralna terapija (HAART) poboljšava kvalitet života ljudi obolelih od HIV infekcije. Anemija je najčešći prisutan komorbiditet i često je znak loše prognoze. Posmatrajući prisustvo anemije može nam ukazati na efikasnost pojedinačnih lekova koji su u HAART-u, kao i ukupne terapije.

Cilj: Cilj ovog rada je da se odredi učestalost anemije među pacijentima na HAART -u i da se utvrdi da li postoji korelacija sa specifičnim antiretroviralnim lekovima.

Materijali i metode: U istraživanje je uključeno 97 pacijenata koji primaju HAART u periodu od 01.01.2008. do 01.01.2012. Uzrast i parametri anemije su obrađeni i upoređeni između grupa pacijenata sa i bez anemije. Prisustvo anemije je zabeleženo za svaki lek iz HAART-a.

Rezultati: Od 97 pacijenata, 85 su bili bez anemije, a 12 sa anemijom. Prisustvo anemije je više zabeleženo kod žena (38.5%) u odnosu na muškarce (8.3%). Najčešće dati lekovi su lamivudine, abacavir, zidovudine, efavirenzi kaletra (lopinavir i ritonavir). Prisustvo anemije je bilo od 10% do 16% za navedenih pet lekova.

Zaključak: Prisustvo anemije je bilo manje nego što se očekivalo kod pacijenata na HAART-u. Korelacija sa specifičnim antiretroviralnim lekovima pokazala je da najčešće prepisivani lekovi ne dovode do značajne razlike u odnosu na anemiju.

Gljučne reči: SIDA, HIV, HAART, anemija

ANEMIA IN PATIENTS ON HIGHLY ACTIVE ANTIRETROVIRAL THERAPY

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Introduction: So far AIDS has killed more than 25 million people and continues to be the cause of death in roughly 2 million people a year. Highly active antiretroviral therapy (HAART) is improving the lives of those with HIV infection. Anemia is the most frequent comorbidity that is often associated with bad outcomes, its treatment and resolution is critical. Assessing the presence of anemia in the specific medications of HAART is crucial to obtaining data on the success of the medications and therapy itself.

The Aim: The aim of this study is to determine the frequency of anemia in patients on HAART and its correlation with specific antiretroviral drugs.

Materials and methods: Data was collected from 97 patients receiving HAART between 01.01.2008. and 01.01.2012. Age and parameters of anemia were assessed and compared between the anemic and non-anemic groups. Presence of anemia was recorded for each drug in HAART.

Results: From the 97 patients, 85 were no-anemic, 12 were anemic. Females in the study had more cases of anemia (38.5%) compared to males (8.3%). The most frequently prescribed medications were lamivudine, abacavir, zidovudine, efavirenz and kaletra (lopinavir and ritonavir). The presence of anemia ranged 10%-16% for the most frequently prescribed drugs.

Conclusion: The frequency of anemia is lower than is to be expected for the patients on HAART and the correlation with specific antiretroviral drugs shows that the most frequently prescribed drugs have no significant difference when it comes to presence of anemia.

Key words: AIDS, HIV, HAART, anemia

ZNAČAJ EDUKACIJE MEDICINSKIH SESTARA TEHNIČARA, LABORATORIJSKIH TEHNIČARA I STUDENATA ZDRAVSTVENE NEGE U POZNAVANJU POSTEKSPOZICIONE PROFILAKSE HIV INFEKCIJE

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Uvod: Smatra se da je prosečan rizik od transmisije HIV virusa u slučaju profesionalne izloženosti oko 0,09–0,3%. Ukoliko dođe do povrede preko kože ili sluzokože što pre treba započeti postekspozicionu profilaksu, koja prevenira mogućnost nastanka HIV infekcije. Glavni adut u pokušaju sprečavanja profesionalno stečene HIV infekcije, je adekvatna obuka i edukacija u vezi sa prevencijom profesionalne izloženosti i blagovremena, pravilna primena postekspozicione profilakse.

Cilj rada: Cilj rada bio je da se ispita poznavanje medicinskih sestara i tehničara, laboratorijskih tehničara i studenata zdravstvene nege u vezi mogućnosti primene postekspozicione profilakse nakon profesionalne izloženosti HIV infekciji. Drugi cilj rada bio je da se ispita koliko edukacija u toku rada i školovanja imaju uticaja na poznavanje ove problematike.

Materijal i metode: Istraživanje je sprovedeno anketnim upitnikom među 232 ispitanika. Anketirane su medicinske sestre – tehničari i laboratorijski tehničari zaposleni u Kliničkom centru Vojvodine, i studenti zdravstvene nege Medicinskog fakulteta u Novom Sadu.

Rezultati: Studenti zdravstvene nege, medicinske sestre - tehničari sa infektivnih i internističkih odeljenja, i laboratorijski tehničari statistički značajno pokazuju veće poznavanje potencijalnih rizika od profesionalne ekspozicije HIV infekciji u odnosu na medicinske sestre- tehničare sa hiruških odeljenja a koje su u vrlo malom procentu imale edukaciju iz ove oblasti.

Zaključak: Poznavanje ove problematike još uvek nije na zadovoljavajućem nivou među medicinskim sestrama - tehničarima i laboratorijskim tehničarima. Kako je pokazalo ovo istraživanje, najvažnije je obezbediti edukaciju medicinskim sestrama - tehničarima sa hiruških odeljenja i kontinuiranu edukaciju tokom rada u vezi ove problematike.

Gljučne reči: Postekspoziciona profilaksa, HIV/AIDS, edukacija

IMPORTANCE EDUCATION OF NURSES, LABORATORY TECHNICIAN AND NURSING STUDENTS IN KNOWLEDGE OF POST-EXPOSITIONAL PROPHYLAXIS OF HIV INFECTION

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Introduction: It is considered that the average risk of transmission of HIV virus in the case of occupational exposure is approximately 0.09 to 0.3%. If the injury occurs through the skin or mucous membranes, first post-expositional prophylaxis should be initiated, which prevents the possibility of HIV infection. The main feature in an attempt to prevent HIV infection acquired by a professional, is adequate training and education for the prevention of occupational exposure and proper application of post-expositional prophylaxis.

The Aim: The objective was to examine the knowledge of nurses, laboratory technicians and nursing students about possibilities of post-expositional prophylaxis after occupational exposure to HIV infection. The second objective of this study was to examine how education while working and schooling have an impact on the knowledge of this problem.

Materials and methods: The study was conducted by a questionnaire, among 232 respondents. Respondents were nurses employed at the Clinical Center of Vojvodina, and Nursing students from Medical Faculty of Novi Sad.

Results: Students of Nursing, nurses from infectious and general internal departments, and laboratory technicians are very well aware of the potential risks of occupational exposure to HIV infections, which cannot be said for nurses on the surgical departments, who had a very small percent of any training in this field.

Conclusion: The knowledge of this issue is still not satisfying enough among the nurses and laboratory technicians. As this research shows, it is most important to ensure the education of nurses within the surgical department, and continuous education regarding this issue.

Key words: Post-expositional prophylaxis, HIV / AIDS, education

POTROŠNJA NAJČEŠĆE KORIŠĆENIH ANTIBIOTIKA NAKON PRIMENE SMERNICA NA KLINICI ZA INFektivNE BOLESTI KLINIČKOG CENTRA VOJVODINE

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Uvod: Farmakoekonomija je naučna disciplina, čiji je cilj da se uz pomoć metoda ekonomske evaluacije nađe najbolji lek koji će davati optimalne efekte, uz najnižu cenu koštanja lečenja.

Cilj: Cilj istraživanja je bio da se utvrdi da li postoji smanjenje troškova lečenja bakterijskih infekcija i uticaj na potrošnju antibiotika na Klinici za infektivne bolesti Kliničkog centra Vojvodine, nakon primene smernica za početnu adekvatnu antimikrobnu terapiju.

Materijal i metode: Istraživanjem su obuhvaćeni svi pacijenti koji su hospitalizovani na Klinici za infektivne bolesti, Kliničkog centra Vojvodine. Istraživanje je sprovedeno u tri faze, od kojih je svaka trajala po tri meseca. Prva faza se odnosila na sagledavanje dosadašnje celokupne potrošnje antibiotika u lečenju bakterijskih infekcija, kada je odabir antibiotika bio prema ličnom izboru lekara. U drugoj fazi utvrđena je struktura uzročnika i stanje rezistencije na najčešće bakterijske uzročnike izolovanih iz bolesničkog materijala. U trećoj fazi, primenjivane su smernice u lečenju bakterijskih infekcija pri odabiru antibiotika.

Rezultati: Tokom prve faze istraživanja, ukupna cena koštanja potrošenih ampuliranih antibiotika bila je 3.285.357,27 dinara, a nakon primene smernica, ukupna cena koštanja bila je 1.657.766,05 dinara. U prvoj fazi potrošeno je ukupno 29,54 DDD/100 BOD, dok je posle primene smernica potrošeno ukupno 19,21 DDD/100 BOD. Pre primene smernica na prvom mestu po potrošnji bio je ceftriakson, na drugom meropenem, a na trećem metronidazol, dok je nakon primene smernica na prvom mestu bio ceftriakson, na drugom ciprofloksacin i na trećem ampicilin i sulfometoksazol + trimetoprim.

Zaključak: Primenom smernica za adekvatnu antimikrobnu terapiju, za 3 meseca na osnovu smanjene potrošnje ampuliranih antibiotika beležimo uštedu od 1.627.591,22 dinara (49,5%).

Ključne reči: farmakoekonomija, antimikrobni lekovi, potrošnja lekova.

CONSUMPTION OF COMMONLY USED ANTIBIOTICS AFTER APPLYING THE GUIDELINES AT THE CLINIC FOR INFECTIOUS DISEASES CLINICAL CENTER OF VOJVODINA

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Introduction: Pharmacoeconomics is a scientific discipline, which aims to find the best medicine to give optimum effect, with the lowest cost of treatment, by using the economic evaluation method.

The Aim: The aim of study was to determine whether there is a significant reduction in costs of treatment of bacterial infections and the impact on antibiotics consumption at the Clinic for Infectious diseases, Clinical Center of Vojvodina, after the initial application of the guidelines for appropriate antimicrobial therapy.

Materials and methods: The study included all patients who were hospitalized at the Clinic for Infectious diseases, Clinical Center of Vojvodina. The survey was conducted in three phases, each lasting three months. The first phase concerned the review of current overall consumption of antibiotics in bacterial infections treatment. In the second phase we determined the pathogen structure and condition of resistance to common bacterial pathogens. In the third phase, the guidelines have been applied in the treatment of bacterial infections.

Results: During the first phase of the research, the total cost of antibiotics was 3.285.357,27 dinars. After application of the guidelines, the total cost spent on antibiotics was 1.657.766,05 dinars. In the first stage was spent a total of 29,54 DDD/100 BOD, while after the application of the guidelines, a total of 19,21 DDD/100 BOD. Before applying the guidelines in the first place by spending was ceftriaxone, and meropenem on the second, and third metronidazole, whereas after their application of the guidelines in the first place was ceftriaxone, ciprofloxacin on the second and third ampicillin and sulfamethoxazole+trimethoprim.

Conclusion: It has been shown that application of adequate guidelines for 3 months enjoys an approval rating a great saving of 1.627.591,22 dinars (49,5%). **Key words:** pharmacoeconomics, antimicrobial drugs, consumption of drugs.

UTICAJ ISTOVREMENE HCV INFEKCIJE NA USPEH HAART KOD PACIJENATA SA HIV INFEKCIJOM U SRBIJI

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Uvod: Infekcije virusom humane imunodeficijencije (HIV), hepatitis C (HCV) i hepatitis B (HBV) virusom imaju sličan način prenošenja, te je učestalost istovremene javljanja velika. Visokopotentna antiretrovirusna terapija (HAART) je doprinela smanjenju morbiditeta od AIDS, dok produžen tok HIV infekcije uz HAART dopušta progresiju u hronične istovremenih HCV i HBV infekcija

Cilj: Cilj ovog istraživanja bio je ispitivanje uticaja istovremene HCV infekcije na uspeh HAART kod pacijenata sa HIV infekcijom u Srbiji.

Materijal i metode: Ova kohortna studija uključila je 1041 pacijenata sa HIV infekcijom koji su primali HAART. Pacijenti su u podeljeni u tri grupe, HIV monoinfekcija, HIV/HCV istovremena infekcija i HIV/HBV istovremena infekcija. Na osnovu kliničkih, virusoloških i imunoloških parametara utvrđeni su preterapijski diskriminatori koji su karakterisali navedene grupe pacijenata, a potom i karakter međusobne interakcije ovih virusnih infekcija posle godinu dana primene HAART. Podaci su statistički obrađeni korišćenjem metoda logističke regresije u okviru paketa SPSS.

Rezultati: Prevalenca istovremene HCV je 22,1 %, a HBV infekcije je 7,1 % kod pacijenata sa HIV infekcijom u Srbiji. HCV infekcija je bila udružena sa povećanim rizikom od imunološkog neuspeha nedogodnije primene HAART kod ispitivanih pacijenata (OR 1.974; 95% JP 1.426-2.374), dok HBV infekcija nije imala uticaj.

Zaključak: Nepovoljan uticaj HCV istovremene infekcije na tok HIV infekcije uz HAART nalaže uspostavljanje optimalne strategije lečenja HCV infekcije, tim pre što odsustvo značajne interakcije između HIV i HBV infekcije kod ispitivanih pacijenata, između ostalog možemo objasniti uspešnom istovremenom antirusnom terapijom.

Ključne reči: HIV infekcija, Hepatitis C, Hepatitis B, Koinfekcija, HAART.

INFLUENCE OF SIMULTANEOUS HCV INFECTION ON SUCCESS OF HAART IN PATIENTS WITH HIV INFECTION IN SERBIA

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Introduction: Infection with human immunodeficiency virus (HIV) and hepatitis C (HCV) and B (HBV) viruses have similar modes of transmission and incidence of concurrent infections is high. Highly active antiretroviral therapy (HAART) has contributed to reducing the morbidity of AIDS, while prolonged course of HIV infection with HAART allows simultaneous progression of chronic HCV and HBV infection.

The Aim: Investigation of effects of HCV co-infection on success of HAART in patients with HIV infection in Serbia

Materials and Methods: Cohort study included 1041 patients with HIV infection who received HAART. Patients are divided into three groups: HIV monoinfection, HIV/HCV co-infection and HIV/HBV co-infection. Based on clinical, virological and immunological parameters we defined baseline discriminators for studied groups. Subsequently we determined character of interaction of these viral infections after a year use of HAART. Data were statistically analyzed using logistic regression model within SPSS.

Results: Prevalence of concurrent HCV and HBV infection was 22,1%, and 7,1%, respectively, in patients with HIV infection in Serbia. HCV infection was associated with increased risk of immunological failure one year with HAART (OR 1.974; 95% CI 1.426-2.374), while HBV infection had no effect.

Conclusion: Unfavorable mutual interaction between simultaneous HIV and HCV infections, as in natural course of HIV infection, and with HAART, requires establishing optimal treatment strategies of HCV infection during HIV infection, especially because simultaneous successful therapy for HBV and HIV infections can explain the absence of their significant interactions in studied patients.

Keywords: HIV infection, Hepatitis C, Hepatitis B, co-infection, HAART.

ZNAČAJ ULTRAZVUČNE DIJAGNOSTIKE U OTKRIVANJU HEPATOCELULARNOG KARCINOMA VIRUSNE ETIOLOGIJE

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Uvod: Hepatocelularni karcinom (HCC) je peti najčešći karcinom u svetu, a treći najčešći onkološki uzrok smrti. Virusna etiologija predstavlja najčešći predisponirajući faktor. Ultrazvučna dijagnostika je neinvazivna, dostupna i ponovljiva metoda koja se koristi u ranom otkrivanju HCC-a.

Cilj: Procena ultrazvučnog (UZ) i nalaza kompjuterizovane tomografije (CT) u ranom otkrivanju HCC-a, praćenje vrednosti alfa-fetoproteina (AFP) i preživljavanje kod ovih pacijenata.

Materijal i metode: Retrospektivnom studijom obuhvaćeno je 40 pacijenata hospitalizovanih u Klinici za infektivne i tropske bolesti Kliničkog centra Srbije. Praćene su demografske, kliničke, biohemijske i karakteristike vizuelizacionih nalaza (UZ i CT), kao i ishod bolesti.

Rezultati: Utvrđeno je da ne postoji statistička značajnost u poređenju UZ i CT nalaza kao i u poređenju UZ i serumske vrednosti alfa-fetoproteina, ali postoji visoka statistička značajnost u poređenju dijametara najveće promene na UZ i preživljavanje pacijenata.

Zaključak: Studija je pokazala da se nalaz na UZ i CT-u ne razlikuje značajno što znači da UZ kao dijagnostičku metodu možemo sa velikom sigurnošću smatrati pouzdanom prilikom dijagnostikovanja HCC-a. Alfa-fetoprotein ne korelira sa veličinom promene na UZ, pa nije pouzdan marker HCC-a. Preživljavanje je veoma uslovljeno veličinom promene viđene UZ.

Ključne reči: hepatocelularni karcinom, ultrazvučna dijagnostika, alfa-fetoprotein

SIGNIFICANCE OF ULTRASONOGRAPHY IN THE DIAGNOSIS OF VIRAL ETIOLOGY HEPATOCELLULAR CARCINOMA

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Introduction: Hepatocellular carcinoma (HCC) is the fifth most common cancer worldwide and the third most common cause of death. Viral etiology is the most common predisposing factor.

Ultrasonography is a noninvasive, available and reproducible method which is being used in early detection of HCC.

The Aim: To evaluate ultrasound (US) and computed tomography (CT) findings in early detection of HCC, follow-up of alpha fetoprotein and survival time in these patients.

Material and methods: This retrospective study included 40 patients hospitalized at the Clinic of Infectious and Tropical Diseases, Clinical Center of Serbia. We followed the demographic, clinical, biochemical and characteristics of visualization findings (US and CT), and outcome.

The conclusion: The study showed that the findings on ultrasound and CT do not differ significantly, which means that US findings can be used for early diagnosis of HCC, with great confidence. Alpha-fetoprotein doesn't correlate with the size of the lesion seen on US findings and it is not a reliable marker of HCC. Survival time is in great correlation with the size of the lesions seen on US findings.

Key words: hepatocellular carcinoma, ultrasound, alpha-fetoprotein

TERAPIJA VISCERALNE LAJŠMANIOZE

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Uvod: Lajšmanioza je parazitska infekcija izazvana organizmom iz roda *Leishmania*. Prema kliničkoj slici razlikuje se visceralna, kutana i mukokutana lajšmanioza. Zbog malog broja lekova koji se koriste za lečenje lajšmanioze, a imaju dosta neželjenih efekata, terapija predstavlja značajan klinički problem.

Cilj: Cilj rada je prikaz primenjene terapije kod obolelih od visceralne lajšmanioze, lečenih u periodu od januara 2000. do februara 2012. godine u Klinici (ranije Institutu) za infektivne i tropske bolesti Kliničkog centra Srbije.

Materijal i metode: Studija je obuhvatila 14 obolelih od visceralne lajšmanioze. Studijom je kod obolelih praćen terapijski efekat primenjenih lekova.

Rezultati: Studijom je pokazano da je najčešći simptom kod obolelih od visceralne lajšmanioze bila prisutna spleno-hepatomegalija, pri čemu su temperatura i gubitak težine bile prisutne kod više od polovine pacijenata. Na osnovu analize podataka o korišćenim lekovima u terapiji oboljenja, Glucantim je bio najčešće primenjivani lek, pri čemu se kao dobra alternativa Glucantimu u slučaju lošeg terapijskog odgovora, pokazao neki od preparata amfotericina B.

Zaključak: Iako je visceralna lajšmanioza u Srbiji retka bolest, nije retka pojava neuspeha terapije preparatima antimona, pri čemu se mora misliti na porast rezistencije ovog parazita na prostoru Balkanskog poluostrva.

Ključne reči: visceralna lajšmanioza, simptomi, terapija

THERAPY OF VISCERAL LEISHMANIASIS

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Introduction: Leishmaniasis is the parasitic infection caused by microorganism from genus *Leishmania*. According to clinical presentation, there are visceral, cutaneous and mucocutaneous leishmaniasis. Because of only few drugs that are active against *Leishmania* parasites, with many side effects, the therapy represents important clinical problem.

The Aim: The objective of this study is the representation of utilized therapy in patients with visceral leishmaniasis, treated in period from January 2000. to February 2012 in Clinic (former Institute) for Infectious and Tropical Diseases, Clinical Center of Serbia.

Material and methods: The study included 14 patients with diagnosis of visceral leishmaniasis. The study followed patients for therapeutic effect of the administered drugs.

Results: The study showed that the most common symptom in patients with visceral leishmaniasis was spleno-hepatomegaly, also with fever and weight loss which were present in more than half of patients. Based on the analysis of data on drugs used in treatment of diseases, Glucantime was the most frequently used drug, with a good alternative to Glucantime, in the case of poor treatment response, showed some of the preparations of amphotericin B.

Conclusion: Although the visceral leishmaniasis in Serbia is a rare disease, it is not uncommon failure of therapy with preparations of antimony, so it is must be on mind the fact of the increasing resistance of this parasite in the territory of the Balkan Peninsula.

Keywords: visceral leishmaniasis, symptoms, therapy

KLINIČKE KARAKTERISTIKE BOLESNIKA SA VIRUSNOM CIROZOM JETRE

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Uvod: Hronični virusni hepatitis uzrokuju virusi hepatitisa B i C. Klinički tok mu je u većini bolesnika supklinički i doživljava se kao laka bolest, dok se njegove komplikacije – ciroza jetre i hepatocelularni karcinom, završavaju smrtnim ishodom.

Cilj rada: Analizirati kliničke karakteristike bolesnika sa virusnom cirozom jetre, prediktivne faktore za njihov ishod kao i nastanak hepatocelularnog karcinoma. **Materijal i metode:** Analizirano je 210 bolesnika sa virusnom cirozom jetre hospitalizovanih u Klinici za infektivne i tropske bolesti Medicinskog fakulteta Univerziteta u Beogradu, Kliničkog centra Srbije u periodu od 2007. do 2011. godine. Dijagnoza ciroze jetre i hepatocelularnog karcinoma postavljena je na osnovu fizikalnog nalaza, biohemijskih i virusoloških testova i nalaza metoda vizuelizacije.

Rezultati: U ukupnom broju bolesnika, značajno više je bilo bolesnika sa virusnom C cirozom u odnosu na B cirozu (69%) kao i osoba starijih od 50 godina (79%). Nije uočena značajnost razlike ishoda bolesti u odnosu na pol i etiologiju ciroze. U uzrasnoj grupi 60-69 godina i preko 70 godina, postoji statistički značajna razlika u odnosu na smrtni ishod bolesti ($p < 0.05$ i $p < 0.01$). Dijagnoza hepatocelularnog karcinoma pokazala se kao visoko statistički značajna za smrtni ishod bolesnika ($p < 0.01$). Bolesnici stariji od 70 godina su pod visokim rizikom za nastanak HCC ($p < 0.01$), bez obzira na pol, etiologiju ciroze i primenjenu antivirusnu terapiju.

Zaključak: Težak i progredirajući oblik hronične virusne bolesti jetre i visoka smrtnost starijih osoba obavezuju na mere prevencije, otkrivanja, praćenja, vakcinacije i ranog antivirusnog lečenja ovih bolesnika.

Glavne reči: hepatitis B virus, hepatitis C virus, ciroza jetre, hepatocelularni karcinom.

CHARACTERISTICS OF THE PATIENTS WITH VIRAL LIVER CIRRHOSIS

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Introduction: Chronic viral hepatitis B and C are mild diseases in the majority of patients. Complications - cirrhosis and hepatocellular carcinoma have a fatal outcome.

The Aim: To analyse data of the patients with cirrhosis C and determine predictive factors for the outcome and development of hepatocellular carcinoma.

Materials and Methods: Total of 210 patients with cirrhosis C hospitalized from 2007 to 2011 was investigated. Physical examination, biochemical, virologic tests and visualisation methods were used for diagnosis of liver cirrhosis and hepatocellular carcinoma.

Results: Among all patients, there were a significant higher number with cirrhosis C compared with cirrhosis B (69%). As well, persons over 50 years of age dominated (79%). A difference in the outcome of the disease with regard to gender and aetiology of cirrhosis was significant. A significant statistical difference with regard to fatal outcome of the disease in the age group from 60 to 69 and patients over 70 was found ($p < 0.05$ and $p < 0.01$), respectively. The occurrence of hepatocellular carcinoma noticed as independent predictive factor for a fatal outcome of the patients with cirrhosis ($p < 0.01$). Age over 70 was found as predictive factor for development of hepatocellular carcinoma regardless of gender, aetiology of cirrhosis and applied antiviral treatment ($p < 0.01$).

Conclusion: Severe and progressive form of chronically viral liver disease and high mortality among older persons require extensive preventive measures for detecting, monitoring, vaccination and early antiviral treatment of these patients.

Key words: Hepatitis B Virus, Hepatitis C Virus, liver cirrhosis, hepatocellular carcinoma.

KLINIČKE I EPIDEMIOLOŠKE KARAKTERISTIKE CLOSTRIDIUM DIFFICILE INFEKCIJE

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Uvod: *C. difficile* infekcija je vodeći uzrok bolnički-stečene dijareje u svetu, sa porastom incidence javljanja u protekloj deceniji. Klinička slika oboljenja kreće se od umerene dijareje, preko fulminantnog kolitisa, pa sve do potencijalno fatalnog ishoda. Glavni faktori rizika za nastanak ove infekcije su starost, postojanje komorbiditeta, potreba antibiotika i prethodne hospitalizacije.

Cilj: Cilj ovog rada bio je da se utvrde glavne kliničke i epidemiološke karakteristike *C. difficile* infekcije, kao i ishod oboljenja kod bolesnika lečenih na Klinici za infektivne i tropske bolesti.

Materijal i metode: Ova studija je obuhvatila 143 bolesnika, lečenih na Klinici za infektivne i tropske bolesti, tokom perioda od dve godine (2009/2010). Kod bolesnika kod kojih je postojala pozitivna anamneza o prethodnoj hospitalizaciji i/ili terapiji antimikrobnim agensima, a koji su razvili dijareju, dijagnoza *C. difficile* infekcije postavljena je upotrebom ELISA testa za *C. difficile* toksin A i toksin B, ili endoskopskim pregledom i patohistološkom analizom uzoraka dobijenih biopsijom mucoze kolona.

Rezultati: Prosečna starost bolesnika u studiji iznosila je 67.71 ± 13.34 godine. Procenat bolesnika starijih od 65 godina bio je 67.8. Prethodna hospitalizacija registrovana je kod 92.3% bolesnika, dok je 87.4% primalo antibiotsku terapiju. Preko 90% bolesnika primalo je fluorohinolone ili cefalosporine treće generacije pre nastanka dijareje. Recidiv je registrovan kod 8.4% bolesnika, komplikacije su zabeležene kod 2.8% bolesnika, a devet bolesnika (6.3%) je umrlo.

Zaključci: Klinička slika oboljenja je varijabilna, stepen komplikacija i smrtnost je niska, dok prognoza zavisi prevashodno od starosti i prethodnog stanja bolesnika.

Glavne reči: *C. difficile* infekcija, faktori rizika, antibiotici, kliničke karakteristike

CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF CLOSTRIDIUM DIFFICILE INFECTION

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Introduction: *C. difficile* infection is the leading cause of hospital-acquired diarrhea in the world, with increasing incidence over the past decade. The clinical spectrum of disease varies from moderate diarrhea, through fulminant colitis with complications, up to a potentially fatal outcome. Main risk factors for the infection are age, presence of comorbidity, use of antibiotics and previous hospitalization.

The aim: The objective of this study was to determine the main clinical and epidemiological features of *C. difficile* infection and disease outcome in patients treated at the Clinic for Infectious and Tropical Diseases.

Material and methods: This study included 143 patients treated in the period of two years (2009/2010). The diagnosis of *C. difficile* infection in patients with a positive history of previous hospitalization and/or therapy with antimicrobial agents, who developed diarrhea, was made using ELISA test for *C. difficile* toxin A and B, or endoscopic examination and histopathological analysis of colonic mucosa.

Results: The mean age of patients was $67.71 \text{ years} \pm 13.34$. The percentage of patients older than 65 was 67.8. Previous hospitalization was registered in 92.3% of patients, while 87.4% received antibiotics. Over 90% received fluoroquinolones or third-generation cephalosporins, before the diarrhea. Relapse was registered in 8.4% of patients, complications were recorded in 2.8% of patients, and nine patients (6.3%) died.

Conclusion: The clinical spectrum of disease is variable; the incidence of complications and mortality is low, while the prognosis depends on age and prior condition of the patient.

Keywords: *C. difficile* infection, risk factors, antibiotics, clinical characteristics

POVEZANOST ISTOVREMENE HCV INFEKCIJE SA MORTALITETOM PACIJENATA SA HIV INFEKCIJOM U SRBIJI

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Uvod: Infekcije HIV i HCV imaju sličan način transmisije i sklonost ka hronicitetu, te je pojava istovremenih infekcija ovim virusima česta.

Cilj: Ovim radom smo želeli da utvrdimo učestalost istovremenih HCV i HBV infekcija kod pacijenata sa HIV infekcijom u Srbiji i ispitamo uticaj HCV infekcije na preživljavanje pacijenata sa istovremenom HIV infekcijom.

Materijal i metode: Obavljena je kohortna studija koja je obuhvatila 1.041 pacijenta sa HIV infekcijom, koji su primali HAART, u periodu od 1997. do 2011. godine u Klinici za infektivne i tropske bolesti, KCS, u Beogradu. Dijagnoza HIV infekcije postavljena je prema kriterijumima CDC klasifikacije iz 1993. godine. Praćeni su klinički, imunološki i virusološki parametri toka HIV infekcije, uz HAART, kao i prisustvo istovremenih HCV ili/ HBV infekcija. Analizirana je povezanost navedenih parametara sa preživljavanjem ispitivanih pacijenata. Podaci su statistički obrađeni korišćenjem Cox-ove proporcionalne hazardne regresione analize u okviru paketa SPSS.

Rezultati: Prevalenca HCV istovremene infekcije kod pacijenata sa HIV infekcijom iznosila je 22,1%, dok je prevalenca HBV koinfekcije bila 7,1%. Sve tri infekcije istovremeno imalo je 1,5% pacijenata. Istovremena HCV infekcija je negativni prediktor preživljavanja, obzirom da pacijenti sa istovremenom HIV/HCV infekcijom imaju skoro dva puta veći rizik za smrtni ishod u odnosu na pacijente sa HIV mono-infekcijom. S druge strane, istovremena HBV infekcija nije imala statistički značajan povezanost sa preživljavanjem ishodom pacijenata.

Zaključak: Nepovoljan uticaj istovremene HCV infekcije na tok i krajnji ishod HIV infekcije ukazuje na neophodnost razvoja uspešnijih strategija lečenja pacijenata sa HIV/HCV istovremenom infekcijom.

Ključne reči: HIV, HCV, istovremene infekcije, preživljavanje

CORRELATION OF SIMULTANEOUS HCV INFECTION WITH MORTALITY OF PATIENTS WITH HIV INFECTION IN SERBIA

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Introduction: HIV and HCV infections have a similar mode of transmission and the tendency to chronicity, and the occurrence of concurrent infections with these viruses is high.

The aim: The study was conducted to determine the prevalence of concurrent HCV and HBV infection population of patients with HIV infection in Serbia and examine the impact of HCV infection on survival of patients with concurrent HIV infection.

Material and Methods: Cohort study included 1041 patients with HIV infection who received HAART in the period since 1997. by 2011. at the Clinic for Infectious and Tropical Diseases, Belgrade. The clinical, immunological and virological parameters of HIV infection course, with HAART, were monitored, as well as the presence of concurrent HCV and / or HBV infection. We analyzed the correlation of these parameters with survival of patients. The data were statistically analyzed using Cox's proportional hazardous regression analysis within SPSS.

Results: The prevalence of HCV co-infection in patients with HIV infection was 22.1%, while the prevalence of HBV coinfection was 7.1%. All three simultaneous infections had 1.5% of patients. Concomitant HCV infection is a negative predictor of survival, considering patients with concurrent HIV / HCV infection have almost twice higher risk for death compared to patients with HIV mono-infection.

Conclusion: The adverse effects of concurrent HCV infection on the course and outcome of HIV infection indicates the necessity of developing optimal treatment strategies in patients with HIV / HCV co-infection.

Keywords: HIV, HCV co-infection, survival

INFEKCIJE I INTOKSIKACIJE DIGESTIVNOG SISTEMA NA TERITORIJI KOSOVA I METOHIJE U 2010/2011 GODINI

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Uvod: Infekcije i intoksikacije digestivnog sistema su najčešće prouzrokovane bakterijama, ali mogu i drugim mikroorganizmima. Najčešće nastaju konzumacijom kontaminiranih namirnica.

Cilj rada: Cilj našeg rada je prikaz epidemiologije i kliničke slike crevnih infekcija na teritoriji Kosova i Metohije.

Metode i materijali: Za naša istraživanja koristili smo Medicinsku dokumentaciju (istorija bolesti) bolesnika lečnih u Infektivnom odeljenju Zdravstvenog centra Kosovska Mitrovica u 2010 i 2011 godini.

Rezultat: U ovom periodu u Infektivnom odeljenju je lečeno 220 pacijenata. Kod 119 (54,1%) je dijagnostikovano enterocolitis 34 (28.5%) a kod 65 (55%) gastroenteritis, 19 (16%) je imalo alimentarnu intoksikaciju. Oboljenja su se mahom javljala sporadično, a redje su imala epidemijski karakter. Klinička slika se najčešće manifestovala mučninom i povraćanjem 89 (75%), dijareom 116 (97.5%), povišenom temperaturom 37 (31%), bolovima u trbuhu 70 (59%), a redje malaksalošću i glavoboljom. Koprokultura je kod 70 (59%) bila sterilna, a kod 7 (5%) su izolovane bakterije roda Salmonela. U laboratorijskim analizama 34 (29%) je imalo leukocitozu, 16 (14%) povišenu aktivnost serumskih transaminaza (AST i ALT), 17 (14.5%) povišenu ureu. Kod većine pacijenata 110 (95%) je primenjena rehidrataciono i simptomatska terapija.

Zaključak: Infekcije i intoksikacije digestivnog sistema su se na teritoriji Kosova i Metohije uglavnom javljale sporadično. Dominirala je lakša i srednje teška forma oboljenja.

Ključne reci: Enterocolitis, gastroenteritis, intoxicatio alimentaris.

INFECTION AND INTOXICATION DIGESTIVE SYSTEM IN KOSOVO AND in 2010/2011 YEAR

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Introduction: Infection and intoxication of the digestive system are most commonly caused by bacteria, but they and other microorganisms. Most commonly occurring eating contaminated food.

Objective: The aim of our study was to review the epidemiology and clinical features of intestinal infections in the territory of Kosovo and Metohija.

Methods and Materials: In our study we used the medical documentation (history of disease) in patients lečnih Infectious Diseases Department of the Health Center in Kosovska Mitrovica in 2010 and 2011.

Result: In this period, the Department of Infectious Diseases 220 patients were treated. In 119 (54.1%) were diagnosed enterocolitis 34 (28.5%) and in 65 (55%) of gastroenteritis, 19 (16%) had alimentary intoxication. Disease have occurred mostly sporadically, and rarely had the character of the epidemic. The clinical picture is usually manifested by nausea and vomiting 89 (75%), diarrhea 116 (97.5%), fever 37 (31%), abdominal pain 70 (59%), and rarely weakness and headache. Coproculture was found in 70 (59%) were sterile, and in 7 (5%) of the isolated bacteria of the genus Salmonella. In laboratory studies 34 (29%) had leukocytosis, 16 (14%) elevated serum aminotransferase levels (AST and ALT), 17 (14.5%) increased urea. For most patients, 110 (95%) was used Rehydration and symptomatic therapy.

Conclusion: Infection and intoxication of the digestive system on the territory of Kosovo and Metohija, mainly occurred sporadically. Dominated by the lighter and medium-heavy form of the disease.

Keywords: Enterocolitis, gastroenteritis, Intoxicatio alimentaris.

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Uvod: Virusni hepatitis A spada u pikorna virusa, član familije Picornaviridae akutno zapaljenje jetre izazvano virusom hepatitisa A i praćeno je različitim stepenom hepatocelularne nekroze. Sporadično se javlja kod dece svih uzrasta i u manjem broju slučajeva kod odraslih. Inkubacija je najčešće od 15 do 50 dana, prosečno traje od 28-30 dana.

Cilj rada: Cilj našeg rada je prikazivanje broja obolelih i kliničke slike hepatitisa A na teritoriji severne Kosovske Mitrovice u periodu od 2007-2010 godine.

Materijal i metode: Za naše istraživanje je korišćena medicinska dokumentacija (istorije bolesti) bolesnika lečenih na infektivnom odeljenju Zdravstvenog centra u Kosovskoj Mitrovici u periodu od 2007-2010. godine.

Rezultati istraživanja: U periodu od 2007-2010 godine od ukupnu 400 pacijenata primljenih na infektivnom odeljenju u severnom delu Kosovske Mitrovice 18 je primljeno sa istim simptomima koju ukazuju na akutni virusni hepatitis A. Klinička slika se manifestovala žutilom beonjača, malaksalošću, povraćanjem, gubitkom apetita, povišenom temperaturom, tamnija boja mokraće. U laboratorijskim analizama zabeležen je znatni skok AST i ALT, Bil C i Bil D. Dijagnoza je potvrđena nalazom anti HAV IgM antitela ELISA metodom.

Zaključak: Hepatitis A se javlja na teritoriji severne Kosovske Mitrovice povremeno u vidu manjih ili većih komplikacija. Dominiraju srednje teske forme bolesti.

Ključne reči: Hepatitis acuta virosa „A“.

ACUTA VIROSA HEPATITIS A IN THE TERRITORY OF NORTHERN IN KOSOVSKA MITROVICA

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Introduction: Viral hepatitis A is one of the pikorna virus, a member of the family Picornaviridae, acute inflammation of the liver caused by hepatitis A virus and is accompanied by varying degrees of hepatocellular necrosis. Occasionally occurs in children of all ages and in the few cases in adults. The incubation period is usually 15 to 50 days, the average duration of 30 days per 28-.

Objective: The aim of our study is to present certain number of patients and clinical hepatitis A in the territory of northern Kosovska Mitrovica, in the period 2007-2010 years.

Material and Methods: Our study used medical records (anamnesis) of patients treated at the Infectious Diseases Department of the Health Center in Kosovska Mitrovica in the period 2007-2010 year.

Research results: Between 2007-2010 total of 400 patients admitted to the infectious ward in the northern part of Kosovska Mitrovica, 18 were admitted with the same symptoms that suggest acute viral hepatitis A. The clinical picture is manifested in yellowing of the white of the eye, malaise, vomiting, loss of appetite, elevated temperatures, the darker the color of urine. In laboratory analysis was reported substantial jump AST and ALT, Bil Bil C and D. Diagnosis is confirmed by anti HAV IgM antibodies using ELISA method.

Conclusion: Hepatitis A occurs in the territory of northern Kosovska Mitrovica from time to time in the form of minor or major complications. Dominated by moderately severe form of disease.

Keywords: Hepatitis acuta virosa "A".

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Uvod: Kala-azar je teško parazitaro oboljenje iz grupe transmisivnih zoonoza. U Crnoj Gori rezervoar parazita *Leishmaniae donovani* su psi, a vektori insekti roda *Phlebotomus*.

Cilj rada: je da se prikažu epidemiološke karakteristike kala-azara u Crnoj Gori.

Materijal i metode: Retrospektivna studija za period 2000-2008 godine. Istraživanjem je praćen broj oboljelih od kala-azara za taj period, njihova geografska i sezonska distribucija, uzrastna i polna struktura. Obuhvaćeni su i podaci o inficiranim psima u Crnoj Gori za period 2006-2008 godine. Kao izvor podataka korišćena je medicinska evidencija: Infektivne klinike Podgorica, Pedijatrijske klinike Podgorica, Opšte bolnice Bar, Specijalističke veterinarske laboratorije Podgorica, kao i zvanični podaci Instituta za javno zdravlje Crne Gore.

Rezultati: Broj oboljelih od kala-azara za period 2000-2008 je bio 37. Najveći broj oboljelih živi u Podgorici i Baru, a najviše prijavljenih je tokom maja i juna. Djeca su češće oboljevala od kala-azara od odraslih (56,75% / 43,24%), a najviše djece je bilo uzrasta 1-5 godina. Muški pol je bio zastupljeniji u oboljevanju od ženskog pola (62,16% / 37,83%). Broj zaraženih pasa sa rodom *Leishmania* za period 2006-2008 godine je bio 120, a najveći broj je bio iz Podgorice.

Zaključak: Ovim radom su prikazane epidemiološke karakteristike kala-azara u Crnoj Gori. Veliki broj zaraženih pasa upućuje da je i broj inficiranih ljudi veći nego što je realno registrovan. Najveći broj pacijenata, kao i najveći broj zaraženih pasa je iz Podgorice, što upućuje na mogućnost širenja endemskog žarišta kala-azara (od Bara do Ulcinja).

Ključne riječi: kala-azar, epidemiologija, Crna Gora, *Leishmania*, psi, oboljeli.

EPIDEMIOLOGICAL CHARACTERISTICS OF KALA-AZAR IN MONTENEGRO

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Introduction: Kala-azar is a difficult parasitic disease from a group of transmissible zoonoses. In Montenegro, dogs are the reservoir of the parasite *Leishmania donovani* and the vectors are insects of the genus *Phlebotomus*.

The aim: To present the epidemiological characteristics of kala-azar in Montenegro.

Materials and Methods: It is a retrospective study for the period 2000-2008. The number of patients with kala-azar in this period, their geographical and seasonal distribution, age and sex structure were followed by research. Data on the infected dogs in Montenegro for the period 2006-2008 were also included. As a source of data medical records were used from: Clinic for Infectious Diseases Podgorica, Pediatric Clinic Podgorica, General Hospital Bar, Specialistic Veterinary Laboratory Podgorica as well as official records of the Institute of Public Health of Montenegro.

Results: The number of patients with kala-azar in the period 2000-2008 was 37. Most of the patients live in Podgorica and Bar and have been mostly reported during May and June. Children had higher incidence of kala-azar from adults (56,75% / 43,24%) and the majority of children were 1 to 5 years old. Male sex was predominant when compared to female sex (62,16% / 37,83%). The number of dogs infected with genus *Leishmania* in the period 2006-2008 was 120 and the largest number was in Podgorica.

Conclusion: This study presented epidemiological characteristics of kala-azar in Montenegro. A large number of infected dogs suggests that the number of infected people is larger than has been really registered. The majority of patients and the majority of infected dogs are from Podgorica, suggesting the possibility of the spread of endemic focus of kala-azar (from Bar to Ulcinj).

Keywords: kala-azar, epidemiology, Montenegro, *Leishmania*, dogs, patients.

ФЕБРИЛНА СТАЊА НЕЈАСНОГ ПОРЕКЛА НА КЛИНИЦИ ЗА ИНФЕКТИВНЕ БОЛЕСТИ У КРАГУЈЕВЦУ
У ПЕРИОДУ ОД 2010. ДО КРАЈА ДЕЦЕМБРА 2011.ГОДИНЕ

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Увод: Фебрилно стање нејасног порекла (ФУО, према енглеском “fever of unknown origin”) означава виšekратно појављивање температуре изнад 38,3 °C у току три недеље, чије порекло остаје неразјашњено након три посете лекару амбулантне службе, односно седам дана болничког испитивања уз спровођење уобичајених дијагностичких поступака (крвна слика, брзина седиментације еритроцита, преглед мокраће, радиографија плућа).

Циљ: Утврдити:

- однос (процент) инфективних и неинфективних обољења у етиологији нејасних фебрилних стања,
- које су инфективне и неинфективне болести најчешћи узрок нејасног фебрилног стања,
- дистрибуцију појединих болести које се презентују нејасним фебрилним стањем везано за пол,
- разлике у учесталости обољења ФУО код млађе и старије популације.

Материјал и методе: Радом је обухваћено 59 пацијената са Клинике за Инфективне болести у Крагујевцу, који су испитивани и лечени у периоду од 2010. до краја децембра 2011. године. Однос пацијената према половима био је, 28 особа мушког и 31 особа женског пола. Обухваћене су две популације болесника изнад 60. година и до 60. година старости.

Резултати: На основу добијених резултата, однос инфективних и неинфективних болести као узрочника нејасних фебрилних стања био 81%:19% у корист неинфективне патологије. Након учињених клиничко-лабораторијских претрага и других испитивања, као узрок фебрилних стања нејасне етиологије дијагностикована су: 4 кардиолошка, 3 ендокринолошка, 1 пулмолошко, 6 реуматолошких, 2 гастроинтестинална, 5 инфективних обољења. Код 3 болесника дијагностиковане су локализоване инфекције (апсцеси) појединих органа, а код 2 пацијента малигна обољења (тумори дебелог црева).

Закључци: ФУО има бројне узрочнике, међу којима се поред неконтагиозних и контагиозних, локализованих и генерализованих инфекција, најчешће наводе неоплазме, системске болести везивног ткива, као и бројна друга етиолошко добро дефинисана или још неразјашњена стања.

Кључне речи: температура, повишена температура непознатог порекла, фебрилност, фебрилно стање.

FEBRILE CONDITIONS OF UNKNOWN ORIGIN AT THE CLINIC FOR INFECTIOUS DISEASE IN KRAGUJEVAC
IN PERIOD FROM 2010. THE END OF DECEMBER 2011.YEAR

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Introduction: The febrile condition of unknown origin (fu), the English “fever of unknown origin”) means the repeated occurrence of temperatures above 38.3 ° C for three weeks, the origin of which remains unresolved after three visits to outpatient physician services, or seven days of hospital tests with implementation of common diagnostic procedures (blood count, erythrocyte sedimentation rate, urine examination, radiography of the lungs)

The goal: To Determine

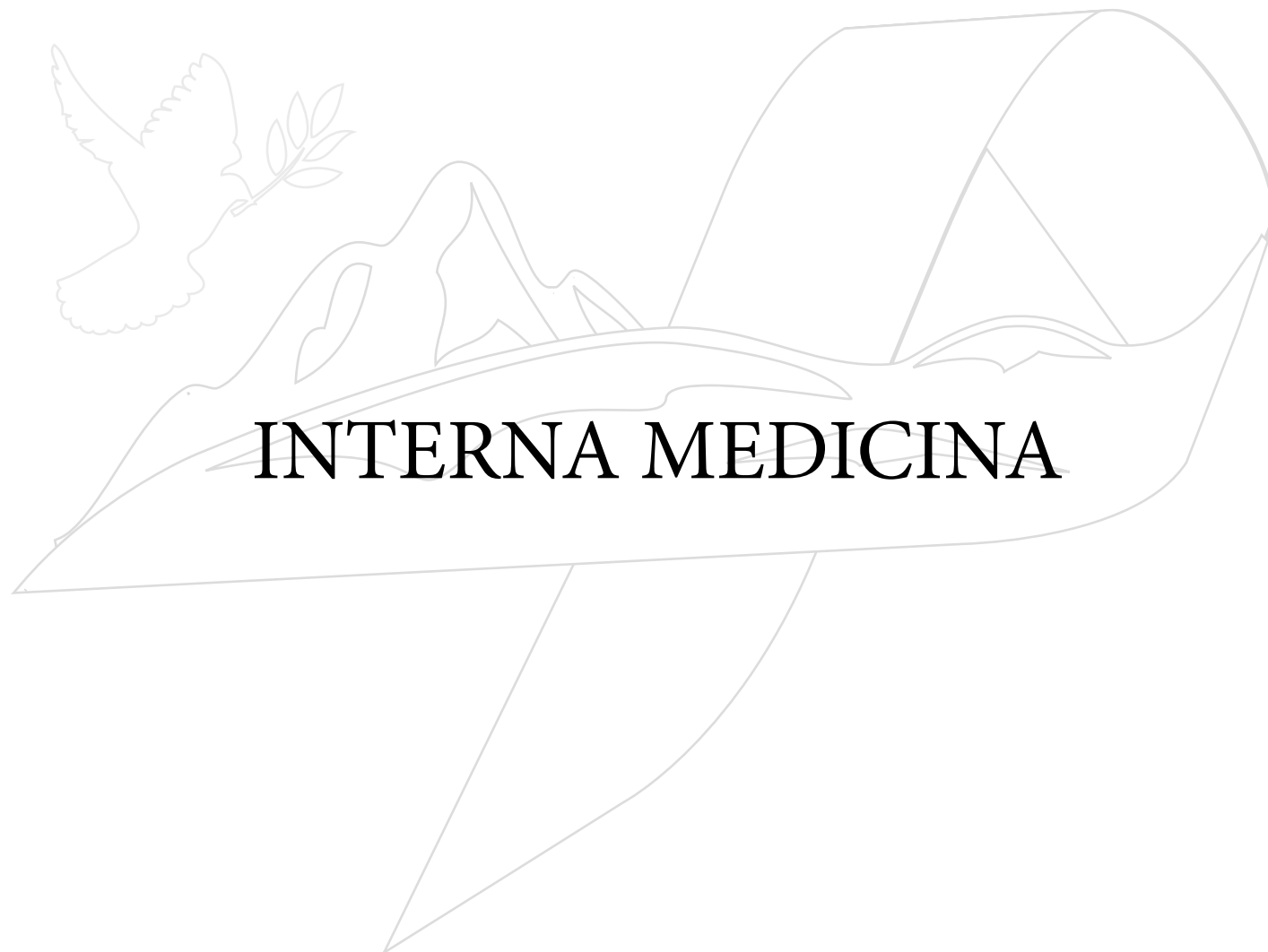
- the ratio (percentage) of infectious and noninfectious diseases in the etiology of febrile illness of unclear.
- which non-infectious and infectious disease most common cause of ambiguous febrile state.
- the distribution of certain diseases that are presented fever of unknown origin and sex.
- differences in the incidence of disease fuo in younger and older population.

Material and methods: The study included 59 patients from the Clinic for Infectious Diseases in Kragujevac, which were examined and treated in the period from 2010. the end of December 2011. The ratio of patients by gender was 28 males and 31 females. Included are two populations of patients over 60 years up to 60 years age.

Results: Based on the results, the ratio of infectious and noninfectious diseases as a cause of obscure febrile illness was 81%: 19% in favor of non-infectious pathology. After that clinical-laboratory tests and other tests, as a cause of febrile illness of unknown etiology were diagnosed: 4 cardiac, 3 endocrine, 1 pulmonary, rheumatology 6, 2 gastrointestinal, infectious diseases 5. In 3 patients diagnosed with localized infection (abscess) of individual organs, and 2 patients with malignant diseases (tumors of the colon).

Conclusions: fuo has many causes, including the addition of noncontagious and contagious, localized and generalized infection, they often describe neoplasms, systemic connective tissue diseases, as well as many other well-defined etiological or unresolved situation.

Key words: temperature, fever of unknown origin, fever, febrile state.



UTICAJ FIZIČKOG TRENINGA NA DVOSTRUKI PROIZVOD KOD PACIJENATA U POSTINFARKTNOM PERIODU

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Uvod: Fizički trening integralni deo rehabilitacionog tretmana pacijenata obolelih od ishemijske bolesti srca, kod kojih povećava efikasnost ekstrakcije kiseonika i metabolizam u skeletnim mišićima čime se smanjuje srčan rad i povećava kolateralni koronarni protok krvi. Dvostruki proizvod predstavlja proizvod frekvencije srca i sistolnog arterijskog pritiska, a korelacija između ovog proizvoda i miokardne potrošnje kiseonika ocenjuje se visoko statistički značajnom.

Cilj rada: Cilj ispitivanja je bio da se procene efekti fizičkog treninga dvostruki proizvod kod pacijenata u postinfarktnom periodu.

Pacijenti i metode: Retrospektivnom studijom je obuhvaćeno 275 pacijenata Instituta za lečenje, rehabilitaciju i prevenciju srčanih i reumatičnih bolesti „Niška Banja“, prosečne starosti 57,6 godina. Studijom je obuhvaćeno 55 žena i 220 muškaraca s preživelim infarktom miokarda, u sinusnom ritmu, bez AV blokova i blokova grana. Značajnost razlika za svaki parametar pre i posle perioda rehabilitacije, kao i između grupa bolesnika testirana je Studentovim t-testom. Statistička hipoteza testirana je na nivou signifikantnosti za rizik od $\alpha = 0.001$.

Rezultati: Kod ispitanih bolesnika s preživelim infarktom miokarda, nakon sprovedenog tretmana fizičkim treningom došlo je do značajnog smanjenja krvnog pritiska, kako sistolnog ($143.3 \pm 18.4 : 128.2 \pm 12.3$ mmHg; $p < 0.001$), tako i dijastolnog ($97.1 \pm 12.4 : 82.3 \pm 11.5$ mmHg; $p < 0.001$), frekvencije srčanog rada ($83.2 \pm 15.7 : 71.4 \pm 12.9$ /min; $p < 0.001$) i dvostrukog proizvoda ($12472.3 \pm 1984.9 : 9874.8 \pm 1426.4$; $p < 0.001$).

Zaključak: Postoji statistički značajna razlika u DP kod pacijenata pre i posle fizičkog treninga.

Ključne reči: fizički trening, dvostruki proizvod, postinfarktorni period

EFFECT OF TRAINING ON DOUBLE PRODUCT OF PATIENTS IN POSTINFARCTION PERIOD

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Introduction: Physical training is an integral part of rehabilitation in patients with ischemic heart disease, which increases the efficiency of oxygen extraction and metabolism in skeletal muscle, thereby reducing the heart rate and increases coronary collateral blood flow. Rate – pressure product (RPP) is a product of heart rate and systolic blood pressure, and correlation between this product and myocardial oxygen consumption estimates highly statistically significant.

Aim: To evaluate the effects of physical training on RPP in patients in postinfarct period.

Patients and Methods: This retrospective study included 275 patients (mean age 57.6 years) of the Institute "Niska Banja". The study included 55 women and 220 men after myocardial infarction in sinus rhythm without AV blocks and branch blocks. The significance of differences for each parameter before and after a period of rehabilitation, as well as between groups of patients tested using the Student t-test. The statistical hypothesis was tested at the level of risk significance for $\alpha = 0.001$.

Results: In patients with survived myocardial infarction, after physical training treatment, there was a significant decrease in blood pressure, both systolic ($143.3 \pm 18.4 : 128.2 \pm 12.3$ mmHg, $p < 0.001$) and diastolic ($97.1 \pm 12.4 : 82.3 \pm 11.5$ mmHg, $p < 0.001$), heart rate ($83.2 \pm 15.7 : 71.4 \pm 12.9$ /min, $p < 0.001$) and RPP ($12472.3 \pm 1984.9 : 9874.8 \pm 1426.4$, $p < 0.001$).

Conclusion: There was a statistically significant difference in RPP in patients before and after physical training.

Key words: physical training, RPP, postinfarct period

KORELACIJA KARDIOVASKULARNOG RIZIKA I OŠTEĆENJA CILJNIH ORGANA U HIPERTENZIJU

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Uvod: Hipertenzija ima vodeću ulogu u razvoju kardiovaskularnih bolesti srca, koronarne bolesti, miokardne hipertrofije (HLK), srčane i bubrežne insuficijencije, cerebrovaskularnog inzulata.

Cilj rada: Utvrditi da li postoji korelacija između različitih vrednosti rizika dobijenih iz SCORE sistema i hipertrofije leve komore, debljine intimo-medijalnog kompleksa (IMK) na karotidama i klirensa kreatinina.

Materijal i metode: Ispitivanjem je obuhvaćeno 62 bolesnika (prosečne starosti 68.8 ± 9 godina, 38 žena-59.4%), kod kojih smo analizirali: godine, pol, totalni rizik od kardiovaskularne smrti u narednih 10 godina određen SCORE–tablicama, totalni rizik od kardiovaskularnih fatalnih i nefatalnih događaja u narednih 10 godina određen iz tablica Evropskog udruženja za hipertenziju (ESH score), indeks mase tela, nivo holesterola i glukoze, metabolički sindrom, elektrokardiografiku i ehokardiografiku HLK, klirens kreatinina i debljinu intime medije.

Rezultati: Hipertrofija leve komore, izražena preko indeksa mase leve komore, bila je značajno izraženija kod hipertenzivnih pacijenata sa veoma visokim rizikom određenim SCORE tablicama. Pacijenti sa visokim i veoma visokim ESH skorom, imali su deblji IMK i niži klirens kreatinina, ali nije bilo povezanosti između ovog skora i stepena HLK. Rezultati korelacije i linearne regresije pokazali su značajnu povezanost evropskog SCORE-a sa indeksom mase leve komore ($t = 0.30; p < 0.05$) dok je ESH score korelirao najbolje (negativno) sa klirensom kreatinina ($t = 0.27; p < 0.05$).
Zaključak: Rezultati pokazuju veliku učestalost oštećenja ciljnih organa kod pacijenata sa i stadijumom hipertenzije. Postoji dobra korelacija indeksa mase leve komore sa kardiovaskularnim rizikom određenim iz SCORE tablica, dok je nešto bolja korelacija debljine IMK i pada u klirensu kreatinina sa ESH skorom.

Ključne reči: kardiovaskularni rizik, oštećenje ciljnih organa, hipertenzija

CORRELATION BETWEEN CARDIOVASCULAR RISK AND TARGET ORGAN DAMAGE IN HYPERTENSION

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Introduction: Hypertension plays a leading role in development of cardiovascular and coronary artery disease, myocardial hypertrophy, cardiac and renal failure and stroke.

The Aim: To determine if there is correlation between different risk values obtained by SCORE system and left ventricular hypertrophy (LVH), thickness of intima-medial complex (IMC) in carotid arteries and creatinine clearance.

Materials and Methods: The study includes 62 patients. We analyzed: age, gender, total risk of cardiovascular death in the next 10 years determined by SCORE charts, risk of cardiovascular fatal and nonfatal events over next 10 years determined from charts of the European Society of Hypertension (ESH score), body mass index, cholesterol and glucose levels, presence of metabolic syndrome, electrocardiographic and echocardiographic LVH, creatinine clearance and IMC.

Results: LVH expressed through the left ventricular mass index was significantly more pronounced in hypertensive patients with very high SCORE risk. Patients with high and very high ESH score had a thicker IMC and lower creatinine clearance, but there was no correlation between this score and LVH. Results of correlation and linear regression analysis showed a statistically significant relationship to European SCORE with left ventricular mass index ($t = 0.30, p < 0.05$), while ESH score correlated negatively with creatinine clearance ($t = 0.27, p < 0.05$).

Conclusion: Results show high rate of target organ damage in patients with stage I hypertension. There is good correlation between left ventricular mass index with cardiovascular risk determined by SCORE charts, and slightly better correlation between IMT and decrease creatinine clearance with ESH score.

Key words: cardiovascular risk, target organ damage, hypertension

PRIMENA MERA SEKUNDARNE PREVENCIJE DVE GODINE NAKON KARDIOVASKULARNOG DOGAĐAJA

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Uvod: Kardiovaskularne bolesti su vodeći uzrok oboljevanja i umiranja u svetu. Zato, lečenje bolesnika sa kardiovaskularnim bolestima ima za cilj da smanji rizik od budućih događaja, poboljša kvalitet života i produži život.
Cilj: Cilj ove studije bio je da testira primenu Evropskih preporuka za prevenciju kardiovaskularnih bolesti kod koronarnih bolesnika sa i bez revaskularizacije, dve godine nakon kardiovaskularne rehabilitacije.

Ispitanici i metod: Nakon dve godine sproveden je telefonski intervju sa 150 pacijenata koji su metodom slučajnog izbora dobijeni iz grupe pacijenata kod kojih je sprovedena specijalizovana rehabilitacija. Iz intervjua su dobijani podaci o trenutnom stanju bolesnika, prisustvu velikih kardiovaskularnih događaja kao i sprovođenje preporučenih mera sekundarne prevencije

Rezultat: U analizu je uključeno 39 (26%) žena, prosečne starosti 61 godin. Bez revaskularizacije (BR) bilo je 37 (24.7%, PTCA je imalo 47 (31.3%) i CABG 66 (50%) ispitanika. Veliki kardiovaskularni događaj desio se kod 19 (12.7%) pacijenata. Dvoje je umrlo – jedna bolesnica zbog nekoronarnog događaja a drugi bolesnik zbog reinfarkta. Nefatalni infarkt miokarda imao je jedan pacijent, kod 5 pacijenata urađen je PTCA, kod jednog CABG a 14 (9.3%) pacijenata je hospitalizovao zbog pogoršanja koronarne bolesti.

Zaključak: Nakon 24 meseca veliki KV događaji bili su češći: kod žena i pacijenata bez revaskularizacije i revaskularizovanih sa PTCA nego kod muškaraca i pacijenata sa CABG. Ovi pacijenti su u većem broju bili pušači, lošije su regulisali KP i imali su lošiji kvalitet života za vreme rehabilitacije.

Ključne reči: koronarna bolest, sekundarna prevencija.

APPLICATION OF SECONDARY PREVENTION MEASURES TWO YEARS AFTER A CARDIOVASCULAR EVENT

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Introduction: Cardiovascular diseases are the leading cause of morbidity and mortality in the world. Treatment of patients with cardiovascular diseases, aims to reduce the risk of future events, improve quality of life and prolong life.

The Aim: The objective of this study was to test the implementation of European guidelines for prevention of cardiovascular disease in patients with and without revascularization, performed two years after cardiovascular rehabilitation.

Patients and Methods: After two years, conducted the telephone interviews with 150 patients who were randomly obtained from a group of patients who have implemented a specialized rehabilitation. From the interview data were obtained on the current status of the patient, the presence of major cardiovascular events as well as implementation of recommended measures for secondary prevention

Results: The analysis included 39 (26%) women, mean age of patients was 61 years, without revascularization (BR) was 37 (24.7%, PTCA had 47 (31.3%) and CABG 66(50%)patients.

Conclusion: After 24 months of monitoring a skilled events were more common: in women and patients without revascularization with PTCA and revaskularizovanih than men and patients with CABG. These patients had been in a number of smokers, lower regulated BP and had worse quality of life during rehabilitation.

Keywords: coronary heart disease, secondary prevention measures.

ANKIZIOZNOST I DEPRESIJA KOD PACIJENATA SA ISHEMIJSKOM BOLESTI SRCA I SRČANOM INSUFICIJENCIJOM

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Uvod: Poslednjih decenija pojavila su se istraživanja koja ukazuju na značajnu ulogu psiholoških faktora (pre svega depresije i anksioznosti) kao etiološkog faktora za nastanak ishemijske bolesti srca, ali i faktora koji može uticati na tok i prognozu bolesti.

Cilj: Cilj istraživanja je da se utvrdi postojanje i stepen depresije i anksioznosti kod pacijenata sa IBS i prisutnom srčanom insuficijencijom kao i da li postoji razlika u stepenu anksioznosti i depresivnosti između pacijenata sa IBS, sa i bez prisutne srčane insuficijencije.

Materijal i metode: Da bi se utvrdilo eventualno postojanje i stepen depresije kod pacijenata sa IBS korišćen je HADS (Hospital Anxiety and Depression Scale) preveden na srpski jezik, koji sadrži sedam pitanja specifičnih za anksioznost i sedam pitanja specifičnih za depresiju. Anketirano je 75 pacijenata kod kojih je dokazana IBS. Pacijenti su podeljeni u dve grupe u zavisnosti od prisutne srčane insuficijencije (EF <50%). Podaci su analizirani standardnim statističkim metodama.

Rezultati: Ispitivanjem je dokazano je da je stepen depresivnosti i anksioznosti u populaciji obolelih od IBS viši nego u opštoj populaciji, a značajno je viši u pacijenata sa prisutnom srčanom insuficijencijom. Depresivnost je nađena kod 46,66% bolesnika sa srčanom insuficijencijom i 17,33% bolesnika bez prisutne srčane insuficijencije (2,69 puta manje). Anksioznost je verifikovana u 33,33% bolesnika sa srčanom insuficijencijom i IBS i u 14,66% bolesnika bez srčane insuficijencije. **Zaključak:** Depresija, kao i anksioznost su učestalije kod pacijenata sa IBS i srčanom insuficijencijom u odnosu na pacijente bez prisutne srčane insuficijencije i ova razlika je statistički značajna.

Ključne reči: depresija, anksioznost, ishemijska bolest srca, srčana insuficijencija.

ANXIETY AND DEPRESSION IN PATIENTS WITH ISHEMIC HEART DISEASE AND HEART FAILURE

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Introduction: In recent decades there have appeared studies indicating the important role of psychological factors (primarily depression and anxiety) as etiological factors for ischemic heart disease, and factors that may influence the prognosis of the disease.

The Aim: The aim of the study was to determine the existence and level of depression and anxiety in patients with IBS and present heart failure and whether there is a difference in the level of anxiety and depression between patients with IHD, with or without the presence of heart failure.

Materials and methods: To determine the possible existence and level of depression in patients with IHD we used the HADS (Hospital Anxiety and Depression Scale) translated into Serbian, which contains seven questions specific to anxiety and seven questions specific to depression. We surveyed 75 patients with proved IHD. Patients were divided into two groups depending on the presence of heart failure (EF <50%). The data were analyzed by the standard statistical methods.

Results: The study has demonstrated that the level of depression and anxiety in the population of patients with IHD is higher than in the general population, and significantly higher in patients with heart failure present. Depression was found in 46.66% of patients with heart failure and 17.33% of patients without the presence of heart failure (2.69 times less). Anxiety was detected in 33.33% of patients with heart failure and IHD and in 14.66% of patients without heart failure.

Conclusion: Depression and anxiety are more frequent in patients with IHD and heart failure compared to patients without the presence of heart failure, and this difference was statistically significant.

Key words: depression, anxiety, ischemic heart disease, heart failure.

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Uvod: Metabolički sindrom predstavlja skup faktora rizika za nastanak kardiovaskularnih oboljenja i tipa II dijabetesa. Mnogobrojna istraživanja o metaboličkom sindromu svedoče o njegovoj važnosti i uticaju na razvoj kardiovaskularne bolesti.

Cilj: Cilj rada je da se utvrdi da li je postojanje metaboličkog sindroma uvek povezano sa promenama na epikardnim krvnim sudovima.

Pacijenti i metode: Sprovedena je pilot studija kojom je obuhvaćeno 40 pacijenata sa metaboličkim sindromom, lečenih u Institutu za kardiovaskularne bolesti Vojvodine u Sremskoj Kamenici (januar 2011.- decembar 2011.). Ispitivani pacijenti su podeljeni u dve grupe, na osnovu postojanja promene na krvnim sudovima, utvrđene selektivnom koronarografijom. Prvu grupu činili su pacijenti sa simptomima koronarne bolesti bez prisutnih promena, a drugu sa prisutnim promenama na krvnim sudovima koje su zbrinute implantacijom stentova.

Rezultati: Između dve grupe ispitanika utvrđena je statistički značajna razlika u vrednostima glikemije našte (8.6mmol/l vs 11.13mmol/l; $p=0.048$) koje su bile zantno više kod osoba sa koronarnom bolešću. Statistički značajna razlika nije utvrđena u vrednostima triglicerida (2.54mmol/l vs 2.96mmol/l; $p=0.219$), vrednosti sistolnog (136 mmHg vs 152 mmHg; $p=0.071$) i dijasolnog krvnog pritiska (85 mmHg vs 87 mmHg; $p=0.347$). Statistički značajna povezanost ehokardiografskih parametara, dimenzije interventrikularnog septuma leve komore (1.2 mm vs 1.1 mm; $p=0.160$) i zadnjeg zida leve komore (1.2 mm vs 1.1 mm; $p=0.137$), između dve grupe ispitanika nije utvrđena.

Zaključak: Vrednost glukoze našte dominantan je parametar koji učestvuje u nastanku koronarne bolesti kod osoba sa metaboličkim sindromom. Vrednost triglicerida, holesterola, sistolnog i dijasolnog pritiska, indeksa telesne mase, dimenzije interventrikularnog septuma i zadnjeg zida leve komore ne utiču na pojavu koronarne bolesti kod osoba sa metaboličkim sindromom.

ključne reči: metabolički sindrom, koronarna bolest, dijabetes melitus.

DOES THE METABOLIC SYNDROME ALWAYS MEAN CORONARY ARTERY DISEASE?

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Introduction: The metabolic syndrome is a name for a group of risk factors that can cause the development of coronary artery diseases as well as the type II diabetes. Multiple researches about the metabolic syndrome carried out, testify about its importance as well as they show the impact of this syndrome on the development of coronary artery disease.

The Aim: The main purpose of this work is to determine whether the presence of the metabolic syndrome is necessarily related to the possible abnormalities on the epicardial blood vessels.

Materials and Methods: Forty patients with metabolic syndrome treated in the Institute for cardiovascular diseases of Vojvodina in Sremska Kamenica where subjected to examinations that where part of the pilot study (january 2011.- december 2011.). The patients tested where divided into two groups, based on the presence of the abnormalities on the blood vessels, which was determined with coronary arteriography. In the first group where the ones with the symptoms of the coronary disease without abnormalities on the blood vessels, and in the second group where the patients with the abnormalities that where treated with stent implantations.

Results: Among the two group of the patients tested it has been detected a significant difference in the values of the fasting blood glucose (8.6 mmol/l vs 11.13 mmol/l; $p=0.048$). Those values where much higher among the patients with the coronary disease. When it comes to the level of triglyceride (2.54 mmol/l vs 2.96 mmol/l; $p=0.219$), values of the systolic (136 mmHg vs 152 mmHg; $p=0.071$) and diastolic (85 mmHg vs 87 mmHg; $p=0.347$) blood pressure, there was no statistically significant difference. Also, it hasn't been detected a statistically significant relation of the echocardiographic parameters-wall thickening of intraventricular septum (1.2 mm vs 1.1 mm; $p=0.160$) and posterior wall left ventriculae (1.2 mm vs 1.1 mm; $p=0.137$) between the two group of patients.

Conclusion: Fasting blood glucose value is the dominant parameter when it comes to the development of the coronary disease within the persons with the metabolic syndrome. The level of triglyceride, cholesterol level, body mass index, values of the systolic and diastolic blood pressure, wall thickening of intraventricular septum and posterior wall left ventriculae have no impact on the development of the coronary disease within the patients with the metabolic syndrome

Key words: metabolic syndrome, coronary disease, diabetes mellitus.

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Uvod: Atrijalna fibrilacija je aritmija uzrokovana multiplim faktorima što čini njeno lečenje ponekad kompleksnim. Uobičajeni pratioci atrijalne fibrilacije su arterijska hipertenzija i koronarna bolest srca.

Cilj: Cilj ovog rada je da se utvrdi učestalost atrijalne fibrilacije kod hospitalizovanih pacijenata, njihove kliničke karakteristike, tok i ishod lečenja.

Materijal i metode: Rađena je retrospektivna studija i korišćene su istorije bolesti pacijenata hospitalizovanih u periodu januar-decembar 2010. godine na internom odeljenju KBC Priština -Gračanica. Elektrokardiografski kod svakog pacijenta detektovana je atrijalna fibrilacija i analizirani su klinički, biohemijski i ehokardiografski parametri.

Rezultati: Od ukupno 729 hospitaizovanih pacijenata tokom 2010 god. kod 99 (13,5%) zabeležena je atrijalna fibrilacija (AF). Srednja starosna dob pacijenata iznosila je $70 \pm 9,75$ god., od toga 62 % su stariji od 70 godina. Po polnoj strukturi 42 % muškaraca i 58% žena. Od epidemioloških podataka kod 66 % zabeležena je hipertenzija, 14% je imalo hroničnu obstruktivnu bolest pluća (HOBP), 19 % diabetes mellitus, 54 % srčanu insuficijenciju, a kod 33% dijagnostikovana ishemijska bolest srca (IBS). Cerebrovaskularni insult (CVI) je dijagnostikovao kod 14 % pacijenata. Kod 28 (28%) od 99 uspostavljen je regularni sinusni ritam (medikamentna konverzija). Kod 5 pacijenata zabeležen je letalni ishod. Na antikoagulantnoj terapiji je bilo 43% pacijenata. Srednja vrednost levog atrijuma (LA) izmerenog ehokardiografski je $45,4 \pm 5,8$.

Zaključak: Učestalost atrijalne fibrilacije raste sa starošću pacijenata. Najčešći prisutni komorbiditeti u našem istraživanju su arterijska hipertenzija, ishemijska bolest srca i srčana insuficijencija.

ključne reči: Atrijalna fibrilacija, komorbiditet, učestalost.

CLINICAL CHARACTERISTICS OF PATIENTS WITH ATRIAL FIBRILLATION AND COMORBIDITIES

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Introduction: Atrial fibrillation is the arrhythmia caused by multiple factors, which makes its treatment sometimes complex. The usual companions of atrial fibrillation are hypertension and coronary heart disease.

The Aim: The aim of this study was to determine the incidence of atrial fibrillation in hospitalized patients, clinical features, course and outcome of treatment.

Materials and Methods: The study is a retrospective study and used the medical records of patients hospitalized between January and December 2010. The Department of Internal Hospital Centre in Gračanica. ECG in each patient was detected in the atrial fibrilacija and analyzed the clinical, biochemical and echocardiographic parameters.

Results: Of the 729 hospitalized patients during 2010 years in 99 (13.5%) had atrial fibrillation (AF). The mean age of patients was 70 ± 9.75 years., of which 62% were older than 70 years. By sex structure 42% was men and 58% women. From epidemiological data observed in 66% of hypertension, 14% had chronic obstructive pulmonary disease (COPD), diabetes mellitus 19%, 54% of heart failure, and in 33% of diagnosed coronary heart disease (IHD). Cerebrovascular insult (CVI) was diagnosed in 14% of patients. In 28 (28%) of 99 was established by the regular sinus rhythm (pharmacological conversion). In 5 patients reported a lethal outcome. Anticoagulant therapy was 43% of patients. The mean left atrium (LA) measured by echocardiography was 45.4 ± 5.8 .

Conclusion: The incidence of atrial fibrillation increases with age of patients. The most common comorbidities are present in our study were hypertension, ischemic heart disease and heart failure.

Keywords: Atrial fibrillation, comorbidity, frequency.

**PROCENA MIOKARDNE PERFUZIJE NAKON PRIMARNE PERKUTANE KORONARNE INTERVENCIJE:
KORELACIJA INDEKSA MIKROCIRKULATORNE REZISTENCIJE SA ANGIOGRAFSKOM
I ELEKTROKARDIOGRAFSKOM METODOM**

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Uvod: Primarna perkutana koronarna intervencija (pPCI) je preferirani način lečenja bolesnika sa akutnim infarktom miokarda sa elevacijom ST segmenta (ST elevation myocardial infarction-STEMI). Pomoću pPCI uspostavlja se koronarna cirkulacija i miokardna perfuzija. Uspešnost pPCI se procenjuje angiografski, elektrokardiografski i ehokardiografski. Cilj ove studije je da se utvrdi da li nova, fiziološka metoda za direktno merenje rezistencije mikrocirkulacije koreliše sa standardnim metodama za procenu miokardne reperfuzije i da se odrede vrednosti indeksa mikrocirkulatorne rezistencije koje su potencijalno udružene sa miokardnom reperfuzijom

Cilj rada: Cilj rada je da se proceni miokardna perfuzija nakon pPCI i ispitivanje korelacije indeksa mikrocirkulatorne rezistencije sa angiografskom i elektrokardiografskom metodom

Materijal i metode: U istraživanju je učestvovalo 37 pacijenata, od toga muškaraca 21 a žena 16. Prosečna starosna dob je 55±9 godina. Kriterijum po kome su pacijenti izabrani jeste da su imali STEMI lečen sa pPCI. Ovi pacijenti su hemodinamski stabilni, bez AV-bloкова I bez hronične obstruktivne bolesti pluća. Na osnovu podataka ovih pacijenata obrađeni su njihovi elektrokardiografski nalazi, podaci o angiografiji, i indeks mikrocirkulatorne rezistencije.

Rezultati: Utvrđeno je postojanje korelacije između indeksa mikrocirkulatorne rezistencije i stepena ispiranja kontrasta (MBG) ($p=0,414$, $p=0,011$), dok korelacija između ST rezolucije i MBG nije dokazana. Određena je vrednost IMR-a (cut of point) u odnosu na MBG.

Zaključak: Zaključeno je da IMR kao noviji fiziološki parametar za procenu perfuzije miokarda koreliše sa standardnim angiografskim pokazateljima miokardne perfuzije. Takođe, određena je vrednost IMR-a koja je udružena se reperfuzijom miokarda, sa boljom prognozom i sa manjom smrtnošću.

Gljučne reči: primarna perkutna koronarna intervencija, indeks mikrocirkulatorne rezistencije, perfuzija miokarda

**ASSESSMENT OF MYOCARDIAL PERFUSION AFTER PRIMARY PERCUTANEOUS INTERVENTION:
CORRELATION OF THE INDEX OF MICROCIRCULATORY RESISTANCE WITH ANGIOGRAPHIC
AND ELECTROCARDIOGRAPHIC METHOD**

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Introduction: Primary percutaneous intervention (pPCI) is the preferred treatment for patients with acute myocardial infarction with ST-segment elevation (STEMI). Success of pPCI was assessed by myocardial blush grade (MBG), resolution of ST-segment elevation and index of microcirculatory resistance (IMR). Objective of this study was to determine whether new physiological method for direct measurement of microcirculatory resistance correlates with the standard methods of assessment and myocardial reperfusion and to determine the cut-off point of IMR for the best diagnostic performance compared to MBG.

The Aim: The aim of this study is to assess myocardial perfusion after pPCI and examining the correlation of the index of microcirculatory resistance with angiographic and electrocardiographic method.

Materials and Methods: The study included 37 patients, 21 men and 16 women. The average age was 55±9 years. The consecutive patients with STEMI treated by pPCI were included in the study. These patients were hemodynamically stable, without HOBP or advanced AV block.

Results: Correlations between index of microcirculatory resistance and the myocardial blush grade (MBG) was found ($p=0,414$, $p=0,01$), while the correlation between ST-resolution and MBG has not been proven, is not statistically significant. Also, determined the values (cut of point) of microcirculatory resistance compared to MBG

Conclusion: It is concluded that IMR as a new physiological parameter for assessment of myocardial perfusion correlate with standard angiographic indices of myocardial perfusion. Also, is determined the value of IMR and it is associated to the reperfusion of myocardium, with a better prognosis and low mortality.

Key words: primary percutaneous intervention, index of microcirculatory resistance, myocardial perfusion

**PREDIKTORI BOLNIČKOG MORTALITETA U PACIJENATA SA PRVIM PREDNJIM INFARKTOM MIOKARDA
SA ST ELEVACIJOM LEČENIH PRIMARNOM PERKUTANOM KORONARNOM INTERVENCIJOM**

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Uvod: Primarna perkutana koronarna intervencija (pPCI) predstavlja metodu izbora u lečenju bolesnika sa prvim prednjim infarktom miokarda sa ST elevacijom (STEMI). Prediktori bolničkog mortaliteta kod pacijenata sa STEMI lečenih pPCI nisu jasno utvrđeni.

Cilj: Ispitivanje prediktora bolničkog mortaliteta kod pacijenata sa prvim prednjim STEMI lečenih pPCI.

Materijal i metodi: Naša studija obuhvata populaciju od 70 pacijenata sa prvim prednjim STEMI lečenih u Urgentnom centru.

Rezultati: U ispitivanoj populaciji bilo je 62,9% muškaraca. Prosečna starost je bila 60,37±12,22 godina. Srčanu insuficijenciju pri prijemu imalo je 22,9%, reinfarkt u toku hospitalizacije 2,9%, a višesudovnu koronarnu bolest 58% pacijenata. Incidenca bolničkog mortaliteta bila je 8,6%. Multivarijantnom logističkom regresijom utvrđeno je da su nezavisni prediktori bolničkog mortaliteta bili kreatin kinaza (CK) (OR=1,001, 95% CI, 1,000-1,001, $p=0,026$) i ejectiona frakcija leve komore (EFLK) (OR=0,807, 95% CI 0,665-0,979, $p=0,030$).

Zaključak: Rezultati naše studije pokazuju da su vrednosti CK i EFLK nezavisni prediktori bolničkog mortaliteta u pacijenata sa STEMI lečenih pPCI.

Gljučne reči: STEMI, primarna perkutana koronarna intervencija, prognoza.

**PREDICTORS OF IN-HOSPITAL MORTALITY OF PATIENTS WITH FIRST ANTERIOR WALL ST-ELEVATION
MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION**

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Introduction: Primary percutaneous coronary intervention (pPCI) has become the treatment of choice for patients with first anterior ST-elevation myocardial infarction (STEMI). Predictors of in-hospital mortality are not well established.

The Aim: We aimed to identify the predictors of in-hospital mortality of patients undergoing emergent PCI for first anterior wall STEMI

Materials and Methods: A retrospective study of 70 patients referred for emergent pPCI for STEMI to a single tertiary referral center was performed

Results: The average age was 60,37±12,22 years. Patient were 62,9% male, 22,9% patients had heart failure Killip class>1 at admission, 2,9% reinfarction during hospitalisation and 58% multivessel disease. In-hospital mortality rate was 8,6%. Multivariate predictors of in-hospital mortality were creatin kinase (CK) (OR=1,001, 95% CI, 1,000-1,001, $p=0,026$) and ejection fraction of the left ventricle (EFLV) (OR=0,807, 95% CI 0,665-0,979, $p=0,030$).

Conclusion: Our results show that creatin kinase level and left ventricle ejection fraction are independent predictors of in-hospital mortality for patients with STEMI undergoing pPCI.

Key words: STEMI, Primary percutaneous coronary intervention, prognosis

VREMENSKI INTERVALI KAŠNENJA BOLESNIKA SA AKUTNIM INFARKTOM MIOKARDA NA PRIMARNU PCI PROCEDURU

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Uvod: Vreme trajanja ishemijske kod bolesnika sa STEMI je važan prediktor neželjenih kardiovaskularnih događaja. Jedan od ciljeva u najranijoj fazi ove bolesti je skraćeno vreme od početka simptoma do reperfuzije arterije odgovorne za infarkt.

Cilj: Opisivanje vremena kašnjenja i administraciju antiagregacione terapije, kao i faktore od uticaja.

Materijal i metode: U ovu retrospektivnu opservacionu studiju uključeno je 976 sukcesivnih bolesnika sa STEMI, iz Beograda, koji su od marta 2010-aprila 2011. godine lečeni primarnom PCI procedurom u KCS- u. Od bolesnika, putem anketa i medicinske dokumentacije, prikupljeni su podaci o vremenima kašnjenja do sale i administraciji antitrombotične terapije.

Rezultati: Medijana ukupnog vremena kašnjenja populacije je 240 minuta. Od toga, 60 minuta je kašnjenje vezano za bolesnika, a ostatak je sistemsko kašnjenje. U odnosu na muškarce, žene imaju duže kašnjenje vezano za bolesnika (90 nasuprot 60 minuta) i duže ukupno vreme trajanja ishemijske (287 nasuprot 225 minuta). Dijabetičari takođe imaju duže ukupno ishemijsko vreme (290 minuta) u poređenju sa nedijabetičarima (235 minuta). Bolesnici koji su pozivali hitnu pomoć imaju kraća vremena kašnjenja (45 nasuprot 120 minuta) kao i ukupno vreme trajanja ishemijske (230 nasuprot 270 minuta), u poređenju sa bolesnicima koji se sami prezentuju u zdravstvenu ustanovu. Žene su ređe dobijale klopidoget od muškaraca (26,9% nasuprot 38,6%).

Zaključci: Studija je identifikovala dve posebno vulnerable grupe bolesnika sa STEMI: žene i dijabetičare. Ovi preliminarni podaci ukazuju potrebu za brojnim poboljšanjima sistema u cilju skraćivanja vremena kašnjenja bolesnika, čime bi efekti blagovremene reperfuzije bili bolji.

KLjučne reči: Srbija, vreme kašnjenja, infarkt miokarda.

TIME DELAYS OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION IN THE PRIMARY PCI PROCEDURE

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Introduction: The duration of ischemia in patients with STEMI is an important predictor of adverse cardiovascular events. One of the goals in the earliest stages of this disease is to shorten the time from onset of symptoms to reperfusion artery.

The Aim: To describe the time delays and antiplatelet therapy administration, and factors that influence them.

Materials and Methods: In this retrospective observational study included 976 consecutive patients with STEMI, from Belgrade, who from March 2010- April 2011. was treated by primary PCI. Of the patients using a questionnaire and medical records, data were collected on time delay to sale and administration of antiplatelet therapy.

Results: The median total delay of the population was 240 minutes. Of these, 60 minute delay is related to the patient, and the rest of the system delay. Compared to men, women had longer delays related to the patients (90: 60 minutes) and longer total duration of ischemia (287: 255 minutes). Diabetics also have a longer total ischemic time (290 minutes) compared with nondiabetics (235 minutes). Patients who called an ambulance had a shorter time delay (45: 120 minutes), total duration of ischemia (230: 270 minutes) compared with patients who present themselves to a hospital. Women receiving clopidogrel were less likely than men (26.9%: 38.6%).

Conclusion: This study has identified two particularly vulnerable groups of patients with STEMI: women and diabetics. These preliminary data suggest the need for numerous improvements in order to shorten the delay time of patients.

Keywords: Serbia, time delays, myocardial infarction.

EKSUDATIVNI PERIKARDITIS I TAMPONADA SRCA: ZNAČAJ EPIKARDNOG HALO FENOMENA

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Uvod: Epicardni halo fenomen je radiološki znak koji predstavlja granicu srčane senke. Eksperimenti i kliničke studije su pokazali da intenzitet znaka korelira sa veličinom perikardnog izliva.

Cilj: Cilj naše studije je bio da utvrdimo prevalencu epikardnog halo fenomena kao markera za sigurnu zonu kod perikardiocenteze i plasranju perikardnog drenažnog katetera.

Materijali i metode: Grupa pacijenata sa perikardnim izlivom i srčanom tamponadom je činila 39 osoba i grupu sa bolestima srca koju su činile 31 osoba koje su bez perikardnog izliva. Tri ispitivača su ocenjivali znak u PA/lateralnoj fluoroskopiji kao: negativan fenomen- ocena 0, slabo pozitivan fenomen- ocena 0.5, srednje pozitivan- ocena 1, ili jasan fenomen- ocena 2.

Rezultati: Značajna povezanost postoji između halo fenomena sa srčanom frekvencom, niskom QRS voltažom, prisustvom električnog alternansa i perikardnim izlivom izmerenim ehokardiografskim pregledom. Značajna korelacija postoji i sa BMI i starošću pacijenata samo u lateralnom profilu i sa volumenom perikardnog izliva samo u posteriorno-anteriornom profilu. Senzitivnost znaka kod detekcije perikardnog izliva je 100% u posteriorno-anteriornom i 99% u lateralnom profilu. I kao što je očekivano, specifičnost halo fenomena je niža 58.6% u posteriorno-anteriornom profilu, i 40.4% u lateralnom.

Zaključak: Intenzitet epikardnog halo znaka je visoko senzitivna za detekciju perikardnog izliva i pozitivno korelira sa volumenom perikardnog izliva na ehokardiografiji, srčanom frekvencom, BMI. Stoga, halo fenomen je skoro univerzalno prisutan kod pacijenata sa velikim perikardnim izlivom i dovoljno intezivan da bi se sa sigurnošću koristi kao vodič za perikardiocentezu.

KLjučne reči: perikarditis, perikardium, perikardiocenteza

PERICARDITIS EXUDATIVA AND HEART TAMPONADE: SIGNIFICANT OF EPIKARDIAL HALO PHENOMENON

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Introduction: Epicardial halo phenomenon is a radiological sign depicting the borders of the heart shadow. This sign is frequently present in patients with pericardial effusion and therefore potentially useful for the guidance of pericardiocentesis.

Aim: The aim of this study was to investigate the prevalence of the epicardial halo phenomenon as the marker of the safety zone for pericardiocentesis and placement of pericardial drainage catheter.

Materials and methods: The group of patients with pericardial effusion comprised 39 patient and coronary artery disease group included 31 patient with no pericardial effusion. Three graders evaluated the sign in PA/lateral fluoroscopy as: absent – grade 0, indistinct – 0.5, clear – 1, or intensive – 2.

Results: The sign correlated well with HR, low QRS voltage, presence of electrical alternans, and pericardial effusion diastolic minimum and maximum in echocardiography in both angiographic views. Correlation with BMI and age was significant only in the lateral view and with PE volume only in the PA view. The sensitivity of the sign for the detection of pericardial effusion was 100% in PA and 99.0% in lateral views. As expected, specificity of the sign was rather low 58.6% in PA view, and 40.4% in the lateral view

Conclusion: The epicardial halo sign was highly sensitive for the detection of pericardial and correlated well in at least one angiographic projection with the volume of pericardial effusion, HR, age, BMI, and pericardial effusion size in echocardiography. Therefore the sign is almost universally present in patients with large pericardial effusion and intensive enough to be used for fluoroscopic guidance of pericardiocentesis.

Key words: pericarditis, pericardium, pericardiocentesis

PROGNOŠTIČKI ZNAČAJ VIJABILNOG MIOKARDA KOD REVASKULARIZOVANIH I MEDIKAMENTNO LEČENIH PACIJENATA

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Uvod: Ishemijska kardiomiopatija je oboljenje koje se karakteriše funkcionalnom slabošću srčanog mišića kao posledicom gubitka ili oštećenja srčanog tkiva (>20%) usled akutne ili hronične ishemije. Koronarna bolest čini patofiziološki supstrat ovog oboljenja, a ona je zapravo i uzrok razvoja hronične srčane insuficijencije u 70% slučajeva. Otkrivanje reverzibilne disfunkcije ima klinički i prognostički značaj.

Cilj: Cilj ovog rada je ispitati kakav je prognostički značaj vijabilnog miokarda kod pacijenata koji su lečeni revaskularizacijom miokarda u odnosu na medikamentozno lečene pacijente.

Materijal i metode: Pratile smo 83 pacijenta (60 muškaraca, 23 žene), prosečne starosti 61,1 ± 9,2 godina, sa dijagnozom koronarne arterijske bolesti i disfunkcijom leve komore, kojima je rađen dobutaminski test. Poštovan je standardni protokol dobutaminskog testa. Registrovana je pojava neželjenog događaja u vremenu praćenja pacijenata.

Rezultati: Registrovana je pojava 14 (35,9%) neželjenih događaja u grupi od 39 pacijenata sa nevijabilnim miokardom dijagnostikovanim dobutaminskim testom i 14 (31,8%) neželjenih događaja u grupi od 44 pacijenta sa vijabilnim miokardom. Kod pacijenata koji su lečeni revaskularizacijom zabeleženo je 5 (29,4%) neželjenih događaja, a u grupi medikamentno lečenih 23 (34,8%) neželjenih događaja.

Zaključak: U našem radu nije postojala statistički značajna povezanost između postojanja vijabilnog miokarda i manje incidence neželjenih događaja. Takođe, nije postojala značajna povezanost između načina lečenja i incidence neželjenih događaja.

Ključne reči: koronarna bolest, dobutaminski test, vijabilnost miokarda

PROGNOSTIC VALUE OF VIABLE MYOCARDIUM IN REVASCULARIZED AND MEDICALLY TREATED PATIENTS

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Introduction: Ischemic cardiomyopathy is a disease characterized by a functional weakness of the heart muscle as a consequence of loss of or damage to cardiac tissue (> 20%) due to acute or chronic ischemia. Coronary heart disease makes the pathophysiological substrate of this disease, and it is actually the cause of chronic heart failure in 70% of cases. Detection of reversible dysfunction has clinical and prognostic significance.

The Aim: The aim of this study is to determine prognostic value of viable myocardium in revascularized compared to medically treated patients.

Material and methods: We followed 83 patients (60 males, 23 females), mean age 61.1 ± 9.2 years, diagnosed with coronary artery disease and left ventricular dysfunction, who underwent dobutamine test. We used the standard protocol of dobutamine test. We registered the appearance of unwanted events during monitoring of patients.

Results: We registered the appearance of 14 (35.9%) unwanted events in a group of 39 patients with dobutamine test diagnosed nonviable myocardium and 14 (31.8%) unwanted events in a group of 44 patients with viable myocardium. In patients who were treated with revascularization was noted 5 (29.4%) unwanted events and in medically treated group, 23 (34.8%) of unwanted events.

Conclusion: In our study there was no statistically significant interaction between the presence of viable myocardium and less incidence of unwanted events. Also, there was no significant association between the treatment and the incidence of unwanted events.

Key word: coronary artery disease, dobutamine test, myocardial viability

PROCENA ELASTIČNOSTI LEVE KOMORE I AORTE U BOLESNIKA SA PRVIM INFARKTOM MIOKARDA

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Uvod: Međusobni odnos srca i sistemske vaskulature, ventrikulo-arterijalna spojnica (celina), je centralna odrednica funkcionisanja kardiovaskularnog sistema. Izmena tekture i funkcije zida leve komore (LK) oštećenog miokardnim infarktom vodi smanjenju globalne kontraktilnosti, promenama elastičnosti arterijske cirkulacije i ventrikuloarterijske spojnice.

Cilj: Cilj studije je utvrđivanje odstupanja ventrikuloarterijalnog indeksa od normalnih vrednosti posle preležanog infarkta miokarda i promene ventrikuloarterijske spojnice kod bolesnika sa sistolnom ili dijastolnom disfunkcijom.

Materijal i metode: Populaciju čini 64 bolesnika sa preležanim prvim infarktom miokarda 6 do 12 meseci pre uključivanja u studiju. Ventrikuloarterijalna spojnica je procenjena pomoću indeksa Ea/Ees. Ea (arterijska elastanca) i Ees (endsistolna ventrikularna elastanca) su izračunate koristeći vrednosti sistolnog i dijastolnog krvnog pritiska merenog ručnim sfigmomanometrom, ehokardiografski izračunatog udarnog volumena, ejeckione frakcije LK i odnosa između aortnog preejekcionog vremena i vremena trajanja sistole.

Rezultati: Primećuju se razlike sistolnih parametara kod ispitanih sa dijastolnom u odnosu na sistolnu disfunkciju: ejeckiona frakcija LK (p<0.05), LVESD (p<0.05), LVEDD (p<0.05), d. volumen LK (p<0.05), s. volumen LK/BSA (p<0.05), kinetika zida LK (p<0.05), kod parametara dijastolne funkcije odstupanje je u brzini propagacije LK (p<0.05). Parametri procene ventrikuloarterijalne spojnice odstupaju u Ees (p<0.05) i Ea/Ees (p<0.05). Uočena je povezanost između ventrikuloarterijalnog indeksa Ea/Ees sa ejeckionom frakcijom (p<0.05) i indeksom kinetike zidova LK (p<0.05).

Zaključci: Vrednosti Ea/Ees su veće kod ispitanih sa infarktom miokarda nego kod zdrave populacije. Ea/Ees je nepovoljniji kod onih sa sistolnom disfunkcijom LK. Ea/Ees korelira sa ejeckionom frakcijom i indeksom kinetike zidova LK.

Ključne reči: ventrikuloarterijska spojnica, arterijska krutost, infarkt miokarda, sistolna disfunkcija

ESTIMATION OF ELASTICITY OF THE LEFT VENTRICLE AND AORTA IN PATIENTS WITH FIRST MYOCARDIAL INFARCTION

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Introduction: Heart and systemic vasculature interaction, termed ventricular-arterial coupling, is a central determinant of cardiovascular performance. Changes in left ventricle (LV) texture and wall features caused by myocardial infarction lead to global contractility reduction, arterial circulation elasticity and ventricular-arterial coupling changes.

The Aim: The aim was to determine ventricular-arterial index deviations from normal values after myocardial infarction and changes of ventricular-arterial coupling in patients with systolic and diastolic dysfunction.

Material and Methods: Population contains 64 patients with first myocardial infarction 6 to 12 months before study inclusion. Ventricular-arterial coupling was estimated by Ea/Ees index. Ea (arterial elastance) and Ees (endsystolic ventricular elastance) were calculated using systolic and diastolic blood pressure values measured by manual sphygmomanometer, echocardiographically calculated stroke volume, LV ejection fraction and ratio between aortic preejection time and systolic time.

Results: Differences were in systolic parameters in patients with diastolic compared to systolic dysfunction: LV ejection fraction (p<0.05), LVESD (p<0.05), LVEDD (p<0.05), d. LV volume (p<0.05), s. LV volume/BSA (p<0.05), LV wall motion (p<0.05), diastolic function parameters had deviation in LV propagation speed (p<0.05). Ventricular-arterial coupling parameters differed in Ees (p<0.05) and Ea/Ees (p<0.05). Ea/Ees correlates with LV ejection fraction (p<0.05) and LV wall kinetics index (p<0.05).

Conclusion: Ea/Ees values were increased in patients with myocardial infarction unlike healthy individuals. Ea/Ees was worse in those with LV systolic dysfunction. Ea/Ees correlated with ejection fraction and LV wall kinetics index.

Keywords: ventricular-arterial coupling, arterial stiffness, myocardial infarction, systolic dysfunction

POVEZANOST METABOLIČKOG SINDROMA SA OPORAVKOM SRČANE FREKVENCE

NAKON TESTA FIZIČKOG OPTEREĆENJA

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Uvod: Metabolički sindrom predstavlja važan faktor rizika za oboljevanje od kardiovaskularnih bolesti i DM 2, dok je oporavak srčane frekvencije nakon testa fizičkog opterećenja važan pokazatelj rizika za nastanak kardiovaskularnih bolesti i umiranja uopšte i predstavlja važnu neinvazivnu dijagnostičku proceduru.

Cilj: ovog rada je da se ispita povezanost metaboličkog sindroma kao faktora rizika za nastanak kardiovaskularnih oboljenja i oporavka srčane frekvencije nakon testa fizičkog opterećenja kao važnog prognostičkog parametra.

Materijal i metode: 61 konsekutivni bolesnik je bio podvrgnut testu fizičkog opterećenja (stres-ehokardiografski test po Bruce protokolu). Pre testa, od svakog bolesnika intervjuom i uvidom u medicinsku dokumentaciju dobijeni su opšti podaci, podaci o faktorima rizika i njihovoj terapiji, a zatim im je izmeren obim struka, krvni pritisak i srčana frekvencija. Po završetku test ponovo je meren krvni pritisak i srčana frekvencija u prvom minutu odmora.

Rezultati: U ispitivanoj populaciji 70,5% ispitanika je imalo metabolički sindrom pri čemu su najzastupljeniji kriterijumi bili hipertenzija (83,6%) i obim struka – centralna gojaznost (73,77%). Rezultati stres-ehokardiografskog testa su bili pozitivni kod 36,1% ispitanika, dok je spor oporavak srčane frekvencije (≤ 18) bio zabeležen kod 21,3% ispitanika. Ispitanici sa metaboličkim sindromom su imali sporiji oporavak srčane frekvencije u odnosu na ispitanike bez metaboličkog sindroma ali bez statističke značajnosti.

Zaključak: Rezultati ove studije su pokazali da metabolički sindrom nema uticaja na oporavak srčane frekvencije nakon testa fizičkog opterećenja, ali da je gojaznost (izražena kao obim struka), kao jedan od kriterijuma metaboličkog sindroma, nezavistan prediktor oporavka srčane frekvencije.

Ključne reči: metabolički sindrom, oporavak srčane frekvencije, kardiovaskularne bolesti, gojaznost.

PROCENA AUTONOMNE DISFUNKCIJE KOD PACIJENATA SA VAZOVAGALNOM SINKOPOM I ORTOSTATSKOM HIPOTENZIJOM KORIŠĆENJEM KARDIOVASKULARNIH REFLEKS TESTOVA

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Uvod: Sinkopa je prolazni, kratkotrajni gubitak svesti i položajnog tonusa nastao usled globalne hipoperfuzije moždanog tkiva, uz spontan i potpun oporavak.

Cilj rada: Uvrđivanje tipa i stepena disfunkcije autonomnog nervnog sistema (ANS) kod pacijenata sa vazovagalnom sinkopom i ortostatskom hipotenzijom (OH).

Materijal i metode: Ispitivana grupa se sastojala od kontrolne grupe, osoba sa sinkopom i osoba sa sinkopom i OH. Pacijenti su testirani korišćenjem kardiovaskularnih refleks testova po Ewingu. Na osnovu rezultata autonomna disfunkcija je klasifikovana kao: disfunkcija parasimpatikusa, disfunkcija simpatikusa ili kompletna autonomna disfunkcija.

Rezultati: Rezultati testa ortostatske hipotenzije češće su bili abnormalni kod osoba sa sinkopom i osoba sa sinkopom i OH nego u kontrolnoj grupi. Funkcija simpatikusa je bila oštećena kod najvećeg broja osoba sa sinkopom i OH (86,7%) i samo kod 67,2% zdravih osoba. Rezultati testa dubokog disanja su bili abnormalni u 40,0% osoba sa sinkopom i OH. Definitivno oštećenje parasimpatikusa je imalo 18,4% ispitanika sa sinkopom, 40,0% ispitanika sa sinkopom i OH i 6,9% zdravih ispitanika. Autonomna disfunkcija otkrivena je kod 80,0% osoba sa sinkopom i OH. Teška autonomna disfunkcija se najčešće (60,0%) javljala u grupi ispitanika sa sinkopom i OH, dok u kontrolnoj grupi nije postojala.

Zaključak: Rezultati pokazuju da osobe sa sinkopom češće imaju oštećenje ANS nego zdrave osobe. Autonomna disfunkcija se češće javlja i težeg je stepena kod osoba koje istovremeno imaju sinkopu i OH, nego kod osoba koje imaju samo vazovagalnu sinkopu.

Ključne reči: sinkopa, ortostatska hipotenzija, kardiovaskularni refleks testovi, autonomna disfunkcija

METABOLIC SYNDROME AND HEART RATE RECOVERY AFTER TREADMILL TEST A COMPLEX LINK?

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Introduction: Metabolic syndrome is important risk factor for cardiovascular diseases and DM 2, while heart rate recovery after treadmill test is important prognostic marker of cardiovascular morbidity and all-cause mortality and it represents usefull non-invasive diagnostic procedure.

The Aim: of this study was to examine whether there is correlation between metabolic syndrome as a risk factor for cardiovascular diseases and heart rate recovery as an important prognostic factor.

Materials and Methods: 61 consecutive patients underwent treadmill test (stress-echocardiography by Bruce protocol). Before the test, by interview and examination of medical records from each patient were obtained general informations, informations about the risk factors and their therapy and then we measured their waist circumference, blood pressure and heart rate. Upon completion of the test we re-measured blood pressure and heart rate in the first minute of rest.

Results: 70,5% of study population had metabolic syndrome whereas the most common criteria were hypertension (83,6%) and waist circumference (73,77%). The results of stress-echocardiography was positive in 36,1% of the patients, while the slow heart rate recovery (≤ 18) was noted at 21,3% of the patients. Patients with metabolic syndrome had slower heart rate recovery as compared to the patients without metabolic syndrome but without statistical significance.

Conclusion: The results showed that metabolic syndrome has no effect on heart rate recovery after treadmill test, but that obesity (measured as waist circumference), as one of the criteria of metabolic syndrome, is an independent predictor of heart rate recovery.

Keywords: metabolic syndrome, heart rate recovery, cardiovascular diseases, obesity.

ESTIMATION OF AUTONOMIC DYSFUNCTION IN PATIENTS WITH VASOVAGAL SYNCOPE AND ORTHOSTATIC HYPOTENSION USING CARDIOVASCULAR REFLEX TESTS

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Introduction: Syncope represents a transient loss of consciousness and postural tone due to generalized cerebral ischemia, with spontaneous recovery.

The Aim: Determination of the type and degree of autonomic dysfunction in patients with vasovagal syncope and orthostatic hypotension (OH).

Materials and Methods: Examined group consisted of a control group, persons with syncope and persons with syncope and OH. Patients were examined using Ewing’s cardiovascular reflex tests. According to the results, autonomic dysfunction was classified as: parasympathetic, sympathetic or complete autonomic dysfunction.

Results: Results of the blood pressure response to standing test were more often abnormal in patients with syncope and patients with syncope and OH, than in the control group. Sympathetic function was damaged in most patients with syncope and OH (86.7%) and only in 67.2% of healthy subjects. Results of the deep breathing test were abnormal in 40.0% of persons with syncope and OH. Parasympathetic dysfunction occurred in 18.4% of patients with syncope, 40.0% of persons with syncope and OH and 6.9% of healthy subjects. Autonomic dysfunction was found in 80.0% of persons with syncope and OH. Severe autonomic dysfunction occurred most often (60.0%) in patients with syncope and OH, while it was not observed in the control group.

Conclusion: Results show that patients with syncope have more often the damage of autonomic nervous system than healthy persons. Autonomic dysfunction occurs more often and is severer in patients with syncope and OH, than in those which have only vasovagal syncope.

Keywords: syncope, orthostatic hypotension, cardiovascular reflex tests, autonomic dysfunction

UTICAJ PREKOMERNOG KONTINUIRANOG UNOSA ALKOHOLA NA NEPOSREDAN TOK I PROGNOZU AKUTNOG INFARKTA MIOKARDA

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Uvod: Pojedina ispitivanja pokazala su da osobe koje umereno konzumiraju alkohol, u poređenju sa osobama koje apstiniraju od njega ili sa osobama koje ga prekomerno uzimaju, imaju smanjenu ukupnu smrtnost kao i smrtnost od srčanih oboljenja.

Cilj: Analiza uticaja prekomernog kontinuiranog unosa alkohola na prognozu kod bolesnika sa AIM.

Materijal i metode: Retrospektivno smo posmatrali 246 bolesnika, koji su bili podeljeni u dve grupe: Grupa 1 – 134 (54.5%) bolesnika sa AIM koji su prekomerno kontinuirano unosili alkohol i Grupa 2 – 112 (45.5%) bolesnika sa AIM koji su umereno unosili alkoholna pića.

Rezultati: U toku jednogodišnjeg praćenja ovih bolesnika, u Grupi 1 češće je bio prisutan smrtni ishod (48% vs 37%, $p=0.0782$), pojava nestabilne angine pectoris (22.8% vs 17.4%, $p=0.2311$), dok je kod pojave reinfarkta (40.2% vs 21.7%, $p=0.0015$) i revascularizacije miokarda (33.7% vs 19.6%, $p=0.0145$) registrovana statistički značajna razlika između posmatranih grupa bolesnika. Kumulativna kriva preživljavanja nakon 1, 3, 6, 9 i 12 meseci praćenja imala je vrednosti 93%, 88%, 84%, 82% i 80% u Grupi 1 dok je u Grupi 2 imala sledeće vrednosti: 99%, 95%, 90%, 87% i 85% ($p<0.05$).

Zaključak: Bolesnici, koji prekomerno kontinuirano konzumiraju alkohol, imaju lošiju neposrednu i udaljevu (jednogodišnju) prognozu, u toku i nakon preležanog AIM, sa većim brojem novih koronarnih događaja.

Ključne reči: akutni infarkt miokarda, alkohol, prognoza

EFFECT OF CONTINUOUS EXCESSIVE ALCOHOL INTAKE IN A DIRECT COURSE AND PROGNOSIS ACUTE MYOCARDIAL INFARCTION

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Introduction: Some studies have shown that people who consume alcohol moderately compare with this who abstain of it or the people who take it excessively have reduced overall mortality and mortality of heart disease.

The Aim: Analyze the influence of severe alcohol consumption on in-hospital and one-year prognosis of patients(pts) with AMI.

Material and Methods: We studied 246 pts, with alcohol consumption and AMI. All pts were divided in two groups: Group I - 134 (54,5%) pts with AMI and severe alcohol consumption and Group II - 112 (45,5%) pts with AMI and mild to moderate alcohol consumption.

Results: In-hospital mortality was higher in Group 1 ($p=0.0069$). Reinfarction ($p=0.0015$) was more frequently in Group 1, as well as revascularization ($p=0.0145$). After 1, 3, 6, and 12-month cumulative survival was 93%, 88%, 84%, 82% and 80% in Group 1 and 99%, 95%, 90%, 87% and 85% in Group 2 ($p<0.05$).

Conclusion: This study suggested that pts with severe alcohol consumption had worse in-hospital and one-year prognosis after AIM.

Key words: acute myocardial infarction, alcohol, prognosis

REMODELOVANJE LEVE KOMORE KOD PACIJENATA SA REZISTENTNOM HIPERTENZIJOM

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Uvod: Arterijska hipertenzije je najčešća nezazna bolest u razvijenim društvima. Po isključivanju sekundarnih razloga hipertenzije i ukoliko pacijenti ispune sve predložene savete o modifikaciji života, i uz pun terapijski opseg sa najmanje tri antihipertenziva od kojih je jedan tiazidni diuretik, a održavaju se vrednosti pritiska $> 140/90$ mm Hg možemo govoriti o rezistentnoj arterijskoj hipertenziji (RAH). Ovaj oblik hipertenzije je povezan sa povećanjem rizika od subkliničkog oštećenja ciljnih organa, ali i kardiovaskularnog oboljevanja i umiranja.

Cilj rada je bio da se ispita uticaj RAH na nastanak hipertrofije miokarda leve komore.

Materijal i metode: U retrospektivnu studiju je bilo uključeno 53 bolesnika, 29 sa RAH i 24 sa dobro regulisanom arterijskom hipertenzijom (DRAH). Evaluacija vrednosti arterijskog krvnog pritiska sprovedena je ambulantnim merenjem i 24 h ABPM (Ambulatory Blood Pressure Monitoring), a promene u strukturi leve komore smo procenjivali korišćenjem konvencionalne 2D ehokardiografije.

Rezultati: U grupi bolesnika sa RAH 86.2% je imalo hipertrofiju miokarda leve komore, a 6.9% promene u vidu koncentričnog remodelovanja leve komore, dok je kod 6.9% bio uredan nalaz. U grupi bolesnika sa DRAH 79.16% njih je imalo hipertrofiju leve komore, 4.16% promene definisane kao koncentrično remodelovanje leve komore, a 16.8% nije imalo patološke promene u smislu remodelovanja leve komore.

Zaključak: Nadane promene u građi leve komore nam ukazuju da je proces remodelovanja leve komore neminovni pratilac arterijske hipertenzije, s tim što je bio češći u grupi bolesnika sa RAH.

Ključne reči: rezistentna arterijska hipertenzija, hipertrofija leve komore, 24 ABPM, 2D ehokardiografija

LEFT VENTRICULAR REMODELING IN PATIENTS WITH RESISTANT HYPERTENSION

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Introduction: Arterial hypertension is the most common communicable disease in developed societies. After exclusion of secondary hypertension and reasons if patients meet all the advice on the proposed modification of life, and with the full therapeutic range with at least three antihypertensive drugs, of which a thiazide diuretic, and maintain the pressure values $> 140/90$ mm Hg, we can speak of resistant arterial hypertension (RAH). This form of hypertension is associated with increased risk of subclinical target organ damage and cardiovascular morbidity and mortality.

The aim of this study was to investigate the effect of the RAH occurrence of left ventricular hypertrophy.

Material and methods: The retrospective study included 53 patients, 29 with RAH and 24 with well-regulated arterial hypertension (DRAH). Evaluation of arterial blood pressure was conducted by measuring the out-patient and 24 h ABPM (Ambulatory Blood Pressure Monitoring), a change in the structure of the left ventricle were evaluated using conventional 2D echocardiography.

Results: In patients with RAH 86.2% had left ventricular hypertrophy, a 6.9% change in the form of concentric left ventricular remodeling, whereas in 6.9% had normal findings. In patients with DRAH 79.16% of them had left ventricular hypertrophy, 4.16% change defined as concentric left ventricular remodeling, and 16.8% had no pathological changes in terms of left ventricular remodeling.

Conclusion: We have found changes in left ventricular structure we suggest that the process of left ventricular remodeling inevitable companion of arterial hypertension, but it was more common in patients with RAH.

Keywords: resistant hypertension, left ventricular hypertrophy, 24 ABPM, 2D echocardiography

**PROGNOŠTIČKI ZNAČAJ VREDNOSTI GLIKEMIJE ODREĐENE PRI PRIJEMU BOLESNIKA
SA PRVIM PREDNJIJIM INFARKTOM MIOKARDA SA ST ELEVACIJOM LEČENIH
PRIMARNOM PERKUTANOM KORONARNOM INTERVENCIJOM**

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Uvod: Hiperglikemija na prijemu je česta kod pacijenata sa akutnim infarktom miokarda.

Cilj: Utvrđivanje prediktivne vrednosti glikemije na prijemu u pacijenata sa prvim prednjim akutnim infarktom miokarda sa ST elevacijom (STEMI) u kratkoročnom preživljavanju.

Materijal i metode: U ovo istraživanje je uključeno 70 pacijenata sa prvim prednjim STEMI koji su lečeni u Urgentnom centru. Primenom ROC analize određena je vrednost glikemije od 9,4mmol/l koja ima najveću prediktivnu vrednost (senzitivnost 80% i specifičnost 65%) za MACE (Major Adverse Coronary Events) u toku 30 dana. U MACE su bili uključeni: mortalitet, reinfarkt miokarda, ponovna revaskularizacija infarktne arterije.

Rezultati: Pacijenti su na osnovu prijemne glikemija podeljeni u dve grupe: pacijente sa glikemijom >9.4mmol/l (n=29) i one sa glikemijom <9.4mmol/l (n=41). Pacijenti sa glikemijom >9.4mmol/l imali su češće dijabetes melitus (p=0.006) i veće vrednosti troponina I (p=0.015). Incidencija MACE-a bila je 14,3%, značajno češće (27,6%) u pacijenta sa glikemijom >9.4mmol/l nego u onih sa glikemijom <9.4mmol/l (4,9%) (p=0,015). Multivarijantnom regresionom logističkom analizom nađeno je da su nezavisni prediktori MACE-a u toku 30 dana bili Killip klasa >1 pri prijemu (OR=7,9, CI 95%, 1,38-45,08, p=0,020) i vrednosti glikemije pri prijemu (OR=1,43, 95% CI 1,09-1,89, p=0,010).

Zaključak: Hiperglikemija pri prijemu kod pacijenata sa prvim prednjim infarktom miokarda sa STEMI je nezavisan prediktor nepovoljnog ishoda u toku 30 dana.

Ključne reči: Hiperglikemija, prognoza, STEMI, primarna PCI.

**SRČANA INSUFICIJENCIJA U DILATATIVNOJ KARDIOMIOPATIJI: ANALIZA INDIKACIJA
I KONTRAINDIKACIJA ZA TRANSPLANTACIJU SRCA**

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Uvod: Dilatativna kardiomiopatija (DCM) predstavlja najčešći uzrok neishemijskog tipa srčane slabosti, a teške, progresivne forme se mogu jedino lečiti transplantacijom srca.

Cilj: Analiza indikacija i kontraindikacija za transplantaciju srca u populaciji bolesnika, bolnički lečenih zbog srčane insuficijencije u tercijernoj zdravstvenoj ustanovi, kao i potrebe za dodatnim dijagnostičkim procedurama u odnosu na standardnu obradu bolesnika, radi formiranja liste kandidata za transplantaciju srca.

Materijal i metode: U populaciji koju je činilo 121 konsekutivnih bolesnika (87.6% muškaraca, srednje starosti 69,7±8,6 godina, srednje ejeckione frakcije leve komore LVEF 29,2%±7,6%), bolnički lečenih od srčane insuficijencije u Klinici za kardiologiju, Kliničkog centra Srbije, u periodu od godinu dana izvršena je analiza prisustva indikacija ili kontraindikacija za transplantaciju srca prema važećim internacionalnim preporukama. Parametri koje smo koristili su: godine starosti, kompletna anamneza i fizikalni pregled, evaluacija funkcije organskih sistema i maligniteta, procena težine srčane slabosti (neinvazivno, ehokardiografijom i invazivno, kateterizacijom srca), ABO tipizacija krvnih grupa i kompletna laboratorijski pregled krvi i urina.

Rezultati: Od ukupnog broja ispitanika 57,8% ima dijagnozu primarne DCM; 5% ima indikaciju za transplantaciju srca (LVEF 23,0±8,8%; 66,7% sa primarnom DCM), dok 18% ima kontraindikacije (među kojima 95,4% ima primarnu DCM). Od neophodnih nalaza za stavljanje pacijenata na listu čekanja za transplantaciju, u rutinski ispitivanoj populaciji bolesnika nedostaju: kompletna serološki nalaz, HLA tipizacija, merenje pritiska i otpora u plućnoj kapilarnoj mreži.

Zaključak: U populaciji bolesnika stacionarno lečenih zbog srčane insuficijencije samo 5% je indikovano za transplantaciju srca, a među etiološkim faktorima najčešća je primarna DCM. Za procenu hitnosti transplatacije, najznačajniji su hemodinamski parametri.

Ključne reči: dilatativna kardiomiopatija, srčana insuficijencija, transplantacija srca.

**PROGNOSTIC SIGNIFICANCE OF CERTAIN VALUES OF GLYCEMIA AT ADMISSION IN PATIENTS
WITH FIRST ANTERIOR MYOCARDIAL INFARCTION WITH ST ELEVATION
TREATED WITH PRIMARY PERCUTANEOUS CORONARY INTERVENTION**

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Background: Hyperglycemia on admission is frequent in patients with acute myocardial infarction.

Objective: Determining predictive value of glycemia on admission in patients with first anterior acute myocardial infarction with ST elevation (STEMI) in short term survival.

Materials and methods: This study includes 70 patients with first anterior STEMI which are treated in Emergency room. Using ROC analysis we determined glycemia value of 9,4 mmol/L which has the greatest predictive value (sensitivity 80% and specificity 65%) for MACE (Major Adverse Coronary Event) during 30 days. MACE included: mortality, reinfarction, target-vessel revascularization.

Results: Based on the value of admission glycemia, patients have been divided into two groups: patients with glycemia >9,4 mmol/L (n=29) and those with glycemia <9,4 mmol/L (n=41). Patients with glycemia >9,4 mmol/L had more frequent diabetes melitus (p=0,006) and higher troponine I values (p=0,015). MACE incidence was 14,3%, significantly frequent (27,6%) in patients with glycemia >9,4 mmol/L than in those with glycemia <9,4 mmol/L (4,9%) (p=0,015). Multivariate logistic regression analysis showed that independent predictors of MACE during 30 days were Killip class >1 on admission (OR=7,9; CI 95%, 1,38-45,08; p=0,020) and glycemia values on admission (OR=1,43; 95% CI, 1,09-1,89; p=0,010).

Conclusions: Hyperglycemia on admission in patients with first anterior STEMI is an independent predictor of adverse outcome during 30 days.

Key words: Hyperglycemia, STEMI, prognosis, primary PCI

**HEART FAILURE IN DILATED CARDIOMYOPATHY: ANALYSIS OF INDICATIONS
AND CONTRAINDICATIONS FOR HEART TRANSPLANTATION**

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Introduction: Dilated cardiomyopathy (DCM) is one of the most frequent causes of nonischemic heart failure and indication for heart transplantation (HTx) in most severe and progressive forms.

Aim: The aim of this study was to establish HTx indications in patients hospitalized due to the worsening of heart failure in a tertiary medical center and to elucidate investigations necessary to claim urgency status on the HTx list.

Material and methods: Study population included 121 consecutive patients (87.6% males, mean age 69.7±8.6 years, mean left-ventricular ejection fraction LVEF 29.2±7.6%), hospitalized due to the worsening of heart failure at the Department of Cardiology of the Clinical Center of Serbia over the one-year time. Following parameters were evaluated: age, clinical presentation and physical examination, heart failure severity (echocardiography and cardiac catheterization), presence of comorbidities or malignancy, ABO serotyping and complete urine and blood laboratory.

Results: Out of 121 evaluated patients (57.8% with primary DCM) 5% had indications for HTx (LVEF 23.0±8.8%; 66.7% with primary DCM), while 18% had contraindications (95.4% of them with primary DCM). Analyses missing in the routine clinical work-up, but necessary for the assessment of urgency at the HTx list were as follows: determination of HLA genotype, complete serological analyses, pulmonary resistance and pulmonary capillary wedge pressure.

Conclusion: In the evaluated population of patients hospitalized due to the worsening of heart failure, only 5% would fulfil indications for HTx, with the primary DCM as the predominant etiology. For the assessment of the HTx urgency hemodynamic parameters are particularly important.

Key words: dilated cardiomyopathy; heart failure & heart transplantation.

PROMENA KOŠTANO MINERALNE GUSTINE KOD OBOLELIH OD DIJABETES MELITUSA TIP 1

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Uvod: Šećerna bolest predstavlja stanje hronične hiperglikemije nastale zbog apsolutnog ili relativnog nedostatka insulina. U toku trajanja bolesti nastaju izmene metabolizma građivnih materija masti, belančevina i elektrolita pre svega kalcijuma. DEXA aparati omogućavaju ranu dijagnostiku i praćenje minimalnih promena od 1%. Produžena loša glikoregulacija uslovljava pojavu metaboličke acidoze kod bolesnika sa šećernom bolesti što može da uzrokuje poremećaj metabolizma kalcijuma.

Cilj rada: Ustanoviti povezanost DM1 sa pojavom osteoporozе.

Pacijenti i metode: Ispitivanje obuhvata 108 osoba obolelih od tip 1 DM, lečenih i kontrolisanih na Klinici za endokrinologiju, dijabetes i bolesti metabolizma KC u Nišu. Bilo je 50 žena i 58 muškaraca, prosečne starosti 31,4 godina i trajanje bolesti 9,7 godina, svi na terapiji insulinom. Kontrolnu grupu čini 80 zdravih osoba, 40 muškaraca i 40 žena, prosečne starosti 33,8 godina. Ispitivanje je obuhvatilo kliničku obradu, laboratorijske nalaze, hormonske analize, procenu koštane gustine dvofotoskom denzitometrijom.

Rezultati: Sve vrednosti parametara laboratorijskih analiza ispitnika kontrolne grupe se nalaze u okviru referentnih vrednosti. U grupi sa tipom 1 DM vrednosti glikemije, holesterola i triglicerida premašuju gornje granice normalnih vrednosti. Vrednosti parathormona, estradiola, kalcijuma, fosfora i alkalne fosfatase manje su u eksperimentalnoj grupi ($p < 0,001$). U grupi ispitnika sa tipom 1 DM vrednosti koštane mineralne gustine su 1.114 gr/cm^2 SD 0.142.

Zaključak: Tip 1 šećerne bolesti dovode do signifikantnih promena koštano mineralne gustine obolelih od ovog oblika šećerne bolesti.

Ključne reči: koštano mineralna gustina, dijabetes melitus tip 1

CHANGES IN BONE MINERAL DENSITY IN PATIENTS WITH TYPE 1 DIABETES

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Introduction: Diabetes is a chronic hyperglycemia condition caused by absolute or relative insulin deficiency. In the course of the disease occurring metabolic changes matter building blocks of fats, proteins and electrolytes especially calcium. Dexa machines allow early diagnosis and monitoring of minimal changes of 1%. Prolonged bad glycoregulation inducing metabolic acidosis in patient with diabetes mellitus, which may cause disturbance in calcium metabolism which may cause disturbance in calcium metabolism.

Aim: Establish a connection of osteoporosis and DM1

Patients and methods: The study includes 108 patients with type 1 DM, treated and controlled at the clinic for endocrinology, diabetes and metabolic diseases, Clinical center Nis. There were 50 women and 58 men, mean age 31,4 years and disease duration of 9,7 years, all treated with insulin. In the control group was 80 healthy subjects, 40 men and 40 women, mean age 33,8. The study included clinical assessment, laboratory research, hormone analysis, bone density.

Results: All parameters were normal in control group. In the group with DM 1 values of glucose, cholesterol and triglyceride levels exceed the upper limit of normal values. The values of pth, estradiol, calcium, phosphorus and alkal phosphatase were lower in the experimental group ($p < 0,001$). In the group of the patients with DM1 values of bone mineral density were 1.114 gr/cm^2 SD 0.142.

Conclusion: DM1 leads to significant changes in bone mineral density of patients with this form of DM.

Keywords: bone mineral density, type 1 diabetes

ULTRAZVUČNE KARAKTERISTIKE DOJKE KOD BOLESNICA SA HIPERPROLAKTINEMIJOM

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Uvod: Studija je vođena sa ciljem da odredi da li prolaktin (PRL) utiče na radiološke karakteristike benignih lezija dojke.

Cilj: Cilj ovog istraživanja bio je da zabeleži glavne radiološke karakteristike benignih lezija dojke kod bolesnica sa hiperprolaktinijom.

Materijal i metode: Videli smo 50 bolesnica sa sekrecijom bradavice: 23 sa normalnim vrednostima prolaktina (Grupa 1) i 27 sa hiperprolaktinijom (grupa 2a pre tretmana hiperprolaktinijom i grupa 2b posle tretmana hiperprolaktinijom). Pacijenti posmatrani tokom ovog istraživanja podvrgnuti su ultrazvuku (US) grudi. Radiološki nalazi u grupi 1, grupi 2a i 2b su upoređeni.

Rezultati: Najčešći radiološki nalaz u grupi 2a su prošireni otvori mlečnih kanala i cistične lezije sa statističkom značajnošću $p < 0,001$ i $p < 0,01$. U grupi 1 značajno manje prisustvo proširenih laktifernih kanala je primećeno ($p < 0,05$) i srazmerno manja frekvencija solidnog čvorića u odnosu na grupu 2a. Naši rezultati su pokazali znatno nižu učestalost ($p < 0,001$) dilatiranih laktifernih kanala, posle hiperprolaktinijomskog tretmana (grupa 2b). U grupi 2b takođe je primetno manje prisustvo solidnih čvorića i uvećanih čvorove pazušne u odnosu na grupu 2a. Učestalost cističnih lezija značajno je smanjena ($p < 0,05$) i primetno je potpuno povlačenje pseudocističnih lezija u pacijenata sa normalizovanim vrednostima prolaktina.

Zaključak: Prolaktin je hormon koji značajno utiče na radiološke karakteristike benignih lezija dojke. Lečenje hiperprolaktinije rezultira u vidu povlačenja dilatacije mlečnih kanala, pseudocističnih formacija, cističnih lezija i solidnih čvorića. Ultra sonografiju dojke treba smatrati rutinskom dijagnostičkom procedurom kod pacijenata sa hiperprolaktinijom.

Ključne reči: Hiperprolactinemia; ultrazvučni pregled dojke, dilatacija.

CHARACTERISTICS OF BREAST ULTRASOUND IN PATIENTS WITH Hyperprolactinemia

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Introduction: A study was conducted in order to determine whether prolactin (PRL) influences radiological features of benign breast lesions.

The aim: The aim of this study was to document the main radiological features of benign breast lesions in patients with hyperprolactinemia.

Materials and methods: We saw 50 patients with nipple secretion: 23 with normal prolactin (group 1) and 27 with hiperprolaktinijom (group 2a before treatment hiperprolaktinijom and group 2b after treatment hiperprolaktinijom). Patients observed in this study underwent ultrasound (U.S.) breast. The imaging findings in group 1, group 2a and 2b are compared.

Results: The most common radiological findings in group 2a were extended Lactiferous channels and cystic lesions with statistical significances $p < 0,001$ and $p < 0,01$. In group 1 significantly less presence of varicose laktiferous channels was observed ($p < 0,05$) and correspondingly the frequency of solid lumps compared to group 2a. Our results showed a significantly lower incidence ($p < 0,001$) of dilated laktiferous ducts, after hiperprolactinemia treatment (group 2b). In group 2b also less presence of solid lumps and enlarged axillary nodes compared to group 2a is also observed. The incidence of cystic lesions was significantly reduced ($p < 0,05$) and the pseudocystic lesions in patients with normalized prolactin values.

Conclusion: Prolactin is a hormone that significantly affect the radiological features of benign breast lesions. Hiperprolaktinije treatment results in the form of milk withdrawal joint channel pseudocystic formations, cystic lesions and solid nodules. Ultrasonography of the breast should be considered a routine diagnostic procedure in patients with hiperprolaktinijom.

Keywords: Hiperprolactinemia, breast ultrasound, dilation.

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Uvod/cilj: Vednost ultrazvučnog ispitivanja u poremećajima funkcije štitaste žlezde može biti veoma značajna. Cilj rada je ispitati mogućnost upotrebe ultrazvučnog pregleda štitaste žlezde i njene ehogenosti kao markera rane detekcije njene izmenjene funkcije.

Metode: U ispitivanje je uključeno 328 ispitanika. Kod svih ispitanika urađeni su ultrazvučni pregled tireoidne žlezde i određene su vrednosti FT4, TSH, TPOab. Svi ispitanici podeljeni su u dve grupe, grupu A sa normalnom ultrazvučnom ehogenošću štitaste žlezde i grupu B sa smanjenom ehogenošću. Grupa B podeljena je u dve podgrupe, B1 sa umereno smanjenom i B2 za izrazito smanjenom ehogenošću.

Rezultati: Srednje vrednosti TSH, TPO i TG antitela bile su značajno više u grupi B, kao i u podgrupama B1 i B2, u odnosu na grupu A, $p < 0.001$. U grupi A samo 2 ispitanika (1%) su sa subkliničkom hipotireozom. U grupi B 29 ispitanika (25%) ima izmenjenu funkciju štitaste žlezde, subkliničku hipotireozu ima 21 ispitanika, a kliničku 8. U podgrupi B1 10 ispitanika (11%) ima izmenjenu funkciju, 8 ispitanika ima subkliničku, a 2 kliničku hipotireozu. U grupi B2 19 ispitanika (76%) ima izmenjenu funkciju štitaste žlezde, subkliničku hipotireozu ima 13, a kliničku 6 ispitanika.

Zaključak: Ultrazvučni skrining tireoidne žlezde igra važnu ulogu u ranoj detekciji tireoidne disfunkcije, kako subkliničke tako i kliničke hipotireoze. Smanjena ultrazvučna ehogenost predstavlja značajan marker izmenjene tireoidne funkcije

Ključne reči: smanjena ultrazvučna ehogenost, subklinička hipotireoza, TSH, TPOab, TGab

DECREASED ULTRASOUND ECHOGENITY AS A THYROID HYPOFUNCTION MARKER

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Objectives: The value of ultrasound in functional disorders can be significant. The question arises on the use of ultrasound examination of thyroid gland and its echogenicity as a screening method in early detection of disfunctions.

Methods: Testing included 328 patients. All examinees underwent ultrasound examination of thyroid gland, the blood was taken for determination of FT4, TSH, TPOab and TGab. The patients were divided into two groups. Group A with normal echogenicity of thyroid gland tissue, and B with decreased echogenicity. Group B was divided into two subgroups, B1 with a mildly decreased and B2 with significantly decreased echogenicity.

Results: TPO antibodies, TSH and TG antibodies positivity and their mean values in group B are significantly higher, as well as in subgroups B1 and B2, in relation to group A, $p < 0.001$. In group A only two examinees (1%) were indicated with subclinical hypothyroidism. In group B the subclinical hypothyroidism was indicated in 21, while the clinical hypothyroidism in 8 examinees. 29 (25%) suffered of thyroid gland altered function. In subgroup B1 8 examinees were indicated with subclinical and 2 with clinical hypothyroidism. 10 examinees (11%) suffered of altered thyroid function. In group B2 the subclinical was found in 13 examinees, while the clinical hypothyroidism in 6. 19 (76%) suffered of altered thyroid function.

Conclusion: The ultrasound screening of thyroid gland plays important role in early detection of thyroid disfunction. Decreased ultrasound echogenicity represents the significant marker of altered thyroid gland function.

Key words: Decreased ultrasound echogenicity, subclinical hypothyroidism, TSH, TPOab.

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Uvod: Metabolički sindrom predstavlja udruženošću povećanja visceralnog masnog tkiva, insulinske rezistencije, porasta triglicerida, sniženog HDL-holesterola, poremećaja glikozne tolerancije i hipertenzije, dovodeći do povećanja rizika za razvoj kardiovaskularnih bolesti i tipa 2 šećerne bolesti

Cilj: Cilj ovog rada je da se ustanovi postojanje komponenti kardiometaboličkih faktora rizika i nivo leptina kod gojaznih ispitanika sa metaboličkim sindromom i gojaznih ispitanika bez metaboličkog sindroma.

Materijal i metode: U istraživanje je uključeno 83 ispitanika, 57 sa metaboličkim sindromom i 26 bez metaboličkog sindroma, oba pola (36 osoba muškog pola i 47 osoba ženskog pola). Kod svih ispitanika izvršeno je merenje nivoa glikemije, insulinemije, HDL holesterola i LDL holesterola, nivoa triglicerida, leptina, izračunat je HOMA-IR i meren je krvni pritisak.

Rezultati: Vrednosti glikemije, insulinemije, HOMA IR, triglicerida, LDL holesterola su više kod ispitanika sa metaboličkim sindromom nego kod ispitanika kod koji isti nije ustanovljen. Nivo HDL holesterola je niži kod ispitanika sa metaboličkim sindromom nego kod ispitanika bez metaboličkog sindroma. Kod svih ispitanika sa metaboličkim sindromom nivoa leptina je signifikantno viši (48.79+/-21.03 ng/ml) nego kod ispitanika bez metaboličkog sindroma (32+/-14.9 ng/ml).

Zaključak: Sumirajući dobijene rezultate poređenja kardiometaboličkih faktora rizika, koegzistira i hiperleptinemija kao odraz disfunkcionalnog masnog tkiva koje je izraženo kod ispitanika sa već prisutnim metaboličkim sindromom. Ključne reči: leptin, metabolički sindrom, gojaznost

HYPERLEPTINEMIA AS COMPONENT OF METABOLIC SYNDROM

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Introduction: Metabolic syndrome is the association of increasing visceral fat, insulin resistance, increased triglycerides, reduced HDL-cholesterol, glucose tolerance disorders and hypertension, leading to increased risk for cardiovascular disease and diabetes type 2.

The Aim: The aim of this study was to determine the existence of the components of the cardio-metabolic risk factors and leptin levels in obese subjects with metabolic syndrome and obese subjects without metabolic syndrome.

Materials and Methods: The study consisted of 83 subjects, 57 with metabolic syndrome and 26 without metabolic syndrome, both sexes (36 males and 47 females). In all subjects were elevated blood glucose levels, insulinemia, HDL-cholesterol and LDL-cholesterol, triglyceride, leptin, calculated HOMA-IR, and measured the blood pressure.

Results: The values of glycaemia, insulinemia, HOMA-IR, triglycerides, LDL-cholesterol levels were higher in patients with metabolic syndrome than those without metabolic syndrome. HDL-cholesterol was lower in subjects with metabolic syndrome than those without metabolic syndrome. In all subjects with metabolic syndrome leptin levels were significantly higher (48.79 + / -21.03 ng / ml) then in subjects without the metabolic syndrome (32 + / -14.9 ng / ml).

Conclusion: Summing up the results of comparing cardio-metabolic risk factors coexists hyperleptinemia as a reflection of dysfunctional adipose tissue which is more pronounced in patients with metabolic syndrome already present.

Key words: leptin, metabolic syndrome, obesity

DIJAGNOSTIKA OBOLJENJA ŠTITASTE ŽLEZDE

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Uvod: Diferencijalna dijagnoza oboljenja štitaste žlezde se postavlja na osnovu kliničke slike, laboratorijskih nalaza, vizuelizacionih metoda, prvenstveno ehosonografije i metode nuklearne medicine. Poslednjih godina poseban značaj ima FNA, posebno u evaluaciji solitarnih nodusa. Rezultati citološkog nalaza mogu se klasifikovati kao maligni, sumnjivi, benigni, neadekvatni.

Cilj: Ukazati na značaj kombinovanja različitih dijagnostičkih metoda u postavljanju dijagnoze oboljenja štitaste žlezde.

Materijal i metode: U studiju je uključeno 30 bolesnika, 28 žena i 2 muškarca, sa nodozno promenjenom štitastom žlezdom. Ispitanicima su određivani nivoi vrednosti TSH, ultrazvučni pregledi štitaste žlezde i punkcija nodozno izmenjene štitaste žlezde. (FNA)

Rezultati: Prosečne vrednosti TSH bile su 4,70 mIU/L. Citološkim istraživanjem od 30 ispitanika kod 26 su pronađene nodozne strume, 2 ispitanika je imalo Hašimotov tiroiditis i 2 papilarni karcinom.

Zaključak: Bolesnicima sa oboljenjima štitaste žlezde pored kliničkog pregleda, koji je od neprocenjivog značaja i određivanja hormona u cirkulaciji, treba uraditi UZ radi evaluacije morfoloških promena u žlezdi. Ova metoda omogućava da se utvrdi da li je nodus solitarni ili cističan ili je deo plinodozne strume. Zbog svoje jednostavnosti FNA bi trebalo da bude prva dijagnostička metoda, rezultati naše studije potvrđuju veliku efikasnost ove metode.

Ključne reči: FNA, UZ, hormonske analize.

DIAGNOSTICS OF THYROID DISEASE

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Introduction: Differential diagnosis of thyroid gland disease is established by clinical features, laboratory findings, visual methods, especially echocardiography methods of nuclear medicine. In recent years, FNA has a special significance, especially in the evaluation of solitary nodules. Results of cytologic findings may be classified as malignant, suspicious, benign, inadequate.

The aim: To show the importance of combining different diagnostic methods in diagnosing diseases of the thyroid gland.

Material and methods: The study included 30 patients, 28 women and 2 men with thyroid altered thyroid gland. Respondents were assessed levels of TSH, thyroid gland ultrasound and puncture nodosum altered thyroid gland. (FNA)

Results: The mean TSH was 4.70 mIU / L. Cytological research was done on 30 patients, of whom in 26 was found thyroid nodule, 2 with chronic lymphocytic thyroiditis and 2 with papillary carcinoma.

Conclusion: In patients with diseases of the thyroid gland in addition to clinical examination, which is of paramount importance and determination of hormones in the circulation, it should be done with to evaluate morphologic changes in the gland. This method allows to determine whether a solitary pulmonary nodule or cystic or multinodular goiter is a part. Due to its simplicity FNA should be the first diagnostic method, the results of our study confirm the high reliability of this method.

Keywords: FNA, ultrasound, hormone analysis.

POVEZANOST ODNOSA TG/HDL, INSULINSKE REZISTENCIJE I POJAVE I INTENZITETA KORONARNE BOLESTI U PACIJENATA SA TIPOM 2 DIJABETESA I NEDIJABETIČARA

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Uvod: Jedan od faktora rizika za KB je i visok odnos Tg/HDL, koji je povezan je sa pojavom malih i gustih LDL čestica, za koje je poznato da su veoma aterogene. Takođe, ovaj odnos (Tg/HDL) je pokazan kao marker insulinske rezistencije, koja je značajna za pojavu KB, ali i T2D.

Cilj: Cilj istraživanja bio je da se analizira korelacija između između Tg/HDL, insulinske rezistencije i intenziteta koronarne bolesti u dijabetičara i nedijabetičara.

Materijal i metode: Istraživanje je sprovedeno među 192 pacijenta, podeljenih u 4 grupe. T2D je imalo 104 pacijenta: 60 sa KB i 44 bez KB (grupe A i B) i 88 pacijenata bez T2D, od kojih je 60 imalo KB i 28 zdravih ispitanika (grupe C i D). Mereni su: intenzitet KB, glikemija, HbA1C, ukupni holesterol, HDL, LDL i Tg, Tg/HDL i učestalost nivoa Tg/HDL>1.33. Homeostatskim modelom određena je insulinska rezistencija na osnovu vrednosti glikemije i insulinemije u bazalnim uslovima.

Rezultati: Vrednosti lipida su bile znatno više u grupama A, B i C, ali i kod obolelih od KB u odnosu na pacijente bez KB. Tg/HDL, kao i učestalost nivoa TG/HDL iznad 1.33, bio je značajno povišen kod pacijenata sa KB, bez obzira na prisustvo T2D. Odnos Tg/HDL, insulinemija kao i insulinska rezistencija, korelirali su sa intenzitetom KB, a insulinska rezistencija je bila značajno viša u grupama A i C u odnosu na grupe B i D. Nađena je povezanost nivoa Tg/HDL i HOMA-IR u grupama dijabetičara i nedijabetičara. Svi podaci su obrađeni uz pomoć kompjuterskog programskog paketa SPSS Windows, verzija 17.0, Microsoft.

Zaključak: Rezultati pokazuju da bi jednostavan klinički parametar, kao što je odnos Tg/HDL mogao biti dobar pokazatelj prisustva KB, kod dijabetičara i nedijabetičara.

Ključne reči: Koronarna bolest, dijabetes mellitus, trigliceridi, HDL, insulinska rezistencija

CONNECTION BETWEEN TG/HDL RATIO, INSULIN RESISTANCE AND APPEARANCE AND INTENSITY OF CORONARY DISEASE AMONG PATIENTS WITH TYPE 2 DIABETES AND NONDIABETICS

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Introduction: One of the risk factors for CHD is high Tg/HDL ratio, which is associated with appearance of small and dense LDL particles, which are known as very atherogenic. Also, this ratio (Tg/HDL) is shown to be a marker of insulin resistance, which is important for development of CHD as well as T2D.

The aim: The aim of this study was to analyze correlation between Tg/HDL, insulin resistance and intensity of coronary disease among diabetics and non-diabetics.

Material and methods: The study was conducted among 192 patients, divided into 4 groups. Hundred and four patients had T2D: 60 with CHD and 44 without CHD (groups A and B), and 88 patients without T2D of which 60 had CHD and 28 control patients (groups C and D). Intensity of CHD, glycaemia, HbA1C, total cholesterol, HDL, LDL and Tg, Tg/HDL and frequency of level Tg/HDL>1.33 were measured. By homeostatic model, insulin resistance was determined based on levels of glycaemia and insulinemia in basal conditions.

Results: Values of lipids were significantly higher in groups A, B and C, but also between patients with CHD compared to patients without CHD. Tg/HDL, as well as frequency of level Tg/HDL>1.33 were higher among patients with CHD, regardless of T2D. Tg/HDL ratio, insulinemia and insulin resistance correlated with intensity of CHD, and insulin resistance was higher in groups A and C compared to groups B and D. A connection between levels of Tg/HDL and HOMA-IR was found in groups of diabetics and non-diabetics. All data was processed by computer programme package SPSS Windows, version 17.0, Microsoft.

Conclusion: The results show that simple clinical parameter such is Tg/HDL could be good indicator of CHD among diabetics and non-diabetics.

Key words: coronary heart disease (CHD), diabetes mellitus type 2 (T2D), triglycerides (Tg), HDL, insulin resistance

DESETOGODIŠNJI KARDIOVASKULARNI RIZIK KOD BOLESNIKA SA SUBKLINIČKIM HIPOTIREOIDIZMOM

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Uvod: Subklinički hipotireoidizam karakteriše povišene koncentracije serumskog tiro-stimulišućeg hormona (TSH), uz normalne serumske koncentracije slobodnog tiroksina (fT4).

Cilj: Analiza desetogodišnjeg rizika za fatalni kardiovaskularni događaj kod ispitanika sa subkliničkim hipotireoidizmom, u zavisnosti od vrednosti TSH.

Materijal i metode: Istraživanje je obuhvatilo 39 ispitanika sa postavljenom dijagnozom subkliničkog hipotireoidizma. Na osnovu serumskih koncentracija TSH, ispitanici su podeljeni u dve grupe: 1)TSH 4.0–6.9mIU/L, 2)TSH 7.0–9.9mIU/L. Za procenu desetogodišnjeg individualnog rizika za nastanak fatalnog kardiovaskularnog (KV) događaja, korišćene su SCORE tablice, na osnovu kojih su formirane sledeće grupe: a) sa niskim rizikom, < 3% (SCORE 0,1,2), b) umerenim rizikom, 3 – 4.9% (SCORE 3,4) i c) visokim rizikom, ≥ 5% (SCORE ≥ 5).

Rezultati: Poređenjem dobijenih rezultata, između grupa podeljenih na osnovu serumske koncentracije TSH, statistički značajna razlika je pronađena, očekivano, u odnosu na prosečnu koncentraciju TSH (5.34 ± 0.75 vs 8.45 ± 0.92 mIU/L; p = 0.0001), prosečan SCORE (1.05 ± 0.92 vs 2.30 ± 2.18%; p = 0.021) i totalni holesterol (4.98 ± 0.98 vs 6.30 ± 1.22 mmol/L; p = 0.001). Statistički značajna razlika nije nađena u odnosu na pol, starost, HDL holesterol, pušački status i prisustvo antitireoidnih antitela, kao ni za vrednosti sistolnog pritiska.

Zaključak: Naši rezultati su pokazali da se, sa povećanjem vrednosti serumskog TSH iznad 7.0mIU/L, povećava i rizik od nastanka fatalnih kardiovaskularnih događaja, što praktično znači da subklinički hipotireoidizam predstavlja stanje povećanog rizika za kardiovaskularni mortalitet, te zbog toga treba razmotriti mogućnost lečenja ovih osoba pre ispoljavanja manifestnog hipotireoidizma.

KLjučne reči: Subklinička hipotireoza; kardiovaskularni rizik; SCORE tablice.

TEN-YEAR CARDIOVASCULAR RISK IN PATIENTS WITH SUBCLINICAL HYPOTHYROIDISM

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Introduction: Subclinical hypothyroidism occurs when free thyroxine (fT4) levels are normal, but thyroid-stimulating hormone (TSH) levels are elevated.

The aim: The aim of this study was to investigate ten-year risk of fatal cardiovascular event for patients with subclinical hypothyroidism, according to their TSH levels.

Material and methods: This survey included 39 patients with proven subclinical hypothyroidism. According to TSH serum levels, patients were divided into two groups: 1)TSH 4.0–6.9mIU/L, 2)TSH 7.0–9.9mIU/L. SCORE scales were used in order to estimate ten-year risk of fatal cardiovascular event among these patients. According to these scales, three groups were formed: a) those with low risk, <3% (SCORE 0,1,2), b) with moderate risk, 3.0–4.9 % (SCORE 3,4) and c) with high risk, >5% (SCORE ≥ 5).

Results: Statistical significance was found between groups (divided according to serum TSH concentration) when comparing mean TSH concentration (5.34±0.75 vs 8.45±0.92 mIU/L; p = 0.0001) as could be expected, mean SCORE (1.05±0.92 vs 2.30±2.18%; p = 0.021), and total cholesterol (4.98±0.98 vs 6.30±1.22 mmol/L; p = 0.001) concentrations. On the other hand, when comparing age, sex, HDL cholesterol concentration, smoking status, presence of anti-thyroid antibodies and systolic pressure, statistical significance was not found.

Conclusion: These results suggest that increase of TSH levels above 7.0 mIU/L also increases risk for fatal cardiovascular event, which means that subclinical hypothyroidism is associated with increased risk for cardiovascular mortality. This leaves an open question whether subjects with subclinical hypothyroidism should get treatment, before expressing overt hypothyroidism.

Key words: Subclinical hypothyroidism, cardiovascular risk, SCORE scale.

ODGOVOR KORTIZOLA TOKOM ACTH TESTA I KVALITET ŽIVOTA KOD OBOLELIH SA SINDROMOM HRONIČNOG ZAMORA

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Uvod: Sindrom hroničnog zamora (SHZ) je iscrpljujuća bolest, koju karakteriše jak, prolongiran umor i pridruženi fizički i neuropsihološki simptomi, u odsustvu organske ili teške psihijatrijske bolesti.

Cilj: Cilj rada je da se ispita odgovor kore nadbubrega na stimulaciju i mogući uticaj izmenjene funkcije nadbubrega na kvalitet života kod pacijenata sa SHZ.

Materijal i metode: Za stimulaciju kore nadbubrega korišćen je niskodozni ACTH test, intravenskom primenom 1µg sintetskog ACTH. Upoređivan je odgovor kortizola kod pacijenata sa SHZ i zdravih. Obe ispitivane grupe su obuhvatale po 36 osoba - 30 žena i 6 muškaraca. Uzorci za određivanje kortizola u serumu uzimani su neposredno pre (0) i 15, 30, 60 minuta posle primene ACTH. Za procenu kvaliteta života korišćeni su skala uticaja zamora, skala težine zamora i upitnik o uticaju zamora na kvalitet života. **Rezultati su prikazani kao aritmetička sredina grupe podataka (X) ± standardna devijacija (SD).**

Rezultati: Bazalni kortizol nije se razlikovao između grupa. Porast kortizola tokom testa je bio značajno niži kod obolelih od SHZ, kao i maksimalna vrednost kortizola tokom testa. Kod obolelih od SHZ testirani parametri kvaliteta života su značajno korelirali sa maksimalnim kortizolom tokom testa.

Zaključak: Odgovor kortizola na direktnu stimulaciju sa ACTH je smanjen kod obolelih od SHZ, u odnosu na normalnu kontrolu. Maksimalni odgovor kortizola je korelirao sa uticajem SHZ na kvalitet života, što upućuje na moguć uticaj poremećaja HPA osovine na ispoljavanje bolesti. **KLjučne reči:** Sindrom hroničnog zamora, kortizol, ACTH test, kvalitet života

CORTISOL RESPONSE DURING THE ACTH TEST AND QUALITY OF LIFE IN CFS PATIENTS

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Introduction: Chronic fatigue syndrome (CFS) is a debilitating disease, characterized by intensive fatigue and associated physical and neuropsychological symptoms, in the absence of organic or severe psychiatric disease.

The Aim: The aim of this study was to investigate the response of the adrenal cortex to stimulation and possible impact of altered adrenal function on quality of life in patients with CFS.

Materials and Methods: For stimulation of the adrenal cortex we used low-dose ACTH test, with the iv injection of 1µg synthetic ACTH. Cortisol response was compared in CFS patients and healthy. Each study group included 36 people- 30 women and 6 men. Samples for measuring the cortisol concentration in serum were taken immediately before (0), 15, 30 and 60 minutes after application of ACTH. To assess the quality of life we used fatigue impact scale, fatigue severity scale and quality of life score. Results are presented as group mean data (X) ± standard deviation (SD).

Results: Baseline cortisol wasn't different between the groups. Cortisol increase was significantly lower in CFS, and also maximal cortisol during the test. In CFS patients tested quality of life parameters significantly correlated with maximal cortisol during the test.

Conclusion: The response of the adrenal gland on direct stimulation is lower in CFS patients, compared with normal group. The maximum response of cortisol correlated with the impact of CFS on quality of life, suggesting the possible influence of HPA axis derangement on manifestation of the disease.

Keywords: Chronic fatigue syndrome, cortisol, ACTH test, quality of life

UČESTALOST DEPRESIJE KOD BOLESNIKA SA METABOLIČKIM SINDROMOM

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Uvod: Metabolički sindrom (MetS), predstavlja grupu metaboličkih, antropoloških i hemodinamskih poremećaja koje je definisala NCEP ATP III klasifikacija. Premda je dokumentovano da MetS doprinosi bolestima kao što su hipertenzija, koronarna bolest, diabetes melitus tip 2 (DM tip2), mnogo manje se zna za moguću povezanost gojaznosti i mentalnih poremećaja, kao što je depresija.

Cilj: Cilj rada bio je da ispitamo učestalost depresije kod kod obolelih od MetS, kao i povezanost svake komponente metaboličkog sindroma sa prisustvom depresije.

Materijal i metode: Retrospektivna studija obuhvatila je 51 osobu, sa potvrđenom dijagnozom MetS. Za postavljanje dijagnoze MetS korišćena je ATP III klasifikacija. Za utvrđivanje depresije kod ovih bolesnika korišćena je Hamiltonova skala.

Rezultati: Hamiltonovom skalom depresija je utvrđena kod 22/51 osobe (43.1%), približno iste učestalosti kod oba pola. Obim struka i dijasistolni pritisak bili su faktori MetS najviše povezani sa depresijom bez statističke značajnosti.

Zaključak: Treba naglasiti da je nadjena povezanost i veća učestalost blage depresije kod osoba sa metaboličkim sindromom čak 43,1%, a da su najznačajniji povećani faktori metaboličkog sindroma povezani sa depresijom bili obim struka i dijasistolni pritisak. Ovo ukazuje da su hiperinsulinemija i insulinska rezistencija koje leže u osnovi metaboličkog sindroma, a direktno su povezani sa stomaćnom gojaznošću i hipertenzijom, povezani i sa pojavom depresije kod ovih pacijenata.

Ključne reči: metabolički sindrom, depresija, Hamiltonova skala, obim struka, insulinska rezistencija

PREVALENCE OF DEPRESSION IN PATIENTS WITH METABOLIC SYNDROME

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Introduction: Metabolic syndrome (MetS), is a group of metabolic, anthropological and hemodynamic disorders defined by NCEP ATP III classification. Even though it is proved that MetS deteriorates illnesses such as hypertension, coronary disease, diabetes mellitus type 2 (DM type 2), the potential connection between obesity and mental disorders such as depression is less known nowadays.

Aim: The aim of this study is to analyse the frequency of depression in patients with MetS as well as the connection of every single component of metabolic syndrome with the presence of depression.

Material and methods: The retrospective study included 51 persons with diagnosis of MetS. ATP III classification was used for diagnosing MetS and Hamilton's scale was used for confirming depression in these patients.

Results: Depression was confirmed with the use of Hamilton's scale in 22 of 51 persons (43.1 %) with the approximate frequency of both sexes. Girth and diastolic blood pressure were the factors of MetS mostly related to the depression without any statistical importance.

Conclusion: It should be emphasized that a connection and a greater frequency of mild depression were found even in 43.1 % of persons with metabolic syndrome and that the most important increased factors of MetS, related to the depression, were girth and diastolic blood pressure. This indicates the fact that hyperinsulinemia and insulin resistance, which are the basis of metabolic syndrome and are directly related to the abdominal girth and hypertension, are also related to the emergence of depression in these patients.

Keywords: metabolic syndrome, depression, Hamilton's scale, insulin resistance

KLINIČKI ZNAČAJ ODREĐIVANJA TSH RECEPTORSKIH ANTITIJELA KOD PACIJENATA SA GRAVES-OVOM ORBITOPATIJOM

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Uvod: Graves-ova orbitopatija (GO) je organo-specifično, genetski uslovljeno, autoimuno oboljenje, nastalo kao posledica poremećaja funkcije štitaste žlezde. Ovo oboljenje je najčešća ekstratiroidna manifestacija Graves-ove bolesti. Obično se manifestuje bilateralno, mada se može javiti i unilateralno. Patofiziološki mehanizam nastanka ove bolesti nije još u potpunosti razjašnjen.

Cilj rada: Cilj rada je određivanje TSHrAt kod pacijenata sa GO i ispitivanje moguće udruženosti sa aktivnošću, težinom ili tokom bolesti što bi imalo poseban značaj pri donošenju odluke o terapiji. Takođe smo željeli da ispitamo da li su antitijela na tiroidnu peroksidazu (anti TPOAT) ili antitireoglobulinska antitijela (antiTgAT) na bilo koji način povezana sa GO.

Materijal i metode: Retrospektivna studija u koju je uključeno 84 bolesnika hospitalizovanih u Klinici za endokrinologiju, dijabetes i bolesti metabolizma, Kliničkog centra Srbije u Beogradu. Bolesnicima je urađena sledeća laboratorijska analiza: FT4, TSH, TSHrAt, antiTPOAT i antiTgAT.

Rezultati: Ovom studijom je utvrđena statistički značajna povezanost između aktivnosti bolesti i titra TSHrAt, i antiTPOAT. Nije utvrđena značajna povezanost između anti TgAT i TSH antitijela sa aktivnošću bolesti.

Zaključak: Povišen nivo TSHrAt i antiTPOAT ukazuje na autoimuni karakter bolesti. Vrednosti TSHrAt i antiTPOAT predstavljaju mjerilo aktivnosti GO za razliku od antiTgAT.

Ključne riječi: Graves-ova orbitopatija, antitireoidna antitijela, aktivnost.

CLINICAL SIGNIFICANCE OF TSH RECEPTOR ANTIBODIES OF PATIENTS WITH GRAVES'S OPHTHALMOPATHY

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Introduction: Graves' ophthalmopathy (GO) is an organ-specific, genetically determined, autoimmune disease, it is result from a thyroid disorder. This disease is the most important extrathyroid manifestation of Graves's disease. It usually appears as a bilaterally disease, although it may be unilateral as well. Pathogenetic mechanisms of this disease has not yet been fully elucidated.

Objective: Our objective is to evaluate levels of TSHrAb in patients with GO and testing possibility association with activity, or severity during the illness which would have special importance in making decisions about therapy. We also wanted to examine whether antibodies of thyroid peroxidase (anti TPOAb) or antithyroglobulin antibody (antiTgAb) in any way associated with GO.

Material and Methods: A retrospective study in which were include 84 patients hospitalized at the Clinic for Endocrinology, Diabetes and Metabolic Diseases, Clinical Center of Serbia in Belgrade. Patients underwent the following laboratory analyzes: free thyroxine (FT4), thyrotropin (TSH), TSHrAb, antiTPOAb, and antiTgAb.

Results: This study showed a statistically significant association between disease activity and levels TSHrAb and antiTPOAb. There were no significant association between anti TPOAb and TSH antibodies with disease activity.

Conclusion: High levels of TSHrAt and TGAB indicates the nature of an autoimmune disease. TSHrAb and antiTPOAb levels are a measure of activities GO. And levels of anti TgAb don't correlate with clinical signs of disease.

Keywords: Graves' ophthalmopathy, antithyroid antibodies, activity.

ANALIZA FINDRISK UPITNIKA U PROCENI RIZIKA ZA ISPOLJAVANJE TIP 2 DIJABETESA

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Uvod: Prethodno je pokazano da je upitnik The Finnish Diabetes Risk Score - FINDRISK efikasan skrininga za rizik za ispoljavanje tipa 2 dijabetesa (T2D).

Cilj: Cilj rada je analiza primene FINDRISK upitnika za detekciju rizika za T2D u našoj populaciji.

Materijal i metode: U ispitivanje je uključeno 100 osoba, starosti ≥ 45 godina, nedijabetičara. Ispitanici su popunili FINDRISK upitnik i podeljeni su u 3 grupe prema broju bodova, A- ispitanici sa niskim rizikom/zbir bodova ≤ 7 ; B- sa lako povišenim i umerenim rizikom/zbir bodova 8-14; C- sa visokim i veoma visokim rizikom/zbir bodova ≥ 15 za ispoljavanje T2D.

Rezultati: Broj ispitanika u grupi A je bio 13 %, grupi B 53% i grupi C 34%. Ispitanici grupe C bili su statistički starije životne dobi, većeg indeksa telesne mase i obima struka ($p=0,031$; $p=0,02$; $p=0,03$) u poređenju sa grupom A. Istovremeno, ispitanici grupe C su ređe upražnjavali fizičku aktivnost, manje konzumirali voće i/ili povrća u odnosu na ispitanike grupe A ($p=0,01$; $p=0,04$). U grupi C je utvrđeno češće korišćenje antihipertenzivnih lekova, izmerena povišena vrednost šećera u krvi i postojanje dijabetesa u porodici u odnosu na grupu A ($p < 0,001$). Nije bilo značajnih razlika poređenjem odgovora ispitanika grupe B vs A i B.

Zaključci: Rezultati upotrebe FINDRISK upitnika u našoj populaciji ukazuju da je u grupi ispitanika sa visokim rizikom značajno veći broj osoba imao prisutne faktore rizika za ispoljavanje T2D u odnosu na grupu koji imaju nizak rizik za T2D.

Ključne reči: Tip 2 dijabetesa, faktori rizika, FINDRISK upitnik

ANALIZA RAZLIČITIH KRITERIJUMA ZA DIJAGNOZU GESTACIJSKOG DIJABETESA

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Uvod: Gestacijski dijabetes (GD) se definiše kao bilo koji stepen poremećaja tolerancije glukoze, koji je prvi put otkriven u trudnoći. Dijagnoza GD se postavlja primenom kriterijuma Američke asocijacije za dijabetes (ADA) na osnovu dve glikemije iznad graničnih vrednosti u 2h OGTT, ili Internacionalnog udruženja za dijabetes i trudnoću (IADPSG) na osnovu jedne povišene glikemije u 2h OGTT.

Cilj rada: U našem radu analizirali smo različite kriterijume za dijagnozu GD.

Materijal i metode: Ispitano je 100 trudnica u periodu između 24. i 28. nedelje gestacije, urađeno 2h OGTT, i na osnovu dobijenih rezultata detektovana je učestalost GD prema kriterijumima ADA (grupa A) i IADPSG (grupa B).

Rezultati: Utvrđena je statistički značajno viša starosna dob, indeks telesne mase (ITM) pre trudnoće i u toku testiranja u grupi A vs B ($p < 0,03$; $p < 0,01$, $p < 0,03$). Registrovane su statistički značajno veće srednje vrednosti glikemija u toku 2h OGTT-a (A: 0 min. 4.8 ± 0.7 mmol/L, 1h. 9.53 ± 1.9 mmol/L, 2h 10.26 ± 1.4 mmol/L vs B: 0 min. 4.4 ± 0.9 mmol/L, 1h 9.23 ± 0.6 mmol/L, 2h 8.9 ± 1.8 mmol/L $p < 0,05$), i HbA1c (A: 5.3 ± 0.8 vs B $5.0 \pm 0.5\%$, $p < 0,05$). Utvrđena je značajna razlika u gestacijskoj nedelji završetka trudnoće (A: 35 ± 2 vs B: 39 ± 3), broja trudnoća završenih carskim rezom (A: 41,6% vs B: 32,1%) i učestalosti makrozomije (A: 16,66% vs B: 10,7%) ($p < 0,05$).

Zaključak: Naši rezultati su pokazali da se primena strožijih IADPSG kriterijuma povećava incidenciju GD, što je značajno sa aspekta rane detekcije, kao i formiranja ujednačenih i široko prihvaćenih kriterijuma za dijagnozu GD, u cilju pravovremenog uvođenja terapije i sprečavanje neželjenih ishoda trudnoće.

Ključne reči: gestacijski dijabetes, ADA, IADPSG

ANALYSIS OF QUESTIONNAIRES FINDRISK INDIVIDUALS AT RISK FOR THE MANIFESTATION OF TYPE 2 DIABETES

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Introduction: Questionnaire The Finnish Diabetes Risk Score-FINDRISK is an effective instrument for screening of type 2 diabetes (T2D) risk.

Materials and Methods: We included 100 participants, aged >45 years, nondiabetics. They completed FINDRISK questionnaire, and were divided into 3 groups based on the test score, A-patients with low risk/total score ≤ 7 , B-patients with moderate risk / total score 8-14, C-patients with high risk / total score ≥ 15 points for risk of T2D development.

Results: Group A consisted of 13%, group B 53% and group C 34% participants. Group C was significantly older, with higher BMI and waist ($p=0,03$; $p=0,02$; $p=0,03$) than group A. In group C there was significantly less practiced physical activity, consumed fruits and/or vegetables than in group A ($p = 0.01$, $p = 0.04$). However, in group C was significantly higher use of antihypertensive drugs, measured higher blood glucose and presence of diabetes in the family, compared to group A ($p < 0.001$). There were no significant differences in compared parameters in group B vs A and C.

Conclusion: The results of FINDRISK questionnaire in our population indicate that participants with a high risk have significantly higher presence of questionnaire-defined risk factors for the risk of T2D development, than in those with low risk.

Keywords: Type 2 diabetes, risk factors, FINDRISK questionnaire

ANALYSIS OF DIFFERENT CRITERIA FOR DIAGNOSIS OF GESTATIONAL DIABETES

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Introduction: Gestational diabetes (GD) is any degree of glucose intolerance first time detected during pregnancy. GD diagnosis is based on American Diabetes Association (ADA) - two glycemia, or International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria - only one glycemia above threshold, standard 2h OGTT.

The aim: We analyzed different criteria for GD diagnosis.

Material and methods: 100 pregnant women, 24-28. gestational weeks, performed 2h OGTT and divided into 2 groups, whether GD diagnosis was established due to ADA (A) or IADPSG (B) criteria.

Results: We found significantly higher age, body mass index before pregnancy and during the test in A vs B ($p < 0,03$, $p < 0,01$, $p < 0,03$), together with significantly higher mean blood glucose during OGTT (A: 0 min. 4.8 ± 0.7 , 1h. 9.53 ± 1.9 , 2h 10.26 ± 1.4 vs B: 0 min. 4.4 ± 0.9 , 1h 9.23 ± 0.6 , 2h 8.9 ± 1.8 mmol/L, $p < 0,05$) and HbA1c (A: 5.3 ± 0.8 vs B: $5.0 \pm 0.5\%$, $p < 0,05$). There was significant difference in gestational week of the end of pregnancy (A: 35 ± 2 vs B: 39 ± 3), pregnancies ended by caesarean section (A: 41.6% vs B: 32,1%) and incidence of macrosomia (A: 16.66% vs B: 10.7%) ($p < 0,05$).

Conclusion: IADPSG criteria increases GD incidence, which is important in early GD detection and forming widely accepted criteria for GD diagnosis, for timely introduction of treatment and prevention of adverse pregnancy outcomes.

Keywords: gestational diabetes, ADA, IADPSG

PRISUSTVO I TEŽINA DEPRESIJE KOD BOLESNIKA SA SUBKLINIČKIM HIPOTIREOIDIZMOM

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Uvod: Subklinički hipotireoidizam nastaje kada su serumske koncentracije hormona štitaste žlezde normalne, a nivo tiro-stimulišućeg hormona (TSH) povišen. U stanjima smanjene funkcije štitaste žlezde, mozak trpi strukturne i funkcionalne promene koje su karakteristične za osobe obolele od depresije, pa je hipotireoidizam često udružen sa depresijom.

Cilj: Proceniti prisustvo i težinu depresije kod ispitanika sa subkliničkim hipotireoidizmom u poređenju sa eutireoidnim ispitanicima sa nodoznom strumom i ispitanicima sa klinički manifestnim, do sada neleženim hipotireoidizmom.

Materijal i metode: Istraživanje je obuhvatilo 41 ispitanika, koji su tokom pregleda u endokrinološkoj ambulanti dobrovoljno popunjavali Bekov upitnik depresivnosti. Prema serumskim koncentracijama TSH i slobodnog tiroksina (FT4), kao i na osnovu medicinske dokumentacije, ispitanici su podeljeni u tri grupe: eutireoidni ispitanici sa nodoznom strumom, ispitanici sa subkliničkim i ispitanici sa manifestnim hipotireoidizmom.

Rezultati: Prosečna vrednost serumskog TSH bila je veća kod depresivnih ispitanika u poređenju sa onima bez depresije, što znači da su prisustvo depresije i nivo serumskog TSH direktno povezani. Učestalost depresije se razlikuje između sve tri grupe ispitanika, sa statističkom značajnošću između grupe eutireoidnih ispitanika i onih sa subkliničkim hipotireoidizmom, kao i između grupe eutireoidnih i onih sa manifestnim hipotireoidizmom.

Zaključak: Subklinički hipotireoidizam je najčešće asimptomatski. Obzirom na statistički značajnu razliku u učestalosti depresije između ispitanika sa subkliničkim hipotireoidizmom i onih koji su imali očuvanu funkciju štitaste žlezde, osobe sa subkliničkim hipotireoidizmom se često prvo upućuju psihijatru umesto endokrinologu. Ovaj problem bi mogao da se izbegne obaveznom skriningom koncentracija TSH i FT4 kod svih novo-otkrivenih slučajeva depresije.

Ključne reči: Subklinički hipotireoidizam, Bekov upitnik depresivnosti.

EFEKAT DUGOTRAJNE PRIMENE STATINA NA NIVO GLIKEMIJE I INSULINSKU REZISTENCIJU U NEDIJABETIČARA

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Uvod: Statini, strukturni analozi HMG-CoA, prouzrokuju parcijalnu inhibiciju enzima i indukuju povećanje broja LDL receptora sa visokim afinitetom što za posledicu ima sniženje holesterola. Povoljan efekat na prevenciju kardiovaskularnih bolesti u prethodne četiri decenije je doveden u pitanje zbog globalne epidemije gojaznosti, metaboličkog sindroma i povećanja učestalosti tipa 2 dijabetesa. Efekat statina na metabolizam glukoze i pojavu dijabetesa još uvek nije razjašnjen, a postojeće kliničke studije imaju oprečne rezultate.

Cilj: Cilj našeg istraživanja je bio da ispitamo efekat višegodišnje primene statina na nivo glikemija i insulinsku rezistenciju, kao i na učestalost pojave dijabetesa u ovoj grupi bolesnika.

Materijal i metode: Ispitivanje je sprovedeno u Kabinetu za lipidske poremećaje Klinike za endokrinologiju, dijabetes i bolesti metabolizma Kliničkog centra Srbije. Analizirana je postojeća baza podataka i kartoni 600 pacijenata koji su na terapiji statinima, a za naše istraživanje su odabrani pacijenti koji su na višegodišnjoj terapiji statinima. Sva ispitivanja urađena su uz pomoć kompjuterskog programskog paketa SPSS Windows, verzija 17.0, Microsoft.

Rezultati: Logističkom regresionom analizom smo ispitivali koji od analiziranih parametara može biti prediktor pojave dijabetesa. Prema našim rezultatima, samo ITM korelira sa pojavom dijabetesa ($\beta=0.589$; $p<0.001$), ali ne i vrednosti HOMA-IR, insulina, bazalne glikemije ili lipida. Iako dolazi do promene HOMA indeksa i insulina, ove dve varijable nisu bile prediktori za pojavu dijabetesa u našoj grupi ispitivanih pacijenata.

Zaključak: Iz dobijenih rezultata možemo doći do zaključka da povećana telesna težina predstavlja najznačajniji parametar za nastanak stečenog dijabetesa. Kako bismo smanjili porast novonastalog dijabetesa uz terapiju statinima trebalo bi preporučiti dijetu i institirati na smanjenju težine.

Ključne reči: statini, dijabetes tip 2, indeks telesne mase (ITM)

PRESENCE AND SEVERITY OF DEPRESSION AMONG SUBJECTS WITH SUBCLINICAL HYPOTHYROIDISM

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Introduction: Subclinical hypothyroidism occurs when thyroid hormone levels are normal, but thyrotropin (TSH) levels are elevated. Hypothyroid states are associated with functional and structural brain alterations also seen in patients with major depression; thus hypothyroidism and depression are usually connected.

The Aim: To investigate presence and severity of depression among subjects with subclinical hypothyroidism compared to those with nodular euthyroid goiter and patients with untreated overt hypothyroidism.

Material and methods: This investigation included 41 out-patients who have filled Beck Depression Inventory while being examined by their endocrinologist. According to TSH and free thyroxin (FT4) serum levels, as well as medical data, subjects were divided into three groups: those with nodular euthyroid goiter, those with subclinical hypothyroidism and those with overt hypothyroidism.

Results: Average TSH levels were higher in subjects with the symptoms of depression when compared to those who were not depressed. Thus, it seems that TSH levels and depression are closely connected. Incidence of depression differs among groups, being significantly less frequent in subjects with nodular euthyroid goiter compared to those with subclinical hypothyroidism, as well as to those with overt hypothyroidism.

Conclusion: Subclinical hypothyroidism is mostly asymptomatic. Due to statistically significant difference in depression incidence between subjects with subclinical hypothyroidism compared to those with nodular euthyroid goiter, patients with subclinical hypothyroidism are often being mistakenly referred to psychiatrist instead of endocrinologist. This could be avoided by routine screening for TSH and eventually FT4 serum levels in all patients newly diagnosed with depression.

Keywords: Subclinical hypothyroidism, Beck depression inventory.

THE EFFECT OF LONG-TERM STATIN THERAPY ON LEVEL OF GLYCEMIA AND INSULIN RESISTANCE AMONG NON-DIABETICS

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Introduction: Statins, structural analogs of HMG-CoA, cause partial inhibition of the enzyme and induce an increase in number of LDL high affinity receptors, which results in lowering cholesterol levels. This favorable effect on prevention of cardiovascular diseases has been questioned in the last four decades due to global epidemic of obesity, metabolic syndrome and increased incidence of type 2 diabetes. Effect of statins on glycose metabolism and development of diabetes has not been clarified yet, and existing clinical studies have opposing results.

The objective: The objective of this study was to analyze the effect of long-term statin use on glycemia levels and insuline resistance, as well as frequency of diabetes development in this group of patients.

Material and methods: The study was conducted in Cabinet for lipid disorders, Clinic for endocrinology, diabetes and metabolic diseases in the Clinical Centre of Serbia. Existing database and medical charts of 600 patients using statine therapy have been analyzed, and for our study only patients on long-term statine therapy have been chosen. All data was processed by computer programme package SPSS Windows, version 17.0, Microsoft.

Results: Using logistic regression analysis we have examined which of the analyzed parameters can be predictors of diabetes development. According to our results, only ITM correlates with development of diabetes ($\beta=0.589$; $p<0.001$), while levels of HOMA-IR, insulin, basal glycaemia and lipids do not. Although there is a change in HOMA index and insulin, these variables were not predictors of diabetes development in our group of examined patients.

Conclusion: According to our results we can conclude that increased body mass is the most important parameter for developing diabetes type 2. In order to decrease incidence of acquired diabetes, along with statin therapy, we should recommend diet and insist on loosing weight.

Key words: statins, type 2 diabetes, body mass index (BMI)

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Uvod: Samokontrola glikemija (SG) je nemedikamentni terapijski postupak koji omogućava uvid u nivo glikemija naše i posle obroka, varijabilnost glikemija i postojanje hiperglikemijskih epizoda.

Cilj rada: Da se pokaže efekat strukturisane SG na parametre glikoregulacije.

Metode: Ispitivanjem je obuhvaćeno 20 bolesnika sa dijabetesom, sa nezadovoljavajućom glikoregulacijom (HbA1c >7,0%) podeljenih u dve grupe: grupa A (N=10) – sprovedena SG prema standardnim preporukama iz Nacionalnog vodiča dobre kliničke prakse, grupa B (N=10) - ispitanici edukovani kroz Accu-Chek Assist program, koji su radili profile glikemija (7 vrednosti na dan u 3 zastopna dana) pre i 3 meseca nakon edukacije. Određivana je i srednja vrednost glikemija (SVG), HbA1c, procenat hipoglikemija, učestalost testiranja glikemija (UTG) na početku i nakon tri meseca.

Rezultati: U grupi B, u profilima glikemija, registruje se značajno snižavanje postprandijalnih glikemija posle doručka (10,7+/-1,4 vs 7,6+/-1,0; p<0,05), ručka (11,7+/-0,9 vs 7,8+/-1,2; p<0,01) i večere (11,8+/-1,6 vs 8,3+/-1,2; p<0,05), kao i sniženje SVG (9,8+/-1,7 vs 8,60+/-1,4; p<0,05); značajno niži HbA1c (9,6+/-0,33 vs 8,2+/-0,17; p<0,05 na kraju ispitivanja u odnosu na početak. U istoj grupi registrovani su značajno sniženje procenta hipoglikemija (4,6+/-0,85 vs 1,3+/-0,65; p<0,05), dok je UTG bila značajno veća na kraju ispitivanja u odnosu na početak (1,00+/-0,38 vs 1,43+/-0,44; p<0,01). U grupi A nije uočena značajna razlika ispitivanih parametara na početku i kraju ispitivanja.

Zaključak: Naši rezultati ukazuju da edukacija bolesnika sa dijabetesom za strukturisanu samokontrolu glikemija omogućava uspostavljanje bolje glikoregulacije, naročito u smislu bolje kontrole postprandijalnih glikemija, ali i nivoa HbA1c, već u kratkom vremenskom periodu.

Gljučne reči: dijabetes, samokontrola glikemija, HbA1c.

EFFECTS OF STRUCTURED SELF-CONTROL ON PARAMETERS OF GLYCOREGULATION

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Introduction: Self-monitoring of blood glucose (SMBG), enables evaluation of pre and postprandial hyperglycemia, glycaemic variability and frequency of hypoglycemia.

The aim: To show the influence of structured glucose monitoring on glycaemic parameters.

Methods: We included 20 diabetics, with unsatisfactory metabolic control (HbA1c >7,0%), divided into two groups: group A (N=10) – conducted SMBG according to standard recommendations from The National guideline for good clinical practice; group B (N=10) - participants were educated through Accu-Chek-Assist program and were determining glycaemic profiles (7 values/day, in 3 consecutive days/weekly) before and 3 months after. Mean blood glucose (MBG), HbA1c, frequency of hypoglycemia, and testing of blood glucose (FTM) were also determined before and 3 months after.

Results: In group B significant lowering of postprandial glycaemia after breakfast (10,7+/-1,4 vs. 7,6+/-1,0; p<0,05), lunch (11,7+/-0,9 vs. 7,8+/-1,2; p<0,01) and dinner (11,8+/-1,6 vs. 8,3+/-1,2; p<0,05) were detected as well as significant reduction of MBG (9,8+/-1,7 vs. 8,60+/-1,4; p<0,05), at the end compared to the beginning of the study. Also, significant decreasing of HbA1c (9,6+/-0,33 vs. 8,2+/-0,17; p<0,05) and frequencies of hypoglycemia (4,6+/-0,85 vs. 1,3+/-0,65; p<0,05) were detected, whereas FTM was significantly higher at the end of study compared to the beginning (1,00+/-0,38 vs. 1,43+/-0,44; p<0,01). In group A, no significant difference was detected due to examined variables.

Conclusion: Our results suggest that patient education about structured glucose monitoring enables better metabolic control, especially related to control of postprandial glycaemia and HbA1c level in diabetics, in a short period of time.

Key words: diabetes, blood glucose self-monitoring, HbA1c.

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Uvod: Hiperparatiroidizam je bolest koja se karakteriše porastom serumskog i jonizovanog kalcijuma i padom serumskih fosfata usled pojačane sekrecije paratiroidnog hormona. Kliničku sliku karakteriše simptomatologija hiperkalcemije, ali i brojne komplikacije, među kojima su i kardiovaskularne bolesti.

Cilj: Ispitivanje učestalosti kardiovaskularnih oboljenja u pacijenata sa hiperparatiroidizmom.

Materijal i metode: Ispitivana populacija obuhvata grupu od 33 pacijenta sa hiperparatiroidizmom. Vrednosti kalcijuma, fosfata, LDL, HDL i glikemija su određivane standardnim bihemijskim metodama. Vrednosti intaktnog PTH su određivane pomoću RIA. Za analizu podataka korišćeni su T test i Pearsonova korelacija.

Rezultati: Nije dokazana korelacija između vrednosti kalcijuma, fosfata i PTH sa pojavom hipertenzije i patoloških pojava na EKG. Takođe smo utvrdili da ne postoje razlike između laboratorijskih vrednosti posmatranih parametara u pacijenata sa hipertenzijom kao najčešćom komplikacijom i bez nje. Isto važi i za EKG promene. Nije dokazana ni korelacija između vrednosti LDL, HDL i triglicerida sa nivoima kalcijuma i PTH.

Diskusija: Naš rad nije dokazao korelaciju vrednosti PTH, kalcijuma i vitamina D sa povećanom incidencijom kardiovaskularnih oboljenja. U našoj posmatranoj grupi uočen je povećan broj pacijenata sa hipertenzijom, znatno veći nego u opštoj populaciji. U literaturi se navode oprečni nalazi vezani za korelaciju pojedinih od posmatranih parametara i kardiovaskularnih bolesti i najverovatnije su njihovi efekti zbirni.

Gljučne reči: Hiperparatiroidizam, kalcijum, kardiovaskularne bolesti

SERUM CALCIUM, PTH AND VITAMIN D AND CARDIOVASCULAR DISEASE

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Introduction: Hyperparathyroidism is a condition characterised by increased levels of calcium and low phosphates, all due to increased secretion of parathyroid hormone. Symptoms all mostly due to hypercalcemia. The condition has many complications, including cardiovascular disease.

The Aim: Examination of the incidence of cardiovascular disease in patients with hyperparathyroidism.

Material and Methods: The study population includes a group of 33 patients with hyperparathyroidism. The values of calcium, phosphates, LDL and HDL were determined using standard methods. PTH values were determined using RIA. For data analysis we used T-test and Pearson's correlation.

Results: We didn't prove a correlation between calcium, phosphate and PTH levels and hypertension or ECG pathology. We also found that there were no differences between these values in patients with or without hypertension. The same goes for ECG pathology. We also didn't prove a correlation of LDL, HDL and triglyceride levels with calcium and PTH levels.

Discussion: Our work has not shown a significant correlation of PTH, calcium and vitamin D levels and cardiovascular disease, which doesn't coincide with previous findings. We noticed a higher percentage of patients with hypertension in our study group, than in general population. The literature has contradictory allegations related to the correlations of some of the studied parameters and cardiovascular disease, their effects are probably cumulative.

Keywords: Hyperparathyroidism, calcium, cardiovascular disease

UPOTREBA UPITNIKA (COPD ASSESSMENT TEST) ZA PROCENU I LEČENJU I PRAĆENJU HRONIČNE OPSTRUKTIVNE BOLESTI PLUĆA

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Uvod: CAT upitnik je novi upitnik, dizajniran da pruži jednostavan i pouzdan uvid u kontrolu zdravstvenog stanja pacijenata oboljelih od HOBB-a, pogodan za rutinsku upotrebu.

Cilj: Cilj rada je utvrditi kako rezultati CAT upitnika koreliraju sa lekarskom procenom o stanju pacijenata sa HOBB, a u cilju dobijanja brzih i sigurnih pokazatelja kretanja toka bolesti.

Materijal i metode: Prospektivna studija je obuhvatila 100 pacijenata (slučajno odabranih), koji su se obratili pulmologu, u periodu od novembra 2011. do januara 2012. godine. Svakom pacijentu je pre pregleda i spirometrije dat CAT upitnik da ga samostalno popuni, a na osnovu dobijenih odgovora gradirao se subjektivan osećaj težine njihovog zdravstvenog stanja. Korišćeni su podaci iz zdravstvenog kartona pacijenata lečenih u Polikliničkoj službi Instituta za plućne bolesti Vojvodine.

Rezultati: Prosečna starost pacijenata je iznosila 65,92 godine. Od ukupno 100 pacijenata u našem uzorku, najviše pacijenata je pripadalo II i III stadijumu bolesti (85%). Od 35 pacijenata, njih 12 (skoro jedna trećina), koji su po lekarskoj proceni bili poboljšani u odnosu na prethodni pregled, imali su zbir bodova „CAT iznad 20“, odnosno žalili su se na otežano funkcionisanje pri uobičajenim životnim aktivnostima ($p < 0.005$). Pacijenti koji su procenjeni od strane pulmologa da nije došlo do promene njihovog zdravstvenog stanja, skoro dve trećine (20/29) je po CAT-u bilo do 20. ($p < 0.005$).

Zaključak: Serijska primena CAT upitnika kao praktičnog testa u određenim vremenskim intervalima, zajedno sa spirometrijom je izuzetno korisna za procenu težine bolesti, lečenja, kao i terapijskog odgovora.

Ključne reči: Hronična opstruktivna bolest pluća, CAT upitnik, lečenje

SPIROMetriJA I CAT UPITNIK KAO KOMPARATIVNE METODE ZA PROCENU TEŽINE HRONIČNE OPSTRUKTIVNE BOLESTI PLUĆA

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Uvod: Hronična opstruktivna bolest pluća (HOBB) je bolest koja se može sprečiti i lečiti, a karakteriše je perzistentno ograničenje protoka vazduha u disajnim putevima koje je obično progresivnog toka i udruženo sa popravljivim hroničnim inflamatornim odgovorom u disajnim putevima i plućima na štetne čestice i gasove. Za bolju i lakšu procenu zdravstvenog stanja oboljelih od HOBB je dizajniran upitnik (engleski naziv COPD Assessment Test-CAT).

Cilj rada: Cilj ovog ispitivanja bio je da se primenom CAT upitnika proceni uticaj HOBB na zdravstveno stanje i svakodnevni život oboljelih.

Materijal i metode: Uključeno je 40 osoba sa dijagnozom HOBB, lečenih na Institutu za plućne bolesti i tuberkulozu Kliničkog centra Srbije. Simptome HOBB ispitivali smo putem CAT upitnika dizajniranog da pruži pouzdanu meru zdravstvenog stanja kod oboljelih od HOBB.

Rezultati: Prosečne vrednosti CAT skora svih ispitivanja iznosile su $27,43 \pm 7,54 (8,0-39,0)$. Prosečna vrednost forsiranog vitalnog kapaciteta (FVC) izražena u procentima bila je $70,85 \pm 18,11 (29,0-110,0)$, a FEV1 bila je $39,80 \pm 14,8 (19,0-80,0)\%$. Lošije ostvarene vrednosti FEV1 korelirale su sa lošije ostvarenim skorovima CAT upitnika. Naša studija pokazala je da se visoke vrednosti CAT upitnika javljaju kod onih pacijenata koji imaju teži stepen HOBB.

Zaključak: Kao i drugi autori, mišljenja smo da je primena ovog upitnika veoma korisna, a posebno za lekare primarne zdravstvene zaštite koji će nakon sprovođenja upitnika i dobijanja vrednosti skora moći da procene potrebu brzog upućivanja obolelog pulmologa radi daljeg ispitivanja i dopunskog lečenja.

Ključne reči: HOBB, CAT upitnik, spirometrija

USE OF QUESTIONNAIRE (COPD ASSESSMENT TEST) FOR ASSESSMENT AND MONITORING IN THE TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Introduction: The CAT is a new questionnaire, designed to provide simple and reliable insight into the control of the health status of patients with COPD, suitable for routine use.

The Aim: to determine how the results of CAT questionnaires correlate with the medical assessment on the condition of patients with chronic obstructive pulmonary disease, in order to obtain rapid and safe indicator of the disease.

Materials and methods: This prospective study included 100 patients (randomly selected), which was addressed by pulmonologists in the period from November 2011. until January 2012. year. Each patient before the examination is given and spirometry CAT questionnaire to be completed independently, based on the responses received are graded subjective heaviness of their health status. We used data from medical records of patients treated at the polyclinics of the Institute of Lung Diseases.

Results: The mean age of patients was 65.92 years, while the average age for men was 67.60 years and women 62.97 godina. Od total of 100 patients in our sample, most patients belonged to stage II and III disease (85%). Of the 35 patients, 12 (nearly one-third), who have the medical evaluation were improved compared to the previous review, they had a CAT above 20, and complained of difficulty functioning in ordinary life activities ($p < 0.005$). Patients were evaluated by a pulmonologist that there was no change in their health status, almost two thirds (20/29) by the CAT in there until 20 ($p < 0.005$).

Conclusion: Serial CAT application form as a practical test at regular intervals, along with spirometry is extremely useful for the assessment of disease severity, treatment, and treatment response.
Key words: Chronic obstructive pulmonary disease, CAT questionnaire, treatment

SPIROMETRY AND CAT QUESTIONNAIRE AS A COMPARATIVE METHOD FOR ASSESSMENT OF SEVERITY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Introduction: Chronic obstructive pulmonary disease (COPD) is a disorder which can be prevented and treated, characterized by limitation of air conduction in airways, progressive course, in combination with chronic inflammatory response in lungs and airways, on damaging fluids and corpuscles. In order to have better and easier assessment of health status in people with COPD, questionnaire COPD Assessment Test (CAT) has been designed.

The aim: The aim of this study was to evaluate influence of COPD in health and everyday life, implementing the CAT.
Materials and methods: The study included 40 persons with diagnose of COPD, treated in Institute of Pulmonary Disease and Tuberculosis, Clinical Center of Serbia. We evaluated symptoms of COPD implementing CAT, designed to give a confident measure of health status in persons with COPD.

Results: Average amounts of CAT score in all examined subjects were $27,43 \pm 7,54 (8,0-39,0)$. Average amounts of forced volume vital capacity (FVC), described in percent were $70,85 \pm 18,11 (29,0-110,0)$, and FEV1 forced expiratory volume in 1 s were $39,80 \pm 14,8 (19,0-80,0)\%$. Values of FEV1 were in correlation with worse score of CAT. Our study showed that high values of CAT questionnaire are related to patients with severe degree of COPD.

Conclusion: Our estimation, similarly to estimates of other authors is that application of the questionnaire is very useful for doctors in primary health care. Doctors could get score values, after implementation of questionnaire and according to those values they could rank emergency and send patients to pulmonologist for further evaluation and treatment.

Key words: COPD, CAT questionnaire, spirometry

ZNANJE I STAV PREMA TUBERKULOZI MEDJU STUDENTIMA UNIVERZITETA U BEOGRADU

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Uvod: Znanje stanovništva o tuberkulozi (TBC) je važno da bi se oboleli na vreme obratili za pomoć lekaru. Kašnjenje u dijagnozi ma iz kojeg razloga dovodi do odmaklih formi bolesti i njenog širenja u zajednici. Znanje o TBC u opštoj populaciji Srbije je slabo.

Cilj rada: Ispitivanje znanja o TBC u grupi studenata Univerziteta u Beogradu koji ne studiraju medicinu, njihovih stavova u odnosu na obolele i korišćenih izvora zdravstvenih informacija.

Materijal i metode: Ovo je studija preseka bazirana na upitniku. Ispitanici su studenti Fakulteta organizacionih nauka i Geografskog fakulteta koji su dobrovoljno i anonimno popunili upitnik od 27 pitanja. Pitanja su se odnosila na etiologiju, način prenošenja, faktore rizika i izvor zdravstvenih informacija koji koriste. Dobijene podatke smo statistički analizirali.

Rezultati: Svi ispitanici (69 studenata starih 20±0,777 godina, 69,7% muškog i 30,3% ženskog pola) su prethodno čuli za tuberkulozu. Najveći broj misli da je to plućna bolest a retko bolest vanplućnih organa. Kao uzrok bolesti trećina (31,9%) ispitanika vidi bacil kao jedini uzrok a jedna petina navodi da ne zna odgovor; 95% misli da je TBC izlečiva; jedna trećina ne poznaje simptome TBC a 45/69 (65%) misli da je TBC zarazna. Većina (78,3%) bi otišla u posetu bolesniku, ½ sa strahom od zaraze, koji je u pozitivnoj korelaciji sa verovanjem o zaraznosti ($p=0,041$). Najčešći izvor informacija je televizija. Poverenje u informaciju koja potiče od lekara je najveće.

Zaključak: Znanje studenata o tuberkulozi je nedovoljno, naročito o uzroku i prenošenju bolesti. Neophodno je veće angažovanje u zdravstvenom prosvetavanju studenata.

Ključne reči: tuberkuloza, znanje, student, upitnik, ponašanje

KNOWLEDGE AND ATTITUDE TOWARD TUBERCULOSIS AMONG STUDENTS OF THE UNIVERSITY OF BELGRADE

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Introduction: Population's knowledge on tuberculosis (TB) is crucial in early seeking of medical care. Delay in diagnosis contributes to advanced forms and TB transmission in the community. Knowledge about TB in general population of Serbia is poor.

The Aim: to assess knowledge about tuberculosis in group of non medical students University of Belgrade, their attitude towards TB patients and sources of health information.

Materials and methods: This is observational, questionnaire based study. Participants are students of Faculty of Organizational Sciences and Faculty of Geography, who completed the 27-item questionnaire voluntarily and anonymously. The questions related to TB etiology, way of transmission, risk factors and the source of health informations students preferred. We performed statistical analysis.

Results: All the participants (69 students aged 20±0.777 years, 69,7% male, 30,3% female) previously heard about TB, mostly describing it as pulmonary disease. Extrapulmonary sites are rarely mentioned. Cause of TB is bacillus as the only answer in 31,9% of the participants and 21% have declared not to know the cause. TB is curable (95%). One third does not know TB symptoms and 45/69 (65%) think that TB is infectious disease. Majority (78,3%) would pay visit to TB patient, ½ with fear of infection that is in positive correlation with knowledge on infectiousness ($p=0,041$). Television is the most commonly used source of health information. Students believe in doctors' information the best.

Conclusion: Students' knowledge on TB is inadequate, especially on its cause and way of transmission. More effort is needed in students' health education.

Key words: tuberculosis, knowledge, university students, questionnaire, behaviour

ZNAČAJ NEUROENDOKRINIХ MARKERA У ODГОВОРУ НА ТЕРАПИЈУ И ПРЕЖИВЉАВАЊЕ КОД ПАЦИЈЕНАТА СА ОДМАКЛИМ НЕМИКРОЦЕЛУЛАРНИМ КАРЦИНОМОМ ПЛУЋА

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Uvod: Немикроцелуларни карцином плућа (НСЦЛЦ) представља 70-80% свих малигнух болести плућа. Висок степен резистенције на хемио и радио терапију даје и ниску стопу петогодишњег преживљавања. Откриће неуроендокриних маркера у групи ових карцинома отворило је питање њиховог значаја у терапији и прогнози.

Циљ: нашег рада је да се утврди утицај експресије неуроендокриних маркера на терапијски одговор и преживљавање код пацијената са одмаклим НСЦЛЦ.

Материјал и методе: У ретоспективну студију укључено је 120 пацијената са узнапредовалим НСЦЛЦ, ИИИ и ИВ стадијум болести, лечених у КЦ Крагујевац у периоду 2002.-2007. год. Хистопатолошка потврда учињена је на ткивним узорцима стандардном хематоксилин-еозин методом. На истим узорцима одређивана је и неуроендокрина диференцијација, експресија неурон специфичне енoлазе, хромогрaнина А и синаптофизина. Примењено је укупно 4-6 циклуса терапије. Преживљавање болесника у односу на неуроендокрину експресију праћено је у једно и двогодишњем периоду.

Резултати: Експресија неурон специфичне енoлазе (НСЕ) је била заступљена код 28 (23,3%), хромогрaнина А (Цхр А) код 16 (13,3%) и синаптофизина (СУН) код 20 (16,6%) болесника са НСЦЛЦ. Повољан терапијски одговор (парцијални/ комплетни) био је значајно већи у групи болесника са експресијом НСЕ, Цхр А и СУН ($p<0,05$). Постоји значајна корелација између терапијског одговора и процента позитивних туморских ћелија ($p<0,05$). Код болесника са позитивном неуроендокрином диференцијацијом једногодишње преживљавање било је 64% (без експресије 28%) ($p<0,001$), а двогодишње 30% ($p=0,000$).

Закључак: Ткивна експресија неуроендокриних маркера значајно утиче на терапијски одговор болесника одмаклог НСЦЛЦ. Време преживљавања је веће код лечених болесника, када постоји експресија неуроендокриних маркера.

Кључне речи: Неситноћелијски карцином плућа, неуроендокрини маркери, хемотерапија, терапијски одговор, преживљавање.

THE VALUE OF NEUROENDOCRINE MARKERS FOR RESPONSE TO THERAPY AND SURVIVAL IN PATIENTS WITH ADVANCED NON-SMALL CELL LUNG CANCER

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Introduction: Nonmicrocellular lung cancer (NSCLC) represents 70-80% of all malignant lung disease. The high degree of resistance to chemotherapy and radio therapy and provides a low five-year survival rate.

The Aim: our work is to determine the effect of expression of neuroendocrine markers of treatment response and survival in patients with advanced NSCLC.

Material and methods: In retrospective study included 120 patients with advanced NSCLC, stage III and IV disease treated during 2002-2007. years. Histopathological confirmation was done on tissue samples by standard hematoxylin-eosin method. At the same samples was determined and neuroendocrine differentiation, expression of neuron-specific enolase, chromogranin A and synaptofizina. Survival was compared to the neural expression was observed in one and two-year period.

Results: Expression of neuron specific enolase (NSE) was present in 28 (23.3%), chromogranin A (Chr A) in 16 (13.3%) and synaptofizina (SYN) in 20 (16.6%) patients with NSCLC. Favorable response rate (partial / full) was significantly higher in patients with the expression of NSE, Chr A and SYN. There is a significant correlation between treatment response and the percentage of positive tumor cells. In patients with neuroendocrine differentiation of positive one-year survival rates were 64% (without the expression of 28%) a two-year 30%.

Conclusion: Tissue expression of neuroendocrine markers significantly affect the therapeutic response of patients with advanced NSCLC. The median survival time was higher in treated patients, when there is expression of neuroendocrine markers.

Keywords: non-small cell lung carcinoma, neuroendocrine markers, chemotherapy, treatment response, survival.

SMANJENA KOŠTANA GUSTINA U SISTEMSKOJ SKLEROZI-PREVALENCIA I FAKTORI RIZIKA

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Uvod: Sistemska skleroza (SSc) je retka hronična bolest nepoznatog uzroka. Karakterišu je difuzna fibroza, degenerativne promene i vaskularne abnormalnosti u koži, zglobovima i unutrašnjim organima. Jedna od komplikacija bolesti, usled inflamacije ili primarne glikokortikoida, je smanjena gustina kosti, osteoporozna i osteopenija

Cilj: Utvrditi prevalencu OP i osteopenije u SSc bolesnika (sa ISSc, dSSc, overlap sindromom) primenom DXA denzitometrije, odrediti faktore rizika za smanjenu koštanu gustinu i utvrditi progresiju gubitka koštane gustine kod ispitanika.

Materijal i metode: Istraživanje je obuhvatilo 52 SSc bolesnika, 49 ženskog (16 premenopausalnih i 33 menopausalne) i 3 muškog pola, prosečne starosti 53.12±10.25 godina (podeljenih u 3 grupe: mlađi od 50 godina, 51-60, >60), 28 je primalo kortikosteroide. Svi pacijenti su klinički i laboratorijski obrađeni. Koštana denzitometrija je rađena na lumbalnom delu kičme (L1-L4), DXA metodom. Vrednosti su izražavane kao apsolutne (g/cm²) i kao Tskor.

Rezultati: 42,30% bolesnika je imalo osteopeniju, a 19,23% OP. Bolesnici sa Overlap sindromom imali su niže vrednosti BMD, analizom Tskora, u odnosu na celu ISSc i CREST podgrupu. Bolesnici mlađi od 50 godina su imali vecu koštanu gustinu u odnosu na stariju populaciju. Menopausalne SSc bolesnice imale su nižu koštanu gustinu od premenopausalnih. SSc bolesnici lečeni KS imali su nižu BMD u odnosu na one koji nisu primali KS terapiju. ANA+ SSc bolesnici imali su nižu BMD u odnosu na ANA negativne. ACA+ bolesnici imali su nižu koštanu gustinu od Anti Scl-70+. Uočena je značajna progresija gubitka koštane gustine tokom dve godine praćenja kod naših ispitanika.

Ključne reči: sistemska skleroza, osteopenija, osteoporozna.

LOW BONE MINERAL DENSITY IN SYSTEMIC SCLEROSIS PATIENTS- PREVALENC AND RISK FACTORS

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Introduction: Systemic sclerosis (SSc) is a rare chronic disease characterized by diffuse fibrosis, degenerative changes, and vascular abnormalities in the skin, joints, and internal organs.

Objectives: To analyze the results of bone densitometry in SSc patients, determining the frequency of osteoporosis and osteopenia in different subtype patients, evaluating the prognostic factors for low bone mineral density, and to determine the bone loss progression course in these patients.

Material and methods: The study included 52 SSc patients (mean age 53.12±10.25, divided into three subgroups: <50 years, 51-60, >60), 3 male, 49 female (16 premenopausal, 33 menopausal), 28 receiving corticosteroids. The patients underwent the clinical examination and lab diagnostics. The bone densitometry was measured on the lumbar part of the spine, using dual energy X-ray absorptiometry.

Results: 42,30% SSc patients presented osteopenia, 19,23% osteoporosis. Overlap group showed lower Tscore than ISSc and CREST subgroup. The group aged <50 years had higher Tscore than 51-60 years group and >60 years old group. Menopausal SSc women have lower Tscore than premenopausal SSc women. The patients treated with corticosteroids showed lower Tscore than those who were not. ANA+ patients have lower Tscore than ANA- patients. ACA+ patients showed lower Tscore than Anti Scl 70+ patients. Significant progression of bone loss is observed among the SSc patients.

Conclusion: The significant reduction of bone mineral density is observed among the SSc patients. This reduction is associated to age, menopause, subtype and disease duration, the antibody subset and use of corticosteroids.

Key words: systemic sclerosis, osteopenia, osteoporosis.

PARAMETRI AKTIVNOSTI I FUNKCIONALNOG KAPACITETA BOLESTI PRE I POSLE TERAPIJE ETANERCEPTOM KOD BOLESNIKA SA REUMATOIDNIM ARTRITISOM

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Uvod: Reumatoidni artritis (RA) je idiopatsko, hronično oboljenje u čijoj osnovi je perzistentni, progresivni i destruktivni sinovitis autoimune prirode. TNF α i IL-1 su glavni proinflamatorni citokini koji omogućavaju početak, kao i dalji tok inflamacije u RA. Etanercept je monoklonoalno antitelo, lek iz grupe -inhibitora TNF α koji se vezuje za solubilne TNF α receptore.

Cilj rada: je da se utvrde efekti Etanercepta na parametre aktivnosti bolesti i na funkcionalni kapacitet obolelih.

Materijal i metode: Praćeno je ukupno 32 bolesnika prosečne starosti 52,52god. koji su tokom 18 meseci bili na terapiji Etanerceptom. Sistematski su praćeni uz određivanje DAS28 (Disease Activity Score 28) i HAQ (Health Assessment Questionare) skora.

Rezultati: Zabeleženo je statistički značajno smanjenje DAS28 ($p < 0,001$) između njegovih vrednosti pre početka i nakon 3.meseca lečenja. Takođe, vrednost DAS28 se smanjivao tokom daljeg praćenja i prosečna DAS28 vrednost sa početka terapije od 5,39 smanjila se na 3,18 posle 18 meseci primenjivane terapije. Postoji kontinuirano smanjenje aktivnosti HAQ skora, sa statistički značajnom razlikom ($p < 0,005$) u odnosu početak lečenja- 3.mesec i u vremenskom periodu od 3-6.meseca ($p < 0,05$).

Zaključak: Etanercept značajno smanjuje vrednosti pojedinačnih parameta za procenu aktivnosti RA, kao i vrednosti DAS28. Takođe, značajno popravlja funkcionalnu sposobnost obolelih. Njegovi pozitivni terapijski efekti se javljaju rano (posle 3 meseca od početka lečenja) i održavaju se tokom daljeg tretmana.

Ključne reči: Reumatoidni artritis (RA), Etanercept, DAS28, HAQ

PARAMETERS OF ACTIVITY AND FUNCTIONAL CAPACITY OF DISEASE BEFORE AND AFTER TREATMENT WITH ETANERCEPT IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction: Rheumatoid arthritis (RA) is an idiopathic, chronic disease, which based on persistent, progressive and destructive autoimmune synovitis. TNF α and IL-1 are major proinflammatory cytokines that have key role at induction and progression of the inflammation in RA. Etanercept is a monoclonal antibody, a drug from the group of TNF α -inhibitors..that..binds..to..soluble..TNF α ..receptors.

The Aim: was to determine the effects of Etanercept on the parameters of disease activity and functional capacity of patients.

Material and Methods: We evaluated a total of 32 patients with mean age of 52.52 years. They were evaluated during 18 months of treatment with Etanercept. We were systematically monitored the DAS28 (Disease Activity Score..28)..and..HAQ..(Health..Assessment..Questionare)..score.

Results: There was a statistically significant reduction of DAS28 ($p < 0.001$) between its values before the treatment and after 3rd month. Also, the value of DAS28 decreased during further follow-up and mean DAS28 score decreased from 5.39 on the beginning of therapy to 3.18 after 18 months of treatment applied. There was a continuous decrease of HAQ score, with statistically significant difference ($p < 0.005$) between the start and after 3 months of treatment and, also, between the period...3rd-6th..month..of..therapy..($p < 0.05$).

Conclusion: Etanercept significantly reduces the value of individual parameters for evaluation of RA activity and DAS28 score values. It also significantly improves the functional capacity of patients. Positive therapeutic effects of Etanercept occur early (after 3 months from starting of treatment) and maintained during further treatment.

Keywords: Rheumatoid arthritis (RA), Etanercept, DAS28, HAQ

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Uvod: Lupus nefritis (LN), je heterogena bolest, raznolika u kliničkom ispoljavanju: od asimptomatske, blage proteinurije do brzo progresivnog glomerulonefritisa sa razvojem renalne insuficijencije za samo nekoliko nedelja. Polazi se od hipoteze da neki enzimi, proteini i parametri oksidativnog stresa mogu predstavljati ne-invazivne, rane biološke markere glomerulonefritisa.

Cilj: Ispitati značaj markera disfunkcije ćelija bubrega (glomerulske filtracije, izlučivanja urinom proteina, PC-1 i nekoliko drugih enzima renalnih proksimalnih tubula, te oksidativnog stresa) kod pacijenata sa LN, i ukazati na moguće terapijske modifikacije njihove ekspresije kao koristan tretman.

Materijal i metod: Studijom je obuhvaćeno 39 pacijenata sa LN starosti 43,0+10,5 godina. Kontrolnu grupu je činilo 50 klinički zdravih osoba životnog doba 47,7+11,6 godina.

Rezultati: Kod svih pacijenata sa LN prisutan je povišen nivo serumskog kreatinina, nižen klirens kreatinina, signifikantno niži nivo hemoglobina i serumska koncentracija ukupnih proteina u poređenju sa kontrolnom grupom. Inflamacija prikazana porastom CRP-a i niva fibrinogena prisutna je u ovoj grupi ispitanika u odnosu na kontrolnu grupu. Signifikantna korelacija je zapažena između 24h proteinurije i urinarne aktivnosti NAG i PC-1. Nađeno je da u grupi pacijenata sa LN C3 komponenta komplemента u plazmi korelira sa APN. Samo kod pacijenata sa stadijumom III bubrežne insuficijencije je postojala signifikantna korelacija jačine glomerulske filtracije i aktivnosti pojedinih enzima.

Zaključak: Oštećenje bubrega u LN praćeno je oslobađanjem nekoliko tubulskih enzima, sa mogućim dijagnostičkim i prognostičkim značajem. Istraživanje ukazuje na moguću uticaj oksidativnog stresa i značaj antioksidantne terapije u prevenciji oštećenja u obolelih od LN kao deo buduće terapije.

Ključne reči: lupus nefritis, ektoenzimi, oksidativni stres

THE IMPORTANCE OF ECTOENZYMES IN ASSESSMENT ACTIVITIES OF LUPUS NEPHRITIS

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Introduction: Lupus nephritis (LN) is a heterogeneous disease in diverse clinical manifestations: from asymptomatic proteinuria to rapidly progressive glomerulonephritis with the development of renal failure. Its hypothesis is that some enzymes, proteins and parameters of oxidative stress may represent early biological markers of glomerulonephritis.

The aim: To investigate the importance of markers of renal cell dysfunction (glomerular filtration rate, urine protein excretion and several other enzymes of renal proximal tubules and oxidative stress) in patients with LN, and point to possible therapeutic modification of its expression.

Materials and Methods: The study included 39 patients with LN age 43.0 +10.5 years, and control group of 50 clinically healthy individuals age 47.7 +11.6 years.

Results: Patients with LN are present in elevated levels of S-creatinine, decreased creatinine clearance, significantly lower levels of hemoglobin and serum total protein compared with control group. Inflammation shown increased CRP and fibrinogen niva in LN patients compared to controls. Significant correlation was observed between 24h proteinuria and urinary NAG activity and PC-1. It was found that for patients with LN complement component C3 in plasma correlates with APN. Only patients with stage III renal insufficiency was a significant correlation between GFR and the activity of certain enzymes.

Conclusion: Kidney damage in LN followed by the release of several tubular enzymes, with potential diagnostic and prognostic significance. Research indicates the potential impact of oxidative stress and the importance of antioxidant therapy in the prevention of damage in patients with LN.

Keywords: lupus nephritis, ectoenzymes, oxidative stress

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Uvod: Fibrodysplasia Osificans Progresiva (FOP) je retko genetsko oboljenje sa incidencijom 1:2000000, usled koga se misici, tetive, ligamenti i vezivno tkivo uopšte pretvaraju u kosti stvarajući tzv. sekundarni skelet. Na rodjenju prisutne blage kongenitalne malformacije, tokom prve-drugog decenije razvijaju se bolne fibrozne izrasline na vratu, leđima, ramenima koje kasnije postaju kosti, siri se zatim na trup i udove, a kostani mostovi ograničavaju pokretljivost. Progresija FOP je različita i nepredvidljiva.

Cilj rada: je da saopštimo detalje o samoj bolesti, mogućnostima prevencije, lečenja, odnosno potencijalnim tretmanima.

Materijal i metode: U Srbiji oboleli od FOP su devojka J.M. rođena 1980.god. i mladic I.P. rođena 1985.god. (članovi udruženja IFOPA) i devojka N.V. rođena 1994. god. Koristili smo medicinsku dokumentaciju mladica I.P. i devojke N.V. tokom lečenja u Specijalnoj bolnici u Ribarskoj Banji.

Rezultati: I.P. ispitan u vise medicinskih ustanova u svetu i rano utvrđena tačna dijagnoza, u vise navrata lecen u SB u Ribarskoj Banji, hronoloski pracen citav tok bolesti. Kod N.V. je FOP primecena prilikom lecenja u SB u Ribarskoj Banji. Ukazujemo na znacaj pravilne dijagnoze u bilo kojoj fazi bolesti, ranije studije su ukazivale na greske u dijagnozi i posledice pogresnog lecenja, uz to postoje i odredjena "sestrinska stanja".

Zaključak: Nameće se važnost multidisciplinarnog pristupa i timskog rada uz edukaciju i najaktivnije učesce porodice. Istraživanje osnovnog procesa FOP je korisno za one koji pate od manje retkih koštanih oboljenja što može biti ključ bolje budućnosti miliona ljudi. Sirom sveta se vodi borba sa vremenom da se podigne nivo kolektivne svesti o ovom problemu.

Ključne reči: FOP, IFOPA, retke bolesti.

FIBROMYOSITIS OSIFICANS PROGRESIVA-FOP RARE DISEASE

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Introduction: Fibrodysplasia Osificans Progresiva (FOP) is rare genetic disease with indicator 1:2000000 when the muscles, tendons, ligaments and fibrous tissue general being ossified creating a secondary bone tissue. Children born with FOP have small congenital deformation. In first decade, painful fibrous growths on neck, back, shoulders are appearing which later become bones. Then it expands on whole body, and ossified parts constrain moves. The progression of FOP is different and unpredictable.

Aim: Aim is to show details of disease, possibilities of prevention, hospitalization - eventual treatment.

Materials and methods: In Serbia, patients of FOP are: female person: J.M., born: 1980 and male person: I.P., born: 1985 (both members of association IFOPA) and second female person: N.V. born: 1994. We used medical records of young man: I.P. and women: N.V. during hospitalization in Special Hospital (SP) of Ribarska banja, in Central Serbia.

Results: I.P. was tested in several medical institutions. His correct diagnosis was early determined. He was treated several times in SP Ribarska banja, chronological followed the entire course of the disease. At female patient: N.V. this disease was noticed at the time of treatment in SP Ribarska banja. We want to indicate on significance of correct diagnosis in any phase of disease, earlier researches had signified on mistakes in diagnosis and consequences of wrong treatment, and there are some similar symptoms in other diseases.

Conclusion: The importance of multidisciplinary approach and team work with education and active participation of family is obvious. The researches of basic process of FOP is useful for those who suffer from more frequent bone diseases which can be key in a better future millions of people. Around the world there is a „fight“, against time to improve a level group consciousness of this problem.

Keywords: FOP, IFOPA, rare diseases.

ODREĐIVANJE RAZLIKE U VREDNOSTIMA KRVNOG PRITISKA KOD BOLESNIKA SA I BEZ BUBREŽNE INSUFICIJENCIJE

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Uvod: Krvni pritisak je u fizičkom smislu jačina sile po jedinici površine. Prema definiciji Svetske zdravstvene organizacije arterijska hipertenzija je stanje u kome je sistolni krvni pritisak povišen preko 140 mmHg a diastolni preko 90 mmHg. Arterijska hipertenzija je često udružena sa hroničnom bubrežnom insuficijencijom, koja predstavlja oštećenje bubrežne funkcije usled progresivnog opadanja glomerulske filtracije.

Cilj: Cilj ovog rada je bio da se utvrdi povezanost između arterijskog krvnog pritiska i postojanja hronične bubrežne insuficijencije, kao i potencijalna povezanost visine krvnog pritiska i gojaznosti.

Materijal i metode: Istraživanje predstavlja prospektivnu studiju sprovedenu na 30 ispitanika, koji su podeljeni u ispitivanu i kontrolnu grupu. Prvu grupu su činili 15 ispitanika sa terminalnim stadijumom bubrežne insuficijencije, a drugu, kontrolnu, grupu 15 ispitanika bez oštećenja bubrežne funkcije. Svim ispitanicima su u toku tri dana određivane vrednosti krvnog pritiska (TA) i pulsa. Na osnovu izračunatog indeksa telesne mase (BMI), ispitanici su dodatno bili podeljeni na normalno uhranjene, i prekomerno uhranjene i gojazne, te su poređene vrednosti TA između ovih ispitanika.

Rezultati: Prosečna jutarnja vrednost sistolnog TA u prvoj grupi ispitanika je iznosila 146,44±10,48mmHg, a večernja 145,22±10,83mmHg. U drugoj grupi ispitanika, prosečni jutarnji sistolni TA iznosio je 128,33±14,85mmHg, a večernji 129,11±22,01mmHg. Prosečna jutarnja vrednost diastolnog TA u prvoj grupi ispitanika iznosila je 81,89±4,89mmHg, a večernja 83,44±3,36mmHg. U drugoj grupi, jutarnji diastolni TA iznosio je 81,00±7,20mmHg, a večernji 79,22 ± 6,36mmHg. Registrovane su statistički značajno veće vrednosti sistolnog TA u prvoj grupi, kako u jutarnjim (p<0.01), tako i u večernjim časovima (p<0.05). Ne postoji statistički značajna razlika u vrednostima diastolnog TA u jutarnjim časovima između dve grupe, dok je diastolni krvni pritisak statistički značajno veći u večernjim časovima kod ispitanika prve grupe. Nije registrovana značajna razlika u vrednostima TA između normalno uhranjenih i gojaznih pacijenata u našoj studiji (p<0.05).

Zaključak: Kod pacijenata sa hroničnom bubrežnom insuficijencijom je registrovana arterijska hipertenzija sistolnog tipa.

Ključne reči: arterijska hipertenzija, hronična bubrežna insuficijencija, indeks telesne mase.

DIFFERENCES IN VALUES OF ARTERIAL BLOOD PRESSURE IN PATIENTS WITH OR WITHOUT KIDNEY FAILURE

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Introduction: In the physical sense, blood pressure represents the force of blood per unit of cross-sectional area. As defined by the World Health Organization, hypertension is a condition characterized with elevated systolic blood pressure over 140 mmHg and diastolic blood pressure over 90 mmHg. Arterial hypertension is often associated with chronic renal failure, i.e. the impairment of renal function due to a progressive decline in glomerular filtration rate.

The Aim: The aim of this study was to investigate the correlation between arterial blood pressure and the presence of chronic renal failure, and potential association of blood pressure elevation and obesity.

Materials and methods: This was a prospective study conducted in 30 subjects, divided into test and control group. The first group consisted of 15 patients with the final stage of renal failure, while in the control group were 15 patients without renal function impairment. In all the patients, values of arterial blood pressure (TA) and pulse rate were measured for three consecutive days. Based on the calculated body mass index (BMI), participants were further divided into normal weight group, and overweight and obese group, and TA values were compared between them.

Results: Average morning value of systolic BP in the first group was 146,44±10,48mmHg, while evening systolic BP was 145,22±10,83mmHg in average. In the second group, average systolic BP was 128,33±14,85mmHg in the morning, and 129,11±22,01mmHg in the evening. Average morning value of diastolic BP in the first group was 81,89±4,89mmHg, and 83,44±3,36mmHg in the evening. In the second group, average systolic BP was 81,00±7,20mmHg in the morning, and 79,22±6,36mmHg in the evening. Average morning value of systolic BP was significantly higher in the first group (p<0.01), as well as the evening value (p<0.05). There was no significant difference in morning diastolic BP value between groups, while the evening value of diastolic BP was significantly higher in the first group. Also, there was no significant difference in values of arterial BP between lean and obese patients in our study.

Conclusion: The systolic type of arterial hypertension has been registered in patients with chronic kidney failure.

Key words: Arterial hypertension, chronic renal failure, body mass index

UČESTALOST I KARAKTERISTIKE ŽELUDAČNIH POLIPA U PACIJENATA SA DISPEPTIČNIM TEGOBAMA

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Uvod: Funkcionalni poremećaji gastrointestinalnog trakta su odgovorni za oko 40% svih oboljenja u gastroenterologiji. Dispepsija je dominantan funkcionalni poremećaj u proksimalnom segmentu digestivnog trakta. U literaturi nema saopštenja o učestalosti želudačnih polipa u bolesnika sa dispeptičnim tegobama.

Cilj: Cilj našeg rada je da proceni učestalost i karakteristike želudačnih polipa u bolesnika sa dispeptičnim tegobama.

Materijal i metode: Proksimalna endoskopija i transgastroskopska polipektomija je izvršena u bolesnika sa želudačnim polipima prečnika ≥ 5mm.

Rezultati: Želudačni polipi su dijagnostikovani u 111 (1,1%) od svih bolesnika sa dispeptičnim tegobama. U 45 bolesnika, starosti od 30-78 godina, prosečno 57,6 godina, uklonjeno je 76 želudačnih polipa (1-3 po bolesniku). Jednaka je zastupljenost polipa u antrumu i korpusu. Veličina uklonjenih polipa je 5-25mm, prosečno, 9,6mm. Najveći broj polipa je veličine 5-9mm (80,3%), p<0,001. Na peteljci je 52 (68,4%), dok je široke baze 24 (31,6%) uklonjena polipa, p<0,05. Hiperplastični polipi su dominantna histološka struktura uklonjenih polipa. Njihova učestalost u odnosu na adenome i fibroinflamatorne polipe je visoko statistički značajna, p<0,001. Svi uklonjeni adenomi su tubulo-vilozne strukture i sa displazijom umerenog i teškog stepena.

Zaključak: Zastupljenost želudačnih polipa u bolesnika sa dispeptičnim tegobama je 1,1%. Međutim, otkrivaju se i ozbiljne displastične promene u uklonjenim adenomima. Sve bolesnike sa dispeptičnim tegobama koji su stariji od 55 godina treba uputiti na proksimalni endoskopski pregled.

Ključne reči: dispepsija, želudačni polipi, polipektomija

FREQUENCY AND CHARACTERISTICS OF GASTRIC POLYP IN THE PATIENTS WITH DYSPLECTIC DIFFICULTIES

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Introduction: Functional disorders of gastrointestinal tract are responsible for approximately 40% of all diseases in gastroenterology. Dyspepsia is the predominant functional disorder in the proximal segment of the digestive tract. There is no statement in the literature about the frequency of gastric polyps in patients with dyspeptic difficulties.

Objective: The objective of our study is to evaluate the incidence and characteristics of gastric polyps in patients with dyspeptic difficulties.

Material and methods: Proximal endoscopy and transgastroskopska polypectomy was performed in patients with gastric polyps ≥ 5 mm in diameter.

Results: The gastric polyps were diagnosed in 111 (1.1%) of all patients with dyspeptic difficulties. In 45 patients aged 30-78 years, average 57.6 years, 76 gastric polyps (1-3 per patient) were removed. There is an equal incidence of polyps in the antrum and corpus. Size of removed polyps is 5-25mm, on average, 9.6 mm. The largest number of polyp are size 5-9mm (80.3%), p<0.001. 52 (68.4%) of polyps removed are on pedicle, while 24 (31.6%) are wide base, p<0.05. Hyperplastic polyps are the predominant histological structure of the removed polyps. Their frequency in relation to adenomas and fibroinflammatory polyps is highly statistically significant, p<0.001. All removed adenomas are tubular-villous structure with dysplasia of moderate and high degree.

Conclusion: Presence of gastric polyps in patients with dyspeptic difficulties is 1.1%. However, there are serious dysplastic changes discovered in removed adenomas. All patients with dyspeptic difficulties who are older than 55 years should be sent to the proximal endoscopy.

Key words: dyspepsia, gastric polyps, polypectomy

PROCENA RIZIKA RECIDIVA KRVARENJA U BOLESNIKA SA KRVAREĆIM GASTRODUODENALNIM ULKUSOM

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Uvod: Krvarenje je najčešća komplikacija ulkusne bolesti. U oko 80% slučajeva se spontano zaustavlja, ali u manje broja bolesnika može da se nastavi ili ponovo javi i onda je u vezi sa povećanim mortalitetom.

Cilj rada: Ispitivanje prognostičke značajnosti kliničkih manifestacija krvarenja, lokalizacije ulkusa, Forrest-ove klasifikacije krvarećih ulkusa, kao i pridružene rizične terapije za pojavu recidivirajućeg krvarenja.

Bolesnici i metode: Studija je obuhvatila 144 bolesnika, koji su lečeni na Klinici za gastroenterologiju i hepatologiju KC Niš zbog krvarenja iz gastroduodenalnog ulkusa. Dijagnoza bolesti je postavljena na osnovu anamneze, kliničkog pregleda, krvne slike i proksimalne endoskopije (klasifikacija po Forrestu).

Rezultati: Ulkusno krvarenje je češće bilo zastupljeno u muškaraca (62,5%) nego u žena (37,5%). Prosečna starost bolesnika je 66,7 godina. Recidivantno ulkusno krvarenje se javilo u 9 bolesnika: 44,4% žena i 55,6% muškaraca. Najčešći simptom krvarenja bila je melena u 61,1% bolesnika. Najveći broj bolesnika - 47,9% je krvario iz ulkusa bulbosa duodenuma. Anamnestički podaci su pokazali da je 50,6% bolesnika koristilo nesteroidne antiinflamatorne lekove (NSAIL), aspirin ili antikoagulantnu terapiju pre manifestacije ulkusnog krvarenja. Nije nadjena statistički značajna povezanost između učestalosti recidiva krvarenja i endoskopskog nalaza po Forrest-ovoj klasifikaciji ($H_i=7,752$, $p=0,458$).

Zaključak: Krvarenje iz ulkusa se gotovo dva puta se češće javlja u muškaraca nego u žena, starije životne dobi. Upotreba NASIL, aspirina i antikoagulantne terapije je značajan faktor rizika za nastanak ulkusnog krvarenja. Klasifikacija krvarećih ulkusa prema Forrestu je od značaja za planiranje endoskopske terapije, kao i procenu eventualnih recidiva ulkusnog krvarenja.

Ključne reči: ulkusna bolest, krvarenje, recidivi krvarenja

RISK EVALUATION OF REBLEEDING IN PATIENTS WITH BLEEDING GASTRODUODENAL ULCER

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Introduction: Bleeding is most frequent complication of the ulcer disease. In about 80% of cases bleeding stops spontaneously, but in small number of patients it could be continued or occur again and then is related with increased mortality.

Aim of study: Testing prognostic significance of clinical manifestation of bleeding, ulcer localization, Forrest classification, and also associated risk therapy for causing recurrent bleeding.

Patients and methods: The study included 144 patients which were cured on Clinic for gastroenterology and hepatology KC Nis because of the bleeding from gastroduodenal ulcer. The illness was diagnosed by anamnesis, clinical examination, blood analysis and proximal endoscopy (Forrest classification).

Results: Ulcer bleeding was frequent in men (62,5%) rather than woman (37,5%). Average age of patients was 66,7 years. Recidivant ulcer bleeding occurred in 9 patients: 44,4% women i 55,6% man. The most common symptom was melena in 61,1% of patients. The largest number of patients - 47,9% was bleeding from ulcer of duodenal bulb. Anamnestical data showed that 50,6% of patients used NSAID, aspirin or anticoagulant therapy before manifestation of ulcer bleeding. Statistically significant correlation was not found between rebleeding and endoscopic finding by Forrest classification ($H_i=7,752$, $p=0,458$).

Conclusion: Bleeding from ulcer was two times more frequent in men than women, older age. Use of NSAID, aspirin and anticoagulant therapy is significant risk factor for occurrence of ulcer bleeding. Classification of bleeding ulcers by Forrest is significant for planning endoscopic therapy, and also evaluation of possible ulcer rebleeding.

Keywords: ulcer disease, bleeding, rebleeding

KOLONOSKOPIJA U DIJAGNOZI KARCINOMA DEBELOG CREVA

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Uvod: Kolorektalni karcinom (KRK) predstavlja sve važniji dijagnostički i terapijski problem, čija su incidenca oboljevanja i smrtnosti stalno u porastu. To je treći maligni tumor u svetu, a po smrtnosti je na drugom mestu u razvijenim zemljama. Jedan od najbitnijih faktora rizika jeste starost, ali je neizostavna i interakcija genetskih faktora i faktora spoljašnje sredine.

Cilj istraživanja: Ispitati učestalost KRK po polu i starosti, odrediti anatomsku lokalizaciju i histološke karakteristike.

Materijal i metode: Retrospektivnom studijom su obuhvaćeni pacijenti sa simptomatologijom oboljenja debelog creva tokom 2010. godine. U svih pacijenata uradjena je kolonoskopija. Tokom pregleda beležena je pojava KRK, lokalizacija i morfološke karakteristike, a makroskopske lezije sluznice suspektne na KRK su biopsirane i materijal je patohistološki obrađivan.

Rezultati: Tokom 2010. godine, uradjeno je 1793 kolonoskopska pregleda. KRK je pronađen u 62 (3,46%) pacijenta, muškaraca je bilo 43 (69,35%), a žena 19 (30,65%), prosečne starosti 68,9 godina. KRK je najčešće bio lokalizovan u rektumu-kod 27 pacijenta (43,55%), a najređe u descedensu-kod 3 pacijenta (4,84%). Najčešći patohistološki nalaz je adenokarcinom u 60 pacijenata (96,77%).

Zaključak: KRK se najčešće javlja posle 50 godine, nešto više kod muškaraca nego kod žena, sa najčešćom lokalizacijom u levoj polovini debelog creva. Za otkrivanje KRK neophodna je adekvatna dijagnostika, tačno određivanje stadijuma bolesti, pravovremeno i pravilno lečenje. Rezultati retrospektivne analize nameću potrebu kolonoskopije kao primarnog pregleda za eksploraciju debelog creva.

Ključne reči: Kolorektalni karcinom, kolonoskopija

COLONOSCOPY IN DIAGNOSIS OF CARCINOMA OF THE COLON

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Introduction: Colorectal cancer (KRC) is an increasingly important diagnostic and therapeutic problem, with the incidence of morbidity and mortality is increasing steadily. This is the third malignant tumor worldwide, and the mortality rate is second in developed countries. One risk factor is age, but it is unavoidable and the interaction of genetic factors and environmental factors.

Objective: To investigate the frequency of KRK by sex and age, to determine the anatomical localization and histological features.

Materials and methods: This retrospective study included patients with symptoms of diseases of the colon in 2010 year. In all the patients underwent a colonoscopy. During the examination was recorded as KRK occurrence, localization and morphological features and macroscopic mucosal lesions suspected to KRK underwent biopsy and the material was processed histologically.

Results: During 2010 year, done in 1793 colonoscopic examinations. KRK was found in 62 (3,46%) patients, men were 43 (69,35%) and women were (30,65%), mean age 68,9 years. KRK is the most localized in the rectum in 27 (43,55%) patients, and least common in descedent part of colon-3 (4,84%) patients. The most common histopathological findings were adenocarcinoma in 60 patients (96,77%).

Conclusion: KRK is most common after age 50, more men than women, most frequently localized in the left half of colon. For the detection of KRK is necessary adequately assessed accurately determine the stage of disease, timely and proper treatment. The results emphasize the necessity of retrospective analysis of colonoscopy as a primary examination for the exploration of the colon.

Key words: colorectal cancer, colonoscopy

LIGATURA VARIKOZITETA JEDNJAKA U PREVENCIJI RECIDIVANTNOG KRVARENJA U BOLESNIKA SA CIROZOM JETRE

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Uvod: Ciroza jetre je vodeći uzrok portne hipertenzije. Ligatura varikoziteta jednjaka tokom proksimalne endoskopije je dominantna metoda za eradikaciju, tj obliteraciju varikozno izmenjenih vena jednjaka.

Cilj rada: Ukazati na efikasnost ligature varikoziteta jednjaka u bolesnika sa cirozom jetere i portnom hipertenzijom različitog etiološkog uzroka i različitog stepena varikoziteta i aktivnosti krvarenja, u prevenciji ponovnog krvarenja iz varikoziteta jednjaka.

Materijal i metode: Proksimalnom endoskopijom u bolesnika sa varikozitetama jednjaka od I-III stepena plasirano je po 6 elastičnih gumenih prstenova, sistemom six shooter.

Rezultati: U 63 bolesnika urađene su 92 seanse ligature varikoziteta jednjaka. Više od polovine bolesnika je imalo portnu hipertenziju u sklopu alkoholne ciroze jetre. U 6 bolesnika rađena je ligatura aktivno krvarećih variksa, a u preostalih 57 bolesnika ligaturom se preveniralo recidivantno krvarenje. Više od 50% bolesnika u toku prve seanse ima varikozitete III stepena, a više od 1/3 bolesnika varikozitete II stepena. U 30 bolesnika postignuta je kompletna eradikacija varikoziteta, nakon 1 do 5 seansi ligacije variksa, prosečno 1,9. U bolesnika sa kompletnom eradikacijom varikoziteta jednjaka u periodu praćenja od 6 do 18 meseci nije se ispoljilo digestivno krvarenje, za razliku od recidivantnog krvarenja koje se ispoljilo u 11 od 33 (33,3%) bolesnika u kojih nije postignuta kompletna eradikacija varikoziteta. Zapažena razlika je statistički značajna, $p < 0,05$.

Zaključak: Endoskopska ligatura varikoziteta jednjaka je sigurna i bezbedna, tehnički lako izvodljiva procedura u terapiji krvarećih varikoziteta jednjaka i u prevenciji recidivantnog krvarenja.

KLjučne reči: ciroza jetre, portna hipertenzija, variksi jednjaka, endoskopska ligatura variksa

LIGATURE ESOPHAGEAL VARICES IN PREVENTION OF RECURRENT BLEEDING IN PATIENTS WITH LIVER CIRRHOSIS

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Introduction: Cirrhosis is a leading cause of portal hypertension. Ligation of esophageal varices in the proximal endoscopy is the dominant method for eradication, ie altered variceal obliteration of veins of the esophagus.

The Aim: Show the efficiency of ligation of esophageal varices in patients with cirrhosis and portal hypertension different aetiological causes and varying degrees of bleeding varices and activities in the prevention of recurrent bleeding.

Material and methods: Proximal endoscopy in patients with esophageal varices of I-III level was placed at 6 elastic rubber rings, six shooter system,

Results: In 63 patients, 92 sessions were performed ligation of esophageal varices. In 6 cases was ligation of actively bleeding varices, and the remaining 57 patients, to prevent recurrent bleeding. More than 50% of patients during the first session, a grade III varices, and more than 1/3 patients, grade II varices. In 30 patients achieved a complete eradication of varices, after 1 to 5 sessions variceal ligation, average 1.9. In patients with complete eradication of esophageal varices in period of monitoring from 6 to 18 months didn't affect the digestive system bleeding, as opposed to recurrent bleeding, which is demonstrated in 11 of 33 (33.3%) patients who failed to achieved complete eradication of varices. The observed difference is statistically significant, $p < 0.05$.

Conclusion: Endoscopic ligation of esophageal varices is a safe and secure, technically easy to perform procedures in the treatment of bleeding esophageal varices and prevention of recurrent bleeding.

Key words: liver cirrhosis, portal hypertension, esophageal varices, endoscopic variceal ligation

EPIDEMIOLOŠKA, ENDOSKOPSKA I PATOHISTOLOŠKA STUDIJA KARCINOMA ŽELUCA

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Uvod: U našoj zemlji karcinom želuca je najčešći maligni tumor digestivnog trakta. Ezofagogastroduodenoskopija je najpouzdanija dijagnostička metoda za otkrivanje karcinoma želuca. U zavisnosti od dubine zahvatanja zida želuca razlikujemo rani i uznapredovali karcinom želuca. Prema Bormann-ovoj klasifikaciji uznapredovali karcinomi se na osnovu endoskopskog izgleda dele na: vegetativne, ulcerativne, ulcero-infiltrativne i difuzno-infiltrativne. Na osnovu histopatoloških karakteristika svi karcinomi želuca se prema Laurenovoj klasifikaciji dele na: difuzne, adenokarcinome i neodređene.

Cilj rada: Utvrditi korelaciju endoskopskih i patohistoloških karakteristika kao i njihovu povezanost sa epidemiološkim parametrima.

Pacijenti i metode: Retrospektivnom studijom analizirana su 68 bolesnika, kojima je tokom ezofagogastroduodenoskopskog pregleda verifikovan karcinom želuca. Svi biopsijski uzorci uzeti tokom endoskopskog pregleda su analizirani u Institutu za patologiju. Svi rezultati su obrađeni statistički.

Rezultati: Najveći broj pacijenata bio je stariji od 65 godina bez značajne razlike u odnosu na pol ($p=0,848$). Dominantna lokalizacija je karcinom korpusa, bez statistički značajne razlike prema polu ($p=0,185$). Endoskopski nalaz je pokazao da je dominantan vegetativni karcinom kod muškaraca, a kod žena je bio ulcerativni karcinom, mada nije bilo statistički značajne razlike ($p=0,164$). Adenokarcinom je dominantan kod oba pola, ali nije bilo statistički značajne razlike ($p=0,464$).

Zaključak: Karcinom želuca se češće javlja kod muškaraca i to najčešće nakon 65. godine života. Kod oba pola obolelih nezavisno od njihove starosne dobi dominira vegetativni adenokarcinom, najčešće lokalizovan u korpusu..

KLjučne reči: epidemiologija, endoskopija, patohistologija, karcinom želuca

EPIDEMIOLOGICAL, ENDOSCOPIC AND HISTOPATHOLOGICAL STUDY OF GASTRIC CANCER

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Introduction: In our country, gastric cancer is the most common malignant tumor of the digestive tract. Esophagogastroduodenoscopy is the most reliable diagnostic method for detection of gastric cancer. Depending on the depth of gastric wall abstractions distinguish early and advanced gastric cancer. According to Bormann's classification of advanced cancer on the basis of endoscopic appearance divided into: vegetative, ulcerative, aphthous-infiltrative and diffuse-infiltrative. On the basis of histopathological features all cancers of the stomach according to Lauren classification divided into: diffuse, vague and adenocarcinomas.

The Aim: To evaluate the correlation of endoscopic and patohistological characteristics and their relation to the epidemiological parameters.

Patients and Methods: This retrospective study included 68 patients who were verified during the esophagogastroduodenoscopy review gastric cancer. All biopsy samples were taken during endoscopy were analyzed at the Institute of Pathology. All results were statistically analyzed.

Results: Most patients were older than 65 years with no significant differences in development as opposed to gender ($p = 0.848$). Dominant localization of the corpus carcinoma, with no statistically significant differences by gender. Endoscopic findings showed that the dominant vegetative cancer in men and women was ulcerative cancer, although there was no statistically significant difference ($p = 0.164$). Adenocarcinoma was predominant in both sexes, but there was no statistically significant difference ($p=0.464$).

Conclusion: Gastric cancer is more common in men, after 65 years. Both sexes of patients regardless of their age dominated by vegetative adenocarcinoma, usually localized in the corpus.

Key words: epidemiology, endoscopy, histopathology, gastric cancer

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Uvod: Aspartat aminotransferaza (AST) i alanin aminotransferaza (ALT) su najčešće korišćeni pokazatelji oštećenja jetre i predstavljaju markere hepatocelularne nekroze.

Cilj: Ispitivanje značaja biopsije jetre kod povišenih vrednosti aminotransferaza nepoznate etiologije.

Materijal i metode: U studiju je uključeno 40 bolesnika sa povišenim vrednostima aminotransferaza nepoznate etiologije. Svim pacijentima je urađena perkutana biopsija jetre. Na osnovu prisutne ili odsutne nekroze, fibroze, stepena aktivnosti i ostalih patohistoloških parametara, postavljena je dijagnoza bolesti. Nakon toga procenjena je korelacija sa povišenim vrednostima enzima jetre.

Rezultati: Najveći broj bolesnika, 32 imalo je istovremeno povišene vrednosti obe aminotransferaze. Prosečna vrednost ALT iznosile su $133,9 \pm 155$ U/L (range 766, median 72) dok je prosečna vrednost AST iznosila $85,9 \pm 114,5$ U/L (range 588, median 51). Nakon patohistološkog pregleda, nejasnu etiologiju, povišenih vrednosti aminotransferaza imalo je 22 (55%), od kojih je 7 (31,8%) sa histološkom slikom hroničnog hepatitisa a 7 (31,8%) bolesnika je imalo portalni i lobularni hepatitis. Toksični hepatitis potvrđen je kod 11 (27,5%) bolesnika dok je nealkoholni steatohepatitis imalo 5 (12,5%). Važno je istaći da je kod jednog bolesnika potvrđena autoimuna bolest jetre a kod jednog Wilsonova bolest. Odnos AST : ALT <1 imalo je 33 bolesnika (17 nejasne etiologije, 10 toksične, 5 nealkoholni steatohepatitis, 1 autoimuni), dok je AST : ALT >1 imalo 7 bolesnika (5 nejasne etiologije, 1 toksične i jedan sa M. Wilson).

Zaključak: Naši rezultati ukazuju da nealkoholni steatohepatitis nije najčešći uzrok povišenih vrednosti aminotransferata, stoga smatramo da je biopsija jetre neophodna kod svakog bolesnika sa klinički nejasnim uzrokom povišenih vrednosti enzima jetre.

Ključne reči: biopsija jetre, aminotransferaze, etiologija

SIGNIFICANCE OF LIVER BIOPSY IN PATIENTS WITH ELEVATED AMINOTRANFERASE LEVELS OF IDIOPATHIC ETIOLOGY

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Introduction: Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) are the most commonly used indicators of liver damage and are used as hepatocellular necrosis markers.

The Aim: To determine the role of liver biopsy in patients suffering idiopathic liver disease with elevated AST and ALT levels.

Materials and Methods: Survey included 40 patients with elevated aminotransferase levels. Percutaneous liver biopsy was performed in all cases. Diagnosis and etiology of liver disease were based on necrosis, fibrosis, activity level and other patho-histological parameters. Afterwards, we estimated correlation between the disease and elevated liver enzymes.

Results: The majority of patients (32) had both aminotransferase levels elevated. Mean ALT level was $133,9 \pm 155$ U/L (range 766, median 72) while mean AST level was $85,9 \pm 114,5$ U/L (range 588, median 51). Out of 22 (55%) patients with elevated liver enzymes and idiopathic etiology of liver disease 7 (31,8%) had histologically confirmed chronic hepatitis and 7 (31,8%) had portal and lobular hepatitis. Toxic hepatitis was confirmed in 11 (27,5%) cases while 5 (12,5%) patients have been confirmed with nonalcoholic steatohepatitis. We would like to emphasize that 1 patient was confirmed with autoimmune liver disease and 1 patient had Wilson's disease. 33 patients had AST:ALT ratio <1 (17 of them had idiopathic liver disease, 10 toxic liver disease, 5 nonalcoholic steatohepatitis, 1 autoimmune liver disease). 7 patients had AST:ALT ratio >1 (5 of them had idiopathic liver disease, 1 toxic liver disease, 1 with Wilson's disease.)

Conclusion: Our results indicate that nonalcoholic steatohepatitis is not the most common cause of elevated liver enzymes. Therefore, it is essential that every patient with elevated liver enzymes and clinically unresolved cause of liver disease, undergo liver biopsy.

Key words: liver biopsy, aminotransferase, etiology

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Uvod: Alogena TMČH predstavlja savremenu, potencijalno kurativno i sve češće primenjivanu metodu lečenja mnogih hemataloških oboljenja. Međutim, i uprkos učenjenom napretku i usavršavanju pre i post transplantacijskog tretmana, kao i same transplantacijske tehnike, smrtnost nakon transplantacije je i dalje visoka i ne može se sa tačnošću predvideti.

Ciljevi: Da se analizira uticaj sledećih faktora na dužinu preživljavanja bolesnika nakon alogene TMČH: životna dob, interval od dijagnoze do transplantacije, izvor MČH, vrsta i stadijum bolesti. Proceniti učestalost aGvHD i hGvHD kod transplantiranih bolesnika, kao prognostičku vrednost sledećih bodovnih sistema: EBMT skor, eEBMT skor i HCT-CI.

Materijal i metode: Retrospektivnom studijom obuhvaćeni su svi bolesnici lečeni alogenom TMČH na Klinici za hematologiju Kliničkog centra Vojvodine, ukupno njih 27. Pored standardnih statističkih metoda, korišćeni su: χ^2 test, Mann-Whitney U test, Kaplan-Meier-ov test i log-rank test.

Rezultati: Petogodišnje preživljavanje nakon transplantacije kod naših bolesnika iznosi 31,6%. Znaci prihvatnja kalema su se značajno ranije javljali kod TMČH iz periferne krvi u odnosu na TKS. Bolnici sa uznapredovalom bolešću su imali statistički značajno lošije preživljavanje u odnosu na ostale bolesnike. U našoj studiji, EBMT skor se pokazao kao najznačajniji bodovni sistem u proceni rizika od posttransplantacijskog mortaliteta.

Zaključci: Vrsta i stadijum bolesti su najznačajniji pojedinačni parametri u proceni rizika kako od posttransplantacijskog mortaliteta tako i od relapsa. EBMT skor predstavlja najznačajniji bodovni sistem na osnovu kojeg se može proceniti rizik od posttransplantacijskog mortaliteta, bez obzira na vrstu bolesti i izvor MČH.

Ključne reči: alogena transplantacija matične ćelije, preživljavanje, EBMT skor

PROGNOSTIC FACTORS FOR ALLOGENIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Despite of all improvements made in the field of pre and post transplant treatment, and in the transplant techniques as well, allogenic HSCT is still associated with a high rate of mortality, which cannot be accurately predicted.

Aims: To analyze the impact of the following parameters on overall survival after allogenic HSCT: age, time interval from diagnosis to transplant, source of HSC and type and stage of the disease. To determine the prognostic value of the following scoring systems: EBMT score, eEBMT score and HCT-CI.

Material and methods: The retrospective study included all patients treated with allogenic HSCT at the Clinic of Hematology, Clinical Center of Vojvodina, total of 27 patients. For analyzing parametric data χ^2 test was used, and for non-parametric data Mann-Whitney U test. In estimating overall survival Kaplan-Meier test was used and for comparing survival between groups of patients log-rank test was used.

Results: Five-year survival rate after allogenic HSCT was estimated at 31.6%. Patients with advanced disease had far worse survival when compared to the rest of transplanted patients. In our study, EBMT score had the most significance in assessing the risk of post transplant mortality.

Conclusion: Type and stage of the disease are of most value in estimating the risk of post transplant mortality and relapse. EBMT score is the most significant of all other scoring systems, by which we can estimate the risk of allogenic HSCT, regardless of disease type and SC source.

Key words: allogenic hematopoietic stem cell transplantation, survival, EBMT score

ZNAČAJ PROTOČNE CITOMETRIJE U OBOLELIH OD LIMFOPROLIFERATIVNIH OBOLJENJA

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Uvod: Imunofenotipizacija u limfoproliferativnim bolestima ima dijagnostički i prognostički značaj

Cilj rada: Detekcija prisustva i prognostičkog značaja ZAP-70 kod bolesnika sa hroničnom B-limfocitnom leukemijom (CLL). Ekspresija ZAP-70 u CLL ima kontinuirani raspon od odsutnog do visokog, što značajno utiče na pouzdanost ovog prognostičkog markera.

Materijal i metode: Analizirano je 22 bolesnika sa CLL lečenih u periodu od marta 2006. do februara 2007. Pacijenti su podeljeni u dve grupe, preovladavali su muškarci -78,1%, preko 60 godina starosti (81,25%). Analiza je vršena na protočnom citometru EPICKS-XL (Beckman Coulter) pomoću Sistem II softvera. Korišćena su direktno konjugovana antitela CD19 PA, ZAP-70-FITC (klon 1E7.2) (eBioscience, San Diego SAD) i CD5-FITC, CD2-PE, FMC7-FITC, CD23-PE, CD11c-PE, CD25-FITC, HLA-DR-PerCP, CD79b PC-Cy5, sigM-FITC, sigD-PE, CD20-PE (Becton Dickinson, Pharmingen, SAD), CD10-FITC (Beckman Coulter). Leuoperm (Serotec, Kidlington Velika Britanija) korišćen za permeabilnost. Svi uzorci preko 20% ZAP-70/CD19 dvostrukih pozitivnih B limfocita su smatrani pozitivnim.

Rezultati: ZAP-70 je odsutan u grupi sa 22 CLL dijagnostikovanih preko 18 meseci od početka praćenja, a 2 od 10 (20%) iz grupe novodijagnostikovanih pacijenata bili ZAP-70+. Praćenjem ZAP-70+ u oba slučaja primećeno je pogoršanje kliničkog statusa koje dovodi do smrti pacijenta u jednoj grupi. U graničnim slučajevima sa ZAP-70+ u rasponu od 10,9-19,9% nije postojala korelacija nivoa ZAP-70 ekspresije sa aktivnošću bolesti ili kliničkim sistemom bodovanja.

Zaključak: Visok procenat ZAP-70+ ćelija predstavlja loš prognostični znak u CLL. Granična ekspresija ZAP-70 nije dovoljno precizna za svrstavanje obolelih u rizične grupe.

Ključne reči: Hronična limfocitna leukemija, Prognostički faktori, ZAP-70.

DIJAGNOSTIČKI ZNAČAJ AKTIVNOSTI ALKALNE FOSFATAZE LEUKOCITA PERIFERNE KRVI U STANJIMA SA NEUTROFILIJOM

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Uvod: Leukemoidna reakcija je čest pratilac oboljenja. Laboratorijski se detektuje neutrofilija koja može biti jako visoka. Uvođenjem specijalnih bojenja na alkalnu fosfatazu leukocita moguće je razlikovati leukocitozu u ovim oboljenjima od leukocitoze kakvu vidjamo u Hroničnoj granulocitnoj leukemiji

Cilj: Utvrditi dijagnostičku vrednost aktivnosti APL kod bolesnika sa neutrofilijom i ispitati korelaciju broja leukocita i visine skora APL.

Materijali i metode: Od 1. novembra 2011. - 31. januara 2012. godine ispitivano je 14 pacijenata sa neutrofilijom. Koristili smo native preparate razmaza periferne krvi koje smo bojili metodom po Kaplowu. Određivanje skora APL vrši se tako što se aktivnost enzima (od 0 - 4) odredi u 100 granulocita, a potom njihov broj pomnoži sa odgovarajućim intenzitetom APL. Sabiranjem tih vrednosti dobija se skor APL.

Rezultati: Kod deset bolesnika utvrđen je nizak skor APL u perifernoj krvi, nakon čega je postavljena dijagnoza HGL. Vrednosti skora kod ostalih bolesnika su bili u opsegu od 95 do 147 što je upućivao na reaktivni fenomen.

Zaključak: U hroničnoj granulocitnoj leukemiji, paroksizmalnoj noćnoj hemoglobinuriji skor APL je ≤ 20 , dok je u reaktivnim leukocitozama kakve vidimo u nehematopoetskim malignitetima, infekcijama i sistemskim bolestima vezivnog tkiva, ovaj skor viši. Određivanje skora APL je jednostavno i pouzdano metoda koja, ima vrednost u diferencijalnoj dijagnozi neutrofilije u HGL od stanja praćenih reaktivnom neutrofilijom.

Ključne reči: leukocitoza, leukemoidna reakcija, neutrofilija, alkalna fosfatasa leukocita.

THE SIGNIFICANCE OF FLOW-CYTOMETRY IN PATIENTS WITH LYMPHOPROLIFERATIVE DISEASE

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Introduction: immunophenotyping in lymphoproliferative disorders has diagnostic and prognostic significance.

The aim: Detection of the presence and prognostic value of ZAP-70 in patients with B-chronic lymphocytic leukemia (CLL). Expression of the ZAP-70 in CLL has a continuum ranging from absent to high, which affects the reliability of prognostic markers.

Materials and Methods: We analyzed 22 patients with CLL who were treated between March 2006. until February 2007. Patients were into two groups, dominated the men -78,1%, over 60 years of age (81,25%). Analysis performed on the flow-cytometry EPICKS-XL (Beckman Coulter) with System II software. Were used directly conjugated antibodies CD19 PA, ZAP-70-FITC (clone 1E7.2) (eBioscience, San Diego USA) and CD5-FITC, CD2-PE, FMC7-FITC, CD23-PE, CD11c-PE, CD25-FITC, HLA-DR-PerCP, CD79b-Cy5 PC, Sigma-FITC, sigD-PE, CD20-PE (Becton Dickinson, Pharmingen, USA), CD10-FITC (Beckman Coulter). Leuoperm (Serotec, Kidlington UK) used for permeability. Samples with over 20% ZAP-70/CD19 double positive B-cells were considered positive.

Results: ZAP-70 wasn't in the group diagnosed over 18 months from the beginning of this follow up, while 2 of 10 (20%) newly diagnosed patients were ZAP-70+. Monitoring of ZAP-70+ in both cases had worsening of their clinical status resulting to death in one patient. Borderline cases with ZAP-70+ ranging from 10.9-19.9% there wasn't correlation of level of ZAP-70 expression with disease activity or clinical scoring systems.

Conclusion: High percentage of ZAP-70+ cells is a sign of poor prognosis in CLL. Borderline expression of ZAP-70, couldn't be enough to classify patients into a risk groups.

Key words: Chronic Lymphocytic leukemia, Prognostic factors, ZAP-70.

DIAGNOSTIC SIGNIFICANCE OF LEUKOCYTE ALKALINE PHOSPHATASE ACTIVITY IN PERIPHERAL BLOOD IN CONDITIONS WITH NEUTROPHILIA

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Introduction: Leukemoid reaction is a common feature of the disease. Laboratory detects neutrophilia that could be very high. The introduction of special staining of leukocyte alkaline phosphatase it's possible to distinguish between leukocytosis in these disease and leukocytosis that we see in Chronic granulocytic leukemia.

Objective: To determine the diagnostic value of APL activity in patients with neutrophilia and investigate the correlation of the number of leukocytes and APL score.

Materials: From November 1st 2011. - January 31st 2012. yr, 14 patients with neutrophilia have been examined. We used native preparations of peripheral blood smear, which are coloured stained by the metod of Kaplow. Determination of APL score is done by determine enzyme activity (from 0 to 4) in 100 granulocytes, and then their number is multiplied by the appropriate intensity of APL. Adding these values we obtain APL score.

Results: Ten patients identified a low score of APL in the peripheral blood, after which he was diagnosed with CML. Score values in the remaining patients were in the range of 95 to 147 as instructed on a reactive phenomenon.

Conclusion: in chronic granulocytic leukemia, Paroxysmal nocturnal hemoglobinuria APL is ≤ 20 , while the reactive leukocytosis that we see in non-hematopoetic malignancies, infections and connective tissue diseases, this score is higher. Determination of APL score is a simple and reliable method which, has a value in the differential diagnosis of neutrophilia in the HGL from state with reactive neutrophilia.

Key words: leukocytosis, leukemoid reaction, neutrophilia, leukocyte alkaline phosphatase.

ZNAČAJ ODREĐIVANJA KONCENTRACIJE HOLESTEROLA I CITOLOŠKOG ISPITIVANJAU DIFERENCIJALNOJ DIJAGNOZI ASCITESA

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Uvod: Ascites se javlja kao posledica ciroze jetre, malignoma, kongestivne srčane insuficijencije, tuberkuloze. Diferencijalna dijagnoza ascitesa može biti vrlo komplikovana.

Cilj rada: Utvrditi značaj određivanja koncentracije holesterola i citološkog pregleda ascitne tečnosti u cilju razlikovanja benignog i malignog ascitesa.

Pacijenti i metode: studijom je obuhvaćeno je 114 pacijenata, 70 muškaraca i 44 žene starosti od 29 do 80 godina, prosečne starosti 65 godina, sa ascitesom, hospitalizovanih u Klinici za gastroenterologiju i hepatologiju Kliničkog Centra u Nišu u periodu 2010 - 2011 g. 10 ml ascitne tečnosti je dostavljano biohemijskoj laboratoriji gde je standardnom biohemijskom metodom određivana koncentracija holesterola. Citološko ispitivanje ascitne tečnosti vršeno je bojenjem hematoksin-eozinom i po metodi Papanikolau.

Rezultati: Pacijenti su nakon sprovedenih ispitivanja podeljeni u dve grupe: cirotični ascites (80); maligni ascites (34). U cirotičnom ascitesu su dominirale mezotelne ćelije i limfociti. Ćelijski tipovi koji su zastupljeni u najvećem procentu u malignom ascitesu su mezotelne ćelije i eritrociti. Maligne ćelije su otkrivene u 32% pacijenata. U grupi pacijenata sa cirotičnim ascitesom prosečna vrednost koncentracije holesterola je bila 1.28 ± 0.24 mmol/L, a u grupi sa malignim ascitesom 2.89 ± 0.33 mmol/L.

Zaključak: Određivanje koncentracije holesterola i citološko ispitivanje ascitne tečnosti su značajni u diferencijalnoj dijagnozi benignog i malignog ascitesa.

Ključne reči: ascites, citološko ispitivanje, koncentracija holesterola.

THE DIAGNOSTIC VALUE OF THE ASCITIC FLUID CHOLESTEROL CONCENTRATION AND CYTOLOGICAL EXAMINATION IN THE DIFFERENTIAL DIAGNOSIS OF ASCITES

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Introduction: Ascites occurs as a consequence of cirrhosis, malignancy, congestive heart failure, tuberculosis. The differential diagnosis of ascites can be difficult.

The Aim: of work is to determine the importance of determining the concentration of ascitic fluid cholesterol concentration and cytological examination in the purpose of distinguishing benign and malignant ascites.

Patients and Methods: This study included 114 patients, 70 men and 44 women aged 29 to 80 years, average age 65 years, with ascites hospitalized at the Clinic for Gastroenterology and Hepatology, Clinical Centre in Niš in the period 2010 - 2011 g. 10 ml of ascitic fluid is delivered to biochemical laboratory where the concentration of cholesterol was assessed by standard biochemical methods. Cytological examination of ascitic fluid was done using the hematoxylin-eosin staining, and by the method of Papanicolaou.

Results: After exams patients were divided into two groups: cirrhotic (80), and malignant ascites (34). In cirrhotic ascites dominated the mesothelial cells and lymphocytes. Cell types that are represented in the highest percentage of malignant ascites are the mesothelial cells and erythrocytes. Malignant cells were detected in 32% of patients. In the group of cirrhotic patients with ascites the average concentration of ascitic fluid cholesterol was 1.28 ± 0.24 mmol/L, while in the group with malignant ascites it was 2.89 ± 0.03 mmol/L.

Conclusion: Determination of the concentration of cholesterol and cytological examination of ascitic fluid are important in the differential diagnosis of benign and malignant ascites.

Keywords: ascites, cytological examination, cholesterol concentration.

ZNAČAJ SERUM ASCITES ALBUMINSKOG GRADIJENTA U DIFERENCIJALNOJ DIJAGNOZI ASCITESA

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Uvod: Ascites je nakupljena slobodna tečnost u trbušnoj duplji, koji nastaje kao posledica brojnih oboljenja, ide paralelno sa portnom hipertenzijom. SAAG predstavlja razliku između koncentracije albumina u serumu i koncentracije albumina u ascitesu. SAAG je značajan biohemijski parametar u diferencijalnoj dijagnozi ascitesa. Vrednosti iznad 11 g/L ukazuju na portnu hipertenziju kao uzrok nastanka ascitesa.

Cilj istraživanja: Određivanje pouzdanosti SAAG u diferencijalnoj dijagnozi ascitesa.

Pacijenti i metode: Istraživanje je obuhvatilo 127 pacijenata, starosti od 28 do 82 godine, prosečne starosti 62 godine, sa ascitesom hospitalizovanih u Klinici za gastroenterologiju i hepatologiju Kliničkog Centra u Nišu u periodu 2010-2011 g. U roku od 24h nakon prijema kod svih pacijenata je urađena abdominalna paracenteza. Paralelno sa uzimanjem ascitne tečnosti uzimana je i krv pacijenata. Oduzimanjem koncentracije albumina u serumu i koncentracije albumina u ascitesu određivan je SAAG. Studentov t-test and Mann-Whitney Rank Sum test su korišćeni za statističku analizu podataka. Rezultati su iskazani kao srednja vrednost ± standardna devijacija.

Rezultati: Pacijenti su nakon sprovedenih ispitivanja podeljeni u dve grupe: cirotični ascites (91); maligni ascites (36). Srednja vrednost SAAG u grupi pacijenata sa cirotičnim ascitesom je iznosila 21.34 ± 6.12, a u grupi pacijenata sa malignim ascitesom 9.97 ± 5.43. Kod 91.02% pacijenata sa cirotičnim ascitesom SAAG je bio veći od 11 g/L, u 69.26% pacijenata sa malignim ascitesom SAAG je bio manji od 11 g/L.

Zaključak: SAAG u kombinaciji sa ostalim metodama ispitivanja može biti od koristi u diferencijalnoj dijagnozi ascitesa, a posebno u razlikovanju cirotičnog i malignog ascitesa.

Ključne reči: ascites, serum-ascites albuminski gradijent.

THE VALUE OF SERUM ASCITES ALBUMIN GRADIENT IN DIFFERENTIAL DIAGNOSIS OF ASCITES

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Introduction: Ascites is free fluid accumulated in the abdominal cavity, which is the result of numerous diseases, running parallel with portal hypertension. SAAG is the difference between serum albumin concentration and albumin concentration in ascite. Values above 11 g/L indicate that patient with ascites has portal hypertension.

The Aim: To estimate the value of SAAG in differential diagnosis of ascites.

Patients and methods: Investigation included 127 patients, aged 28 to 82 years, mean age 62 years with ascites hospitalized in Clinic of Gastroenterology and Hepatology, Clinical Centre Niš in the period 2010-2011 year. Patients underwent abdominal paracentesis in the first 24 hours after admission in clinic. Along with taking ascitic fluid was taken and the blood of patients. Subtracting the albumin concentration in serum and ascites albumin concentrations were determined SAAG. The Student's t-test and Mann-Whitney Rank Sum test were used for statistical analysis of the data. Results are expressed as mean ± standard deviation.

Results: After clinical and instrumental examination patients were divided into two groups: cirrhotic ascites (91), malignant ascites (36). The mean value of SAAG group of patients with cirrhotic ascites was 21.34±6.12. In the group of patients with malignant ascites of 9.97±5.43. In 91.02% of patients with cirrhotic ascites SAAG was greater 11 g/L, in 69.26% of patients with malignant ascites SAAG was below 11 g/L.

Conclusion: SAAG is useful biochemical marker which in combination with other methods can help in differential diagnosis of ascites especially in differentiating cirrhotic and malignant ascites.

Key words: ascites, serum-ascites albumin gradient

ACUTE MYOCARDIAL INFARCTION IN THE CLINICAL HOSPITAL IN STIP

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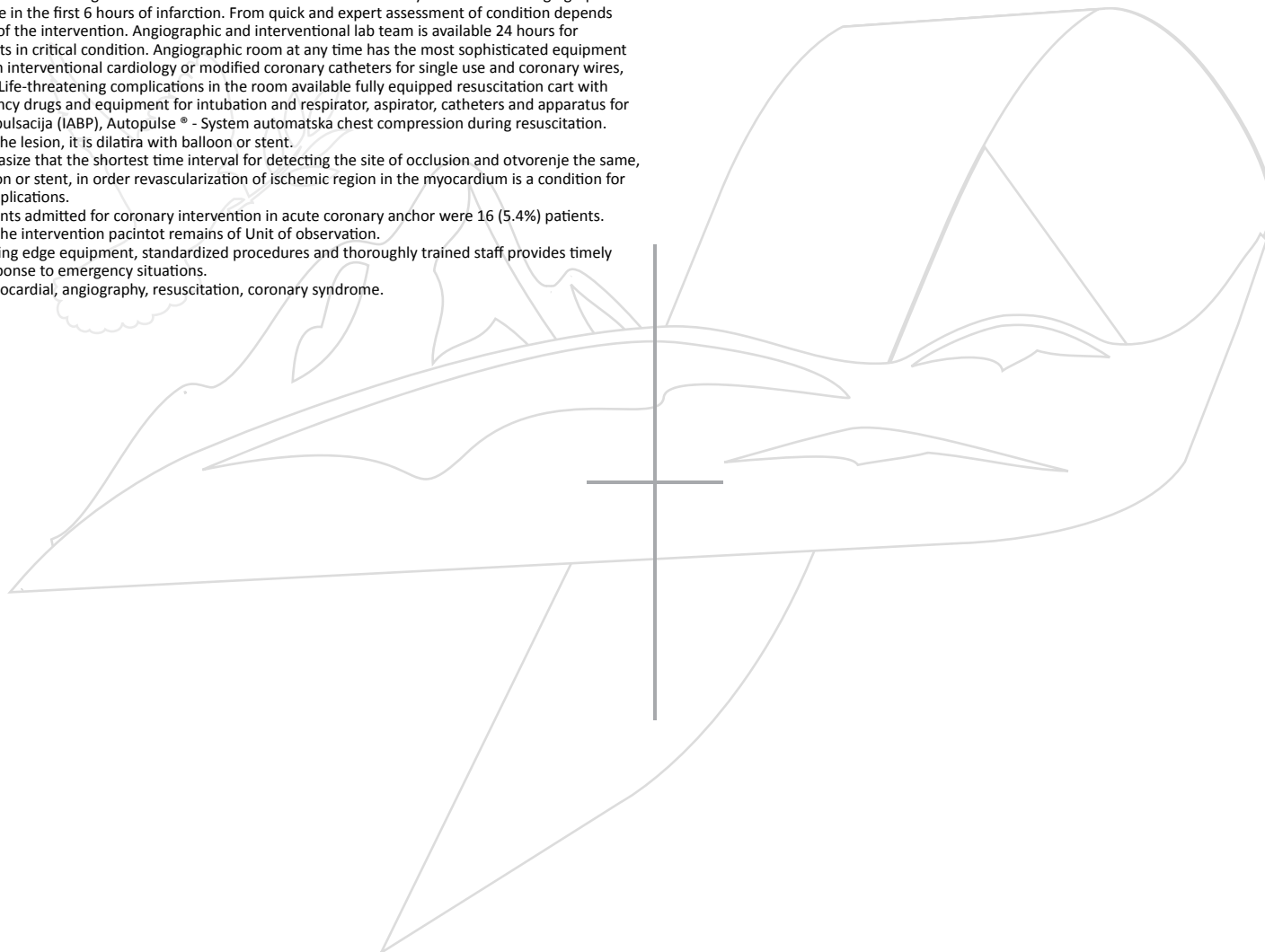
Introduction: Heart diseases in industrialized countries are the most common causes of death. Acute myocardial infarction (AIM) is a life threatening condition. Gold standard treatment is coronary intervention if angiographic laboratory is available in the first 6 hours of infarction. From quick and expert assessment of condition depends on patient outcome of the intervention. Angiographic and interventional lab team is available 24 hours for acceptance of patients in critical condition. Angiographic room at any time has the most sophisticated equipment and materials used in interventional cardiology or modified coronary catheters for single use and coronary wires, stents and balloons. Life-threatening complications in the room available fully equipped resuscitation cart with defibrillator, emergency drugs and equipment for intubation and respirator, aspirator, catheters and apparatus for intraaortalna kontrapulsacija (IABP), Autopulse[®] - System automatska chest compression during resuscitation. After localization of the lesion, it is dilated with balloon or stent.

Objectives: To emphasize that the shortest time interval for detecting the site of occlusion and opening the same, with balloon dilatation or stent, in order revascularization of ischemic region in the myocardium is a condition for avoiding further complications.

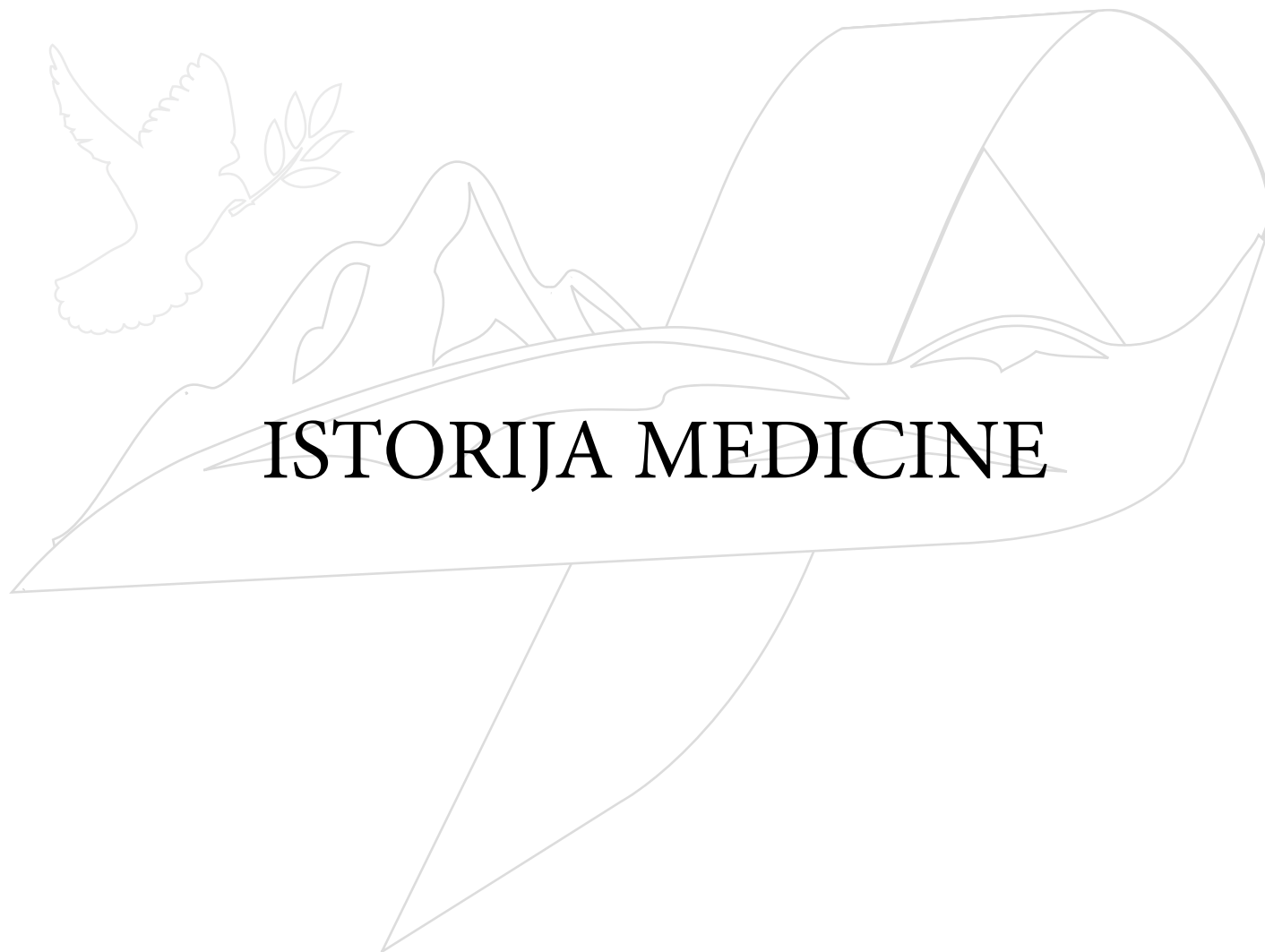
Results: Of 289 patients admitted for coronary intervention in acute coronary syndrome were 16 (5.4%) patients. After completion of the intervention patient remains in Unit of observation.

Conclusion: The cutting edge equipment, standardized procedures and thoroughly trained staff provides timely and professional response to emergency situations.

Key words: acute myocardial, angiography, resuscitation, coronary syndrome.







ISTORIJA MEDICINE

ПРВА ЖЕНА СРПКИЊА ХИРУРГ ДР НАДА ЋОВИЋ – ГРАДИЋ

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Увод: Пуно се мушкараца налази на списку славних хирурга, али наша Српкиња Нада Ћовић – Градић сеодважила да буде та – прва жена хирург.

Циљ:

Материјал и методе:

Резултати: Рођена у Србобрану 1885. Године, где је завршила основну школу, затим уписује прво Вишу девојачку школу, па потом и гимназију у Новом Саду. По завршетку Гимназије уписује 1905. Године Медицински Факултет у Будимпешти, прво завршава факултет 1910. а потом и као прва жена завршава специјалистички испит из Хирургије 1913. године. Први посао добија на чувеној II хируршкој клиници код др Павла Кузмика, али се 1919. Враћа у отаџбину, и почиње да ради у Сомбору. У Сомбору 1932. Године постаје председник Црвеног крста, њена кључна улогау Црвеном крсту се показала после Другог светског рата. И у самом Другом светском рату она је својим хируршким знањем помагала Црвену армију. Основала је Средњу медицинску школу у Сомбору и била њен први директор 1947. године. До своје пензије радила је у школском диспанзеру, умрла је 1973. године, а старији нараштаји сећају се ње као брижног лекара.

Закључци: Нада Ћовић – Градић је жена са том дивном особином која краси најбоље људе нашег народа, особином да прекрши лоша наметнута правила и учини наше друштво бољим, јер заиста би била штета да је једна оваква лекарка и жена хирург подлегла нормама времена у ком је живела.

кључне речи: Нада Ћовић – Градић, Сомбор, хирург

THE FIRST SERBIAN WOMAN SURGEON MD NADA ČOVIĆ – GRADIĆ

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Introduction: A lot of the men on the list of famous surgeon, but our Serb Nada Čović –Gradić dare to be - the first woman surgeon.

The aim: /

Materials and Methods: /

Results: She's born in Srbobran 1885th where she finished elementary school, then enrolled in the Girls' College first, and then high school in Novi Sad. After finishing Gymnasium in 1905th she enrolled the Medical faculty in Budapest, she completed college 1910th and then become the first woman who ends Surgery specialist exam in 1913th. The first gets a job at the famous II surgical clinic of Dr. Paul Kuzmika, but in 1919th returns to she's homeland, and began working in Sombor. In Sombor 1932th she became president of the Red Cross, she was very important person in Red Cross after World War II. In the Second World War with her surgical knowledge help to the soldier's of Red Army. She founded a Medical high-school in Sombor 1947th, and was first director of school. Until she's retirement, she worked in the School clinic, died in 1973rd and older generations remember her as a caring physician.

Conclusion: Nada Čović – Gradić is women with this wonderful characteristic that defines the best people of our nation, to break bad forced rules and make our society better, because it would be shame such a physician and surgeon handed over the norms of time in which she lived.

Keywords: Nada Čović – Gradić, Sombor, surgeon

ПРВИ НАСТАВНИ КАДАР СТОМАТОЛОШКОГ ОДСЕКА МЕДИЦИНСКОГ ФАКУЛТЕТА У НОВОМ САДУ (1976 – 1986)

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Сажетак: 1976. година је у Новом Саду је остала упамћена по оснивању Стоматолошког одсека Медицинског факултета. Др Ђорђе Јаковљевић, 12. фебруара 1976. године на седници Медицинског факултета даје предлог о проширењу делатности на образовање стручног кадра за рад у стоматолошкој пракси. Академик проф. др Данило Брановачки, први професор по позиву, свој први колектив одабира и по убрзаном поступку бивају изабрани у звање ванредних професора. То су били: др Мирослав Милутиновић- Микела, др Саво Папић, др Милена Протић. Затим после тога као асистенти на клинику долазе: др Милан Допућ, др Емил Татић, др Десанка Поповић-Марић, др Душан Мратинковић, др Валерија Хиљер-Коларов и др Драгољуб Ђурић. Идеја је била да се формира образовно научни центар који би школовао кадар за рад на територији Војводине. То је значило олокашавање основних и постдипломских студија за све будуће како студенте, тако и специјализанте. Данас када је овај одсек у четвртој деценији свога рада и постојања ми се осврћемо иза себе и осветљавамо кадар који је подигао идеју о високо школској установи за стоматологију у Новом Саду.

Кључне речи: Први професори, Стоматолошки одсек, Нови Сад.

FIRST PROFESSORS ON DENTAL DEPARTMENT OF FACULTY OF MEDICINE UNIVERSITY OF NOVI SAD

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Abstract: In Novi Sad, year 1976 will stay remembered for establishing Dental department of Faculty of Medicine University of Novi Sad. Dr Đorđe Jakovljević, on February the 12th in 1976, during the session of Faculty of Medicine University of Novi Sad, suggested implementation of dental studies. Academician prof. dr Danilo Branovački, the first professor, choosed his collective which members were: dr Miroslav Milutinović- Mikel, dr Savo Papić, dr Milena Protić and shortly after as assistants came dr Milan Dopuč, dr Emil Tatić, dr Desanka Popović-Marić, dr Dušan Mratinković, dr Valerija Hillier-Kolarov i dr Dragoljub Đurić. The idea was to form education – scientific center which would educate future dentists on territory of Vojvodina. For future students and specialists from this area this meant easier studies. Today when this department is in it's forth decade of existence we look behind ourselves and glorify first professors who made studying dentistry possible for us.

Key words: First professors, Dental department, Novi Sad.

ОГАНГА, БЕЛИ ЧАРОБЊАК АФРИКЕ- ПРИЧА О ДР АЛБЕРТУ ШВАЈЦЕРУ

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Увод: Био је лекар, музичар, теолог, филозоф, али најважније утиске оставио је својим радом, животом и показао пример целом човечанству како људска доброта, хуманост може да победи мржњу, патњу и насиље. Није користио само празне речи, него се одрекао своје каријере у развијеној Европи и отпутовао у Централну Африку да би се одлучно борио против незнања, предрасуда и беде. Доказ његовог рада и дан данас стоји у Ламбаренеу у виду болнице, поред тога здравствене установе у Мексику, Бразилу, Кореји, Зимбабвеу носе име Алберта Швајцера.

Закључак: Данас је прошло четрдесетседам година од смрти Алберта Швајцера. Али његов дух и поштовање живота даље живи у другим људима који су се одлучили да се посвете другима. У оквиру Ламбаренске болнице отворен је музеј, где посетиоци могу видети где је и како велики лекар радио и писао. Оно што је он оставио за собом нису само предмети, књиге и болнице већ су то и снага, љубав и непоколебљива вера у бољу будућност нашег света.

Кључне речи: Алберт Швајцер, хуманост, централна Африка.

OGANAGA, THE WHITE WISARD OF AFRICA- STORY ABOUT DR ALBERT SCHWEITZER

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Introduction: He was a physician, musician, theologian, philosopher, but the most important mark was left by his work, his life. He didn't just preach empty words, but took action: he gave up his career in developed Europe, and traveled to Central Africa to decisively fight ignorance, prejudice and poverty. Evidence of his work still stands in Lambaréné, in a form of a local hospital. Apart from that, healthcare facilities in Mexico, Brazil, and Zimbabwe also bare the name of Albert Schweitzer.

Conclusion: Today it has been forty seven years since Albert Schweitzer passed away, but his spirit and respect for life continue to live among people who have decided to dedicate themselves to others. As a part of Lambaréné hospital a museum has been opened where visitors can see where and how the great doctor has worked and written. He didn't left behind himself just objects, books and hospital but also strength, love and unwavering faith in better future for our world.

Keywords: Albert Schweitzer, humanity, Central Africa.

РИСТО ЈЕРЕМИЋ - ОД ЛЕКАРА ДО НАУЧНИКА

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Ристо Јеремић је још један блистави ум који припада друштву српских интелектуалаца који су стварали у другој половини деветнаестог и првој половини двадесетог века. Један је од пионира историје медицине на овим просторима и први човек из Босне и Херцеговине који је стигао до звања хирурга.

Рођен је 18. В 1869. године у Фочи. Српску основну школу завршио је у родном месту да би прва три разреда Реалне гимназије завршио у Сарајеву (1880- 1883). Матурирао је 1889. године у познатој Дубровачкој гимназији. Студије медицине започео је у Бечу а завршио у Грацу где је и промовисан за доктора целокупне медицине 1897. године. Од 1904. до Првог светског рата ради као шеф хирушког одељења у Тузли где отвара Санаторијум за све болеснике без обзира на имовинско стање. Током Првог светског рата осуђен је на три године робије али је помилован. Након ослобођења 1921. постаје управник Земаљске болнице у Сарајеву и са министром здравља Хамдијом Карамехмедовићем саставља први правилник болнице. Од 1923. до 1934. ради у Суботици као шеф санитета Дирекције државних железница где је и пензионисан. Током свог живота бавио се исторографијом здравствене културе, етнологијом, антропологијом, културом и историјом. Један је од оснивача „Сокола“ и председник културно-просветног друштва „Просвјета“. Током Другог светског рата био је члан Централног националног комитета Драже Михаиловића. Умро је 16. IX 1952. године у Мостару.

Кључне речи : Ристо Јеремић. хирург, Земаљска болница, „Просвјета“.

RISTO JEREMIĆ – FROM PHYSICIAN TO SCIENTIST

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Risto Jeremić is another brilliant mind of the Serbian intellectuals who created in the second half of the nineteenth and early twentieth century. He was one of the pioneers of history of medicine in this region and the first man from Bosnia and Herzegovina, who became a surgeon.

He was born on 18. V 1869. in Foča. He finished the Serbian elementary school in his hometown and completed the first three grades of the high school in Sarajevo (1880-1883). He graduated in 1889 at the famous Dubrovnik High School. Soon, he began his medical studies in Vienna and graduated in Graz, where he was promoted as a doctor of the whole medicine in 1897. From 1904. to the beginning of the World War I, Risto had been working as a chief of the surgery department in Tuzla, where he eventually opened Sanatorium for all patients, regardless of their financial status. Although he was sentenced to three years of prison during the World War I, at the end he was pardoned. After the liberation in 1921. he became manager of the Provincial Hospital in Sarajevo, and with the Minister of Health Hamdija Karamehmedović creates the first hospital rule book. From 1923. to 1934. he was working in Subotica as a head of the Medical Services Directorate State Railways, where he retired. During his life, he studied the historiography of medical culture, ethnology, anthropology, culture and history. He is one of the founders of „Sokol“ and the vice president of cultural-educational society, „Prosvjeta“. During the World War II he was a member of the Central National Committee of Draža Mihailović. He died on 16. IX 1952. in Mostar.

Key words : Risto Jeremić, surgeon, Provincial Hospital, „ Prosvjeta “

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Увод: Др Михаило Андрејевић Андрејка (3. 7. 1898, Пожаревац – 20. 9. 1989, Београд), најистакнутији функционер међународног ранга кога су имали српски и југословенски фудбал. Завршио је студије медицине у Бечу. Недуго по завршетку Светског првенства у Уругвају, 1932. ушао је у ФИФА као члан Надзорне комисије и у Светској фудбалској организацији на разним важним функцијама остао пуних пет деценија. Године 1982. изабран је за доживотног почасног члана ФИФА, а 1984. био међу седморицом заслужних фудбалских радника, првоодликованог орденом FIFA. Као лекар изабран је 1953. за редовног професора Медицинског факултета у Београду. Увео је лечење радио – изотопима, и набавио први апарат за дијализу у нашој земљи. Активно је учествовао у контроли допинга међу спортистима. До пред крај живота писао је у „Недељној Борби“ занимљиве и надасве корисне чланке из области медицине. Био је добровољац у Првом светском рату, а до смрти је обављао функцију председника Удружења ратника Србије 1914-1918. Био је истински господин, светских манира, с јаким везама у свету фудбала и медицине. Био је полиглот и лако се споразумевао на најмање пет светских језика.

Кључне речи: Проф. Андрејевић-Андрејка, Историја медицине, спортска медицина, FIFA.

PROFESOR DR MIHAILO ANDREJEVIĆ - ANDREJKA

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Introduction: Dr Mihailo Andrejević Andrejka (July 3, 1898 Požarevac – September 20, 1989 Belgrade) was the most distinguished, international level, functionary of Serbian and Yugoslavian football. He received a medical degree from the University of Vienna. Shortly after the World Cup in Uruguay he became a member of FIFA Executive Committee in 1932 and for five decades he remained an important official in the organization. In 1982. he was elected a Honorary Member of FIFA and in 1984 was among seven exemplary football officials who were presented with the FIFA Order of Merit. In 1953 he was appointed full professor at Belgrade Medical School. He introduced radioisotope treatment and procured the first dialysis machine in our country. He actively participated in the doping control of athletes. Until his final years he wrote interesting and very useful articles in the field of medicine for "Nedeljna Borba". He has participated in First World War and until his death he served as president of the Association of Serbian Warriors 1914-1918. He was a true gentleman with strong connections in the world of football and medicine. He was multilingual and could easily speak at least five languages.

Keywords: Prof. Andrejevic-Andrejka, History of Medicine, Sports Medicine, FIFA

Аутори: Љиљана Недић, Александар Кобиларов

Ментор: прим Милош Маленковић

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Увод: Рума је градско насеље у Сремском округу. У другој половини 19. и поћетком 20. века повећао се број здравственог особља у Руми. Почетком 20. века у Руму долази брачни пар који ће битно променити медицинску историју Срема.

Циљ: Дати приказ живота и рада брачног пара Маленковић

Материјал и методе: Истраживање података пронађених у енциклопедијама, као и књигама мештана.

Резултати: Др Светолик Маленковић рођен је у Шашинцима 26. 8. 1898. године. Гимназију завршава у Новом Саду, док је Медицински факултет започео у Загребу а завршио у Бечу 1926. године. Годину дана лекарског стажа провео је на Хируршком одељењу у Суботици, где је стекао чврсте основе из области гинеколошко – акушерске патологије. Др Боришка Маленковић је рођена у Сенти 15.1.1897. године. Боришка је у рекордном року завршила све разреде гимназије као ванредни ученик и 1917. године уписала Медицински факултет у Будимпешти а завршила га на Печујском медицинском факултету 1925. године. Године 1928. пар се венчава и обоје долазе у Руму да раде у својој приватној ординацији и санаторијуму. Након рата, у марту 1946. година оснива се прво породилиште у Руми са сменским радом бабица а за шефа је постављен др Светолик Маленковић, с обзиром да је раније имао доста искуства у акушерском раду. Др Боришка је 1949. године завршила у Београду течај из социјалне педијатрије и од тада преузима организацију дечије здравствене заштите за читаву румску општину. Била је један од оснивача Дечијег диспанзера у Руми. Како су све новине писале, за време Боришкиног рада у диспанзеру, број дечије смртности се смањио на два одсто, што је био рекорд.

Закључак: Својим радом, овај лекарски пар задужио је цео Срем, водећи рачуна о сремачкој деци. Др Светолик их је доносио на свет, а о њима бринула др Боришка.

Кључне речи: Рума, гинекологија, педијатрија, диспанзер

MEDICAL COUPLE MALENKOVIC

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Introduction: Ruma is a town in the district of Srem. In the second half of the 19th and early 20th century increased the number of health personnel in Rumi. In the early 20th century, a married couple that will significantly change the medical history of Srem arrived in Ruma.

The Aim: Provide a description of prominent medical couple Malenkovic.

Materials and methods: Researching data found in encyclopedias and books of residents of Ruma.

Results: Dr Svetolik Malenković was born in the 26th of August 1898th year in Sasinci. He completed high school in Novi Sad, and the Medical Faculty began in Zagreb and ended in Vienna in 1926. One year of medical service was conducted by the Surgery Department in Subotica, where he earned a solid basis in the field of gynecological - obstetric pathology. Dr Boriska Malenković was born in Senta in the 15th of January, in 1897. Boriska was completed in record time all classes of high school as a part-time student and in 1917 enrolled at the Budapest Medical School and completed it in Pecs Medical School, in 1925th year. 1928. the couple got married and they both come to Ruma to work in their private office and sanatorium. After the war, in March 1946. the first maternity hospital in Ruma is founded with midwives working shifts and for a head of department is set dr Svetolik Malenković, given that earlier had a lot of experience in obstetric work. Dr Boriska in 1949. completed the course in Belgrade in social pediatrics and then takes over the organization of child care for the entire municipality of Ruma. She was a founding member of the Children's Health Center in Ruma. As all the newspapers wrote, during Boriska's work in an outpatient clinic, the number of child mortality was reduced to two percent, which was a record.

Conclusions: Through their work, the doctor couple helped the entire Srem, taking care of children of Srem. Srem and medicine owe them a lot, and above all keeping them from oblivion and gratitude.

Key words : Ruma, Srem, doctors

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Увод: Др Јован Туцаков је рођен у Чуругу. Основну школу је завршио у Чуругу, а гимназију у Новом Саду. Након положеног тироциналног испита уписује се на Фармацеутски факултет Загребачког универзитета где добија диплому магистра фармације. Потом одлази на специјализацију у Француску, у Нанси. На Фармацеутском факултету у Нансију стиче диплому фармацеута, специјализацију и титулу доктора фармацеутских наука. Када се вратио у Београд, Јован Туцаков добија прекоманду и одлази у Скопље, где остаје пуних 6 година. На захтев Универзитета у Београду прелази на тек отворени Фармацеутски одсек Медицинског факултета и држи наставу из фармакогнозије. Комитет за науку, Универзитет и Велике школе постављају га за управника Института за испитивање лековитог биља РС у Београду, који сада носи назив Институт за проучавање лековитог биља “Др Јосиф Панчић”.

Резултати: Јован Туцаков је једини фармацеут члан Српске академије наука и уметности, што чини част свим фармацеутима. Капитално дело Јована Туцакова је књига “Лечење биљем-Фитотерапија” која је резултат његових свеукупних етномедицинских истраживања обављаних преко четири деценије. Написана је на 717 страна и обогаћена цртежима и колор фотографијама биљака. То је наша енциклопедија о лековитим биљним врстама.

Закључци:

Признања:

Медаља за војне заслуге – 1968.

Медаља “Лавоиснер” Универзитета у Паризу - 1969

Споменица Одбора за прославу и обележавање 150-годишњице радова на Делиблатској пешчари - Панчево - 1969.

Кључне речи: Јован Туцаков, лековито биље, историја фармације.

АКАДЕМИК JOVAN TUCAKOV – THE FOUNDER PHYTOPHARMACY IN SERBIA

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Introduction:

Dr Jovan Tucakov was born in the village of Curug. He finished primary school in Curug, and high school in Novi Sad. After he had passed the “tirocinal” exam, he enrolled at the Faculty of Pharmacy, University of Zagreb, where he received a master’s degree in Pharmacy. Afterwards, he went to France, to Nancy, for specialization studies. At the Faculty of Pharmacy in Nancy, he acquired the Diploma in Pharmacy, gained the (necessary) specialization and the academic title of Doctor of Pharmaceutical Sciences. When he returned to Belgrade, JovanTucakov got a transfer and moved to Skopje, where he stayed for 6 years. At the request of the University of Belgrade, he joined the newly opened Faculty of Pharmacy at the School of Medicine, where he taught Pharmacognosy. The Committee on Science, The University and the Higher Schools appointed him as a Director of the Institute for the study of medicinal plants of the Republic of Serbia, in Belgrade, which is now called the Institute of Medicinal Plant Research “Dr Josif Pancic”.

Results: JovanTucakov has remained the only member of the Serbian Academy of Arts and Sciences, which does honor to all pharmacists. His capital work, “Healing Herbs-Phytotherapy”book, was the result of his overall ethno-medical research over four decades. The book was written on 717 pages and was enriched with drawings and color photographs of plants. (Ever since) it has been our (Serbian) encyclopedia of medicinal plants.

Conclusion: awards:

Medal for Military Merit - 1968.

Medal “Lavoisier” University of Paris - 1969

Memorial Committee for the celebration marking the 150th anniversary of the works on sandstone

Deliblato - Pancevo - 1969.

Keywords: Jovan Tucakov, healing herbs, History of Pharmacy.**Аутор:** Маја Савић Секулић**e-mail адреса:** ma83ja@gmail.com**Ментор:** проф. др Мира Говорчин

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Увод: Делом, пореклом, појавом и именом, Делфа Иванић, по свему упечатљива, остварила је заслуге за српски народ, вредне помена, за незаборав, а ипак, о њој се данас мало говори и зна. Рођена је 06. марта 1881. године у Подгорици, као кћи војводе Ивана Мусића. По Делфином казивању, директни потомци четири и по века старе лозе Мусића, познатој по косовским јунацима и њиховој сестри Јелици – овековеченој на слици Уроша Предића „Косовка девојка”.

Циљ: Приказати лик и дело Делфе Иванић.**Материјал и методе:** Ретроспективна анализа библиотечке и архивске грађе.

Резултати: Године 1903. петнаестог августа (по старом календару), на иницијативу две жене - ентузијаста, Делфе Иванић и Надежде Петровић, у Београду је основано још једно хуманитарно друштво - Коло српских сестара. Пре свега, осећај припадности и привржености српском народу - својем отечеству, силна потреба да помогне рањенима и болеснима, наводила је Делфу на највећа жрвовања док је радила као добровољна болничарка у свим ратовима од 1912-1918. године. Ако је храброст “... и на страшном месту постојати”, онда је то Делфа заистински и била, почев од ИВ резервне болнице, Љеша, Скопља, до преласка преко Албаније. Године 1920. постала је прва жена у Краљевини Југославији која је добила високо међународно признање “Медаљу за милосрђе Флоренс Најтингејл”. Ухапшена је 1946. године, а по изласку из затвора Делфа се повлачи из јавног живота. Преминула је 1972. године у Београду.

Закључак: За разлику од „жена које су владале светом”, Делфа је служила Србији.**Кључне речи:** Делфа Иванић, Коло српских сестара, болничарка, рат.

FROM ACOMPLISHED MISS TO COMPLETED SOLDIER – DELPHA IVANIC

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Introduction: In part, origin, appearance and name, Delpha Ivanic, impressive in all, made a contribution to the Serbian people, worthy of mention, for oblivion, and yet on it today has little to say and know. She was born on the March 6th 1881. in Podgorica as a daughter of Ivan Music, who is in her words the descendant of the four and a half centuries old line of Music family. The family is famous because of the hero of Kosovo and his sister Jelica, who is the subject of Uroš Predic’s picture “Kosovka Devojka”.

The Aim: Display personality and work of Delpha Ivanic.**Materials and Methods:** A retrospective analysis based on the library and archives.

Results: On the August 15th 1903. (old calendar), on the initiative of two women, Delpha Ivanic and Nadezda Petrovic, another humanitarian association was founded – Circle of Serbian Sisters. First of all, a sense of belonging and loyalty to the Serbian people - his fatherland, a strong need to help the wounded and sick, cited Delpha to the greatest victim while working as a volunteer nurse in all wars from 1912-1918. year. If the courage “... and a terrible place to be”, then it is the Delpha really was, from the fourth replacement hospital, Ljes, Skopje, moving up through Albania. In 1920. she became the first woman in Yugoslavian monarchy who received a high international recognition “Florence Nightingale Medal of Mercy”. She was arrested 1946. After leaving prison, Delpha withdrew from public life.

Conclusion: As opposed to “women who ruled the world”, Delpha has served Serbia.**Key words:** Delfa Ivanić, The Circle of Serbian Sisters, nurse, war.

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Увод: Од 1945. године, у службеној употреби је појам "Војводина". Иако се име Војводине у континуитету користи од 1848. године, Војводина је одувек била демографски разноврсно подручје где су међусобно живели народи различитих националности и вероисповести – Срби, Мађари, Јевреји, Хрвати, Немци, Роми, Словаци, Румуни итд. Изузетно важан моменат у напретку научне и наставне мисли у односу на здравствену културу и образовање високих кадрова из ове струке је оснивање и настанак Медицинског факултета у Новом Саду.

Циљ рада: Упознавање живота и рада првих професора Медицинског факултета у Новом Саду и њихов допринос развоју факултета.

Методологија: Испитивање је спроведено на основу објављених публикација, фонда Библиотеке Медицинског факултета у Новом Саду, Архива града Новог Сада, новина, часописа, интернета. У приказивању података примењена је дескриптивна метода.

Резултати: Медицински факултет у Новом Саду званично је основан 18. маја 1960. године, а свечано је отворен 19. октобра 1960. године. За првог декана изабран је професор др Никола Вујић, док је за првог продекана изабран проф. др Страхиња Маринков. За прве наставнике изабрани су: доц. др Олга Стефановић (хемија), доц. др Живојин Гавриловић (биологија), Јелена Харгитаи- предавач (физика) и проф. др Сениша Радојевић са сарадницима (анатомија).

Закључак: Савремена, сазнајна, научно базирана и у локалним условима адекватна здравствена култура не може се стварати и развијати без адекватног суделовања и предводништва Медицинског факултета, као највишег облика науке и наставе. Овај факултет, као највиша научно- наставна и најкомпетентнија здравствена установа у Војводини, мора да прими на себе иницијативу и одговорност за формирање свеобухватне здравствене културе на високом научном нивоу као и за њено уклапање у целокупну културу Војводине и шире друштвене заједнице.

Кључне речи: Медицински факултет, Нови Сад, професори

FIRST PROFESSORS IN THE FACULTY OF MEDICINE IN NOVI SAD

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Introduction: Since 1945. year the name "Vojvodina" has been in official use. Although the name of Vojvodina continuously has been used from the year 1848th. Vojvodina has always been a demographically diverse area where people of different nationalities and religions - Serbs, Hungarians, Jews, Croats, Germans, Romans, Slovaks, Romanians, etc have lived together. A very important moment in the progress of scientific thought and teaching in relation to health education and high culture of staff in this profession is the establishment and development of the Medical Faculty in Novi Sad.

Aim: Understanding the life and work of the first professors of the Medical Faculty in Novi Sad and their contribution to the university.

Methodology: The study was conducted on the basis of available scientific publication, historical archive of Novi Sad, magazines, internet. The disclosure was used descriptive methods.

Results: Medical Faculty in Novi Sad was officially founded in 18th May 1960, and was officially opened 19th October 1960. Professor Nikola Vujic was elected for the first dean, while the first elected prodean was prof. Dr. Strahinja Marinkov. First teachers were: doc. Dr. Olga Stefanovic (chemistry), doc. Dr. Živojin Gavrilovic (biology), Jelena Hargitai lecturer (physics) and prof. Dr. Sinisa Radojevic and his associates (anatomy).

Conclusion: Modern, scientific-funded and local conditions of adequate health education could not be created and developed without adequate leadership of the Medical Faculty, as the highest form of education. This faculty, as the most competent medical institution in Vojvodina, has to undertake the initiative and responsibility for the establishment of a comprehensive health education at a high scientific level and for its integration into the whole culture of Vojvodina and the wider community.

Key words: Medical Faculty, Novi Sad, Professors

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Увод: Богата биографија и библиографија академика Берислава М. Берића, гинеколога, иза које стоји доста уложеног рада, труда, одрицања и позитивних резултата, упућује на великог стручњака свог занимања. Широким пољем интересовања освајао је свет, бавио се не само гинекологијом, здрављем жене, репродукцијом односно планирањем породице, брачним стерилитетом, адолесцентном гинекологијом већ и њеним демографско-популационим аспектима, историјом медицине. Кроз свој свеобухватан рад, објавио је и суделовао је у писању око 500 објављених дела: стручних радова, књига, монографија, публикација. Током своје каријере био је члан многих светски признатих друштава и удружења. Матица српска, Српска академија наука и уметности, Војвођанска академија наука и уметности, Српско лекарско друштво имале су част да међу својим члановима имају овог еминентног стручњака. Додељен му је велики број награда и признања које потврђује његово успешно научно стваралаштво.

Циљ: Упознавање са личношћу, делом и радом академика Берислава М. Берића, лекара, професора, доктора медицинских наука из области гинекологије и акушерства.

Материјал и методе: Ретроспективна анализа базирана је на подацима доступним из литературе и извора.

Закључак: Анализирајући лик и дело академика Берислава Берића, може се закључити да је реч о изузетном лекару, ствароцу и човеку. Његова достигнућа из области гинекологије и акушерства, данас представљају путоказ многим младим лекарима који се опредељују за ову специфичну област медицине.

Кључне речи: Берислав Берић, Гинеколог – акушер, Клиника за гинекологију и акушерство

GYNECOLOGY AND SCIENTIST OF WORLD RENOWN, AKADEMIK BERISLAV BERIĆ

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Introduction: The rich biography and bibliography of academic Berislav M. Beric, a gynecologist, behind which stands a lot of investment, effort, sacrifice and positive results, suggests to great experts of his profession. He conquered the world with wide scope of interest. He did not deal only with: gynecology, women's health, reproduction and family planning, sterility, adolescent gynecology, but also with demographic and populational aspects of its, the history of medicine. Through his comprehensive work, he has also taken part in the writing of 500 published works: papers, books, monographs, publications. During his career he was a member of many world recognized of societies and associations. Matica Srpska, Serbian Academy of Arts and Sciences, Academy of Sciences and Arts of Vojvodina, the Serbian Medical Society had the honor of having among its members the eminent expert. He was awarded numerous prizes and awards, confirming its successful scientific work.

The Aim: Introduction to the personality, life and work of academic Berislav M. Beric, doctor, professor, doctor of medical sciences in the field of gynecology and obstetrics.

Materials and Methods: A retrospective analysis was based on data available from literature and sources.

Conclusion: By analyzing the character and work of academics Berislav Berića, we can conclude that this is an extraordinary doctor, the creator and man. His achievements in the field of gynecology and obstetrics, today as a signpost for many young doctors who choose this particular field of medicine.

Key words: Berislav Beric, gynecologist - obstetrician, Clinic of Gynecology and Obstetrics

ОСНИВАЊЕ СТОМАТОЛОШКОГ ОДСЕКА ПРИ МЕДИЦИНСКОМ ФАКУЛТЕТУ И УЛОГА АКАДЕМИКА ДАНИЛА БРАНОВАЧКОГ

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Сажетак: По речима др Данила Брановачког, стоматолошки одсек у Новом Саду није основан из разлога сто Стоматолошки факултет у Београду није био у стању да школује довољно кадра који би радио на територији Војводине, већ да би се постигла боља координација између потреба саме службе и образовног система у циљу пружања боље зубне здравствене заштите зуба у становништву. Стоматолошка здравствена заштита у Новом Саду иначе има дугу и богату историју, прве зубно лекарске ординације датирају из првих деценија XX века.

Медицински факултет у Новом Саду је основан 1960. године, а припреме за оснивање стоматолошког одсека почињу 1976. године, где др Данило Брановачки, који је иначе био два мандата декан на београдском стоматолошком факултету, одиграо веома значајну улогу у организацији и формирању самог одсека. Веома омиљен међу колегама и студентима, др Брановачки је своју богату стручну и научну каријеру завршио у Новом Саду, где је дочекао своју пензију. Својим делом и футуристичким визијама је задужио генерације које остају после њега.

Кључне речи: Стоматолошки одсек, оснивање, Нови Сад

ESTABLISHMENT OF DENTAL DEPARTMENT AT THE FACULTY OF MEDICINE AND THE ROLE OF ACADEMIC DANILO BRANOVAČKI

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Abstract: According to dr Danilo Branovački, dental department in Novi Sad was not established because it was impossible to educate enough qualified personnel, at faculty of dentistry in Belgrade, that should work in the territory of Vojvodina, but to achieve better coordination between the needs of the service and education system in order to provide better dental care of population. Dental care in Novi Sad has a long and rich history. First dental practices are dating from the early 20th century.

Faculty of Medicine University of Novi Sad was established in 1960, and the preparation for the establishment of Dental Department in Novi Sad have begun in 1976, where dr Danilo Branovački played an important role in the organization and formation. Popular among colleagues and students, dr Branovački has ended his professional career in Novi Sad, where he retired. With his achievements in the field of dentistry, dr Branovački has indebted future generations.

Keywords: dr Danilo Branovački, dental department, dental care

ФАКТОРИ КОЈИ СУ УТИЦАЛИ НА ПОЈАВУ ЦРЕВНИХ ЗАРАЗНИХ БОЛЕСТИ У ПРОШЛОСТИ ВОЈВОДИНЕ И НОВОГ САДА

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Увод: Заразне цревне болести су одувек заузимале важно место у здравственој патологији становништва у прошлости Војводине и Новог Сада. Њихова појава је била резултат комплексног деловања различитих фактора: географског положаја, климе, ратова и сеоба народа, хигијенских прилика средине, здравствене културе становништва (лична хигијена, исхрана), научних сазнања о контагиозним ("прилепчивим"), цревним инфекцијама и путевима шрења, терапијском приступу и мерама сузбијања.

Циљ: Испитати утицај различитих фактора на појаву цревних инфекција (климатских, друштвених, социјалних фактора, приступ збрињавању и лечењу цревних инфекција). Истражити учешће појединих клиничких ентитета у епидемијама (тифус, дизентерија, колера и пегави тифус) у прошлости Војводине и Новог Сада
Материјал и методе: Испитивање је спроведено на основу расположиве научне публикације, Историјски архив Новог Сада, часописи, интернет. У приказивању података примењена је дескриптивна метода.

Резултати: У XVIII веку у Војводини су забележене епидемије. Успостављањем Здравственог законодавства почело је сузбијање заразних болести. У XVIII и XIX веку у Војводини и Новом Саду епидемије цревних заразних болести су се и даље јављале: у Војводини и Новом Саду. Велики број оболелих, недостатак адекватне терапије, а у некима и велика смртност; удрженост епидемија цревних инфекција са епидемијама других заразних болести представљале су значајан здравствени и економски проблем.

Закључак: Напредак науке и сазнање о контагиозности цревних заразних болести довелела је до промене приступа заразним болестима (лечење, сузбијање, превенција), и њиховог сузбијања. До данашњих дана цревне контагиозне болести заузимају прво место у структури инфективних болести у Војводини и Новом Саду. У неразвијеним земљама света су и даље водећи узрок умирања оболелих од заразних болести.

Кључне речи: заразне цревне болести, епидемије, Војводина

FACTORS THAT INFLUENCED THE APPEARANCE OF INTERSTINAL INFECTIOUS DISEASES IN THE PAST OF VOJVODINA AND NOVI SAD

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Introduction: Infectious intestinal diseases have always had an important place in the medical pathology of the population in the past in Vojvodina and Novi Sad. Their appearance was the result of a complex function of different factors: geographic location, climate, wars and migrations, environment sanitation conditions, health education of the population (personal hygiene, nutrition), scientific knowledge about contagious diseases ("prilepčivim"), intestinal infection, therapeutic approach and prevention measures.

The Aim: To examine the effect of various factors on the occurrence of intestinal infections (climate, social, social factors, access to care and treatment of intestinal infection). To investigate the participation of certain clinical entities in epidemics (typhoid, dysentery, cholera and spotted fever) in the history of Vojvodina and Novi Sad.

Materials and methods: Test was conducted on the basis of available scientific publications, the Historical Archives of Novi Sad, magazines, internet. All data was showed used descriptive methods.

Results: In the seventeenth century in Vojvodina epidemics were recorded. The establishment of the Health began fighting infectious diseases. In the eighteenth and nineteenth centuries in Vojvodina and Novi Sad outbreaks of intestinal infectious diseases were recorded. A large number of patients, lack of adequate treatment, and in some large mortality; outbreaks of intestinal infections together with outbreaks of other infectious diseases were a major health and economic problem.

Conclusion: The progress of science and knowledge about the contagiousness of infectious intestinal disease had a great influence in treatment, prevention, and suppression of these diseases. To this day contagious intestinal diseases occupy first place in the structure of infectious diseases in Vojvodina and Novi Sad. In developing countries it is still the leading cause of mortality in patients with infectious diseases.

Key words: epidemics, interstitial infectious diseases, Vojvodina

ДР ПАВЛЕ ФЕЊЕ: ДОПРИНОС РАЗВОЈУ ВАКЦИНА ПРОТИВ БЕСНИЛА И ВЕЛИКИХ БОГИЊА

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Увод: Иако историја превенције почиње истовремено са историјом заразних болести, прва вакцина на свету употребљена је 1798. године. То је била вакцина против великих богиња коју је направио Едвард Џенер. Луј Пастер је 1885. године употребио прву вакцину против беснила. На темељима ова два великана, вековима касније, многи научници радили су на производњи што квалитетнијих вакцина.

Живот у Југославији: Павле Фење родјен је 1915. године у Новом Саду. Медицински факултет завршио је Загребу, а постдипломске студије 1949. у Београду и постао доктор наука и специјалиста микробиологије. Радио је као шеф Одељења за хуману вирусологију у Пастеровом заводу у Новом Саду. Са породицом је 1958. емигрирао у Канаду, где је започео фасцинантну каријеру.

Рад на вакцини против беснила: Нову технологију производње вакцине против беснила на култури ткива представио је 1960. године, а затим је спровео прво клиничко испитивање нове вакцине на добровољцима. Показао је да интерферон превенира развој беснила, његов најпогоднији начин и време примене.

Рад на вакцини против великих богиња: Фење је 1962. установио нове истраживачке приоритете и интензивирао производњу вакцине. Побољшао је методе замрзавања и сушења и стандардизовао методе за тестирање потенциности и стабилности вакцине. У децембру 1964. Фењеова лиофилизирана вакцина задовољила је глобалне стандарде, а 1966. је почела њена масовна производња. Био је званични консултант Светске Здравствене Организације и умногоме помогао званични програм ерадикације. Пре одласка у пензију 1979, створио је залихе вакцине ради потенцијалне будуће потребе. Посебно признање за залагање у ерадикацији урочио му је 2003. године.

Кључне речи: Павле Фење, беснило, велике богиње, вакцинација

DR. PAUL FENJE: CONTRIBUTION TO THE DEVELOPMENT OF VACCINES AGAINST RABIES AND SMALLPOX

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Introduction: Although the history of prevention begins at the same time with the history of infectious diseases, the world's first vaccine was used in 1798. It was smallpox vaccine made by Edward Jenner. Louis Pasteur in 1885 created first rabies vaccine. On the basis of these two giants many scientist, through the centuries, many scientists have worked on production of the best possible vaccines.

Life in Yugoslavia: Paul Fenje was born in 1915 in Novi Sad. He graduated at Faculty of Medicine in Zagreb and postgraduated in Belgrade in 1949 and became PhD and specialist in microbiology. He worked as Head of the Department for Human Virology of Pasteur Institute in Novi Sad. In 1958, with his family, he emigrated to Canada where he began a great career.

Work on rabies vaccine: Fenje presented a new production technology of rabies vaccine on tissue culture in 1960, and than conducted the first clinical trials of the new vaccine on volunteers. He demonstrated that interferon prevents rabies and optimal method and time of its application.

Work on smallpox vaccine: In 1962, Fenje established a new research priorities and intensified production of vaccine. He improved methods of freezing and drying and standardized methods for testing potency and stability of vaccine. In December 1964, Fenje's freeze-dried vaccine met global standards and in 1966 its mass production started. He was official World Health Organization's consultant and greatly helped the official program of eradication. Prior to retirement in 1979, he created a stock of vaccines for potential future needs. Special recognition for eradication effort he received in 2003.

Key words: Paul Fenje, rabies, smallpox, vaccination

ЗНАМЕНИТИ ПРОФЕСОРИ ТОКОМ ИСТОРИЈЕ ХИГИЈЕНСКОГ ЗАВОДА У НОВОМ САДУ

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Увод: Институт за јавно здравље Војводине је савремена установа која се поред изузетно важних активности везаних за здравствено стање популације Војводине, али и шире бави и науком и наставом као огранак Медицинског факултета.

Циљ:

Материјал и методе:

Резултати: Током низа година од момента настанка данашње куће ту су се обављале бројне превентивне активности, са трендом за успостављење пре свега епидемиолошких надзора у пропагирању мера за превенцију настанка заразних болести на поднебљу Војводине, дијагностике инфективних обољења у складу са развојем медицине XX века у домену микробиологије, вирусологије, паразитологије, надзором инциденце и дистрибуције заразних болести, а током претходних неколико деценија и практично присутних у све већем броју и незаразних, а епидемијских - незаразних болести.

Довољно је само напоменути праћење и превенцију оболелих од кардиоваскуларних болести, дијабетеса, те малигних болести, или пак деловање на подручју медицине рада.

Циљеви делатности института базирају се на кључним компонентама као што су: човек, солитарни и генерални здравствени проблеми, људска околина, демографска слика подручја, као и организација рада здравствене службе и заштите.

У низу деценија делања института посебно су се истакли лекари који су својим радом дали упечатљив траг који се удише и данас, а као што су: проф Терзин Александар, проф Аранички Милош, проф Веселин Вујков, проф Тибор Лепеш.

Закључак: Напомињемо, да смо током претходног периода већ објавили рад о управницима Института од оснивања, те да ће се и други знаменити лекари обрадити у следећем нашем раду.

Кључне речи: Институт, истакнути лекари, јавно здравље

EMINENT PROFESSORS IN HISTORY OF PUBLIC HEALTH IN NOV SAD

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Introduction: Apart from extremely significant activities concerning population health in Vojvodina, Institute of Public Health of Vojvodina is contemporary institution dealing with scientific and education activity within organizational chart of the Faculty of Medicine Novi Sad.

The aim:

Material and methods:

Results: Since the period of establishing of the present institute numerous preventive activities have been realized, mainly with the intention to set up epidemiological survey aiming to prevent infectious diseases in the province of Vojvodina, diagnostics of infectious diseases harmonized with development of medicine in 20th century in the field of micro-biology, virology, parasitology, control of incidence and distribution of infectious diseases and also in the previous last decades increasingly expressed non-communicable diseases. It is enough to mention follow-up and prevention of cardiovascular diseases, diabetes, then malignant diseases or activities on the field of occupational medicine.

Objectives of the Institute's activities are based on the essential components, like: human being, solitary and general health problems, human environment and demographic assessment of the area as well as organization of health care services.

In the long period of the Institute's activity numerous famous physicians were known who gave impressive traces that is evident at present as well, prof. Aleksandar Terzin, prof. Milos Araniccki, prof. Veselin Vujkov, prof. Tibor Lepes.

Conclusion: During the previous period we have already issued the paper on the Institute's managers since establishing, so in the same way we are going to present other famous physicians in the following papers.

Key words: institute, famous physicians, public health

MILAN JOVANOVIĆ MORSKI – LEKAR, PISAČ I VELIKI SVETSKI PUTNIK

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Увод: Током XIX века млади људи на подручју Војводине и централне Србије основно образовање су стицали најчешће у родним местима, а затим се школовали у угледним гимназијама. Након завршене средње школе, будући млади интелектуалци су одлазили на даље школовање у многе европске универзитетске центре.

Циљ: /

Материјал и методе: /

Резултати: Тако је и потоњи угледни лекар, Милан Јовановић, након завршене гимназије у Вршцу и Пешти, отишао у Беч на студије медицине. Као студент у Бечу био је један од оснивача и први председник српског академског друштва "Зора". Један период свог је живота (1865-1871) провео је у Београду, где се бавио педагошким радом и написао неколико уџбеника за предмете које је предавао. 1871. године напустио је Београд и прешао у Нови Сад. Овде је радио као приватни лекар и био управитељ тадашње Реалке. У том период се Србија развијала и напредовала, а Јовановић је дао свој допринос, у областима здравства, културе и политике. У време српско-турских ратова, Јовановић је прешао у Херцег Нови и збрињавао повређене. По завршетку бојева, придружио се лекарској служби паробродског друштва "Лојд" и са њима пропутовао свет. Под утиском својих путовања Јовановић је написао многе путописе. 1882. године вратио се у Србију, где је радио као лекар, а од 1889. радио је као професор у Вишој женској школи, Учитељској школи и Српској војној академији.

Закључак: 1896. године Милан Јовановић је преминуо, остављајући иза себе културну заоставштину, која је послужила као темеља за напредак српског друштва.

Кључне речи: Милан Јовановић, педагошки рад, здравство и култура

MILAN JOVANOVIĆ MORSKI – DOCTOR, WRITER AND A GREAT WORLD TRAVELER

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Introduction: During the 19th century, young people in Vojvodina and Serbia had usually got their primary education in their hometowns, and then continued the education at prestigious high schools. After high school, future young intellectuals went to further education in many European university centers.

The aim: /

Materials and Methods: /

Results: Thus, the future prominent doctor, Milan Jovanović, after finishing the high school in Timisoara and Budapest, he went to Vienna to study medicine. As a student in Vienna, he was one of founders and the first president of the SAS "Zora". From 1865 to 1871 he lived in Belgrade, where he was engaged in pedagogical work, and wrote a textbooks for the subjects he had been teaching. In 1871st he left Belgrade and moved to Novi Sad. In that period, Serbia has developed and progressed, and Jovanović has contributed in healthcare, culture and politics. During the Serbian-Turkish wars, Jovanović moved to Herceg Novi where he took medical care for the wounded. After the battles, he joined the Steamship Company "Lloyd", and with them traveled the world. Under the impression of his travels, Jovanović wrote many travelogues. In the 1882 he returned to Serbia, where he had worked as a doctor, and since the 1889. he worked as a professor in the School of Women's College, School of Teacher Education and the Serbian Military Academy.

Conclusion: In 1896 Milan Jovanović had died, leaving behind a significant cultural legacy, which served as a foundation for progress of Serbian society.

Key words: Milan Jovanović, pedagogical work, health culture

BORIS NEDVIDEK И РАЗВОЈ КЛИНИКЕ ЗА МЕДИЦИНСКУ РЕХАБИЛИТАЦИЈУ

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Увод: Борис Недвидек, лекар, специјалиста за физикалну медицину и рехабилитацију, реуматолог, професор Универзитета, а уједно и оснивач медицинске рехабилитације и реуматологије у Војводини.

Резултати: Борис Недвидек је родјен у Сплиту, 07.05.1924. Отац му је као музичар дошао из Чешке. Основну школу и гимназију је похађао у Београду, а матурирао је у ИИИ мушкој реалној гимназији у Београду 1942. Октобра 1945, након демобилизације, уписао се на Медицински факултет и дипломирао је 1951. На Институту за физикалну медицину био је лекар-приправник, а у Трећем дому здравља у Београду је радио као реуматолог. На Медицинском факултету је изабран за асистента 1953. Специјалистички испит из физикалне медицине положио је 1955, а 1957 је реизабран за асистента. 1959 године долази у Нови Сад са задатком да организује рад Одељења за физикалну медицину и рехабилитацију. Умире 2009 године.

Закључак: Захваљујући труду, залагању и истрајности Бориса Недвидека, данас постоји Клиника за медицинску рехабилитацију у Новом Саду, самим тим му морамо одати велико признање и захвалност.

Кључне речи: Борис Недвидек, Клиника за медицинску рехабилитацију, Универзитет у Новом Саду

BORIS NEDVIDEK AND DEVELOPMENT CLINIC FOR MEDICAL REHABILITATION OF NOVI SAD

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Introduction: Boris Nedvidek, a doctor, specialist of physical medicine and rehabilitation, rheumatologist, professor at University, and, also, a founder of medical rehabilitation and rheumatology in Vojvodina.

Results: Boris Nedvidek was born in Split, 7th of May 1924. His father was a musician who came from Czech Republic. Primary school, as gymnasium, he had finished in Belgrade, he graduated in III men's Realgymnasium in Belgrade 1942. In October 1945, after the demobilization, he had managed to get in Medical university of Belgrade where he graduated 1951. At the Institute of Physical Medicine, he was a doctor-trainee, and in The Third Health Center in Belgrade, he worked as rheumatologist. He was elected for assistant 1954. on Medical University. Specialist in physical medicine he has passed 1955, and 1957 he was re-elected for assistant. In 1959, he comes in Novi Sad with a task to organize work of Department of physical medicine and rehabilitation. He passes away 2009.

Conclusion: Thanks to hard work, dedication and perseverance of Boris Nedvidek, today stands Clinic for medical rehabilitation of Novi Sad, therefore, we must give him a great recognition and gratitude.

Key words: Boris Nedvidek, Clinic for Medical Rehabilitation of Novi Sad, University of Novi Sad

ПРИМ. ДР ВЛАДИМИР ЦРЕВАР, ХИРУРГ ВЕЛИКОГ СРЦА

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Сажетак: Лекар, хирург, пионир ортопедије и трауматологије, а пре свега велики човек, допринео је развоју здравства и медицине на територији Војводине. Оснивач и вишегодишњи начелник Трауматолошког одељења Опште болнице у Сомбору, оснивач Секције за ортопедску хирургију и трауматологију Друштва лекара Војводине, помагао је и деци у логорима за време Другог светског рата. Вишеструко је награђиван признањима, како цивилним, тако и војним, године 1970. добио је титулу примаријуса. Активно се бавио научним радом и учествовао на многим стручним скуповима, који су се одржавали на простору старе Југославије. Ради илустрације његових схватања и ширине духа, поред његовог стручног рада, вредно је споменути и да је између осталог био члан Српске читаонице, Мађарске касине и Хрватског друштва „Владимир Назор“. Прим. др Владимир Цревар проживео је један заиста активан и богат живот, који је био испуњен радом од ране младости па све до одласка у заслужену пензију. Оно по чему његово име остаје посебно записано у историји медицине и здравства Војводине јесте чињеница да је био један од пионира ортопедије и трауматологије у Војводини, оснивач једног од првих ортопедско – трауматолошких одељења у овом крају земље, због чега му морамо одати пуно признање.

Кључне речи: Владимир Цревар, доктор, хирург, ортопедија, трауматологија, Сомбор.

PRIM. DR VLADIMIR CREVAR, BIG HEARTED SURGEON

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Abstract: A doctor, surgeon, pioneer of orthopedics and traumatology, most of all a great man, contributed development of health and medicine in Vojvodina. Founder and chief of Traumatology department in General hospital in Sombor for many years, founder of section for orthopedic surgery and traumatology in medical association in Vojvodina, he helped children in concentration camps during World War II. Been rewarded by many civil and military awards, in year 1970. he gets a title of primaries. Actively participated in science studies and many science conventions which were held on territory of former Yugoslavia. For illustration of his wide spirit he was a member of „Srpska čitaonica“, „Mađarska kasina“ and croatian society „Vladimir nazor“. Prim. dr Vladimir Crevar had an active and rich life, which was fulfilled with work from early childhood to his earned retirement. What makes his name so important in history of medicine and health in Vojvodina is the fact that he was one of the pioneers in orthopedics and traumatology in Vojvodina, amongst the first, he founded orthopedic and traumatology department in this region of the country, because of all this we must give him all respect he deserves.

Key words: Vladimir Crevar, doctor, surgeon, orthopedics, traumatology, Sombor.



JAVNO ZDRAVLJE

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Uvod: Redovna fizička aktivnost je veoma važan oblik ponašanja za promociju zdravlja i odlaganje ili sprečavanje nastanka mnogih oboljenja. Opažene barijere predstavljaju faktore koji negativno utiču na praktikovanje fizičke aktivnosti.

Cilj: Cilj ovog istraživanja je bio analiza opaženih barijera u praktikovanju fizičke aktivnosti među studentima Medicinskog fakulteta Univerziteta u Beogradu.

Materijal i metode: Studija je obuhvatila 412 studenata šeste godine Medicinskog fakulteta Univerziteta u Beogradu. Za prikupljanje podataka korišćen je upitnik koji sadrži i kratku formu IPAQ upitnika (International Physical Activity Questionnaire).

Rezultati: 15,5% (n=64) ispitanika ima nizak, 54,4% (224) umereni i 30,1% (124) visok nivo fizičke aktivnosti. Postoji statistički značajna razlika među polovima za nivoe fizičke aktivnosti ($p<0,05$). Najveće skorove su imale sledeće barijere: "Vraćam se sa predavanja umoran/na" (2,83), "Nemam vremena zato što sam prezauzet/a predavanjima i učenjem" (2,73), "Vremenske prilike mi ne dozvoljavaju da vežbam na otvorenom" (2,44) i "Lenjost i nespремnost" (2,04). Među polovima postoji statistički značajna razlika za barijere: "Vraćam se sa predavanja umoran" ($p<0,001$), "Vremenske prilike mi ne dozvoljavaju da vežbam na otvorenom" ($p<0,02$), "Porodica i prijatelji me ne ohrabruju da vežbam" ($p<0,05$) i "Ne volim fizičku aktivnost" ($p<0,05$).

Zaključak: Udeo studenata Medicinskog fakulteta u Beogradu koji redovno praktikuje fizičku aktivnost je visok u poređenju sa populacijom Srbije starosti od 20 do 34 godina. Muškarci značajno više praktikuju fizičku aktivnost od devojaka u ovoj kohorti. Najvažnije opažene barijere u praktikovanju fizičke aktivnosti su: "Vraćam se sa predavanja umoran", "Nemam vremena zato što sam prezauzet predavanjima i učenjem", "Vremenske prilike mi ne dozvoljavaju da vežbam na otvorenom", "Lenjost i nespремnost" i "Nemam vremena zbog socijalnih i porodičnih obaveza".

KLjučne reči: opažene barijere, fizička aktivnost, studenti univerziteta.

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Uvod: Na broj pacijenata u stomatološkoj praksi utiče veliki broj faktora kao što su znanje, manuelna spretnost, veštine stomatologa i drugi. Pretpostavlja se da verbalna komunikacija stomatologa ima uticaja na broj pacijenata.

Cilj rada: Cilj rada bio je da se ispita uticaj verbalne komunikacije stomatologa na broj pacijenata u privatnoj stomatološkoj praksi.

Metod rada: U istraživanju su korišćena dva upitnika posebno konstruisana za potrebe ovog istraživanja. Jedan je bio namenjen stomatolozima, imao je 29 pitanja o opštim podacima o stomatolozima i njihovim ordinacijama, kao i o njihovim stavovima i mišljenjima o činocima koji utiču na uspešnost rada. Drugi upitnik bio je namenjen pacijentima i sadržao je 4 pitanja o tome kako se pacijenti najčešće odlučuju za određenog stomatologa. Anketirano je 49 stomatologa i 56 pacijenata. Podaci su obrađeni standardnim statističkim metodama.

Rezultati: Istraživanje je pokazalo da 81,8% stomatologa smatra da je verbalna komunikacija veoma važna za broj pacijenata. Ovakvo mišljenje podjednako je zastupljeno kod osoba oba pola, kao i srednjeg i starijeg životnog doba. Najveći broj (59,1%) smatra da je verbalna komunikacija čak značajnija u radu od manuelne spretnosti i znanja. Većina smatra da je verbalna komunikacija značajna za njihov rad, za saradnika bi pre izabrali nekomunikativnu osobu sa boljim manuelnim sposobnostima. Za prevazilaženje straha od stomatoloških intervencija pacijentima najznačajnija verbalna komunikacija stomatologa, jer 89,9% ima veliki strah od stomatologa.

Zaključak: Verbalna komunikacija značajna je za uspešan rad stomatologa i za pacijente u prevazilaženju straha od stomatološke intervencije.

KLjučne reči: verbalna komunikacija stomatologa, privatne stomatološke ordinacije, mišljenje pacijenata

PERCEIVED BARRIERS TO PHYSICAL ACTIVITY AMONG STUDENTS OF MEDICAL FACULTY IN BELGRADE

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Introduction: Regular physical activity is an important behavior to promote health, postpone or prevent many diseases. Perceived barriers are the factors that negatively affect the practice of physical activity.

Aim: The aim of this study was to analyze the perceived barriers to physical activity among students of the Medical faculty in Belgrade University.

Material and methods: The study included 412 students from the sixth year of studies of Medical faculty in Belgrade University. For data collection was used a questionnaire containing a short form of IPAQ (International Physical Activity Questionnaire).

Results: 15,5% (n=64) of subjects had low, 54,4% (224) moderate and 30,1% (124) high level of physical activity. There was a statistically significant difference between the genders in levels of physical activity ($p<0,05$). The highest scores had the following perceived barriers: "I leave lectures tired" (2,83), "I don't have time because I'm too busy of lectures and learning" (2,73), "The weather doesn't allow me to practice outdoors" (2,44) and "Laziness and unwillingness" (2,04). Between the genders there is a statistically significant difference for the barriers: "I leave lectures tired" ($p<0,001$), "The weather doesn't allow me to practice outdoors" ($p<0,02$), "Family and friends do not encourage me to exercise" and "I don't like physical activity" ($p<0,05$).

Conclusion: Percent of medical students in Belgrade who regularly practiced physical activity is high in comparison with the Serbian population aged 20 to 34 years. Males significantly do more physical activity than females in this cohort. The most important perceived barriers to physical activity are: "I leave lectures tired", "I don't have time because I'm too busy of lectures and learning", "The weather doesn't allow me to practice outdoors", "Laziness and unwillingness" and "I don't have time because of my social and family responsibilities".

Key words: perceived barriers, physical activity, university students.

INFLUENCE OF DENTIST VERBAL COMMUNICATION ON NUMBER OF PATIENTS IN PRIVATE DENTAL PRACTICE

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Introduction: The number of patients in dental practice are influenced by many factors such as knowledge, manual dexterity skills of dentists, dental offices and equipment and others.

The Aim: The aim of this study was to investigate the influence of verbal communication on the number of dental patients in private dental practice.

Methods: The study used two questionnaires that are especially designed for this research. One questionnaire was designed for dentists, had 29 questions related to general information about dentists and their practices. The other questionnaire was designed for patients and contained four questions about how the patients usually choose their dentist. It is interviewed 49 dentists and 56 patients.

Results: The survey showed that 81.8% of dentists believe that verbal communication is very important for a number of patients. The biggest percent (59.1) of the respondents considered that the verbal communication is even more important in the work of the dentist than the manual dexterity and knowledge. The most respondents who feel that verbal communication is important for their work, would rather choose uncommunicative person with a better manual dexterity for their staff. Results also showed that for overcoming the fear of dental procedures for patients is more important verbal communication of dentists, because 89.9% of them have a great fear of dentists.

Conclusion: The results showed that verbal communication is very important to the success of the dental practice and in patients in overcoming the fear of dental procedures.

Key words: dentists verbal communication, private dental practice, patient's opinion

POVEZANOST UHRANJENOSTI SA PRAKTIKOVANJEM FIZIČKE AKTIVNOSTI I SOCIO-DEMOGRAFSKIM KARAKTERISTIKAMA MEĐU STUDENTIMA MEDICINSKOG FAKULTETA U BEOGRADU

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Uvod: Fizička aktivnost i socio-demografske karakteristike predstavljaju osnovne faktore koji utiču na uhranjenost ljudi.

Cilj: Cilj našeg istraživanja bio je analiza uhranjenosti i povezanosti uhranjenosti sa praktikanjem fizičke aktivnosti i socio-demografskim karakteristikama među studentima Medicinskog fakulteta u Beogradu.

Materijal i metode: Studija je obuhvatila 412 ispitanika, studenata šeste godine studija Medicinskog fakulteta u Beogradu. Za prikupljanje podataka bio je korišćen poseban upitnik koji uključuje i kratku formu standardizovanog IPAQ upitnika (International Physical Activity Questionnaire).

Rezultati: Od 412 ispitanika bilo je 39 (9,2%) pothranjenih, 282 (66,5%) normalno uhranjenih, 83 (19,6%) predgojaznih i 8 (1,9%) gojaznih. Među polovima postoji statistički značajna razlika u BMI ($p<0,001$) i u nivoima fizičke aktivnosti ($p<0,05$). Ispitanici stari 26 i više godina imaju značajno veće vrednosti BMI ($p<0,02$). Značajno veće vrednosti BMI postoje kod ispitanika koji su pre dolaska na studije živeli u mestu manjem od 20 000 stanovnika ($p<0,02$), čiji su roditelji bez škole ili imaju završenu osnovnu školu ($p<0,01$, $p<0,001$) i koji su ranije pušili cigarete ali više ne ($p<0,05$).

Zaključak: Učestalost gojaznosti u ovoj kohorti je jako mala, učestalost predgojaznosti značajno je manja a učestalost pothranjenosti značajno veća nego u populaciji Srbije starosti od 20 do 34 godine. Učestalost predgojaznosti je značajno češća među muškarcima, a učestalost pothranjenosti među devojkama. Prosečne vrednosti BMI su značajno veće kod ispitanika starosti 26 i više godina, zatim kod ispitanika koji su pre dolaska na studije živeli u mestima sa manje od 20 000 stanovnika, čiji su roditelji bez škole ili imaju najviše završenu osnovnu školu i kod ispitanika koji su ranije pušili cigarete ali više ne.

Ključne reči: uhranjenost, BMI, fizička aktivnost, socio-demografske karakteristike.

THE ASSOCIATION BETWEEN NUTRITIONAL STATUS AND PHYSICAL ACTIVITY AND SOCIO-DEMOGRAPHIC CHARACTERISTICS AMONG STUDENTS OF MEDICAL FACULTY IN BELGRADE

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Introduction: Physical activity and socio-demographic characteristics are the main factors affecting the nutritional status of people.

Aim: The aim of our study was to analyze nutritional status and connection between nutritional status and practice of physical activity and socio-demographic characteristics among students of the Medical faculty in Belgrade.

Material and methods: The study included 412 subjects who were students of the sixth year of the Medical faculty in Belgrade. For the data was used a special questionnaire IPAQ (International Physical Activity Questionnaire).

Results: Of 412 respondents 39 (9,2%) was underweight, 282 (66,5%) normal weight, 83 (19,6%) obese and 8 (1,9%) obese. Between the genders there is a statistically significant difference in BMI ($p<0,001$) and in levels of physical activity ($p<0,05$). Respondents aged 26 and older have a significantly higher BMI values ($p<0,02$). Significantly higher values of BMI were in respondents who before coming to study lived in settlements with less than 20 000 inhabitants ($p<0,02$), whose parents have no education or have completed primary school ($p<0,01$, $p<0,001$) and who were smoking cigarettes earlier but no longer ($p<0,05$).

Conclusions: The incidence of obesity in this cohort is very small, the frequency of overweight was significantly lower and the incidence of underweight is significantly higher than in Serbia's population aged 20 to 34 years. The frequency of overweight was significantly more common among male, a prevalence of underweight among female. The average BMI was significantly higher among respondents aged 26 and older, in the respondents who before coming to the study

lived in settlements with less than 20 000 inhabitants, whose parents have no education or have completed primary school and in respondents who was smoking cigarettes earlier but no longer.

Key words: nutritional status, BMI, physical activity, socio-demographic factors.

KORIŠĆENJE PSIHOAKTIVNIH SUPSTANCI I KONZUMACIJA ALKOHOLA KOD STUDENATA UNIVERZITETA U SRBIJI

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Uvod: Studenti su po mnogo čemu posebna grupacija stanovništva jedne zemlje. Prvo pravo osamostaljanje, koje podrazumeva i veću izloženost psihoaktivnim supstancama i alkoholu, studentsku populaciju izlaže i mnogim zdravstvenim rizicima.

Cilj: Cilj istraživanja je da se ispita zdravstveno stanje studenata, navike, stavovi i ponašanja i s njima u vezi korišćenje psihoaktivnih supstanci i alkoholnih pića.

Materijal i metode: Istraživanje je rađeno na 3 državna univerziteta u toku školske 2011/2012. godine i njime je obuhvaćeno 1526 studenata oba pola. Studenti su popunjavali upitnik sastavljen od 18 pitanja koja su se odnosila na demografske, socioekonomske karakteristike, stavove, navike i stilove života, kao i izloženost različitim faktorima rizika. Ispitanici su razvrstani po grupama u odnosu na pol, univerzitet, grupu fakulteta i mesto stanovanja. Ispitivani faktori su upoređivani između ovih grupa.

Rezultati: Alkoholna pića pije povremeno 77,7% studenata, a svakodnevno njih 4,6%. Više piva i žestokog pića popiju muškarci. Studenti u Beogradu popiju najčešće po 6 i više pića u toku jedne prilike. Najmanje piva, ali najviše žestokog pića popiju studenti u Nišu, dok za studente u Novom Sadu važi obrnuto. Postoji značajna razlika između vrste droga koje studenti najčešće koriste, gde su za marihuanu zabeleženi najveći rangovi.

Zaključak: Studenti koji alkoholna pića piju povremeno ili stalno predstavljaju rizične grupe za ispoljavanje zdravstvenih i emocionalnih problema. Treba ohrabriti sve univerzitete i fakultete da obezbede efikasna, pristupačna savetovališta za svoje studente.

Ključne reči: studenti, psihoaktivne supstance, alkoholna pića

THE USE OF PSYCHOACTIVE SUBSTANCES AND ALCOHOL CONSUMPTION IN UNIVERSITY IN SERBIA

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Introduction: In many ways students are a special group of each country's population. The first real independence, which implies greater exposure to psychoactive substances and alcohol, makes student population also exposed to health risks.

The Aim: The aim of this study was to examine the health of students, habits, attitudes and behavior with them regarding the use of psychoactive substances and alcohol.

Material and Methods: The study was conducted at three state universities during the academic year 2011/2012th and included 1526 students of both sexes. Students filled out a questionnaire that consisted of 18 questions pertaining to demographic, socioeconomic characteristics, attitudes, habits and lifestyles, and exposure to different risk factors. Subjects were divided into groups based on gender, university faculty group and place of residence. The tested factors were compared between these groups.

Results: Occasionally drink alcoholic beverages 77.7% of students and 4.6% of them every day. More beer and distilled spirits drink men. Students often drink in Belgrade on 6 or more drinks during one occasion. At least beer, but most students drink liquor in Niš, and for students in Novi Sad goes the other way around. Significant differences between the types of drugs commonly used by students, where they recorded the highest ranks of marijuana.

Conclusion: Students who drink alcohol occasionally or constantly present risk groups for the expression of health and emotional problems. Therefore, universities and colleges should be encouraged to provide efficient, affordable counseling services for their students.

Keywords: students, psychoactive substances, alcohol consumption

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Uvod: Nesanica je stanje neadekvatnog kvaliteta i kvantiteta spavanja. Simptomi nesanicne su: otežano usnivanje, teškoća održavanja sna, prerano jutarnje buđenje i osećaj umora posle prespavane noći.

Cilj: Cilj istraživanja bio je ispitivanje odnosa skorova pojedinačnih stavki Atina insomnija skale sa 5 stavki (AIS-5) i sociodemografskih varijabli studenata medicine i stomatologije.

Materijal i metode: Istraživanje je dizajnirano po tipu studije preseka, sprovedeno je tokom marta 2011. godine i obuhvata 392 studenta Medicinskog fakulteta Priština-Kosovska Mitrovica. Intenzitet simptoma nesanicne ocenjen je primenom Atina insomnija skale sa 5 stavki. Statističke hipoteze su testirane na nivou značajnosti od 0,05.

Rezultati: Prosečna vrednost ukupnog skora svih ispitanika na AIS-5 iznosila je 3,2±2,5. Usnivanje je bilo teže kod ženskog pola (p=0,049) i studenata po Bolonji (p=0,037). Više problema sa noćnim buđenjem imali su studenti koji studiraju po Bolonji (p=0,045). Problem noćnog buđenja bio je učestaliji kod ženskog pola (p=0,025) i studenta sa manjom prosečnom ocenom (r=-0,12; p=0,023). Neplanirano su se ujutru češće budili studenti stomatologije (p=0,038) i ženskog pola (p=0,005). Dužinom spavanja nisu bili zadovoljni studenti stomatologije (p=0,005). Kraće su spavali studenti stomatologije (p=0,018). Kvalitet spavanja je bio niži kod ženskog pola (p=0,034), studenta koji studiraju po Bolonji (p=0,010), mlađih ispitanika (r=-0,14; p=0,005) i studenata nižih godina studija (r=-0,15; p=0,002).

Zaključci: Studenti ženskog pola teže padaju u san, češće se bude noću i rano ujutru, manje su zadovoljni kvalitetom spavanja. Studenti po Bolonji teže padaju u san, imaju više problema sa noćnim buđenjem i nisu zadovoljni kvalitetom sna. Studenti stomatologije kraće spavaju, češće se bude ujutru i nisu zadovoljni kvalitetom spavanja. Mlađi ispitanici i studenti nižih godina studija imaju manji kvalitet spavanja. Smeštaj prilikom studiranja ne utiče na kvalitet spavanja.

Ključne reči: nesanica, studenti, Atina insomnija skala.

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Uvod: Istraživanje stilova života i zdravstvenih problema u studentskoj populaciji ima dans veliku društvenu aktuelnost.

Cilj: Cilj rada je da se ispituju navike i stilovi života studenata u Srbiji, kao i povezanost sa njihovim najčešćim zdravstvenim problemima.

Materijal i metode: Studijom preseka na 3 državna univerziteta u periodu januar-juni školske 2009/2010. godine obuhvaćeno je 2285 studenata oba pola. Studenti su popunjavali upitnik koji je bio sastavljen od 35 pitanja koja su se odnosila na demografske, socioekonomske karakteristike, njihove stavove, navike i stilove života, procenu sopstvenog zdravlja kao i nekih zdravstvenih problema. Ispitanici su razvrstani po grupama u odnosu na pol, grupu fakulteta i mesto stanovanja.

Rezultati: Čak 15,1% muškaraca i 9,2% devojaka nikada ne razmišlja o svom zdravlju pri načinu izbora hrane.

Muškarci su fizički aktivniji nego devojke (p<0,001). Devojke su češće nego muškarci menjale svoja ponašanja zbog boljeg kvaliteta života (p<0,001). Devojke su imale više bolova u nekom delu tela, češće su bile depresivne nego muškarci, bile su više pod stresom i uvećoj meri su sebe ocenjivale kao deblje. Takođe, one su se lakše umarale, bile su više nervozne i imale su više problema sa spavanjem (p<0,01).

Zaključak: Studenti moraju biti okruženi da postanu aktivno angažovani na promociji zdravlja (ZDRAVLJE ZA SVE!) i to ne isključivo kao objekti za profesionalni tretman, nego kao kompetentni i predani promotori zdravih stilova života u svojim porodicama, susedstvu, školi, fakultetu i radnim mestima.

Ključne reči: studenti, stilovi, zdravlje

RELATIONSHIP BETWEEN THE INDIVIDUAL ITEMS OF ATHENS INSNOMNIA SCALE AND DEMOGRAPHIC VARIABLES OF STUDENTS

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Introduction: Insomnia is a condition of inadequate quality and quantity of sleep. Symptoms of insomnia include: difficulty falling asleep, difficulty maintaining sleep, early morning awakening, and fatigue after awakening.

The Aim: The aim of this study was to examine the relationship of scores of individual items of Athens insomnia scale with 5 items (AIS-5), and socio-demographic variables of medical and dentistry students.

Materials and Methods: The study was designed as cross-sectional study, conducted in March 2011 and includes 392 student Faculty of Medicine Priština-Kosovska Mitrovica. The intensity of the symptoms of insomnia were assessed using the Athens Insomnia Scale with 5 items. The statistical hypotheses were tested for significance level of 0.05.

Results: The average value of the total score for all respondents to the AIS-5 was 3.2±2.5. Falling asleep was more difficult for females (p=0.049) and the Bologna students (p=0.037). More problems with the night waking up had students who are studying at Bologna (p=0.045). The problem of night waking was more common in females (p=0.025) and students with lower marks (r=-0.12, p=0.023). Unexpectedly awaking in the morning was more often dental students (p=0.038) and females (p=0.005). With length of sleep were not satisfied more often dental students (p=0.005). Shorter sleep dental students (p=0.018). Quality of sleep was lower in females (p=0.034), a students studying at Bologna (p=0.010), younger students (r=-0.14, p=0.005) and students of lower year study (r=-0.15, p=0.002).

Conclusion: The female students more difficult falling asleep, more often wake up at night and early in the morning, and they are less satisfied with the quality of sleep. Students at Bologna more difficult falling asleep, have more problems with waking up at night and are not satisfied with the quality of sleep. Dental students are sleeping less, more often wake up in the morning and are not satisfied with the quality of sleep. Younger respondents and students of lower year have a lower quality of sleep. Accommodation during the study does not affect the quality of sleep.

Keywords: Insomnia, Students, Athens Insomnia Scale.

LIFESTYLE AND HEALTH PROBLEMS IN STUDENTS OF UNIVERSITIES IN SERBIA

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Introduction: The study habits and health problems in the student population is still very great social actuality.

The Aim: The aim of this study was to examine the habits and lifestyles of students in Serbia, as well as links to their most common health problems.

Materials and Methods: The study section of the three state universities in the period January-June school year 2009/2010. The included 2285 students of both sexes. Students filled out a questionnaire that consisted of 35 questions pertaining to demographic, socioeconomic characteristics, their attitudes, habits and life styles, assessing their health and some health problems. Subjects were divided into groups based on gender, a group of faculty and residence.

Results: Even 15.1% of men and 9.2% of girls never think about their health when choosing food. Men are physically active than girls (p <0.001). Girls were more likely than men to change their behavior because of a better quality of life (p <0.001). Girls had more pain in one part of the body were more depressed than men, they were more stressed and more were judged to measure themselves fatter. Also, they are easily tired, they were more anxious and had more problems with sleep (p <0.01).

Conclusion: Students must be okruženi to become actively involved in health promotion (HEALTH FOR ALL!), Not only as objects for professional treatment, but as a competent and dedicated promoters of healthy lifestyles in their families, neighborhood, school, college and work places.

Keywords: students, lifestyle, health

UTICAJ DRUŠTVENE TRANZICIJE NA UNOS MLEKA I MLEČNIH PROIZVODA KOD STUDENATA

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Uvod: Kvalitet i raznovrsnost ishrane su od posebnog značaja za zdravlje dece i mladih. Mleko i mlečni proizvodi koji su odličan izvor proteina, mineralnih materija i vitamina, predstavljaju važnu grupu namirnica tokom rasta i razvoja i zbog toga je značajno pratiti njihov unos kod vulnerabilnih kategorija.

Cilj rada: Cilj rada bio je ispitivanje uticaja društvenih okolnosti u prethodnoj deceniji na zastupljenost mleka i mlečnih proizvoda u ishrani studenata u Nišu.

Materijal i metode: Epidemiološko ispitivanje sprovedeno je među 69 studenata farmacije Medicinskog fakulteta u Nišu u periodu od septembra do decembra 2011. god. Anketiranje studenata je sprovedeno anonimno korišćenjem originalnog 24-h upitnika po sećanju. Istovremeno analizirane su i obrađene istovetne vrste anketa koje su sakupljane za potrebe drugog ispitivanja sprovedenog 2002.god. (n= 209). Podaci su međusobno upoređeni, a za statističku analizu upotrebljen je program Excel.

Rezultati: Aktuelni prosečan dnevni unos mleka kod studenata u Nišu je iznosio 135.79±96.63 g, što je znatno manje u odnosu na period pre 10 godina kada je iznosio 223.06±109.95. Najčešće upotrebljene namirnice iz grupe mlečnih proizvoda su bile kiselo-mlečni proizvodi. Pušenje i način ishrane nisu bitno uticali na unos mleka i mlečnih proizvoda kod ispitanih studenata.

Zaključak: Prosečan dnevni unos mleka i mlečnih proizvoda kod studenata u Nišu je zadovoljavajući. Društvena tranzicija je negativno uticala na unos ove važne grupe namirnica i taj trend treba zaustaviti.

Ključne reči: mleko, mlečni proizvodi, studenti, dnevni unos

PRITUŽBE ZAPOSLENIH NA MIKROKLIMATSKE FAKTORE NA RADNOM MESTU U ODNOSU NA POL ISPITANIKA

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Uvod: Termin „sindrom bolesnih zgrada“ (SBS) se koristi da bi se opisala situacija u kojoj se veći broj zaposlenih žali na pojavu većeg broja privremenih nespecifičnih simptoma koji su povezani sa boravkom u zgradi u kojoj žive. Sindrom obuhvataju tri grupe simptoma: generalni, kožni i simptomima mukoznih membrana.

Cilj rada: Cilj ovog rada bio je utvrdjivanje da li se u zgradama u kojima je zabeležena pojava SBS pritužbe na mikroklimatske uslove javljaju različito u odnosu na pol ispitanika.

Materijal i metode: Istraživanjem je obuhvaćeno 432 ljudi, 330 žena i 102 muškarca koji rade u istim uslovima u dva poslovna centra u Nišu. Upitnik se sastojao od pet delova- ličnih podataka o zaposlenima, navika, psihosocijalne sredine, mikroklimatskih faktora i pritužba na njih, kao i simptoma koji se javljaju na poslu kao i istorije alergijskih bolesti. Deo upitnika koji se odnosi na mikroklimatske faktore uključivao je takođe Building Index, odnosno prosečan broj pritužbi po zaposlenom.

Rezultati: Među zaposlenima je bilo više žena (76,3%). Većina ljudi bilo je ispod 34 godina (71,7%) i sa srednjom stručnom spremom (73%). Žene se statistički značajno više žale na četiri parametra: prisustvo promaje, buku, hladnoću i stalne varijacije temperature prostorija u kojima rade, dok su se muškarci značajno više žalili na zagađen vazduh. Imajući uvid u Building Index, možemo primetiti da većina zaposlenih ima između 4 i 7 pritužbi.

Zaključak: Naši rezultati pokazuju da su pritužbe na mikroklimatske faktore različito zastupljene prema polu, pri čemu žene prednjače.

Ključne reči: mikroklimatski faktori, sindrom bolesnih zgrada, pol

THE INFLUENCE OF TRANSITION ON THE INTAKE OF MILK AND DAIRY PRODUCT AMONG STUDENTS

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Introduction: The quality and diversity is of a particular importance for the health of children and youth. Milk and milk products which are great source of protein, minerals and vitamins are important group of groceries during growth and development and therefor is important to monitor their intake in vulnerable categories.

The Aim: The aim of this study was to investigate the impact of social circumstances in the last decade, the presence of milk and milk products in feeding of student in Nis.

Materials and methods: An epidemiological study was conducted among 69 students Pharmaceutical Medicine in Nis in the period from September to December 2011. The survey of students was conducted anonymously using the original 24-h questionnaire from memory. At the same time, identical types of surveys were analyzed and processed that were collected for another study conducted in 2002, (n = 209). The data are compared with each other.

Results: Current average daily milk intake of students in Nis was 135.79 ± 96.63 g, which is significantly less than the period of 10 years ago when it was 223.06 ± 109.95g. Frequently used foods from the milk group were the curdled-milk products. Smoking and diet did not significantly affect the intake of milk and dairy products among the students.

Conclusion: Average daily intake of milk and milk products the students in Nis is satisfactory. Social transition has negatively affected the intake of this important food group, and this trend should be stopped.

Key words: milk, dairy products, students, daily intake

EMPLOYEES COMPLAINING ON MICROCLIMATE FACTORS AT WORK ACCORDING TO THE GENDER

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Introduction: The sick building syndrome is defined as the occurrence of an excessive number of subjective complaints by the employees of the building. The syndrome consists of three divided group of symptoms: general, skin and mucosa membrane symptoms.

Aim: The aim of this work was to determine the independence between the occurrence of complaining on microclimate factors and gender.

Material and methods: This study was done on 432 people, 330 women and 102 men, who work in two commercial centers in Nis. The interview was based on five parts – personal data, habits, psychosocial environment, microclimate factors and its complaint, and the history of allergy diseases. The part of interview related to microclimate factors also included BI, building index, which represent the average number of complaints of the employee

Results: Among the employees, more were women (76, 3%), which is in accordance with the number of women employees in this sector in the country. Most of the people were under 34 years old (71, 7%) and with high school level of education (73%). Women significant complain more than men about noise, currant air, cold and variations of temperature, while men are complaining on the air pollution. Reviewing the building index, we can see that most of the employees had between 4 and 7 complaints.

Conclusion: According to our results we can conclude that the complaints on microclimate factors significant differ among gender, in behalf of women.

Key words: sick building syndrome, microclimate factors, gender

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Uvod: Povećanje broja stanovnika u svetu, rezultuje sve većim potrebama za hranom. Rizik po zdravlje ljudi od neispravnih namirnica predstavlja jedan od aktuelnijih problema.

Cilj rada: U radu je prikazana zdravstvena ispravnost namirnica na teritoriji Nišavskog okruga, u periodu od 2006. do 2010. godine.

Materijal i metode: Korišćeni podaci dobijeni su od Instituta za javno zdravlje u Nišu o zdravstvenoj ispravnosti namirnica za period od 2006. do 2010. godine, a koji obuhvataju rezultate mikrobioloških i hemijskih ispitivanja uzoraka namirnica poreklom iz domaće proizvodnje i uvoza. Kontrolom su obuhvaćene 22 grupe namirnica. Rezultati zdravstvene ispravnosti namirnica su sagledani u skladu sa važećim pravilnicima i Zakonom o bezbednosti hrane.

Rezultati: Broj analiziranih namirnica kretao se u rasponu od 2399 do 4222 godišnje. Mikrobiološki je bilo neispravno 6,9% namirnica iz domaće proizvodnje i 3,4% namirnica iz uvoza. Hemijski je bilo neispravno 8,8% namirnica iz domaće proizvodnje i 0,8% namirnica iz uvoza. Najveći broj neispravnih namirnica poticao je iz zanatske proizvodnje, 8,6% je bilo mikrobiološki i 14% hemijski neispravno. Najveći broj mikrobiološki neispravnih namirnica bio je kontaminiran nalazom "ostalih" uzroka kontaminacije (55%). Najčešći uzrok hemijske neispravnosti bio je neodgovarajući sastav (81%). Prethodna istraživanja iz ove oblasti su dale slične rezultate.

Zaključak: Broj ispitivanih namirnica je u porastu, ali i dalje nedovoljan. Postoji trend smanjenja zdravstveno neispravnih uzoraka namirnica na području nišavskog regiona i stalno smanjenje rizika po zdravlje ljudi. Neophodno je i dalje raditi na sprovođenju preventivnih mera u cilju obezbeđenja zdravstveno ispravne hrane.

Ključne reči: Zdravstvena ispravnost namirnica, mikrobiološki pregled, hemijski pregled.

FOOD QUALITY IN NISAVA COUNTY

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Introduction: Increasing population in the world, resulting in ever-increasing needs for food. Risk to human health from unsafe food is one of the most recent problems.

The Aim: The paper describes the health safety of food in the territory of Nis District in since 2006-2010. year period.

Materials and Methods: Used data is obtained from the Public Health Institute in Nis on safety of foods for 2006-2010. year period, which include results of microbiologic and chemical testing of food samples originating in shift from manufacturing domestic and import. Control group included 22 food items.

Results: Number of analyzed foodstuffs ranged from 2399 to 4222 a year. Microbiological was incorrectly 6.9% of foodstuffs from domestic production and 3.4% of foodstuffs imported. Chemical was incorrectly 8.8% of foodstuffs from domestic production and 0.8% of imported foodstuffs. The largest number of contaminated foodstuffs were from craft production, 8.6% were microbiologically and chemically 14% incorrect. The largest number of contaminated foodstuffs was contaminated with the finding of "other" causes of contamination (55%). The most common cause of chemical contamination was inadequate composition (81%). Previous research in this area gave similar results.

Conclusion: Number of tested foods is growing, but still insufficient. There is a decreasing trend of unsafe food samples in Nisava region and continuously reduce risks to human health. It is necessary to continue work on implementation of preventive measures in order to ensure safe food.

Keywords: Food quality, microbiological analysis, chemical analysis.

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Увод: Гонартроза је најчешћа артроза, чешћа код жена него код мушкараца. Код особа са гонартрозом примењују се различити физикални третмани који могу бити са или без употребе ласера.

Циљ рада: Истраживање је имало за циљ да утврди да ли присуство ласеротерапије у третману пацијената са гонартрозом утиче на дужину привремене радне неспособности.

Материјал и метод: Испитивањем је обухваћено 40 испитаника (28 женског и 12 мушког пола) са остеоартрозом колених зглобова, лечених у Дому здравља Звечан, у периоду од 2009-2011. године. Испитаници су подељени у две групе:

- I групу је чинило је 22 испитаника којима је у терапији коришћена ласеротерапија уз хидрокинезитерапију.
- II групу (контролну) чинило је 18 испитаника код којих је у терапији комбинована физикална терапија (кинези, хидрокинези, соно и електротерапија) без ласеротерапије.

Код процене ефикасности примењене терапије коришћени су следећи параметри: бол (оцена од 1-4) и покретљивост (максимална флексија у степенима). Способним за рад ценили смо оне испитанике код којих смо регистровали оцену за бол један и постигли задовољавајућу покретљивост у зглобу колена (максимална флексија преко 110 степени).

Резултати: Код испитаника у I групи после завршетка третмана регистровали смо 9 (45.45%) испитаника способних за рад, док смо код испитаника 3 (16,16%) у II групи способних за рад, што представља статистички значајну разлику ($p < 0,05$).

Закључак: Примена ласеротерапије код испитаника са гонартрозом значајно скраћује трајање неспособности за рад.

Кључне речи: ласеротерапија, гонартроза, привремена спреченост за рад.

LASERTHERAPY AND TEMPORARY INABILITY TO WORK IN PATIENTS WITH KNEE ARTHROSIS

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Introduction: Gonarthrosis is the most common arthritis, more common in women than in men. In patients with gonarthrosis applied to various physical treatments which may be with or without the use of lasers.

The Aim: The study aimed to determine whether the presence of laser therapy in the treatment of patients with gonarthrosis affects the length of temporary disability.

Materials and methods: The study involved 40 patients (28 female and 12 male) stifle joints with osteoarthritis who were treated at the Health Zvečan, from 2009-2011. Subjects were divided into two groups:

-The I groups consisted of 22 patients in whom treatment with laser therapy used hydrochinesitherapy

-The II groups consisted 18 patients who had combined therapy in physical therapy (Chinese, hydrochinesy, sono and electrotherapy) without laserotherapy. When assessing the effectiveness of therapy used the following parameters: pain (score 1-4) and mobility (maximum flexion in degrees). Able to appreciate the work we have examined in which they are registered for evaluation of pain and achieve a satisfactory mobility of the knee joint (maximum flexion of more than 110 degrees).

Results: For subjects in the I group after the treatment were noticed 9 (45.45%) patients capable of work, while we are in the II group 3 (16.16%) in group II able to work, which represents a statistically significant difference ($p < 0.05$).

Conclusion: The application of laserotherapy in patients with gonarthrosis significantly shortens the duration of work disability.

Key words: laserotherapy, gonarthrosis, temporary inability to work.

UČESTALOST PUŠENJA CIGARETA I STAVOVI U VEZI SA ODVIKAVANJEM OD PUŠENJA STUDENATA MEDICINE U KOSOVSKOJ MITROVICI

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Uvod: Pušenje cigareta je jedan od najzastupljenijih faktora rizika po zdravlje, uključujući i studentsku populaciju. Smanjenje učestalosti ove štetne navike među studentima smanjuje verovatnoću pojave mnogih oboljenja.

Cilj: Utvrditi učestalost navike pušenja među studentima medicine u Kosovskoj Mitrovici i povezanost sa njihovim osnovnim karakteristikama, i njihove stavove u vezi sa odvikavanjem od pušenja.

Materijal i metode: Istraživanje je urađeno kao studija preseka na reprezentativnom uzorku studenata Medicinskog fakulteta u Kosovskoj Mitrovici, u period od 12. do 16. decembra 2011. godine. Uzorak su činili svi studenti koji su u navedenom periodu pohađali praktičnu nastavu, a pristali su da učestvuju u istraživanju. Kao instrument istraživanja poslužio je Upitnik o ponašanju i zdravlju. Od statističkih metoda korišćeni su hi-kvadrat i Men-Vitnijev test, sa nivoom značajnosti 0,05.

Rezultati: Pušenje cigareta je zastupljeno među 22,6% studenata Medicinskog fakulteta u Kosovskoj Mitrovici. Značajno češće je među muškarcima, starijim studentima, studentima zdravstvene nege, koji rade i studiraju. Najveći deo pušača bi cigarete ostavio zbog pogoršanja sopstvenog zdravlja, smatra da je za to potrebno više od mesec dana, kao situaciju za pomoć smatra bavljenje sportom, a kao otežavajuću blisku osobu koja puši. Većina nije koristila farmakološka sredstva i savetovališta za ostavljanje, a kao najefikasnijom merom smatra značajno poskupljenje cigareta.

Zaključak: Skoro svaki četvrti student Medicinskog fakulteta u Kosovskoj Mitrovici puši cigarete. Identifikacija grupacija koja češće upražnjava ovu naviku i proučavanje stavova u vezi sa odvikavanjem od pušenja značajno je radi prilagođavanja zdravstveno promotivnih mera i aktivnosti.

Ključne reči: pušenje cigareta, studenti, stavovi, odvikavanje.

PREVALENCE OF SMOKING AND ATTITUDES IN CONNECTION WITH QUITTING SMOKING OF MEDICINE STUDENTS IN KOSOVSKA MITROVICA

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Introduction: Cigarette smoking is one of the most common health risk factors, including the student population. Reducing the prevalence of this harmful habits among students reduce the likelihood of occurrence of many diseases.

The Aim: To determine the prevalence of smoking habits among medical students in Kosovska Mitrovica and the relationship with their main characteristics, and their attitudes about smoking quitting.

Materials and Methods: Research was conducted as a cross-sectional study on a representative sample of medical students in Kosovska Mitrovica, from 12 to 16 December 2011. The sample included all students who have attended in that period practical classes, and were agreed to participate in the survey. As a research instrument was used Questionnaire about behavior and health. From the statistical methods were used chi-square and Men-Withney tests, with significance of 0.05.

Results: Smoking was present among 22.6% of medical students in Kosovska Mitrovica. Significantly more frequent was among men, older students, students of health care, who working and studying. Most of the smokers would be left the cigarettes because of deteriorating their own health, believes that it takes more than a month, as the situation for aid were considered sport and as an aggravating circumstance close person who smoking. Most of them did not use pharmacological agents and counseling for quitting, and as the most effective measure were considered a significant increase in prices of cigarettes.

Conclusion: Nearly one of four students of the Medical Faculty in Kosovska Mitrovica smoking. Identification of groups who more often practice this habit, and the study of attitudes about smoking quitting is important for adaptation health promotion measures and activities.

Keywords: smoking, students, attitudes, quitting.

UNOS VOĆA I POVRĆA KOD STUDENATA FARMACIJE U NIŠU

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Uvod: Pravilna ishrana je od velikog uticaja na zdravstveno stanje svakog pojedinca, a posebno na studentsku populaciju koja je izložena stalnim psiho-fizičkim naporima. Voće i povrće obiluje ugljenim hidratima, mineralima, vitaminima, dijetnim vlaknima i značajno je za očuvanje i unapređenje zdravlja mladih.

Cilj rada: Cilj rada bio je ispitivanje zastupljenosti voća i povrća u ishrani studenata i poređenje sa usvojenim stručnim preporukama.

Materijal i metode: Epidemiološko ispitivanje je sprovedeno na Medicinskom fakultetu u Nišu u periodu od septembra do decembra 2011. godine. Istraživanje je rađeno primenom anonimnog 24-h upitnika po sećanju. Anketom je obuhvaćeno 69 studenata farmacije. Istovremeno su analizirane istovetne vrste anketa, sakupljane za potrebe drugog ispitivanja sprovedenog 2002. godine, a ispitanici su bili studenti medicine (n= 209) . Podaci su upoređeni međusobno, kao i sa usvojenim nutritivnim preporukama.

Rezultati: Ukupan dnevni unos voća i povrća kod ispitanika iznosio je 405 ± 213,5g i pokazuje negativan trend u odnosu na period pre 10 godina. Od povrća bio je najzastupljeniji krompir. Kada je u pitanju voće, najviše se unosile jabuke, a zatim citrusno voće.

Zaključak: Društvena tranzicija u prethodnoj deceniji uticala je nepovoljno na prosečan dnevni unos voća i povrća u ishrani studenata Medicinskog fakulteta u Nišu, iako je ukupni unos pomenutih namirnica ostao zadovoljavajući.

Ključne reči: voće i povrće, ishrana, studenti

INTAKE FRUIT AND VEGETABLES IN PHARMACY STUDENTS IN NIŠ

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Introduction: Proper nutrition is of a particular importance for the health of each individual, especially the student population that is exposed to constant psychological and physical stresses. Fruits and vegetables which are great source of carbohydrates, minerals, vitamins, dietary fiber are important for the preservation and improvement of youth health.

The Aim: Analyse the distribution of fruit and vegetables in the diet of students and comparison with accepted professional guidelines.

Materials and Methods: An epidemiological study was conducted at the Medical Faculty in Nis in the period from September to December 2011. The study was conducted using an anonymous 24-h survey from memory. At the same time, identical types of surveys were analyzed and processed that were collected for another study conducted in 2002 and the subjects were medical students (n = 209). The data are compared with each other and with accepted nutritional recommendations.

Results: The total daily intake of fruits and vegetables in the subjects was 405 ± 213,5 g and it shows a negative trend than the period of 10 years ago. Frequently used foods from a group of vegetables are potatoes. Frequently used ingredients from the group of fruits are apples, and citrus fruits.

Conclusion: The social transition in the past decade has affected adversely the average daily intake of fruits and vegetables in the diet of students of the Medical Faculty in Niš, although the total intake of these foods has remained satisfactory.

Key words: fruit and vegetables, nutrition, students

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Uvod: Strah od stomatološkog zahvata ne zavisi od životnog doba, pola, socijalnog statusa, zanimanja i slično, već se podjednako može javiti kod svih ljudi. Postoje različiti nivoi dentalnog straha, od blage nervoze do dentalne fobije.

Cilj: Cilj rada je da se utvrdi razlika u stepenu anksioznosti kod studenata društvenog, pridodnog i tehničkog fakulteta, tj. ekonomskog, stomatološkog i arhitektonskog fakulteta Univerziteta u Beogradu, kao i razlika dentalne anksioznosti u odnosu na pol.

Materijal i merode: U istraživanju je korišćena Modifikovana Corah-ova skala dentalne anksioznosti (DAS-Corahs Dental Scale, Revised). Ispitano je ukupno 183 studenta, od toga 49 sa ekonomskog, 97 sa stomatološkog i 37 sa arhitektonskog fakulteta Univerziteta u Beogradu..

Rezultati: Krajnji rezultat anksioznosti u odnosu na oblast studiranja pokazao je da su najmanje anksiozni studenti stomatologije sa prosečnim rezultatom od 7,84, zatim studenti arhitekture sa 9,30, a najanksiozniji su studenti ekonomije sa rezultatom od 10,73. U odnosu na pol, žene su pokazale veću anksioznost od muškaraca sa statistički značajnom razlikom ($p=0,00$). Na osnovu postavljenih pitanja, ustanovljeno je da su studenti najanksiozniji zbog predstojeće kontrole.

Zaključak: Studija je pokazala da studenti stomatološkog fakulteta ne pripadaju grupi anksioznih pacijenata, dok studenti ekonomije i arhitekture imaju umerenu anksioznost koju treba kontrolisati.

KLjučne reči: Anksioznost, studentska populacija, pol

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Uvod: Akutni infarkt miokarda (AIM) je rezultat različitih somatskih, okolinskih i bihevioralnih činilaca. Brojni su faktori rizika odgovorni za nastanak AIM-a (povišen krvni pritisak, povećanje masti u krvi, šećerna bolest, fizička neaktivnost, pušenje i drugi). Pored ovih somatskih faktora rizika psihološki faktori takođe su od značaja. Oni mogu biti ili kombinovani sa somatskim ili jedini faktori rizika.

Cilj rada: Procjena uticaja ponašanja kao kompleksnog faktora rizika na nastanak akutnog infarkta miokarda kod žena.

Materijal i metode: Istraživanjem je bila uključena 41 žena (u periodu od 3. oktobra do 21. novembra 2011.) sa dijagnozom akutnog infarkta miokarda. Instrument istraživanja bio je upitnik sa dvadeset pitanja zatvorenog tipa. Za obradu rezultata korišćena je metoda deskriptivne statistike. Rezultati: Istraživanje je pokazalo da ponašanje u vezi sa zdravljem, kao kompleks faktor rizika, nije shvaćeno i prepoznato kao bitno kako za primarnu tako i za sekundarnu prevenciju infarkta, te ne postoji izražena tendencija za njegovom modifikacijom. Većina ispitanica je imala udružene somatske i psihosocijalne faktore za nastanak akutnog infarkta miokarda.

Zaključak: Kod najvećeg broja ispitanica ponašanje, odnosno psihosocijalni faktori, igraju značajnu ulogu faktora rizika u nastanku akutnog infarkta miokarda. Došlo se i do zaključka da je većina ovih faktora neprepoznato kao činilac u nastanku AIM-a.

KLjučne riječi: AIM, ponašanje, faktori rizika.

DENTAL ANXIETY AMONG UNIVERSITY STUDENTS POPULATION

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Introduction: Fear of dental treatment is not dependent on age, sex, social status, occupation, etc., but it can equally occur in all categories of people. There are different levels of dental fear, from mild anxiety to dental phobia.

Aim: The aim of this study was to determine the difference in the degree of anxiety in students population, from social, natural and technical faculty, i.e. economic, dentistry and architectural, University of Belgrade, as well as the difference between dental anxiety in relation to sex.

Materials and Merode: The Modified Corah's Dental Anxiety Scale (DAS-Corahs Dental Scale, Revised) was used in this study. A total of 183 students, 49 from the economic, with 97 dental and 37 of the faculty of architecture in University of Belgrad.

Results: The final result of anxiety in relation to the field study showed that the least anxious had dental students with an average score of 7.84, followed by students of architecture from 9.30, and the highest anxiety had economics students with a score of 10.73. In relation to gender, women had greater anxiety than men with a statistically significant difference.

Conclusion: The study showed that students of dentistry does not belong to a group of anxious patients, and students of economics and architecture have moderate anxiety to be controlled.

Key words: Anxiety, students population, gender

BEHAVIOUR AS RISK FACTOR IN WOMEN WITH ACUTE MYOCARDIAL INFARCTION

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Introduction: Acute myocardial infarction (AMI) results from an interaction of different somatic, environmental and behavioral risk factors. Commonly, development of AMI is associated with arterial hypertension, dyslipidemia, diabetes mellitus, smoking, sedentary life style and the like. Psychological factors in their own sake or in combination with other risk factor are also important for genesis of AMI.

The Aim: Estimation of influence of behaviour, as complex risk factor, in development of AIM.

Materials and methods: Investigation included 41 women (since 3th of october until the 21th of november) with diagnosis of AMI. Instrument was questionnaire with 20 close-type questions. For processing results method of descriptive statistic was used.

Results: Investigation has showed that behaviour related to health, as a complex risk factor, is not recognized and understood as important for primary but secondary prevention too, and also there is no evident tendency for its modification. Most of examinees had associated somatic and psychosocial factors for development of AMI.

Conclusion: In majority of examinees behaviour, or psychosocial factors, play important role as risk factors in development of AMI. There is also conclusion that most of these factors are unrecognized as factors in development of AMI.

Key words: AMI, behaviour, risk factors.

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Uvod: Multipla skleroza je hronično inflamatorno oboljenje centralnog nervnog sistema od koga u svijetu boluje 2,5 miliona ljudi. To je najčešće netraumatsko onesposobljavajuće neurološko oboljenje mladih odraslih osoba. Infekcije, genetski faktori, izloženost sunčevom zračenju i vitamin D su najčešće proučavani faktori u etiologiji MS.

Cilj rada: Procjena kvaliteta života bolesnika sa MS, sagledavanje sveukupnog uticaja bolesti na svakodnevni život bolesnika.

Materijal i metode: Istraživanje je dizajnirano kao studija presijeka. Kriterijumi za uključivanje u studiju bili su pripadnost oboljelih Udruženju Multiple Skleroze u Crnoj Gori. Kriterijumi za isključivanje iz studije bili su egzacerbacije u posljednjih mjesec dana i fizička nemogućnost stupanja u kontakt sa oboljelima. Od ukupno 250 članova Udruženja, istraživanjem je obuhvaćeno 70 oboljelih. Kao instrument mjerenja korišćen je upitnik koji je sadržao 22 pitanja.

Rezultati: Senzorni, motorni i kognitivni simptomi MS interferiraju sa svakodnevnim aktivnostima bolesnika i na taj način značajno utiču na pogoršanje kvaliteta života. Fizička onesposobljenost, komplikovana zamorom, depresijom i mogućim kognitivnim oštećenjima utiče na to da veliki broj oboljelih ne radi. Osobe sa MS, kao i članovi njihovih porodica, imaju veliko opterećenje uslijed boravka kod kuće, modifikacija vezanih za transport, potreba za dodatnim ličnim uslugama. Većina nema osjećaj diskriminacije u društvu ali smatraju da bi sredina mogla biti prilagođenija njihovim potrebama.

Zaključak: Kod bolesnika sa MS u sagledavanju kompletnog psihofizičkog stanja, osim objektivnog neurološkog nalaza, mora se uzeti u obzir i subjektivna percepcija simptoma i znakova. Multipla skleroza ima ogroman uticaj na socijalno funkcionisanje bolesnika. Istraživanje je pokazalo da različiti demografski i klinički parametri imaju veliki uticaj na psihosocijalne aspekte.

Glavne riječi: Multipla skleroza, kvalitet života, psihofizičko stanje.

PSYHOSOCIAL ASPECTS IN PATIENTS WITH MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis is a chronic inflammatory disease of the central nervous system which affects 2.5 million people worldwide. It is the most frequent nontraumatic disabling neurologic disorder among young adults. Infections, genetic factors, sunlight exposure and vitamin D are the most frequently investigated environmental factors in the etiology of MS.

The Aim: Measurement of quality of life in patients with MS, insight into the overall impact of the disorder on everyday life of the patients.

Materials and Methods: Investigation is designed as cross-sectional study. Inclusion criteria: membership in Association of Multiple sclerosis in Montenegro. Exclusion criteria were exacerbation in last month and physical disability in making contact with patients. Among 250 members, study included 70 patients. Instrument of measurement was questionnaire which contained 22 questions.

Results: The sensory, motor and cognitive symptoms of MS can interfere with activities of daily living, which may subsequently result in significantly reduced health-related quality of life in people with MS. Physical disability complicated by fatigue, depression and possibly cognitive impairment contributes to an unemployment of these patients. Together with their family members, people with MS also bear a burden related to home and transport modifications and the need for additional personal services. Most of them don't feel discrimination of society, but they consider environment could be more sensitive for their needs.

Conclusions: In patients with MS, apart from complete psychophysical status and objective neurologic status, a subjective perception of symptoms and signs, must be considered, too. MS has a profound impact on patients' social roles. This study showed different demographic and clinical parameters had a major effects on psychosocial life.

Key words: Multiple sclerosis, quality of life, psychosocial status.

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Uvod: Kvalitet u pružanju zdravstvene zaštite postao je imperativ u radu zdravstvenih ustanova. Zadovoljstvo pacijenata jedan je od ključnih segmenata na osnovu kog se vrednuje kvalitet zdravstvene zaštite, odnosno zdravstvenih usluga koje se pružaju.

Cilj rada: Sagledati zadovoljstvo pacijenata zdravstvenom zaštitom u zdravstvenim ustanovama primarnog nivoa zdravstvene zaštite na teritoriji nišavskog i topličkog okruga u 2010. Godini, kroz pojedine segmente rada lekara i medicinskih sestara.

Materijal i metodologija: U skladu sa metodologijom i korišćenjem upitnika definisanim od strane Ministarstva zdravlja Republike Srbije, novembra meseca 2010. godine, sprovedeno je jednodnevno, anonimno anketiranje pacijenata u 12 domova zdravlja na nišavskom i topličkom okrugu. Za unos, sredjivanje i grafički prikaz podataka korišćen je Excel program iz Microsoft office 2007 softverskog paketa.

Rezultati i diskusija: Ukupno je anketirano 4684 pacijenata. Ukupno zadovoljstvo pacijenata pruženom zdravstvenom zaštitom na primarnom nivou je visoko: 80,5% (3774) pacijenata od ukupnog broja učesnika ankete izjasnilo se kao zadovoljno i vrlo zadovoljno, što se može vrednovati kao visok nivo zadovoljstva. Pacijenti su veoma zadovoljni radom lekara, kao i radom medicinskih sestara u primarnim zdravstvenim ustanovama.

Zaključak: Mnogobrojne aktivnosti koje se od 2004. godine u kontinuitetu sprovode u zdravstvenim ustanovama u Republici Srbiji, pa i na nišavskom i topličkom okrugu, rezultuju promenama koje su uočljive, a ključna je visoko zadovoljstvo pacijenata na primarnom nivou zdravstvene zaštite i samim tim veći ukupni kvalitet rada.

Ključne reci: zadovoljstvo pacijenata, kvalitet zdravstvene zaštite

PATIENTS SATISFACTION AS THE SEGMENT OF TOTAL QUALITY

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Introduction: Quality in health care provision has become an imperative in the work of medical institutions. Patient satisfaction is one of the key segments on the basis of which to evaluate the quality of health care or health services provided.

Objective: To determine patients' satisfaction with health care in primary health care level of care in the territory of Niš and Toplica district in 2010. Year, with the individual segments of doctors and nurses performance.

Materials and Methods: In accordance with the methodology and the use of questionnaires as defined by the Ministry of Health, in November of 2010. years, was conducted one day, an anonymous survey of patients at 12 medical centers in Nišava and Toplica district. To enter, arranging and graphical display of data was used Excel program from Microsoft Office 2007 software package.

Results and discussion: A total of 4684 patients were interviewed. Total patient satisfaction at the primary level is high: 80.5% (3774) of patients of all those surveyed described themselves as very satisfied and satisfied, which can be evaluated as a high level of satisfaction. Patients are very satisfied with the medical doctor as well as with the work of nurses.

Conclusion: A number of activities since 2004. was continuously carried out in health institutions, including the Nišava and Toplica district, result in changes that are visible, a key high patient satisfaction in primary health care level and thus higher overall quality of work.

Keywords: patient satisfaction, quality of health care

PUŠAČKE NAVIKE ZDRAVSTVENIH RADNIKA U SRBIJI

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Uvod: Pušenje je jedna od najpopularnijih i najrasprostranjenijih štetnih aktivnosti ljudi. **Cilj:** Cilj rada je bio da se utvrde pušačke navike zdravstvenih radnika u Srbiji.

Materijal i metode: Studija je organizovana kao epidemiološka multicentrična studija preseka. Ispitivanje je sprovedeno u periodu od 2010-2011. godine u zdravstvenim ustanovama svih nivoa u Nišu, Beogradu, Novom Sadu, Zaječaru i Požarevcu. Ispitivanjem je obuhvaćeno 1383 ispitanika.

Rezultati: Prevalencija pušača u ispitivanom uzorku iznosila je 45,60% (trenutni pušači 34,6%, povremeni pušači 11%, bivši pušači 18,3%). Najveći broj pušača je bio u redovima medicinskih sestara 51,77% (trenutni pušači 39,53%, povremeni pušači 12,34%). Najmanja prevalencija pušenja je među doktorima 34,13% (doktori u nastavi 47,22% i doktori 32,73%). Najkasnije su sa pušenjem počeli doktori (sa 20,4 godina) i doktori u nastavi (sa 20,5 godina) i to statistički signifikantno kasnije od medicinskih sestara koje su u proseku počele da puše (sa 18,9 godina) i nemedicinskog osoblja (sa 18,4 godine). Savet pacijentima da ostave pušenje najviše su davali ispitanici iz redova onih koji nikada nisu pušili i to značajno učestalije od pušača (60,5% vs 36,4%; $\chi^2=17,26$; $p<0,001$). Značajno više od pušača su pacijente savetovali i ispitanici koji su prestali da puše (54,4% vs 36,4%; $\chi^2=4,23$; $p=0,04$).

Zaključci: Uzevši u obzir brzo i agresivno širenje epidemije pušenja, kao i visoku prevalenciju pušenja među zdravstvenim radnicima u Srbiji nameće se zaključak da je potrebno kreirati agresivniju i specifičnu antipušačku kampanju namenjenu zdravstvenim radnicima.

Cljučne reči: pušenje, zdravstveni radnici, Srbija

SMOKING HABBIT OF HEALTH WORKERS IN SERBIA

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Introduction: Smoking is one of the most widely spread harmful human activities.

Objective: The objective of this study was to determine the smoking habits of health workers in Serbia.

Material and methods: The study was organized as a multicenter epidemiological study section. The study was conducted 2010-2011 in medical institutions at all levels in Nis, Belgrade, Novi Sad, Zajecar and Pozarevac. The study involved 1383 respondents.

Results: The prevalence of smokers in the sample was 45.60% (34.6% current smokers, occasional smokers, 11%, 18.3% former smokers). The largest number of smokers was among nurses 51.77% (39.53% current smokers, 12.34% occasional smokers). The lowest prevalence of smokers among doctors was 34.13% (doctors in teaching 47.22% and 32.73 doctors). The ones who started smoking last were doctors (at the age of 20.4) and doctors in teaching (age 20.5) and statistically significantly later than nurses (average age 18.9) and non-medical staff (age 18.4). Those who never smoked advised patients to quit smoking more often than smokers (60.5% vs. 36.4%; $\chi^2=17.26$, $p<0.001$). Significantly more patients were advised by non smokers and those who stopped smoking (54.4% vs. 36.4%; $\chi^2=4.23$, $p=0.04$).

Conclusion: Given the rapid and aggressive spreading of the epidemic of smoking and a high prevalence of smokers among health care workers in Serbia, we can conclude that it is necessary to create a specific and assertive anti-smoking campaign for health professionals.

Keywords: smoking, health workers, Serbian

UČESTALOST KORIŠĆENJA ALKOHOLA I STAVOVI U VEZI SA SOCIJALNOM PRIHVATLJIVOŠĆU KORIŠĆENJA ALKOHOLA STUDENATA MEDICINE U KOSOVSKOJ MITROVICI

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Uvod: Preterano korišćenje alkohola je jedan od najučestalijih faktora rizika uopšte. U našoj kulturi, upotreba alkohola se toleriše. Pri tom je alkohol lako dostupan mladima, uključujući i studentsku populaciju.

Cilj: utvrditi učestalost korišćenja alkohola među studentima medicine u Kosovskoj Mitrovici i povezanost sa njihovim osnovnim karakteristikama.

Materijal i metode: Istraživanje je uradjeno kao studija preseka na reprezentativnom uzorku Medicinskog fakulteta u Kosovskoj Mitrovici u periodu od 12. do 16. decembra 2011 godine. Uzorak su činili svi studenti koji su u navedenom periodu pohađali praktičnu nastavu, a pristali su da učestvuju u istraživanju. Kao instrument istraživanja poslužio je Upitnik o ponašanju i zdravlju. Od statističkih metoda korišćeni su hi-kvadrat i Men-Vitnjev test, sa nivoom značajnosti od 0,05.

Rezultati: U nedelji koja je prethodila istraživanju alkohol je probalo 40, 7% studenata Medicinskog fakulteta u Kosovskoj Mitrovici i češće su alkoholna pića pili muškarci, stariji studenti viših godina i oni koji su obnovili veći broj godina. Najveći deo studenata se izjasnio da je alkohol prvi put probalo u kući uz prisustvo roditelja, da je korišćenje alkohola socijalno prihvatljivo u sredinama u kojoj žive i među kolegama, i da im ne bi bilo neprijatno kada bi u društvu kolega naručili piće koje nije alkoholno.

Zaključak: Skoro svaki student Medicinskog fakulteta u Kosovskoj Mitrovici je probao alkohol u prethodnoj nedelji, a značajna većina ocenjuje da je korišćenje alkohola socijalno prihvatljivo u sredinama u kojoj žive i studiraju.

Cljučne reči: korišćenje alkohola, socijalna prihvatljivost, studenti, stavovi.

OF ALCOHOL CONSUMING AND ATTITUDES IN CONNECTION WITH SOCIAL ACCEPTABILITY OF ALCOHOL CONSUMING OF MEDICAL STUDENTS IN KOSOVSKA MITROVICA.

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Introduction: Excessive use of alcohol is one of the most common risk factors in general. In our culture, alcohol consuming is tolerated. Even the alcohol is readily available youth, including students population.

The Aim: To determine the frequency of alcohol consuming among medical students in Kosovska Mitrovica and the relationship with their main characteristics.

Materials and Methods: Research was conducted as a cross-sectional study on a representative sample of medical students in Kosovska Mitrovica, from 12 to 16 December 2011. The sample included all students who have attended in that period practical classes, and were agreed to participate in the survey. As a research instrument was used Questionnaire about behavior and health. From the statistical methods were used chi-square and Men-Withney tests, with significance of 0.05.

Results: In the week preceding the survey alcoholic beverages were consumed 40.7% of medical students in Kosovska Mitrovica. More often alcoholic beverages drank male, older, senior students and those who have renewed a more number of years. Most of the students pleaded that first tried alcoholic beverages at home with parents' presence, it is socially acceptable to use alcohol in the communities where they live in and among colleagues, and that they would not be embarrassed if they ordered non-alcoholic beverage when colleagues in the company ordered an alcoholic beverage.

Conclusion: Nearly every second student of the Medical Faculty in Kosovska Mitrovica consumed alcoholic beverage in the previous week, a significant majority pleaded that the consuming alcoholic beverages is socially acceptable in the communities where they live and study.

Keywords: alcohol consuming, students, attitudes, social acceptability.

ZADOVOLJSTVO ZDRAVSTVENIH RADNIKA U PRIMARNOJ ZDRAVSTVENOJ ZAŠTITI

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Uvod: Zadovoljstvo poslom zdravstvenih radnika je vrlo važan parameter koji utiče kako na kvalitet pružanja zdravstvene zaštite, tako i motivaciju zapošljenih.

Cilj rada: Cilj ovog rada bio je ocijeniti neke od parametara zadovoljstva poslom kod zdravstvenih radnika.

Materijal i metode: Transverzalno ispitivanje sprovedeno 3. i 12.10. 2011. godine u Podgoričkom Domu zdravlja obuhvatilo je 68 zdravstvenih radnika različitog stepena obrazovanja. Korišćen je upitnik od 20 pitanja zatvorenog tipa. Zadovoljstvo je gradirano petostepenom skalom. Rezultati istraživanja su predstavljeni grafikonima.

Rezultati: U Podgoričkom Domu zdravlja skoro svaki treći ispitanik je zadovoljan svojim poslom, dok je nešto više od trećine ispitanika neodlučno (ni zadovoljno ni nezadovoljno). Nezadovoljnih je nešto manje od trećine ukupnih anketiranih.

Zaključak: S obzirom na to da je veoma mali broj ispitanika koji su se izjasnili kao veoma zadovoljni, može se reći da su zapošljeni u ovoj zdravstvenoj ustanovi generalno ni zadovoljni ni nezadovoljni.

Ključne riječi: Primarna zdravstvena zaštita, zdravstveni radnici, zadovoljstvo.

SATISFACTION OF MEDICAL EMPLOYEES IN PRIMARY HEALTH CARE

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Introduction: Job satisfaction is very important factor of productivity, job quality and motivation, especially for health care workers.

The Aim: The aim of the paper was to assess some of the parameters of job satisfaction among health care workers.

Materials and Methods: Transversal study, which included 68 medical employees with different level of education conducted 3rd and 12th October 2011 in the Health center in Podgorica. A questionnaire of 20 close-type questions was used. Satisfaction is graded by five-graded scale. Research findings were presented by charts.

Results: Almost every third examinee is satisfied with the job in Health center in Podgorica. More than third examinee is undecided (neither satisfied nor dissatisfied) at this medical institution.

Conclusion: Given that a very small number of respondents who identified themselves as very satisfied, it can be said that employees are generally neither satisfied nor dissatisfied at this medical institution.

Keywords: Primary health care, medical employees, satisfaction.

ZDRAVSTVENA BEZBEDNOST HRANE I KOLEKTIVNA ISKHANA DECE I OMLADINE U KRAGUJEVCU

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Uvod: Pod zdravstvenom ispravnošću namirnica, podrazumeva se ispravnost sastava u pogledu energetske, gradivnih i zaštitnih materija koje imaju uticaja na biološku vrednost. Neispravnim u pogledu sastava, smatraju se namirnice smanjene biološke vrednosti koje ne sadrže hranjive sastojke u propisanim količinama. Za bezbednost hrane primenjuju se zakonske norme zasnovane na ХЦЦП (Hazard analysis and critical control points) систему. Битан фактор је микробиолошка контаминација, дефинисана одредбама новог Закона о безбедности хране, 2009. године. Контролу врше овлашћене лабораторије и мрежа завода и института за јавно здравље, у сарадњи са надлежним инспекцијама.

Циљ рада: Циљ је да прикажемо безбедност хране у колективним установама, и обезбеђивање високог нивоа заштите здравља људи.

Материјал и методе: Као материјал за овај рад користили смо документацију ИЗЈЗ Крагујевца, Центра за хигијену и хуману екологију, резултате физичко-хемијског и микробиолошког испитивања намирница, брисева и енергетских вредности оброка за период 2007-2011. год. За статистичку обраду коришћен је програм СПСС 19.0. Подаци су анализирани хи-квадрат тестом и линеарним трендом.

Резултати истраживања: Постоји статистички значајна разлика у односу на годину испитивања, врсту и порекло испитиваних узорака. Највећи проценат неисправности је код неусклађених енергетских вредности оброка ($\chi^2 = 16,35$ $p=0,00$) и влажних брисева ($\chi^2 = 8,78$ $p=0,00$). Резултати линеарног тренда показују тренд смањења неисправности намирница, хране и неисправних брисева ($p = 0,69$ $p=0,01$) док се високи тренд неодговарајућих енергетских вредности оброка задржава ($p = 0,32$ $p=0,05$).

Закључак: Редовна контрола и поштовање хигијенских мера и принципа ХАЦЦП система је предуслов за безбедност хране која се дистрибуира у објектима колективне исхране.

Кључне речи: Безбедност хране, ХЦЦП.

HEALTH FOOD SAFETY AND COLLECTIVE NUTRITION OF CHILDREN AND YOUTH IN KRAJUJEVAC

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Introduction: Under the food safety, means the accuracy of its composition in terms of energy, protective substances that have an impact on biological value. Incorrect composition has food with reduced biological value. Measures are based on HCCP system. An important factor is microbiological contamination, defined by the provisions of the Law on Food Safety, 2009. Control is performed by the Office of Public Health, and National Sanitary Inspection.

The aim: The aim is to present food safety in collective institutions and to ensure a high level of human health protection.

Material and methods: We used the documentation IPH Krajujevac, Center for Hygiene and Human Ecology and results of physico-chemical, microbiological analysis of foods, swabs, energy value of meals for the period 2007-2011. We used SPSS 19.0 program. Data were analyzed by chi-square test and linear trend.

Results: There was a statistically significant difference with the year, type of test and background samples. The highest percentage of failure is inconsistent with the energy value of meals ($\chi^2 = 16.35$ $r = 0.00$) and wet swabs ($\chi^2 = 8.78$ $r = 0.00$). The results show a linear trend downward trend in failure of foods, and foods contaminated specimens ($r = 0.69$ $r = 0.01$) while the high trend of inadequate energy reserves value meals ($r = 0.32$ $r = 0.05$).

Conclusion: Regular inspection and compliance with the principles of HACCP system is the only prerequisite for food security that is distributed in the facilities for the collective consumption.

Keywords: Food safety, HCCP.

NAVIKE U ISHRANI STUDENATA MEDICINE U KOSOVSKOJ MITROVICI

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Uvod: Tokom studiranja, dolaskom u novu sredinu, studenti usvajaju loše navike u ishrani, koje su uslovljene načinom života, nedostatkom vremena, kao i svesti o pravilnoj ishrani.

Metod rada: Istraživanje je urađeno kao studija preseka na uzorku studenata Medicinskog fakulteta u Kosovskoj Mitrovici, obavljeno od 12. do 16. decembra 2011. godine. Uzorak su činili studenti koji su pohađali praktičnu nastavu i izrazili dobrovoljan pristanak za istraživanje. Kao instrument istraživanja poslužio je Upitnik o ponašanju u zdravlju. Od statističkih metoda korišćeni su Hi-kvadrat i Mek-Nemarov test, sa nivoom značajnosti od 0,05.

Ciljevi rada: Utvrditi navike u vezi sa ishranom studenata medicine u Kosovskoj Mitrovici i povezanost sa njihovim osnovnim karakteristikama.

Rezultati: Od anketiranih studenata, 52,2% doručkuje svakodnevno, prerađevine od mesa konzumira 62,8%, a crni hleb je zastupljen u ishrani 18,2% njih. Voće svakoga dana konzumira 52,0% studenta, povrće 60,7% a slatkiše njih 60,5%. Hranu dosoljava 45,9% studenata, a o zdravlju prilikom izbora hrane razmišlja njih 64,5%. U ishrani muškaraca zastupljenije su prerađevine od mesa, a kod žena povrće i slatkiši. Studenti koji studiraju u svom gradu redovnije doručkuju i konzumiraju crni hleb i voće, a u domovima - prerađevine od mesa i povrće. Bolje situirani studenti konzumiraju češće isključivo crni hleb. O sopstvenom zdravlju prilikom izbora hrane češće razmišljaju uspešniji studenti i oni sa dijagnostikovanim oboljenjem.

Zaključak: Na osnovu istraživanja može se zaključiti da kod značajnog dela studenata navike u ishrani nisu zadovoljavajuće, a utvrđivanje onih grupa kod koji su loše navike zastupljenije može usmeriti zdravstveno-vaspitne aktivnosti u ovom polju.

Ključne reči: navike, studenti, ishrana.

NUTRITION HABITS OF MEDICAL STUDENTS IN KOSOVSKA MITROVICA

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Introduction: During the study, the arrival of the new environment, students acquire bad eating habits, which are caused by lifestyle, lack of time and awareness of proper nutrition.

Methods: Research was conducted as a cross-sectional study on a sample of medical students in Kosovska Mitrovica, from 12 to 16 December 2011. The sample consisted of students who attended the practice classes and were agreed to participate in the survey. As a research instrument was used Questionnaire about behavior and health. From the statistical methods were used Chi-square and Mc-Nemar tests, with significance of 0.05.

Objectives: To determine the habits related to nutrition of medical students in Kosovska Mitrovica and its connection with their basic characteristics.

Results: From the surveyed students 52.2% have breakfast every day, meat products consumed 62.8%, and black bread was consumed 18.2% of them. Fruits are consumed each day 52.0% of the student, vegetables 60.7% and sweets 60.5% of them. Food salted 45.9% of students, about health when selecting foods thought 64.5%. Men more often ate meat, women vegetables and sweets. Students who study in own town more often had breakfast and consumed brown bread and fruits, until they who live in dorm the meat and vegetables. More well-off students more often consume only black bread. About health when selecting foods thought more often more successful students and those with diagnosed disease.

Conclusions: It can be concluded that a significant part of students' nutrition habits are not satisfactory, and identification those groups who are represented it may focus health education activities in this field.

Keywords: habits, students, nutrition.

MOGUĆI UTICAJ PESTICIDA NA STANJE VENTILACIJE PLUĆA KOD EKSPONIRANIH RADNIKA

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Uvod: Ispitivanjem dejstva pesticida utvđeni su njihovi štetni efekti na vitalne funkcije ljudi koji su ekspozirani. Najugroženiju grupu predstavljaju poljoprivredni radnici, koji su izloženi 2-3 meseca godišnje, 5-12 časova dnevno.

Cilj rada: Cilj istraživanja je da se ispita uticaj pesticida na stanje ventilacije pluća radnika u poljoprivredi.

Materijal i metode: Ispitivanjem je obuhvaćeno 65 radnika. Ekspozovanu grupu je činilo 33 radnika (3 žene i 30 muškaraca), koji su bili profesionalno ekspozovani pesticidima. Kontrolnu grupu je činilo 32 radnika koji nisu bili izloženi pesticidima na svom radnom mestu. Kod svih radnika je izvršeno kliničko ispitivanje koje je podrazumevalo primenu respiratornog upitnika, biohemijske, hemtološke i toksikološke analize, kao i ispitivanje ventilacije pluća putem spirometrije na aparatu pneumoskrin Jeger.

Rezultati rada: Radnici ekspozovane grupe su bili izloženi pesticidima: herbicida, insekticida i fungicida. Obe grupe radnika su izložene teškom fizičkom radu u lošim mikroklimatskim uslovima. Kod radnika ekspozovane grupe su utvrđene statistički značajno niže vrednosti sledećih parametara: FVC (110,8 ±13,6 u ekspozovanoj, 114,1±13,1 kontrolnoj), FEV1 (107,4±14,2 u ekspozovanoj, 109,5±13,9 kontrolnoj), Tifnao index(107,7±10,3 u ekspozovanoj, 110,4±8,5 kontrolnoj), Pef (104,3±18,3 u ekspozovanoj, 106,6±18,9 kontrolnoj), MEF75 (100,1±19,8 u ekspozovanoj, 102,7±20,5 kontrolnoj), MEF50 (97,1 ±25,3 u ekspozovanoj, 100±25,7 kontrolnoj), MEF 25 (88,3±23,3 u ekspozovanoj, 94,4±22,7 kontrolnoj). Žene su imale statistički značajno niže vrednosti svih parametara ventilacije pluća (p<0.01).

Zaključak: Rezultati ovog istraživanja pokazuju da profesionalna ekspozicija pesticidima dovodi do statistički značajnog poremećaja parametara plućne ventilacije i da je respiratorni sistem žena značajno osetljiviji na delovanje pesticida u odnosu na muškarce.

Ključne reči: pesticidi, izloženost, radnici, ventilacija pluća

POSSIBLE EFFECTS OF PESTICIDES ON THE STATE OF LUNG VENTILATION OF OCCUPATIONALLY EXPOSED WORKERS

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Introduction: By examining the effects of pesticides it is determined that they are harmful for the vital functions of people who are exposed. The agricultural workers are among the most endangered groups, because they are exposed 2-3 months per year, 5-12 hours per day.

The Aim: The aim of this study is to determine the effects of pesticides on the state of lung ventilation of agricultural workers.

Materials and Methods: The study involved 65 workers. The exposed group contained 33 workers, who were occupationally exposed to pesticides. The control group was made of 32 workers who were never exposed to pesticides at their workplace. A clinical trial which involved the application of respiratory questionnaires, biochemical, hematological and toxicological analysis, as well as examining lung ventilation by doing the spirometry on Pneumoskrin Jeger was conducted on all the workers.

Results: The first group was exposed to the following pesticides: herbicides, insecticides and fungicides. Both groups were exposed to heavy physical labour in poor microclimatic conditions. The determined values of the following parameters were statistically significantly lower in the exposed group: FVC (110,8 ±13,6 and 114,1±13,1), FEV1 (107,4±14,2 and 109,5±13,9), Tifnao index (107,7±10,3 and 110,4±8,5), Pef (104,3±18,3 and 106,6±18,9), MEF75 (100,1±19,8 and 102,7±20,5), MEF50 (97,1 ±25,3 and 100±25,7), MEF 25 (88,3±23,3 and 94,4±22,7). Statistically, women had significantly lower values of parameters.

Conclusion: The results of this study show that occupational exposure to pesticides leads to statistically significant disorder of lung ventilation parameters and that female respiratory system is significantly more sensitive than male.

Key words: Pesticides, exposure, workers

ЗНАЊА И СТАВОВИ СРЕДЊОШКОЛАЦА О ХИВ ИНФЕКЦИЈИ

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Увод: Глобална ХИВ/АИДС епидемија представља озбиљан здравствени, економски и социолошки проблем са којим се суочава савремени свет.

Циљ: Циљ истраживања је да се испитају знања и ставови средњошколаца о ХИВ инфекцији како би се предузеле одређене мере едукативне интервенције.

Материјал и методе: Истраживање је спроведено у октобру 2010.године у Медицинској и Економској школи у Крагујевцу применом анкетног упитника. Анкетом је укупно обухваћено 615 испитаника, оба пола: 222 средњошколаца Медицинске школе и 393 средњошколаца Економске школе. Коришћен је упитник из пројекта “Здравствено стање, здравствене потребе и коришћење здравствене заштите становништва Србије”, који је спровео Институт за јавно здравље Србије “Др Милан Јовановић Батут” 2000.године. Анкета садржи 15 питања, отворено-затвореног типа, са понуђеним модалитетима одговора. База података је креирана у статистичком пакету СПСС 12.0.

Резултати: Резултати истраживања су показали да 82,3% средњошколаца сматра да се инфекција ХИВ-ом може избећи. На питање да ли се људи могу заштитити од инфицирања ХИВ-ом ако имају само једног сексуалног партнера који није заражен и немају друге partnere њих 47,6% дало је потврдан одговор док се 2/3 њих не слаже са овом тврдњом. Највећи проценат анкетираних средњошколаца, односно 2/3 њих сматра да се људи могу заштитити од инфицирања ХИВ-ом правилном употребом кондома приликом сваког сексуалног односа.

Закључак: Истраживање је показало да средњошколци имају недовољан степен знања о ХИВ инфекцији и ризицима за њено преношење, те је зато неопходно интензивирати промотивне активности међу средњошколцима.

Кључне речи: средњошколци, ХИВ, знања, ставови.

KNOWLEDGE AND ATTITUDES OF HIGH SCHOOL POPULATION ON HIV INFECTION

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Introduction: Global HIV/AIDS epidemic represents a serious health and socio-economic problem that the contemporary world is facing.

The Aim: The goal of this research is to examine what high school children know and think about HIV infection in order to conduct educational interventions accordingly.

Material and methods: The survey was carried out in October 2010 at the Medical and Economic high schools in Kragujevac via a questionnaire. There were 615 interviewees of both genders: i.e. 222 high school children of the Medical High School and 393 high school children of the Economic High School. The questionnaire that was used was a part of the project “The state of health, health needs and the use of health care of Serbian population” conducted by the Institute of the public health of Serbia “Dr Milan Jovanović Batut” in 2000. The questionnaire contains 15 open-closed questions with offered models of reply. The data base was created using SPSS 12.0 statistical package.

Results: The results of the research revealed that 82,3 per cent of the high school population thinks that the HIV infection can be avoided. 47,6 percent of them replied positively to the question whether people can protect themselves from the HIV infection if they have only one sexual partner who is not infected. The greatest percentage of the interviewees, i.e. two thirds of them, believe that people can protect themselves from the HIV infection due to the proper use of condoms during each sexual intercourse.

Conclusion: The survey conveyed that the high school children possess insufficient knowledge about HIV infection and about risks of its transfer, thus it is necessary to conduct promotive acts among high school population more intensively.

Keywords: high school population, HIV, knowledge, attitudes.



A line art illustration in the background. On the left, a dove is shown in flight, carrying an olive branch. In the center, there are stylized mountains. On the right, a large, rounded tent or shelter is depicted. The entire scene is rendered in a simple, clean line-art style.

MIKROBIOLOGIJA I IMUNOLOGIJA

KOLIKO SU NAŠI MOBILNI TELEFONI ČISTI?

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Uvod: Tokom protekle dekade mobilni telefoni su postali neizbežan aksesoar u našem privatnom i profesionalnom životu. Njihova konstantna upotreba u različitim uslovima čini ih podložnima kontaminaciji mnogim mikrobiološkim patogenima koji se preko ruku mogu preneti na ostale delove tela i dovesti do razvoja infekcija.

Cilj: Cilj istraživanja je bio da utvrdimo najčešće izolovane mikroorganizme sa mobilnih telefona i utvrditi da li postoji rezistencija na antimikrobne lekove među izolatima.

Materijal i metode: Uzorci sa mobilnih telefona u laboratoriji su obarđivani standardnim bakteriološkim metodama (kulturelnim i biohemijskim ispitivanjem) za rutinski mikrobiološki rad, a osetljivost na antimikrobne lekove ispitana je standardnom disk difuzionom metodom.

Rezultati: Od 201 brisa, 109 je dalo pozitivne kulture. Najčešće izolovani mikroorganizmi su mikroorganizmi normalne flore kože. Ispitali smo rezistenciju *S. aureusa*, *Enterobacter spp.*, *Klebsiella pneumoniae*. Dokazani su markeri rezistencije.

Zaključak: Mobilni telefoni su adekvatan medijum za prenos različitih mikroorganizama koji poseduju određene markere rezistencije. Uzrok kontaminacije mobilnih telefona je loša higijenska praksa.

Ključne reči: Mikroorganizmi, mobilni telefon, kontaminacija, infekcija

HOW CLEAN ARE OUR MOBILE PHONES?

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Introduction: During the last decade, mobile phones have become inevitable accessories in our private and professional lives. Their constant use in different conditions makes them liable for contamination by various microbiological pathogens that can be transferred, via hands, to other body parts and can lead to the development of infections.

Aim: The aim of this research was to determine the most isolated microorganisms from mobile phones and establish if there is a resistance to the antibacterial medicine among the isolates.

Materials and methods: The samples from mobile phones in the laboratory were processed using the standard bacteriological methods (cultural and biochemical research) for the routine microbiological work, while the sensitivity to antibacterial medicine was tested using the standard disk-diffusion method.

Results: Out of 201 smears, 109 gave positive cultures. The most isolated microorganisms are the microorganisms of the normal skin flora. The resistances of *S. aureusa*, *Enterobacter spp.*, *Klebsiella pneumoniae* have been tested. The resistance markers have been attested.

Conclusions: Mobile phones are a suitable medium for transformation of various microorganisms that possess certain resistance markers. The cause of the contamination of mobile phones are poor hygienic practices.

Key words: Microorganisms, mobile phones, contamination, infection

REZISTENCIJA NA ANTIMIKROBNE LEKOVE KOLIFORMNIH BAKTERIJA IZOLOVANIH IZ VODE ZA PIĆE

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Uvod: Mikroorganizmi prisutni u vodi za piće čest su uzrok infektivnih bolesti. Neumerena upotreba antimikrobnih lekova vodi sve većoj rezistenciji na antibiotike.

Cilj rada: Utvrditi najčešće izolovane mikroorganizme iz uzoraka vode za piće, tip rezistencije na antibiotike izolovanih mikroorganizama, te potencijalan put prenosa gena rezistencije na antibiotike putem vode.

Materijal i metode: Ispitivanje je obuhvatilo 888 uzoraka vode za piće. Uzorci su podeljeni prema poreklu vode. Dokazivanje koliformnih bakterija vršeno je fermentacionim testom, MPN metodom (metodom najverovatnijeg broja mikroorganizama = most probably number). Osetljivost na antimikrobne lekove testirana je standardnom disk difuzionom metodom, u skladu sa preporukama CLSI (Clinical and Laboratory Standard Institute - Instituta za kliničke laboratorijske standarde).

Rezultati: Mikrobiološki neispravno je 10,4% uzoraka. Između uzoraka iz lokalnih vodovoda i bunara, i gradske mreže, uočena je visoko signifikantna statistička razlika. Od 98 izolovanih bakterija sve su bile iz grupe koliformnih bakterija i to: *Enterobacter spp.* u 41,8% uzoraka, *Citrobacter freundii* (21%), *Klebsiella pneumoniae* (16%), *Escherichia coli* (14%), *Citrobacter spp.* u 6% uzoraka. Bakterijski izolati pokazali su rezistenciju prema redom navedenim antibioticima: na cefaleksin i cefahlor bilo je rezistentno 80,6% izolata, na ampicilin 73,5% izolata, na amoksicilin+klavulansku kiselinu 62,2%, na sulfametoksazol+trimetoprim i na cefuroksim po 10,2%, zatim na piperacilin-tazobaktam 2,0%, cefepim 2,0%, ceftrijakson 1,0%, ceftazidim 1,0%, dok su bakterijski izolati bili potpuno senzitivni na gentamicin, ciprofloksacin, amikacin, imipenem i meropenem

Zaključak: Koliformne bakterije su najčešći uzročnici mikrobiološke neispravnosti uzoraka vode za piće. Ispitivanjem njihove osetljivosti na antibiotike dokazani su markeri rezistencije prenosiivi putem vode za piće na normalnu bakterijsku floru čoveka.

Ključne reči: voda za piće, koliformne bakterije, antibiogram

ANTIMICROBIAL RESISTANCE OF COLIFORM BACTERIA ISOLATED FROM DRINKING WATER

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Introduction: Microorganisms present in drinking water are common cause of infective diseases. Excessive use of antibiotics contributes to increasing antimicrobial resistance.

The Aim: To determine the most common microorganisms isolated from samples of drinking water, resistance type of isolated microorganisms to antibiotics and a potential way of transmission of antibiotic resistance genes through the water.

Materials and methods: The study included 888 samples of drinking water. The samples were divided by the origin. Fermentation test (MPN method – most probably number) was performed to detect coliform bacteria. Sensitivity test to antibiotics was performed by standard disk diffusion method, in accordance with the recommendations of the CLSI (Clinical and Laboratory Standard Institute).

Results: Microbiological contamination was detected in 10.4% of samples. There is a highly significant statistical difference between water samples from local water supply systems, wells and Novi Sad water system. Isolated bacteria were from the group of coliform bacteria: *Enterobacter spp.* in 41.8% samples, *Citrobacter freundii* (21%), *Klebsiella pneumoniae* (16%), *Escherichia coli* (14%), *Citrobacter spp.* in 6% of the samples. Bacterial isolates were resistant to following antibiotics: to cefalexin and cefaclor 80.6% of isolates were resistant, 73.5% isolates to ampicillin, 62.2% isolates to amoxicillin + clavulanic acid, 10,2% isolates to sulfamethoxazole + trimethoprim and cefuroxime, followed by piperacillin-tazobactam 2.0%, cefepime 2.0%, ceftriaxone 1.0%, ceftazidime 1.0% of isolates, while bacterial isolates were fully sensitive to gentamicin, ciprofloxacin, amikacin, imipenem and meropenem

Conclusion: Coliform bacteria are the most common cause of drinking water samples contamination. Examination of resistance to antibiotics proved that resistance can be transferred to human normal bacterial flora by drinking water.

Keywords: drinking water, coliform bacteria, antibiogram

UTICAJ PRSTENJA NA BAKTERIJSKU KOLONIZACIJU RUKU KOD ZDRAVSTVENIH RADNIKA

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Uvod: Prstenje je popularno među zdravstvenim radnicima, a njihov uticaj na efikasnost pranja i dezinfekcije ruku nije dovoljno ispitan.

Cilj: Utvrditi da li postoji razlika u bakterijskoj kolonizaciji ruku nakon uobičajene prakse pranja i dezinfekcije ruku između zdravstvenih radnika koji nose prstenje na radnom mestu i onih koji to ne čine.

Materijal i metode: U studiju je uključeno 70 zdravstvenih radnika, od čega je 35 (radnici koji na radnom mestu nose prstenje), dok je preostalih 35 radnika

svrstano u kontrolnu grupu (radnici koji ne nose prstenje). Svakom ispitaniku je uzet bris sa dlanova, prstiju i predela između prstiju, a nakon što im je naloženo da operu i/li dezinfikuju ruke.

Rezultati: Ukupno je 5.7% ispitanika u brisu imalo *Micrococcus*, a 17.1% je imalo *Bacillus* spp. Više ispitanika iz ispitivane grupe (22.9%) u odnosu na kontrolnu grupu (20.0%) imalo je *Staphylococcus* spp koagulaza negativan u brisu, dok je *Enterococcus* spp izolovan samo kod dva radnika (5.7%) iz kontrolne grupe. *Staphylococcus aureus* je izolovan kod 5 ispitanika (14.3%) iz ispitivane grupe i dva (5.7%) iz kontrolne grupe. Više pozitivnih briseva ruku je zabeleženo kod

radnika iz ispitivane grupe (57.1%) u odnosu na radnike iz kontrolne grupe (42.9%), iako ova razlika nije statistički značajna ($p=0.230$).

Zaključak: Bakterijska kolonizacija ruku zdravstvenih radnika nakon pranja i dezinfekcije ruku nije statistički značajno različita između kontrolne i ispitivane grupe. Na osnovu svega gore navedenog verujemo da je prstenje na rukama zdravstvenih radnika više nego dobrodošlo, ali mimo radnog vremena.

Ključne reči: Bakterijska kolonizacija; Intrahospitalne infekcije; Prsten

IMPACT OF RINGS ON BACTERIAL COLONIZATION HANDS IN HEALTHCARE WORKERS

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Introduction: Rings is popular among health care workers, but its impact on the efficiency of hand washing and disinfection is not clear.

The Aim: To determine whether there is a difference in bacterial colonization of the hands after the usual practice of hand washing and disinfection between health workers who wear rings at work and those who do not.

Materials and methods: The study included 70 health care workers, of which 35 were allocated to the study group, and 35 workers were

allocated to the control group. Each subject underwent a swab of the palm, fingers and areas between fingers after the usual practice of hand washing and disinfection.

Results: 5.7% of health workers had *Micrococcus* in the smear, and 17.1% had *Bacillus* spp from both groups. More workers in the study group (22.9%) than in the control group (20.0%) had *Staphylococcus* spp coagulase negative in the smear, while *Enterococcus* spp was isolated only in two workers (5.7%) in the control group. *Staphylococcus aureus* was isolated in 5 patients (14.3%) from the test group and two patients (5.7%) in the control group. There were more positive swabs in the test group (57.1%) compared to the control group (42.9%), although this difference was not statistically significant ($p=0.230$).

Conclusion: Bacterial colonization of the hands of health workers after the usual practice of hand washing and disinfection is not significantly different between control and test groups. Therefore, we believe that the rings are more than welcome but not at the work place.

Key words: Bacterial colonization; Nosocomial infection; Ring.

SEROLOŠKA POTVRDA INFEKCIJE CHLAMYDOPHILA-OM PNEUMONIAE I MYCOPLASMA-OM PNEUMONIAE KOD STANOVNIKA JUŽNOBAČKOG OKRUGA

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Uvod: *Chlamydomphila pneumoniae* (Cp) i *Mycoplasma pneumoniae* (Mp) predstavljaju značajne uzročnike respiratornih oboljenja u opštoj populaciji, naročito kod dece i mlađih odraslih osoba. Laboratorijska dijagnostika ima važnu ulogu u otkrivanju ovih infekcija, najčešće korišćen dijagnostički postupak je ELISA test.

Cilj rada: Cilj ovog rada je da se utvrdi zastupljenost infekcija izazvanih Cp i Mp u različitim uzrasnim grupama stanovnika Južnobačkog okruga, kao i među ambulantno upućenim i hospitalizovanim pacijentima, evaluacijom seroloških markera infekcije.

Materijal i metode: Izvršena je retrospektivna analiza seroloških rezultata na Cp i Mp dobijenih nakon ispitivanja 924 seruma pacijenata, od decembra 2008. do oktobra 2011. godine. Podaci su uzeti iz Centra za virusologiju, Instituta za javno zdravlje Vojvodine. Za određivanje prisustva i nivoa specifičnih antitela IgM i IgG klase na Cp i Mp, uzorci seruma su testirani ELISA testom proizvođača (Euroimmun, Germany) potpuno automatizovano u zatvorenom Analyzer I-2P aparatu.

Rezultati: Cp (32.1%) je bila statistički češći uzročnik akutnih infekcija kod stanovnika Južnobačkog okruga u poređenju sa Mp (18.7%). U odnosu na uzrast, najčešće oboljevaju deca školskog uzrasta, koja su podjednako osetljiva na oba uzročnika Cp (32.5%) i Mp (37.5%). Kod ambulantno upućenih pacijenata statistički češće je dokazana akutna infekcija Cp (28.3%) u poređenju sa Mp (16.8%). Pacijenti hospitalizovani na Infektivnoj klinici statistički češće su imali akutnu infekciju izazvanu Cp (40.0%) nego Mp (5.9%).

Zaključak: Cp i Mp imaju veliku ulogu u nastajanju akutnih respiratornih infekcija kod populacije Južnobačkog okruga, a najizloženija su deca školskog uzrasta. U postavljanju etiološke dijagnoze opravdano je obratiti pažnju na navedene patogene, u cilju njihove brze dijagnoze, primene adekvatne terapije i specifičnih mera prevencije.

Ključne reči: *Chlamydomphila pneumoniae*, *Mycoplasma pneumoniae*, respiratorne infekcije, ELISA

SEROLOGICAL CONFIRM OF INFECTION CHLAMYDOPHILA PNEUMONIAE AND MYCOPLASMA PNEUMONIAE IN POPULATION OF JUZNABACKA DISTRICT

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Introduction: *Chlamydomphila pneumoniae* (Cp) and *Mycoplasma pneumoniae* (Mp) are important causes of respiratory infections in general population, especially children and young adults. Laboratory diagnosis plays important role in detecting these infections, ELISA test is the most common diagnostic procedure.

The Aim: Aim of this study was to determine the incidence of infections caused by atypical pathogens Cp and Mp using the evaluation of serological markers in different age groups and among patients in hospital or ambulatory treatment from population of Southbacka District.

Materials and methods: We performed a retrospective analysis of serological results obtained from 924 serums from October 2008 to October 2011. Data were used from the Center of Virusology, Institute of Public Health of Vojvodina. The presence and levels of specific antibodies IgM and IgG class of Cp and Mp, serum samples were tested by ELISA manufacturer (EUROIMMUN, Germany) in fully automated closed I-2P Analyzer.

Results: Cp (32.1%) was statistically significantly more frequent cause of acute infection in the population of Southbacka District, compared with Mp infection (18.7%). In relation to age, the most frequent infection was found in children of school age, who were equally sensitive to both agents Cp (32.5%) and Mp (37.5%). In ambulatory treated patients, more common was acute Cp infection (28.3%) compared with Mp (16.8%). Patients hospitalized at the Infectious Clinic statistically more frequent had an acute infection caused by Cp (40.0%) than Mp (5.9%).

Conclusion: Cp and Mp play important role in the appear of respiratory infections in the population of Southbacka District and children of school age are the most exposed to infection. In establishing of the etiological diagnosis is justified to pay attention to these pathogens in their rapid diagnosis, appropriate treatment and specific preventive measures.

Key words: *Chlamydomphila pneumoniae*, *Mycoplasma pneumoniae*, infections of respiratory tract, ELISA

ISPITIVANJE OSETLJIVOSTI NA ANTIMIKOTIKE GLJIVICA IZ RODA *CANDIDA* IZOLOVANIH IZ UZORAKA HUMANE STOLICE

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Uvod: Gljivice iz roda *Candida* su oportunistički mikroorganizmi, koji sve češće kod imunokompromitovanih pacijenata izazivaju teške endogene infekcije. Postoje podaci da su uzročnici kandidijaze sve češće smanjeno osetljivi na antimikotike.

Cilj: Cilj ovog istraživanja je ispitivanje osetljivosti gljivica iz roda *Candida*, izolovanih iz uzoraka ljudske stolice, utvrđivanje na koje antimikotike se rezistencija najčešće javlja i poređenje osetljivosti *Candida albicans* sa ostalim predstavnicima roda *Candida*.

Materijal i metode: Istraživanjem u Centru za mikrobiologiju Instituta za javno zdravlje Vojvodine obuhvaćeno je 200 izolata gljivica iz roda *Candida*. Kultivacija i identifikacija kvasnica izvršena je standardnim mikrobiološkim metodama, kojima se mogu razlikovati *Candida albicans* od ostalih gljivica iz roda *Candida-Candida* spp. Ispitivanje osetljivosti na antimikotike vršeno je testom ATB FUNGUS 3 (bioMérieux, Francuska). Rezultati su očitavani na osnovu zamućenja, tj. određivanja je minimalna inhibitorna koncentracija (MIC) za 5-flucitozin, amfotericin B, flukonazol, itraconazol i vorikonazol.

Rezultati: Od ukupno 200 izolata, markeri rezistencije su pronađeni kod 43 (21.5%) izolata. Na 5-flucitozin rezistentna su 2 (1%), na flukonazol 11 (5.5%), na itraconazol 42 (21%), a na vorikonazol 5 (2.5%) izolata. Rezistencija na amfotericin B nije zabeležena. Ukrštena rezistencija na azole je pronađena kod 5 (2.5%) izolata. Kod 41 (20.5%) izolata MIC je istovremeno povišena za sva tri antimikotika, a 7 (3.5%) izolata je multirezistentno. Utvrđeno je da postoji statistički značajno veći broj markera rezistencije kod *Candida* spp. u odnosu na *Candida albicans*.

Zaključak: Porast broja markera rezistencije i minimalnih inhibitornih koncentracija na antimikotike ukazuje da je neophodan monitoring osetljivosti gljivica iz roda *Candida*, sa ciljem usporavanja razvoja rezistencije i očuvanja efikasnosti antimikotika.

Ključne reči: *Candida*, rezistencija, antigljivični lekovi

SUSCEPTIBILITY TO ANTIMICOTICS OF YEAST FROM GENUS *CANDIDA* ISOLATED FROM HUMAN STOOL SAMPLES

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Introduction: Fungi from the Genus *Candida* are opportunistic microorganisms which causes severe endogenous infections in immunocompromised patients. The resistance to antimycotic drugs has increased in the past few decades.

The Aim: The aim of this study is testing of *Candida* susceptibility to antimycotics, the determination to which antimicrobial drugs the resistance markers are the most commonly found and the comparison of susceptibility of *Candida albicans* and Non-albicans species (*Candida* spp).

Material and methods: The experiment was performed in the Institute for Public Health of Vojvodina and it included 200 *Candida* isolates from the human stool samples. Standard microbiological methods were used for cultivation and identification of yeasts and for differentiation of *Candida albicans* from other fungi from Genus *Candida*. In vitro susceptibility of all isolates to five antifungal agents was established using commercial ATB FUNGUS 3 (bioMérieux, France). The results were interpreted by reading minimal inhibitory concentrations (MIC) for 5-flucytosine, amphotericin B, fluconazole, itraconazole and voriconazole.

Results: Out of total of 200 isolates, resistance markers were found with 43 (21.5%) of isolates. On 5-flucytosine 2 (1%) of isolated fungi were resistant, on fluconazole 11 (5.5%), on itraconazole 42 (22%) and on voriconazole 5 (2.5%). Resistance to amfotericin B wasn't noted. Azole antifungal drugs cross-resistance have been found in with 5 (2.5%) isolates. MIC to 3 tested azoles was increased at the same time with 41 (20.5%) of isolates. It has been found 7 (3.5%) multi-resistant strains. The frequency of resistance markers was statistically higher in *Candida* spp. compared to *Candida albicans*.

Conclusion: The finding of increased number of resistance markers and increased minimal inhibitory concentrations shows that it is necessary to begin with systematic monitoring of susceptibility to antimycotics of fungi from Genus *Candida*.

Key words: *Candida*, resistance, antimycotics

UČESTALOST NALAZA GENITALNIH MIKOPLAZMI KOD ŽENA SA BAKTERIJSKOM VAGINOZOM

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Uvod: Bakterijska vaginoza (BV) predstavlja poremećaj u sastavu vaginalne flore koji može povećati osetljivost genitalne sluzokože na genitalne mikoplazme (GM): *Mycoplasma hominis* (MH) i *Ureaplasma urealyticum* (UU).

Cilj rada je da utvrdimo da li se GM češće javljaju kod žena sa BV u poređenju sa onima bez BV.

Materijal i metode: Ispitivanjem su obuhvaćene 182 negravidne žene u reproduktivnom periodu. Ispitanicama je dijagnostikovano postojanje BV, prisustvo GM i broj polimorfonukleara (PMN). Testirana je značajnost razlika u učestalosti GM kod žena sa i bez BV.

Rezultati: BV je postojala kod 26,4% žena, a 56,3% ovih žena je imalo GM na grliću materice. U grupi žena bez BV, GM je postojala kod 9% ispitanica. Učestalost UU je bila slična kod žena sa BV i kod žena bez BV ($p>0,05$), ali je učestalost MH i MH+UU bila značajno veća kod žena sa BV ($p\leq 0,001$; Mann Whitney test i binarna logistička analiza). Povećan broj PMN bio je značajno češći ($p<0,001$) kod žena sa BV (52,1%), nego kod žena bez BV (11,2%) i značajno je korelirao sa nalazom GM kod obe grupe ispitanica. Nalaz MH, UU+MH i povećanje PMN su nezavisno povezani sa BV ($p\leq 0,001$; multivarijanska regresiona analiza).

Zaključak: Povećanje broja PMN, nalaz MH i udruženi nalaz UU i MH su značajno češći kod žena sa BV, nego kod žena bez BV, za razliku od nalaza UU. Nalaz GM u brisu grlića materice značajno korelirao sa povećanjem broja PMN, bez obzira na postojanje BV.

Ključne reči: Bakterijska vaginoza, *Mycoplasma hominis*, *Ureaplasma urealyticum*, Vaginalna flora

PREVALENCE OF FINDING OF GENITAL MYCOPLASMA AMONG WOMEN WITH BACTERIAL VAGINOSIS

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Introduction: Bacterial vaginosis (BV) is a disorder of vaginal flora which may increase the mucosal susceptibility to genital mycoplasma (GM): *M. hominis* (MH) and *U. urealyticum* (UU).

The Aim of our study is to establish whether the GM is more frequent among women with BV, compared to women without BV.

Materials and methods: Investigation included 182 non-pregnant women in reproductive age. BV was diagnosed as well as presence of GM and number of polymorphonuclears (PMN). The difference in GM prevalence was compared between women with and without BV.

Results: BV existed in 26.4% of women, and MG was isolated in 56.3% of these women. Among women without BV, MG existed in 9% of cases. Incidence of UU was similar among women with and without BV ($p>0.05$), but incidences of MH and MH+UU were significantly higher among women with BV ($p\leq 0.001$; Mann Whitney test and binary logistic analysis). Increased number of PMN was significantly more frequent ($p<0.001$) among women with BV (52.1%), compared to women without BV (11.2%) and it correlated significantly with the finding of MG in both tested groups. The findings of MH, UU+MH, and increased number of PMN were verified as independently related to BV ($p\leq 0.001$; multivariate analysis).

Conclusions: Contrary to the finding of UU, increased number of PMN and findings of MH and UU + MH were significantly more frequent among women with BV, compared to women without BV. Presence of GM correlated significantly with increased number of PMN.

Key Words: Bacterial vaginosis, *Mycoplasma hominis*, *Ureaplasma urealyticum*, Vaginal flora

NALAZ IgG ANTITELA U SERUMU I/ILI LIKVORU KOD PACIJENATA SA SUMNJOM NA NEUROCYSTICERKOZO

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Uvod: Neurocisticerkoza je infekcija čoveka, izazvana larvenim oblikom (*Cysticercus cellulosae*) svinjske pantljičare *Taenia solium*. Republika Srbija je endemsko područje za ovu bolest. Dijagnoza neurocisticerkoze je veoma složena i postavlja se kombinovanjem više dijagnostičkih (kliničkih, radiografskih, laboratorijskih, epidemioloških) kriterijuma. Od imunoloških testova danas se savetuje korišćenje ELISA i/ili EITB, kao testova koji imaju najveću osetljivost i specifičnost.

Cilj: Utvrditi prisustvo specifičnih anti-*Cysticercus* IgG antitela kod pacijenata sa sumnjom na neurocisticerkozu.

Materijal i metode: Na osnovu epidemioloških podataka utvrđeno je da su bolesnici iz različitih krajeva Republike Srbije, kako iz gradske tako i seoske sredine. U istraživanju je uključeno 163 bolesnika kod kojih je na osnovu kliničkih i radioloških metoda pregleda postojala sumnja na neurocisticerkozu. Specifična antitela ispitivana su u 158 uzoraka seruma i 30 uzoraka likvora. Korišćeni antigeni su poreklom iz cistične tečnosti cisticerkusa izolovanog iz humanog materijala. Mikrotitracione ploče sa vezanim antigenima, kao i kontrolne serume testa pripremio je proizvođač (NovaTec Immundiagnostica GmbH, Germany). Titar antitela određivan je merenjem intenziteta boje u spektrofotometru.

Rezultati: Od ukupno 188 ispitivanih uzoraka anti-*Cysticercus* antitela dokazana su u 25 uzoraka (13.30%). U 17 uzoraka specifična IgG antitela su otkrivena u serumu, dok su u 8 uzoraka otkrivena u likvoru. Broj ispitivanih uzoraka kod kojih su utvrđene granične vrednosti iznosio je 7 (3.72%). U 156 uzoraka (82,98 %) nisu otkrivena anti-*Cysticercus* antitela.

Zaključak: Nezavisno od ograničenja seroloških ispitivanja, rezultati otkrivanja anti-*Cysticercus* antitela su neophodni pokazatelji u proceni i postavljanju dijagnoze neurocisticerkoze kao najčešće cestoidoze centralnog nervnog sistema čoveka.

Ključne reči: neurocisticerkoza, dijagnoza, ELISA.

DETECTION OF IgG ANTIBODIES IN SERUM AND/OR CEREBROSPINAL FLUID IN PATIENTS WITH SUSPECTED NEUROCYSTICERCOSES

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Introduction: Neurocysticercosis is the human infection, caused by the larval stage (*Cysticercus cellulosae*) of *Taenia solium*. Republic of Serbia is endemic area for this disease. Diagnosis of neurocysticercosis is very complicated, and could be made by many diagnostic (clinical, radiological, laboratory and epidemiological) criteria. Immunologic tests which are advised for routine using are ELISA and/or EITB as tests which have high sensitivity and specificity.

The Aim: To investigate a presence of specific anti-*Cysticercus* IgG antibodies in patients with suspected neurocysticercosis.

Material and methods: Based on the epidemiologic data it was found that patients were from different parts of Serbia, from urban and rural areas. In this study 163 patients with suspected neurocysticercosis were included, based on clinical and radiological methods of examination. Antigens which were used, originating from cystic fluid, were isolated from the human material. Microtiter plates with related antigens and control sera were prepared by the test manufacturer (NovaTec Immundiagnostica GmbH, Germany). Specific antibodies were determined by measuring the intensity of color in a spectrophotometer.

Results: In 188 samples, 25 (13.3%) were detected as seropositive. In 17 samples specific IgG antibodies were detected in the sera, while in 8 samples were detected in cerebrospinal fluid. Number of people that had titres in grey zone was 7 (3.72%). Seronegative were 156 samples (82,98%).

Conclusion: It has already been known that serological investigation has some limitations, but detection of specific antibodies remains an indispensable mark in evaluation of suspected neurocysticercosis patients.

Keywords: neurocysticercosis, diagnosis, ELISA.

FENOTIPSKA DETEKCIJA PRODUKCIJE BETA-LAKTAMAZA KOD ENTEROBakterIJA

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Uvod: Beta-laktamski antibiotici su najčešće korišćeni antibakterijski lekovi. Mnoge bakterije su razvile rezistenciju na ove antibiotike, a najčešći vid rezistencije je produkcija enzima beta-laktamaza. Članovi familije *Enterobacteriaceae* proizvode različite tipove ovih enzima.

Cilj: Cilj ovog rada je bio da se izvrši fenotipska detekcija produkcije i identifikacija tipa beta-laktamaza kod enterobakterija izolovanih iz različitih kliničkih uzoraka kod pacijenata hospitalizovanih u Kliničkom centru Srbije.

Materijal i metode: Sojevi, koji su sakupljeni u periodu od novembra 2011. do januara 2012. godine, identifikovani su do nivoa vrste konvencionalnim metodama bakteriološke dijagnostike i na Vitek2 automatizovanom sistemu. Osetljivost na antibiotike je ispitana disk-difuzionim metodom, a identifikacija beta-laktamaza izvršena je u skladu sa prethodno opisanom metodologijom.

Rezultati: U ovom istraživanju, sakupljeno je 47 sojeva enterobakterija: 25 *K. pneumoniae*, 16 *E. coli* i 6 *P. mirabilis*. Disk-difuzionim metodom je pokazano da je najveći broj sojeva bio rezistentan na cefotaksim i ceftriakson: *K. pneumoniae* (23; 92%), *E. coli* (8; 50%) i *P. mirabilis* (6; 100%). Naše istraživanje je pokazalo i da je najveći broj (27; 57,5%) ispitivanih enterobakterija proizvodilo ESBL tip beta-laktamaze, kao i da su karbapenemaze najčešće proizvodjene od strane *K. pneumoniae*.

Zaključak: Enterobakterije proizvode različite tipove beta-laktamaza, a najčešće detektovani tip su ESBL. Preteći problem je i produkcija karbapenemaza kod analiziranih sojeva *K. pneumoniae*.

Ključne reči: beta-laktamaze, enterobakterije, rezistencija

PHENOTYPIC DETECTION OF BETA-LACTAMASES PRODUCTION IN ENTEROBACTERIAE

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Introduction: Beta-lactam antibiotics are the most common used antibacterial drugs. Many bacteria have developed resistance to these antibiotics, and the most common form of resistance is production of the enzyme beta-lactamase. Members of the *Enterobacteriaceae* family are producing different types of these enzymes.

The Aim: The aim of this study was to perform phenotypic detection of production and identification of the beta-lactamase type in enterobacteria isolated from different clinical specimens of patients hospitalized in the Clinical Center of Serbia.

Materials and Methods: The strains that were collected between November 2011 and January 2012 were identified according to the standard microbiology procedures and confirmed by Vitek2 automated system. Antimicrobial susceptibility test was performed by the disk diffusion method and identification of beta-lactamases was performed according to aforementioned methodology.

Results: A total of 47 strains were collected: 25 *K. pneumoniae*, 16 *E. coli* and 6 *P. mirabilis*. Disk-diffusion method had shown that most of tested strains were resistant to cefotaxime and ceftriaxon: *K. pneumoniae* (23; 92%), *E. coli* (8; 50%) and *P. mirabilis* (6; 100%). Also, our study had shown that most (27; 57,5%) of the tested enterobacteriae produced ESBL type of beta-lactamase, and that carbapenemases were predominantly detected in *K. pneumoniae*.

Conclusion: Enterobacteriae are producing different types of beta-lactamases, and the most common type in our study was ESBLs. Production of carbapenemases that was detected in the analyzed strains of *K. pneumoniae* is also a threatening problem.

Key words: beta-lactamases, enterobacteriae, resistance

DETEKCIJA FENOTIPA REZISTENCIJE NA MAKROLIDI-LINKOZAMIDI-STREPTOGRAMINI
GRUPE ANTIBIOTIKA KOD SOJEVA METICILIN-REZISTENTNOG *STAPHYLOCOCCUS AUREUS*
IZOLOVANIH U KLINIČKOM CENTRU SRBIJE

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Uvod: Meticilin-rezistentni *Staphylococcus aureus* (MRSA) je važan uzročnik nozokomialnih infekcija i jedan od najznačajnijih humanih patogena uopšte. Makrolidi, linkozamidi i streptogramini (MLS) predstavljaju grupu antibiotika koja danas ima najširu primenu u terapiji stafilokoknih infekcija.

Cilj: Detekcija fenotipskih profila rezistencije na MLS grupu antibiotika kod sojeva MRSA izolovanih u laboratorijama Kliničkog centra Srbije.

Materijal i metode: U periodu od septembra 2011. do januara 2012. godine sakupljeni su sojevi MRSA u laboratorijama Kliničkog centra Srbije. Izolacija i identifikacija sojeva izvršena je standardnim mikrobiološkim metodama, a potvrda identifikacije na Vitek2 automatizovanom sistemu. Ispitivanje osetljivosti na antibiotike MLS grupe izvršeno je disk difuzionim metodom antibiograma.

Rezultati: Tokom ovog istraživanja sakupljena su 52 izolata MRSA. Među testiranim izolatima 88,4% je bilo rezistentno na eritromicin, klaritromicin i azitromicin (14- i 15-člani makrolidi), a 78,8% na spiramicin (16-člani makrolid). Konstitutivni MLS_B fenotip rezistencije detektovan je kod 41 (78,9%), a inducibilni MLS_B fenotip kod 4 (7,7%) izolovana soja. Među testiranim sojevima MRSA, nije pokazana rezistencija na kvinopristin/dalfopristin.

Zaključak: Najveći broj sojeva MRSA analiziranih u ovom istraživanju pripadaju konstitutivnom MLS_B fenotipu rezistencije.

Ključne reči: meticilin-rezistentan *Staphylococcus aureus*, makrolidi-linkozamidi-streptogramin (MLS), fenotipski profili rezistencije

OSETLJIVOST NA ANTIBIOTIKE SOJEVA GRUPE A STREPTOKOKA IZOLOVANIH OD ZDRAVE DECE
PREDŠKOLSKOG UZRASTA U BEOGRADU

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Uvod: *Streptococcus pyogenes* je čest kolonizator gornjih respiratornih puteva. Iako je penicilin i dalje zlatni standard u terapiji infekcija izazvanih grupom A streptokoka, smanjena osetljivost na eritromicin je u porastu.

Cilj rada: Cilj ove studije je bio da se ispita faringealno kliconoštvo, osetljivost na antibiotike i da se odrede fenotipovi makrolidne rezistencije *S. pyogenes* izolovanih kod zdrave predškolske dece iz Beograda.

Materijal i metode: U periodu od devet meseci je ispitano 24 084 briseva guša zdrave dece iz beogradskih vrtića. Izolovano je 1664 sojeva *S. pyogenes*, od kojih je za 311 ispitana osetljivost na antibiotike, disk-difuzionom metodom. Fenotipovi makrolidne rezistencije su određeni "double"-disk difuzionom testom, a minimalna inhibitorna koncentracija (MIK) za eritromicin za sojeve rezistentne na makrolide je određena E testom.

Rezultati: Prevalencija kliconoštva *S. pyogenes* je bila 6,9%, a uočena je veća učestalost kod dece starije od 3 godine. Svi sojevi su bili osetljivi na penicilin i hloramfenikol. Smanjena osetljivost na eritromicin je uočena kod 18 sojeva (5,8%). M fenotip je nađen kod 11 izolata, dok je 7 sojeva pokazalo konstitutivni MLS fenotip. Smanjenu osetljivost na tetraciklin je imalo 6,5% sojeva, na klindamicin 5,1%, a na fluorohinolone 2,6% izolata.

Zaključak: Prevalencija kliconoštva streptokokom grupe A kod dece predškolskog uzrasta u Beogradu iznosi oko 7%, što odgovara literaturnim podacima. Penicilin je i dalje lek izbora za terapiju neinvazivnih streptokoknih infekcija. Rezistencija na eritromicin, nije još visoka (6%), ali je upozoravajuća činjenica da je došlo do porasta prevalencije visokorezistentnog MLS fenotipa.

Ključne reči: *Streptococcus pyogenes*, makrolidi, rezistencija

DETECTION OF THE PHENOTYPIC RESISTANCE PROFILES TO MACROLIDE-LINCOSAMIDE-STREPTOGRAMINE
GROUP OF ANTIBIOTICS IN METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* STRAINS
ISOLATED AT CLINICAL CENTER OF SERBIA

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Introduction: Methicillin-resistant *Staphylococcus aureus* (MRSA) is an important cause of nosocomial and community-acquired infections in every region of the world. The macrolides, lincosamides and streptogramins (MLS) group of antibiotics is commonly used in treatment of staphylococcal infections.

The Aim: Determination of the phenotypic resistance profiles to MLS group of antibiotics of MRSA strains isolated at Clinical Center of Serbia.

Material and methods: MRSA strains were collected between September 2011 and January 2012 in the laboratories of Clinical Center of Serbia. The strains were identified according to the standard microbiology procedures and confirmed by Vitek2 automated system. Antimicrobial susceptibility test was performed by the disk diffusion method.

Results: A total of 52 MRSA strains were collected in this study. Among them, 88.4% MRSA isolates were resistant to erythromycin, clindamycin and azithromycin (14- and 15- member macrolides) and 78.7% to spiramycin (16-member macrolides). The constitutive MLS_B (c MLS_B) resistance phenotype was recognized in 78.9% MRSA strains, while 7.7% strains had shown inducible MLS_B (iMLS_B) resistance phenotype. The resistance to quinupristin/dalfopristin was not detected.

Conclusion: The obtain results indicate the dominance of constitutive MLS_B resistance profile.

Key words: methicillin-resistant *Staphylococcus aureus*, macrolides-lincosamides-streptogramins (MLS), phenotypic resistance profiles.

ANTIBIOTIC SUSCEPTIBILITY OF GROUP A STREPTOCOCCI STRAINS ISOLATED FROM HEALTHY
PRESCHOOL CHILDREN IN BELGRADE

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Introduction: *Streptococcus pyogenes* may colonized upper respiratory tracts of children and play an important role in the spread of this infection. Although GAS is uniformly susceptible to penicillin, resistance to erythromycin was noticed worldwide.

The Aim: The aims of this study were to investigate the rate of pharyngeal colonization, drug susceptibility, as well as to determine the macrolide resistance phenotypes of GAS isolated from healthy preschool children in Belgrade.

Materials and methods: The study group included 24 084 healthy children, intended kindergartens in Belgrade. Out of 1664 GAS strains, isolated from throat during 9 months period, 311 were selected for antibiotic susceptibility testing by the disk diffusion method. Erythromycin resistance phenotypes were determined by the double-disk test. Minimal inhibitory concentration of erythromycin was determined by E test.

Results: The prevalence of GAS carriage was 6,9% and it was higher in children older than 3 years. All strains were susceptible to penicillin and chloramphenicol. Decreased susceptibility to erythromycin was found in 18 strains (5,8%). Among them, 11 strains were assigned to the M phenotype, while 7 isolates were constitutively MLS resistant. Decreased susceptibility was found in 6,5%, 5,1% and 2,6% isolates to tetracycline, clindamycin and fluoroquinolones respectively.

Conclusion: The rate of pharyngeal colonization in preschool healthy children in Belgrade is relatively low (7%) which is in agreement with the previous published report. Penicillin is still drug of choice. Macrolide non susceptibility rate was not high, but we observed increased in the proportion of MLS phenotype.

Key words: *Streptococcus pyogenes*, macrolides, resistance

EFEKTI TOKSINA VIPERA AMMODYTES AMMODYTES NA ODABRANE MIKROORGANIZME

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Uvod: Bakterijske infekcije danas nisu toliko letalne zahvaljujući brojnim antibioticima, ali svakako brine sve češća pojava multirezistentnih sojeva. Istraživanje novih antibakterijskih agenasa svakako je prioritet i prirodni izvori su posebno značajni. Zmijski toksini se pomniju kao jedan od mogućih agenasa.

Cilj rada: Ispitivanje moguće antibakterijske aktivnosti toksina *Viperæ ammodytes ammodytes* na odabrane mikroorganizme.

Materijal i metode: Toksin je elektroforetski (SDS-PAGE) profilisan i denzitometrisan. Difuzionom metodom antibiograma je ispitivan antibakterijski efekat toksina u različitim koncentracijama na sojeve *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 35218), *Pseudomonas aeruginosa* (ATCC 27853) i *Enterococcus faecalis* (ATCC 29212), kao i kliničke izolate. Minimalna inhibitorna koncentracija je određivan mikrobuonj dilucijom.

Rezultati: Osetljivost odabranih bakterija je najizraženija kod *S.aureus*>*Pseudomonas aeruginosa*> *Escherichia coli* >*Enterococcus faecalis* kod koga nije bilo efekta, kao i njihovih kliničkih izolata. Mik je bio najizraženiji kod *S.aureusa*. Elektroforetski - denzitometrijom utvrđeno 11 proteinskih frakcija toksina.

Zaključak: Demonstrirano antibakterijsko delovanje toksina *Viperæ ammodytes ammodytes* otvara mogućnosti za dalje ispitivanje komponenti toksina i njihovog potencijalnog efekta i upotrebe.

Ključne reči: *Viperæ ammodytes ammodytes*, zmijski toksin, antibakterijski efekat, MIK, SDS-PAGE.

EFFECT OF VIPERA AMMODYTES AMMODYTES VENOM ON SELECTED MICROORGANISMS

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Introduction: Bacterial infections, in nowhere days, are not as lethal due to a number of antibiotics, but there is a constant increase in the number of of multiresistant strains. Constant research of new antibacterial agents is certainly a priority, and natural resources are particularly important. Snake toxins are mentioned as one of the possible agents.

The aim: The aim of this study was to investigate the possible antibacterial activity of *Viperæ ammodytes ammodytes* venom on selected microorganisms.

Methods: The venom was electrophoretically (SDS-PAGE) and densitometrically profiled. The antibacterial effect was investigated by disk-diffusion method on various concentrations of venom on selected strains *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 35218), *Pseudomonas aeruginosa* (ATCC 27853) i *Enterococcus faecalis* (ATCC 29212), as well as on their clinical isolates. MIC was determined by broath dilution method.

Results: The sensitivity of selected bacteria is most pronounced in *S.aureus*>*Pseudomonas aeruginosa*> *Escherichia coli* >*Enterococcus faecalis*, which didn't had antibacterial effect, as well as their clinical isolates. MIC was the most pronounced in *S.aureus*. Electrophoresis - densitometry showed 11 protein fractions of venom.

Conclusion: The demonstrated antibacterial property of *Viperæ ammodytes ammodytes* venom highlight it for a further studies according to detect which component is/are responsible of this activity and their potential use.

Key words: *Viperæ ammodytes ammodytes*, snake venom, antibacterial effect, MIC, SDS-PAGE.

KARAKTERIZACIJA GLJIVA IZOLOVANIH KOD BOLESNIKA SA AKUTNOM DIFUZNOM INFEKCIJOM SPOLJAŠNJEG SLUŠNOG HODNIKA

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Uvod: Otomikoze su infekcije spoljašnjeg slušnog hodnika izazvane gljivama. Najčešći uzročnici su gljive iz rodova *Candida* i *Aspergillus*. Jedan od razloga terapijskih problema otomikoza je i pojava rezistencije gljiva na antimikotike.

Cilj: Utvrđivanje uzročnika otomikoza i ispitivanje osetljivosti izolata na antimikotike.

Materijal i metode: Brisevi spoljašnjeg slušnog kanala su uzimani od bolesnika sa sumnjom na otomikoza. Izolacija gljiva je vršena korišćenjem Saburo dektrozne podloge, Čapek agara i hrom agara na 26° C i 37° C. Identifikacija izolata je vršena na osnovu morfoloških i biohemijskih karakteristika gljiva, odnosno pomoću API 20C AUX i Candifast komercijalnih setova. Ispitivanje osetljivosti izolovanih gljiva na antimikotike je vršeno standardnom disk difuzionom metodom antimikograma. Osetljivost je određivana na amfotericin B, nistatin, mikonazol, flukonazol, itraconazol, vorikonazol i ketokonazol.

Rezultati: Najveći broj uzročnika otomikoza pripadaju rodovima *Aspergillus* (66,7%) i *Candida* (21,67%). Najčešći uzročnici su *Aspergillus niger* (70,7%), i *Candida albicans* (53,87%). Ređe utvrđeni uzročnici su iz rodova *Penicillium* (n=3), *Scopulariopsis* (n=1) i *Aureobasidium* (n=1). Ispitivanje osetljivosti na antimikotike je pokazalo da je najviše izolata bilo osetljivo na mikonazol (89,8%), vorikonazol (79,7%) i amfotericin B (66,1%). Gljive iz rodova *Scopulariopsis* i *Aureobasidium* su pokazale osetljivost na ketokonazol.

Zaključak: Pravovremena izolacija, identifikacija i ispitivanje osetljivosti uzročnika je neophodna u evaluaciji pacijenata sa otomikozom. Naše ispitivanje je pokazalo da su najčešći uzročnici otomikoza plesni iz roda *Aspergillus*, a najveća aktivnost *in vitro* pokazana je za mikonazol.

Ključne reči: otomikoza, *Aspergillus*, *Candida*, antimikogram, antimikotici.

CHARACTERIZATION OF FUNGI ISOLATED FROM PATIENTS WITH ACUTE DIFFUSE OTITIS EXTERNA

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Introduction: Otomycosis is fungal infection of external auditory meatus. The most common causative agents are from genus *Candida* and *Aspergillus*. Antifungal resistance is one of the issues for therapy outcome.

The Aim: Identification of fungi that cause otomycosis and susceptibility *in vitro* to antifungals.

Materials and Methods: The outer ear canal swabs were taken from patients with suspicion on otomycosis. Isolation of fungi was performed using Sabouraud medium, Čapek agar and Candichrom agar on 26° C and 37° C. Identification of isolates was based on morphological and biochemical characteristics of fungi, or by using API 20C AUX and Candifast commercial kits. Susceptibility testing on antifungals was performed using standard disk diffusion method. Fungal sensitivity was estimated with amphotericin B, nystatin, miconazole, fluconazole, itraconazole, ketoconazole and voriconazole.

Results: The majority of fungi causing otomycosis are from *Aspergillus* (66,7%), and *Candida* (21,67%) species. The most common isolated fungi are *Aspergillus niger* (70,7%) and *Candida albicans* (53,87%). The less common identified fungi were *Penicillium* (n=3), *Scopulariopsis* (n=1) and *Aureobasidium* (n=1). Antifungal susceptibility testing showed the most of the isolates were sensitive to miconazole (89.8%), voriconazole (79.7%), nystatin (79.7%) and amphotericin B (66.1%). Fungi from *Aureobasidium* and *Scopulariopsis* species showed sensitivity to ketoconazole.

Conclusion: Timely isolation, identification and susceptibility testing of pathogens is essential in the evaluation of patients with otomycosis. Our study has showed *Aspergillus* spp. as the most common fungi and miconazole as antifungal agent with the highest *in vitro* activity.

Keywords: otomycosis, *Aspergillus*, *Candida*, susceptibility, antimicrotics.

KLINIČKI ZNAČAJ I ZASTUPLJENOST POJEDINIH TOKSINOTIPOVA CLOSTRIDIUM DIFFICILE KOD HOSPITALIZOVANIH BOLESNIKA

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Uvod: *Clostridium difficile* se može naći u intestinumu zdravih osoba (asimptomatsko nosilaštvo), ali kod osoba sa faktorima rizika može izazvati dijareju.

Cilj rada: Utvrđivanje kliničkog značaja i zastupljenosti toksinotipova *Clostridium difficile* kultivisanih iz uzoraka stolice hospitalizovanih bolesnika.

Materijal i metode: Ispitivana grupa obuhvatila je 80 hospitalizovana bolesnika sa dijarejom i nalazom *Clostridium difficile* u uzorcima stolice i 100 hospitalizovanih bolesnika kontrolne grupe sa formiranom stolicom. Bakteriološki pregled stolice izvršen je primenom standardne mikrobiološke procedure. Utvrđivanje prisustva toksina *Clostridium difficile* u stolici i identifikovanim kolonijama *C. difficile* rađeno je ELISA-ridascreen *Clostridium difficile* Toxin A/B testom (R-Biopharm AG) i ColorPAC Toxin A testom (Becton Dickinson).

Rezultati: Iz 116 uzoraka stolica 80 hospitalizovana bolesnika sa dijarejom kultivisano je 99 izolata *Clostridium difficile*. Kod 53 (66.25%) bolesnika sa dijarejom utvrđen je pozitivan nalaz toksina A i B, kod jednog (1.23%) bolesnika utvrđeno je prisustvo samo toksina A. Netoksigeni *Clostridium difficile* je kultivisan iz uzoraka 26 (32.5%) bolesnika. Međutim, iz uzoraka 16 bolesnika kultivisan je neki od patogenih mikroorganizama intestinalnog trakta. Identifikovanjem kultivisanih kolonija utvrđeno je da pripadaju vrstama roda *Campylobacter spp.*, *Salmonella spp.*, i *Candida spp.* U kontrolnoj grupi, toksigeni *Clostridium difficile* je kultivisan iz uzoraka dva (2%) a netoksigeni *Clostridium difficile* iz uzoraka 5 (5%) bolesnika

Zaključak: Istraživanjem je utvrđena klinička značajnost nalaza toksigenih sojeva *Clostridium difficile* u uzorcima tečne stolice hospitalizovanih bolesnika i asimptomatsko nosilaštvo u 2% bolesnika sa formiranom stolicom.

Ključne reči: *Clostridium difficile*, dijareja, toksini

CLINICAL IMPORTANCE AND REPRESENTATION OF TOXIGENIC AND NON-TOXIGENIC CLOSTRIDIUM DIFFICILE IN HOSPITALIZED PATIENTS

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Introduction: *Clostridium difficile* can be found in the intestine of healthy individuals (asymptomatic carriers), but it can cause diarrhea in people with risk factors.

The Aim: To fortify clinical importance and representation of toxigenic *Clostridium difficile* isolated from stool of hospitalized patients.

Material and methods: Study included 80 hospitalized patients with diarrhea and positive findings of *Clostridium difficile* in stool and 100 hospitalized patients with formed stool as a control group. Bacteriological examination of a stool was conducted using standard microbiological methods. *Clostridium difficile* toxin was detected by ELISA-ridascreen *Clostridium difficile* Toxin A/B (R-Biopharm AG) and ColorPAC Toxin A test (Becton Dickinson).

Results: In this research we isolated 99 *Clostridium difficile* strains from 116 stool samples of 80 hospitalized patients with diarrhea. The 53 (66.25%) of patients with diarrhea were positive for toxins A and B, one (1.25%) were positive for only toxin B. Non-toxigenic *Clostridium difficile* isolated from samples of 26 (32.5%) patients. However, other pathogenic microorganisms of intestinal tract cultivated from samples of 16 patients. Examination of cultivated colonies revealed that most of cultivated species belonged to genera of *Campylobacter spp.*, *Salmonella spp.*, and *Candida spp.* In control group, toxigenic *Clostridium difficile* cultivated from stool samples of two patients (2%) and non-toxigenic *Clostridium difficile* from samples of five patients (5%).

Conclusion: This research confirmed clinical importance of toxigenic *Clostridium difficile* found in liquid stool samples of hospitalized patient, and the possibility of asymptomatic carriage in 2% of patients with formed stool.

Keywords: *Clostridium difficile*, diarrhea, toxins

SEROLOŠKI NALAZ KOD PACIJENATA SA LAJM BORELIOZOM

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Uvod: Serološka dijagnoza Lajm boreliozе (LB), multisistemske bolesti izazvane spirohetom *Borrelia burgdorferi* sensu lato, postavlja se primenom skrining ELISA i potvrdnog imunoblot testa.

Cilj: Utvrditi ELISA testom nalaz antitela IgM i IgG klase prema *B. burgdorferi* u serumu osoba sa kliničkom dijagnozom Lajm boreliozе, poceniti korelaciju sa potvrdnim testom i sagledati prevalenciju antitela IgM i IgG klase prema specifičnim antigenima *B. burgdorferi*.

Materijal i metode: Istraživanje je obuhvatilo 52 pacijenta kod kojih je Serion ELISA classic *Borrelia burgdorferi* IgM/IgG testom potvrđena klinička dijagnoza LB. Potvrdni Recomblot *Borrelia*_{NS} IgG/IgM (MIKROGEN diagnostik) urađen je sa 32 uzorka seruma.

Rezultati: ELISA IgM je imala pozitivne ili granične vrednosti u 47, IgG u 38 uzoraka. Ispitanici sa kliničkom dijagnozom LB imali su samo IgM(14), IgM i IgG(33) i samo IgG(5). Recomblot IgM testom potvrđen je ELISA IgM pozitivan nalaz je u 23 uzorka, dok su dva bila sa graničnim vrednostima, a dva negativna. Recomblot IgG testom ELISA IgG pozitivan nalaz potvrđen je u 9 uzoraka, dok su tri bila sa graničnim vrednostima, a četiri negativna. U većini pozitivnih uzoraka utvrđena su IgM antitela prema OspC, p41, p41/i garinii i p41/i afzeli i IgG antitela prema VlsE, p100, p41, p41/i garinii i p41/i afzeli.

Zaključak: ELISA test je kod pacijenata sa LB bio pozitivan u jednom ili oba imunoglobulina. Recomblot je potvrdio nalaz ELISA testa za IgM 25/28 i za IgG 12/21. Utvrđeno je prisustvo antitela prema antigenima patognomoničnim za klasu imunoglobulina.

SEROLOGICAL FINDINGS IN PATIENTS WITH LYME BORRELIOSIS

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Introduction: Serologic diagnosis of Lyme borreliosis(LB), multisystem disease caused by the spirochete *Borrelia burgdorferi* sensu lato, is set using the screening ELISA and confirmatory immunoblot test.

Aim: Determine the finding of antibodies IgM and IgG to *B. burgdorferi* in the serum by ELISA test in individuals with clinical diagnosis of Lyme borreliosis, assess the correlation with confirmatory test and examine the prevalence of IgM and IgG antibodies to specific antigens of *B. burgdorferi*.

Material and Methods: The study included 52 patients in whom Serion ELISA classic *Borrelia burgdorferi* IgM/IgG confirmed the clinical diagnosis of LB. Confirmation Recomblot *Borrelia*_{NS} IgG/IgM(MIKROGEN diagnostic) was performed with 32 serum samples.

Results: IgM ELISA had a positive or borderline values in 47, IgG in 38 samples. Patients with clinical diagnosis of LB had only IgM(14), IgM and IgG(33) and IgG(5). Recomblot IgM confirmed ELISA IgM positive finding in 23 samples, two were with the borderline values, and two negative. Recomblot IgG confirmed ELISA IgG positive finding in 9 samples, three were with borderline values, and four were negative. In the most of the positive samples IgM antibodies were determined against OspC, p41, p41/i garinii and P41/i afzeli and IgG antibodies against VlsE, p100, p41, p41/i garinii and p41/i afzeli.

Conclusion: ELISA test for patients with LB was positive in one or both immunoglobulin. Recomblot confirmed the findings of the ELISA test for IgM(25/28) and for IgG(12/21). Presence of antibodies against pathognomonic antigens for the class of immunoglobulins was determined.

Key words: Lyme boreliosis, ELISA, immunoblot test.

SEROLOŠKO ISPITIVANJE INFEKCIJA TERATOGENIM UZROČNICIMA (TORCH) U ŽENA GENERATIVNE DOBI

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Uvod: Virusne infekcije trudnica predstavljaju veliki rizik za nastanak perinatalnih infekcija. U etiologiji perinatalnih infekcija značajnu ulogu imaju virusi: *Cytomegalovirus (CMV)*, *Rubella virus*, *Herpes simplex virus tip 1 i 2 (HSV-1 i HSV-2)*. Takođe od značaja su i infekcije protozomom *Toxoplasma gondii*.

Cilj: Cilj rada je bio da se utvrdi učestalost relativno nedavnih i ranijih slučajeva infekcije uzročnicima TORCH sindroma u žena generativne dobi.

Materijal i metode: Izvor podataka za ovo istraživanje bili su rezultati serološkog ispitivanja, vršenog u Institutu za javno zdravlje Vojvodine (Centar za virusologiju), u periodu od januara 2009. do decembra 2011. godine, na uzorku od 349 trudnica različite starosne dobi i u različitim gestacijskom periodu. Detekcija IgM i IgG antitela izvođena je ELISA serološkom metodom (EUROIMMUN, Nemačka i Virion, Nemačka). Za statističku obradu je korišćen χ^2 test.

Rezultati: U 84 (24.07%) žene utvrđena je ranija infekcija (IgG+, IgM-) toksoplazmom gondii dok je u 4 (1.15%) dijagnostikovana relativno nedavna infekcija (IgM+, IgG+). 293 (83.95%) žene generativnog doba je bilo prokuženo virusom rubele dok su u 6 (1.72%) žena utvrđena i IgM i IgG antitela što ukazuje na relativno nedavnu infekciju. Kod 305 (87.4%) žena utvrđena je ranija infekcija citomegalovirusom dok je relativno nedavnu infekciju imalo 3 (0.86%) žena. Kod 261 (74.79%) žene utvrđena je ranija infekcija HSV virusom dok je relativno nedavnu infekciju imalo 10 (2.87%) žena.

Zaključak: Prokuženost žena Južnobačkog okruga na viruse rubele, CMV i HSV je velika. Prokuženost protozomom *Toxoplasma gondii* je manja te je velik postotak seronegativnih žena koje su izložene riziku akutne infekcije u trudnoći. In cilju utvrđivanja konačne dijagnoze akutne infekcije ovim uzročnicima potrebno je slučajeve relativno nedavne infekcije dalje pratiti i izvršiti dokazivanje aviditeta IgG antitela.

Ključne reči: *Toxoplasma gondii*, *Rubella*, *Cytomegalovirus*, *Herpes simplex virus*, ELISA, IgM IgG, žene generativnog doba.

SEROLOGICAL TESTING OF INFECTIONS WITH TERATOGENIC AGENTS (TORCH) IN WOMEN OF CHILDBEARING AGE

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Introduction: Viral infections in pregnancy represent a risk for perinatal infections. In the etiology of perinatal infections an important role have viruses: *Cytomegalovirus (CMV)*, *Rubella virus*, *Herpes simplex virus type 1 and 2 (HSV-1 and HSV-2)*. Also, infections of protozoa *Toxoplasma gondii* are important.

Goal: The aim of this study was to determine the incidence of relatively recent infections and previous cases of infections with TORCH syndrome in women of childbearing age.

Material and methods: Source of these data were the results of serologic examinations performed at the Institute of Public Health of Vojvodina (Virusology department), from January, 2009 to December, 2011 on the sample of 349 pregnant women of different age and gestation period. Detection of IgM and IgG antibodies was performed using ELISA serologic method (EUROIMMUN, Germany and Virion, Germany). χ^2 test was used for statistic calculations.

Results: A total of 84 (24.07%) pregnant women had a earlier infection (IgG+, IgM-) of *Toxoplasma gondii* and 4 (1.15%) had relatively recent infection (IgG+, IgM+). 293 (83.95%) women of childbearing age had protective immunity of virus rubele while 6 (1.72%) had IgM and IgG antibodies that indicating a relatively recent infection. In 305 (87.4%) of women was found earlier cytomegalovirus infection and the relatively recent infection had 3 (0.86%) women. In 261 (74.79%) of women was found earlier HSV infection and the relatively recent infection in 10 (2.87%) women.

Conclusion: A large percent of pregnant women from the South Backa District have protective antibodies (protective immunity) against virus rubele, CMV and HSV. Percent of women with protective antibodies against protozoa *Toxoplasma gondii* is smaller and they are at risk of acute infections in pregnancy. The monitoring of relatively recent infections and detection of IgG antibodies avidity are necessary to determinate the final diagnosis of acute infection with pathogens.

Key words: *Toxoplasma gondii*, *Rubella*, *Cytomegalovirus*, *Herpes simplex virus*, Enzyme-linked immunosorbent assay, IgM IgG, women of childbearing age.

UČESTALOST INFEKCIJE HUMANIM PARVOVIRUSOM B19 KOD STANOVNIKA NOVOG SADA I OKOLINE U TOKU 2011. GODINE

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Uvod: Humani parvovirus B19 je rasprostranjen širom sveta. Kod male dece izaziva osipnu bolest *Erythema infectiosum* („peta bolest“). Kod odraslih infekcija se manifestuje artropatijama, a kod imunokompromitovanih osoba prolaznim aplastičnim krizama i hroničnim anemijama. Humani parvovirus B19 je povezan sa štetnim posledicama po fetus, kao što su anemija, hidrops fetusa i intrauterina smrt.

Cilj: Cilj rada bio je da se utvrdi zastupljenost infekcije humanim parvovirusom B19 kod osoba različitog uzrasta i pola i kod trudnica, u toku 2011. godine, na teritoriji Novog Sada i okoline.

Materijal i metode: Uzorci seruma su dobijeni od 391 pacijenta. Specifična IgM i IgG antitela su određivana korišćenjem komercijalnog ELISA testa.

Rezultati: Kod 22,5% ispitanika dokazana je akutna infekcija. Seroprevalenca IgG antitela dokazana je kod 29,9% osoba, a kod 47,6% osoba nisu dijagnostikovana zaštitna antitela. Akutna infekcija kod dece uzrasta 0-18 godina dokazana je kod 16%, IgG antitela prisutna su kod 21% dece, a 63% dece nije imunizovano. Akutna infekcija najčešće je dijagnostikovana kod predškolske dece (22,2%). Akutnu infekciju ima 23% trudnica i sve su u prvom trimestru trudnoće, a seronegativno je 32% trudnica. Kod žena češća je akutna infekcija (27%) nego kod muškaraca (19%).

Zaključak: Humani parvovirus B19 je prisutan kao infektivni agens u našoj populaciji, ali je veliki deo populacije neimunizovan. Akutna infekcija najčešća je među predškolskom decom. Akutna infekcija je najčešća tokom prvog trimestra trudnoće. Akutna infekcija kod žena statistički značajno je veća nego kod muškaraca iste starosne dobi.

Ključne reči: Humani parvovirus B19, seroprevalenca, *Erythema infectiosum*, trudnoća.

FREQUENCY OF HUMAN PARVOVIRUS B19 INFECTION IN THE POPULATION OF NOVI SAD AND SURROUNDING DURING 2011

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Introduction: Human parvovirus B19 is spread worldwide and it causes *Erythema infectiosum* (“fifth disease”) among young children. This virus infection manifests by arthropathies among adults and by transient aplastic crisis or chronic anemia among immunocompromised individuals. Human parvovirus B19 is associated with adverse effects on the fetus, such as anemia, fetal hydrops and intrauterine death.

The Aim: The study aim was to determine the incidence of human parvovirus B19 infection in patients of different ages and genders and in pregnant women, during 2011 in Novi Sad and its surroundings.

Materials and Methods: Serum samples were obtained from 391 patients. Specific IgM and IgG antibodies were measured using a commercial ELISA kit.

Results: The acute infection was confirmed among 22,5% of respondents. Seroprevalence of IgG antibodies was approved among 29,9%, however 47,6% persons were seronegative. Acute infection in children aged 0-18 was found in 16%, IgG antibodies was found in 21%, and 63% of children were non immunized. Acute infection was most oftenly diagnosed among preschool children (22,2%). Acute infection was confirmed in 23% of pregnant women, and all were in the first trimester of pregnancy, and 32% were seronegative. Among females acute infection was more frequent (27%) among men (19%).

Conclusion: Human parvovirus B19, as an infectious agent exists in our population, but there is a big part of population non immunized. Acute infection is most common among preschool children. Acute infection is most common during the first trimester of pregnancy. Acute infection among women was significantly of higher rate than among men of the same age.

Key words: Human parvovirus B19, seroprevalence, *Erythema infectiosum*, pregnancy.

SEROLOŠKO DOKAZIVANJE KOKSAKI VIRUSNIH INFEKCIJA U DECE I ODRASLIH I NJIHOVA POVEZANOST SA KLINIČKIM MANIFESTACIJAMA

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Uvod: Koksaki virusi najčešće izazivaju asimptomatske infekcije, ali mogu uzrokovati i ozbiljne kliničke sindrome: miokarditis, perikarditis, aseptični meningitis, herpanginu.

Cilj: Rad treba da ukaže na učestalost akutnih i ranijih koksaki infekcija u izabranom uzorku, na razlike u učestalosti ovih infekcija zavisno od uzrasta ispitanika, kao i na značaj ovih infekcija u pojedinim organskim oboljenjima.

Materijal i metode: Izvor podataka za istraživanje bili su rezultati seroloških ispitivanja, vršenih u Institutu za javno zdravlje Vojvodine, od januara do aprila 2011. godine, na uzorku od 300 pacijenata. Detekcija IgM i IgG koksaki antitela, izvođena je ELISA metodom. Za statističku obradu je korišćen χ^2 test.

Rezultati: Kod 14,7% dokazana je akutna infekcija, kod 34,33% ranija infekcija, a seronegativnih je bilo 33%. Među akutno inficiranima radno aktivnih je bilo 79,54%, starih 11,36%, dece i adolescenata 9,09%, a među ranije inficiranima po istom uzrasnom redosledu: 35,29%, 20% i 35,60%. U odnosu na kliničke manifestacije, među akutno inficiranima najviše su bile zastupljene respiratorne bolesti (28%), viroze (24%) i limfatične bolesti (20%), a među ranije inficiranima viroze (49,06%), respiratorne bolesti (18,88%) i bolesti srca (16,98%).

Zaključak: Značajno je više seronegativnih i ranije inficiranih u odnosu na akutno inficirane. Među akutno inficiranima, najčešće su zastupljeni radno aktivni ispitanici i klinički je najviše respiratorno obolelih (ipak statističkih razlika u odnosu na ostale grupe bolesti nema). Među ranije inficiranima nema razlika u učestalosti ranije koksaki infekcije prema starosnoj dobi (što je posledica kratkotrajnog tipski specifičnog imuniteta) i najviše pacijenata ima dijagnozu-virosis non specificata.

Gljučne reči: koksaki infekcije, ELISA, kliničke manifestacije.

SEROLOGICAL PROVING OF COXSACKIE VIRUS INFECTIONS IN CHILDREN AND ADULTS AND THEIR CORRELATION WITH CLINICAL MANIFESTATIONS

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Introduction: Coxsackie viruses usually cause asymptomatic infections, but can cause serious clinical syndromes: myocarditis, pericarditis, aseptic meningitis, herpangina.

The Aim: This study need to point to the frequency of acute and older Coxsackie infections in tested sample and the differences in the occurrence of these infections according to age of respondents and the significance of these infections in particular organs diseases.

Materials and methods: Source of these data were results of serologic examinations performed at Institute of Public Health of Vojvodina, from January to April 2011, on the sample of 300 patients. Detection of IgM and IgG antibodies were performed using ELISA method. χ^2 test was used for statistic calculations.

Results: A total of 14,7% had acute infection, 34,33% had old infection and 33% were seronegative. Distribution among the acutely infected was: active working-79,54%, seniors-11,36%, children and teens-9,09%, and among the earlier infected in the same age order: 35,29%,20%,35,60%. In relation to clinical manifestations, in acutely infected most common were respiratory diseases(28%),virosis(24%) and lymphatic diseases(20%),and in earlier infected were virosis(49,06%), respiratory diseases(18,88%) and heart diseases(16,98%).

Conclusion: It is significantly more seronegative and previously infected comparing with acute infected. In acutely infected, the occurrence of working age respondents is the greatest and clinically is the most respiratory patients (but there is no statistical differences comparing with other groups of diseases). In earlier infected, no statistical difference in the frequency of old infection has been proven in relation to age (this is consequence of short type-specific immunity) and the most patients have diagnosis-virosis non specificata.

Key words: Coxsackie infections, ELISA, clinical manifestations.

DISTRIBUCIJA GENOTIPOVA HUMANIH PAPILOMA VIRUSA U TKIVIMA KARCINOMA GRIČA MATERICE ŽENA

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Uvod: Rak grlića materice je drugi po učestalosti malignitet kod žena u svetu. U Srbiji je najveća incidenca karcinoma grlića materice u Evropi. U odnosu na to koliko često dovode do pojave karcinoma grlića materice HPV genotipovi su podeljeni na grupu niskog stepena i grupu visokog stepena rizika. Posebnu pažnju treba obratiti na visokorizične genotipove 16 i 18 koji se nalaze u 64-79% slučajeva karcinoma cerviksa.

Cilj: Utvrđivanje distribucije različitih genotipova Humanih papiloma virusa u tkivima karcinoma grlića materice žena u našoj populaciji.

Materijal i metode: Istraživanje je obuhvatilo 26 uzoraka tkiva karcinoma grlića materice žena starosti od 28 do 75 godina. Prisustvo HPV-a u deparafinisanim uzorcima tkiva je urađeno primenom PCR tehnike za dokazivanje HPV DNK. Korišćeni su MY09 i MY11 prajmeri za L1 gen, kao i GP1 i GP2 prajmeri za E1 gen HPV DNK. Procedura je uključivala: deparafinizaciju isečaka tkiva, DNK ekstrakciju, PCR, gel elektroforezu za vizuelizaciju PCR produkta i genotipizaciju HPV-a metodom direktnog sekvenciranja.

Rezultati: Od ukupno 26 analiziranih uzoraka tkiva karcinoma cerviksa najveća je učestalost planocelularnog karcinoma (73%). Prisustvo HPV DNK dokazano je u 65% uzoraka tkiva karcinoma grlića materice. Genotipizacijom utvrđeno je prisustvo visoko onkogenih HPV tipova 16, 18 i 58. Najveća je učestalost genotipa 16 i iznosi 67%.

Zaključak: Rezultati ovoga istraživanja, kao i dalja istraživanja će dati preciznije podatke o distribuciji genotipova HPV u tkivima karcinoma grlića materice žena u našoj populaciji i mogu biti veoma korisni pri formulisanju naših nacionalnih preporuka u prevenciji karcinoma grlića materice žena.

Gljučne reči: HPV, karcinom, vakcinacija, genotipizacija

HUMAN PAPILOMA VIRUS GENOTYPE DISTRIBUTION IN CERVICAL CANCER TISSUE SAMPLES OF WOMEN

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Introduction: Cervical cancer is the second most common malignancy in women worldwide. Serbia has the highest incidence of cervical cancer in Europe. Human papilloma viruses (HPV) according to their association with cervical cancer and precursor lesions are classified into high risk and low risk HPV types. The most important are high risk genotypes 16 and 18 detected in 64-79% cases of cervical cancer.

The Aim: Determination of HPV genotype distribution in cervical cancer tissues of women in our population.

Materials and methods: Study included 26 cervical cancer tissue samples from women aged from 28 to 75 years. Presence of HPV in tissue samples was determined using PCR method for detection of HPV DNA. Primers MY09/MY11 were used for detection of L1 gene and GP1/GP2 primers for detection of E1 gene HPV DNA. The procedure included: deparaffinization of tissue samples, DNA extraction, PCR, visualisation of PCR products using gel electrophoresis and HPV genotyping by direct DNA sequencing.

Results: Out of 26 cervical cancer tissue samples, planocellular carcinoma has the highest incidence (73%). The presence of HPV DNA was demonstrated in 65% of cervical cancer tissue samples. High risk HPV types 16, 18 and 58 were identified. The most frequent genotype was HPV 16 (67%).

Conclusion: The results of this study and further studies will provide more detailed informations about HPV genotype distribution in cervical cancer tissues of women in our population and may contribute in formulation of our national guidelines for the prevention of cervical cancer.

Key words: HPV, carcinoma, vaccination, genotyping.

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Uvod: Autofagija je autokatabolički proces koji omogućava ćelijama razgradnju oštećenih organela i proteina. Komponente se pakuju u autofagozom, dvoslojnu vezikulu, koja fuzijom sa lizozomom daje autofagolizozom, gde se odvija razgradnja. Defekti ovog mehanizma dovode do nakupljanja različitih materija u citosolu, kao npr. u Parkinsonovoj bolesti, gde je primećena intracelularna akumulacija proteina α -sinukleina. Oboleli mogu razviti psihoze, za čiju terapiju se koriste atipični antipsihotici (kao što je olanzapin).

Cilj rada: U ovoj studiji ispitan je uticaj olanzapina na autofagiju u neuronima, s obzirom da ovaj proces ima neuroprotektivnu ulogu u α -sinukleinopatijama.

Materijal i metode: Dejstvo olanzapina je ispitivano na ćelijama humanog neuroblastoma stabilno transfektovanim genom za α -sinuklein (α SYN). Kao kontrola korišćene su ćelije transfektovane genom za β -galaktozidazu. Vijabilnost ćelija je procenjena aktivnošću ćelijske kisele fosfataze. Broj autofagolizozoma je ispitan protočnom citofluorimetrijom nakon bojenja ćelija fluorescetnom bojom akridin oranžom. Imunoblot analizom vizuelizovana je konverzija LC3-I u LC3-II, koji je marker formiranja autofagolizozoma i u njima se razgrađuje, kao i nivo p62, koji se selektivno razgrađuje autofagijom.

Rezultati: Tretman olanzapinom doveo je do povećanja broja autofagolizozoma, kao i do povećanja koncentracije LC3-II i p62 u kontrolnim i α SYN ćelijama. Olanzapin je značajno snizio vijabilitet α SYN, ali ne i kontrolnih ćelija.

Zaključak: Nagomilavanje LC3-II i p62 ukazuje na sposobnost olanzapina da blokira njihovu razgradnju autofagijom. Povećana osetljivost α SYN ćelija u skladu je sa ulogom autofagije u razgradnji α -sinukleina, kao i sa primećenim pogoršanjem motornih funkcija prilikom terapije obolelih od Parkinsonove bolesti olanzapinom.

Glavne reči: autofagija, LC3-II, p62, olanzapin, α -sinuklein.

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Uvod: Interleukin (IL) 17F je nedavno otkriveni proinflamatorni citokin koji učestvuje u patogenezi zapaljenskih bolesti kao što su psorijaza, multipla skleroza, reumatoidni artritis, Kronova bolest, astma i druge. S obzirom da različiti polimorfizmi pojedinačnih nukleotida (engl. single nucleotide polymorphisms, SNP) mogu imati uticaj na nivo ekspresije gena kao i ulogu samog proteina i da do sada studije određivanja frekvenci polimorfizama IL-17F nisu ranije rađene u srpskoj populaciji smatrali smo da bi bilo relevantno definisati učestalost polimorfizama ovog gena kod zdravih ispitanika.

Cilj rada: Određivanje zastupljenost varijanti citozin/timidin polimorfizma (rs1146553) gena za interleukin 17F

Materijal i metode: Uzorci krvi dobijeni su od 166 dobrovoljnih davalaca krvi zavoda za transfuziju i iz njih je izolovana DNK koja je kasnije amplifikovana uz pomoć real time polimerazne lančane reakcije (qPCR) sa specifičnim prajmerima i probama.

Rezultati: Studija je pokazala da je učestalost homozigotnog alela CC: 155/166 tj. 0,933, učestalost heterozigota: 8/166 tj. 0,048 a homozigota TT: 3/166 tj. 0,018. Učestalost IL-17F C alela iznosi 0,9578 tj. 318/332 a alela IL-17F T 0,0422 tj. 14/332. Poređenja sa evropskom zdravom populacijom nisu pokazala statistički značajnu razliku.

Zaključak: Ovo istraživanje određuje učestalost alelskih varijanti IL-17F u populaciji koja je po svojim karakteristikama bliska zdravom stanovništvu u Srbiji. Dobijeni rezultati će moći da se koriste kao kontrolna grupa, posebno u studijama koje ispituju veze između genotipskih razlika, incidence i kliničke slike oboljenja

Glavne reči: IL-17F, SNP polimorfizam, zdrave kontrole, Srbija, Taqman.

THE ROLE OF AUTOPHAGY IN THE NEUROPROTECTIVE EFFECT OF ATYPICAL ANTIPSYCHOTICS

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Introduction: Autophagy is an autocatabolic process of intracellular decomposition of damaged organelles and proteins. Components are packed into the autophagosome, a two-layered vesicle, which by fusing with lysosome forms autophagolysosome, where the degradation is carried out. Impairments in this mechanism lead to an intracellular accumulation of various substances, e.g. in Parkinson's disease, where a protein α -synuclein is accumulated. The patients may develop psychoses, which are treated with atypical antipsychotics (such as olanzapine).

The Aim: In the study we examine the influence of olanzapine on autophagy, concerning the latter being neuroprotective in α -synucleinopathies.

Materials and Methods: Effects of olanzapine were examined on human neuroblastoma cells stably transfected with the α -synuclein gene (α SYN), and on cells transfected with β -galactosidase gene for control. Cell viability was estimated by activity of cellular acid phosphatase. The number of autophagolysosomes was examined by flow-cytometry after acridine orange fluorescent staining. With immunoblotting we visualized the conversion of LC3-I to LC3-II isoform, which forms and is degraded in autophagolysosomes, and the level of p62, a selective autophagic target.

Results: Olanzapine treatment increased both the number of autophagolysosomes and the concentration of LC3-II and p62 in both control and α SYN cells. Olanzapine significantly decreased viability of α SYN, but not control cells.

Conclusion: The degradation of LC3-II and p62 via autophagy was blocked with olanzapine treatment. The higher sensitivity of α SYN cells is consistent with the involvement of autophagy in α -synuclein clearance and the noticed decline in motor function in olanzapine-treated parkinsonism.

Key words: autophagy, LC3-II, p62, olanzapine, α -synuclein.

SNP RS1146553 POLYMORPHISM OF THE IL-17 GENE IN VOLUNTEER BLOOD DONORS IN SERBIA

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Introduction: Interleukin (IL)-17F is a novel cytokine involved in pathogenesis of many inflammatory diseases: Psoriasis, Multiple Sclerosis, Rheumatoid Arthritis, Crohn's disease, Asthma and others. Given that single nucleotide polymorphisms (SNP) can modulate the level of expression and function of IL-17F gene transcript and that studies which determine polymorphism frequency have not been conducted in the Serbian population we thought it would be relevant to establish these frequencies in a sample of healthy blood donors. This particular

The Aim: Determining the frequencies of cytosine(C)/thymidine (T) polymorphism rs1146553 variants of the interleukin 17F gene.

Materials and methods: Blood samples were obtained from volunteer blood donors in the Institute for Blood Transfusion of Serbia. DNA was extracted and amplified using real-time polymerase chain reaction with specific primers and probes.

Results: The study showed that allele frequencies were, CC: 155/166 or 0.933, TC: 8/166 or 0.048 and for TT: 3/166 or 0.018. The frequency of allele IL-17F C was: 0.9578 or 318/332 and of the IL-17F T: 0.0422 or 14/332. The comparison with the European population has not shown statistically significant differences.

Conclusion: This study determines the frequencies of IL-17F alleles in what is an approximation of the healthy Serbian population. The results will be used as a control group for comparison, especially in those studies that determine connections between genotypic differences, incidence and clinical manifestations of disease.

Key words: IL17F, SNP polymorphism, interleukin, healthy controls, Serbia, Taqman.

UTICAJ C3435T POLIMORFIZMA MDR1 GENA NA FARMAKOKINETIKU CIKLOSPORINA I TAKROLIMUSA NAKON TRANSPLANTACIJE BUBREGA

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Uvod: Transplantacija je terapijski metod u kome se nefunkcionalne ćelije, tkiva ili organi zamenjuju funkcionalnim sa žive osobe ili kadavera. Imunski odgovor na presađeni organ predstavlja glavni problem ovog načina lečenja, pa je primena imunosupresivne terapije neophodna. Imunosupresivi su lekovi koji smanjuju aktivnost imunskog sistema. Nakon transplantacije najčešće se koriste lekovi koji inhibiraju ili ubijaju T-limfocite, kao što su kalcineurinski inhibitori, ciklosporin i takrolimus. MDR1 gen (eng. multi-drug resistance gene 1) kodira P-glikoprotein koji je membranski transporter odgovoran za efleks mnogih ksenobiotika iz ćelije, uključujući i ciklosporin i takrolimus. Na MDR1 genu nađeno je preko 50 SNP-ova. Polimorfizam C3435T u egzonu 26 doveden je u vezu sa promenom nivoa iRNK, ekspresijom proteina, savijanjem proteina i supstratnom specifičnošću.

Cilj: Cilj ovog rada je da se utvrdi da li polimorfizam C3435T MDR1 gena ima uticaja na farmakokinetiku ciklosporina i takrolimusa.

Materijal i metode: Eksperimentalnu grupu činilo je 100 pacijenata koji su primali ciklosporin ili takrolimus uz još jedan imunosupresivni lek. Detekcija i analiza polimorfizama gena za MDR1 urađena je savremenom SSP-PCR metodom.

Rezultati: Genotip CC imalo je 28, TC 68, a TT 4 pacijenta. Od 88 pacijenata, za koje smo imali dostupne podatke o akutnom odbacivanju bubrega, 34 je akutno odbacivalo organ. Pacijenti sa genotipom CC imaju veću koncentraciju ciklosporina 10. dana od početka terapije. Razlika ne postoji kod pacijenata koji su uzimali takrolimus.

Zaključak: Genotip MDR1 gena ima uticaja na koncentraciju ciklosporina, dok nije zapažen uticaj na koncentraciju takrolimusa.

ključne reči: transplantacija, kalcineurinski inhibitori, MDR1, farmakokinetika

THE EFFECT OF MDR1 GENE C3435T POLYMORPHISM ON CYCLOSPORINE AND TACROLIMUS PHARMACOKINETICS AFTER KIDNEY TRANSPLANTATION

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Introduction: Transplantation is a treatment for replacement of nonfunctioning organs, tissues or cells with healthy ones, taken from a live donor or cadaver. Immune response to alloantigens is the main problem in this type of treatment. That is why immunosuppressive therapy is necessary. Immunosuppressive drugs inhibit immune response. Drugs that inhibit or kill T lymphocytes, such as calcineurin inhibitors cyclosporine and tacrolimus, are the principal agents used after transplantation. MDR1 gene is coding for P-glycoprotein, a membrane efflux protein for various xenobiotics, including cyclosporine and tacrolimus. There are more than 50 SNPs in the MDR1 gene. C3435T polymorphism in exon 26 has been associated with changes in mRNA level, protein expression, protein folding and substrate specificity.

The Aim: The aim of this study was to determine whether MDR1 gene C3435T polymorphism has any influence on pharmacokinetics of cyclosporine and tacrolimus.

Materials and Methods: The experimental group consisted of 100 patients who were treated with cyclosporine or tacrolimus combined with one more immunosuppressive drug. Polymorphism of MDR1 gene was detected and analyzed using SSP-PCR method.

Results: 28 patients had genotype CC, 68 genotype TC and 4 genotype TT. Out of 88 patients for whom clinical information about acute rejection were available, 34 went through acute rejection. Patients with CC genotype have higher concentrations of cyclosporine on the 10th day after the beginning of the treatment.

Conclusion: MDR1 genotype has the effect on cyclosporine levels in serum. This effect on tacrolimus concentration is absent.

Keywords: transplantation, calcineurin inhibitors, MDR1, pharmacokinetics

PREVALENCIA CITOMEGALOVIRUSNE I EPSTEIN BARR VIRUSNE INFEKCIJE KOD PACIJENATA SA TRANSPLANTIRANIM BUBREGOM

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Uvod: Citomegalovirus (CMV) i Epstein Barr virus (EBV) su bitni uzročnici morbiditeta i mortaliteta kod primalaca bubrega. Rizik za nastanak virusne infekcije zavisi od nekoliko faktora: vrste transplantiranog organa, stepena imunosupresije i donor/recipijent serostatusa.

Cilj: Cilj ovog istraživanja bio je da ispita prevalencu CMV i EBV infekcije kod pacijenata sa transplantiranim bubregom.

Materijal i metode: Ispitano je 105 pacijenata, 52 odraslih i 53 dece/adolescenata sa transplantiranim bubregom na prisustvo CMV i EBV DNK u krvi PCR metodom. Posle ekstrakcije DNK iz plazme komercijalnim kitom QiAmp Blood Mini Kit (QiAGEN GmbH, Hilden, Germany), vršeno je umnožavanje CMV DNK sa prajmerima koji su ograničavali sekvencu od 435 bp specifični za glavni neposredno rani gen. Za dokazivanje EBV DNK korišćena su 2 seta prajmera: prvi za sekvencu od 269 bp unutar EBNA 1 gena i drugi koji je ograničavao sekvencu od 239 bp unutar gp220 gena. Očitavanje PCR produkata vršeno je elektroforezom u 2% agaroznom gelu. χ^2 test je korišćen za statističku analizu.

Rezultati: CMV DNK je dokazana kod 14/105 pacijenata (13,33%), od toga kod 13 odraslih odnosno samo kod jednog deteta; EBV DNK pozitivan nalaz je bio prisutan samo kod dece / adolescenata i to kod 6/53 (11, 32%).

Zaključak: Dobljeni rezultati prevalencije CMV i EBV infekcije, ukazuju na značaj dokazivanja ovih virusa kod pacijenata sa transplantiranim bubregom. Molekularno testiranje je važno i sa aspekta otkrivanja pacijenata sa rizikom za nastanak klinički manifestnih CMV /EBV infekcija.

ključne reči: CMV/EBV infekcija kod pacijenata sa transplantiranim bubregom, molekularne dijagnostičke procedure.

PREVALENC OF CYTOMEGALOVIRUS AND EPSTEIN BARR VIRUS IN RENAL TRANSPLANT RECIPIENTS

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Introduction: Cytomegalovirus (CMV) and Epstein Barr virus (EBV) are an important cause of morbidity and mortality in renal transplant patients (RTP). The risk of viral infection depends on several factors: the type of transplanted organ, the intensity of immunosuppression and donor/recipient serostatus.

The aim: The aim of this study was to investigate the prevalence of CMV and EBV infections in RTP.

Materials and methods: A total of 105 RTP, 52 adults and 53 children/adolescents were studied on presence of CMV and EBV DNA in blood sample by PCR. After DNA extraction using QiAmp Blood Mini Kit (QiAGEN GmbH, Hilden, Germany) CMV DNA was amplified using PCR targeting a 435 bp region of Major Immediate Early gen. For EBV detection two different set of primers were used; the first amplified a sequence of 269 bp within EBNA 1 gen; second set of primers amplified region of 239 bp within gp220 EBV gen. Visualization of PCR products was performed by electrophoresis on 2% agarose gel. Chi-square test was used in statistical analysis.

Results: CMV DNA was detected in 14/105 RTP (13, 33%); most of them were adults 13/14, but only one child; EBV DNA positive finding was detected only in children/adolescents RTP 6/53 (11, 32%).

Conclusion: These results of prevalence of CMV/EBV infection show the importance of viral detection in RTP. In the light of these results molecular testing could be useful for identifying recipients at high risk for symptomatic CMV / EBV infections.

Key words: CMV/ EBV infections, RTP, molecular diagnostic procedures

UTICAJ POLIMORFIZMA IL28 GENA NA USPEH TERAPIJE HRONIČNOG C HEPATITISA

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Uvod: Prema najnovijim istraživanjima polimorfizam pojedinačnog nukleotida rs12979860 označen je kao jedan od faktora domaćina koji utiče na ishod terapije hronične hepatitis C infekcije.

Cilj rada: Cilj ovog rada je da se kod pacijenata sa hroničnim C hepatitisom izazvanim genotipom 1 odredi distribucija IL28 genotipova (rs12979860) i ispita njihov uticaj na uspeh terapije.

Materijal i metode: U ispitivanje su uključena 34 pacijenta obolela od hroničnog hepatitisa C, 14 muškaraca i 20 žena. Svakom pacijentu uzet je uzorak krvi iz kojeg je izdvojen buffy coat za ekstrakciju DNK. DNK je umnožavana SSP-PCR (Sequence specific primer PCR) metodom, koja podrazumeva upotrebu 3 prajmera u dve odvojene PCR reakcije. Dobijeni PCR produkti detektovani su elektroforezom u 2% agaroznom gelu. Analiziranjem rezultata obe reakcije vršena je identifikacija genotipa bolesnika.

Rezultati: Najveći broj bolesnika, 64,7% ima CT genotip, 20,6% bolesnika ima CC, a 14,7% TT genotip. Stabilan virusološki odgovor (SVR) je postignut kod 35,3% pacijenata. Iako nije dokazana statistički značajna razlika u dostizanju SVR između različitih IL28 genotipova bolesnika ($\chi^2 = 4.201$, $p > 0,05$), povoljan terapijski ishod je najčešće zabeležen kod osoba sa CC genotipom (57,1%), znatno ređe kod osoba sa CT (36,4%), a ni kod jednog pacijenta sa TT genotipom nije registrovan stabilan virusološki odgovor.

Zaključak: Najzastupljeniji IL28 genotip među pacijentima sa hroničnim C hepatitisom u našoj zemlji je CT, a učestalost C alela je visoka (85,3%). Rezultati potvrđuju da IL28 genotip CC predstavlja povoljan prediktivni faktor za ishod terapije hroničnog C hepatitisa.

Ključne reči: Hepatitis C virus (HCV), polimorfizam IL28, stabilan virusološki odgovor (SVR).

INFLUENCE OF POLYMORPHISM IL 28 GENE ON THERAPY SUCCESS IN CHRONIC HEPATITIS C

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Introduction: A number of recent studies emphasize the importance of single nucleotide polymorphism rs12979860 in IL28 gene on the outcome of treatment of chronic hepatitis C infection.

The Aim: To determine the distribution of IL28 genotypes (rs12979860) in patients with chronic hepatitis C caused by HCV genotype 1 and investigate their effect on the success of therapy.

Materials and methods: The study included 34 patients with chronic hepatitis C, 14 men and 20 women. Buffy coat samples were used for DNA isolation. DNA was amplified using SSP-PCR method, which is performed with three primers in two separate PCR reactions. The PCR products were detected by electrophoresis in 2% agarose gel. IL28 genotypes were identified by analysis of results from both PCR reactions.

Results: The majority of patients, 64.7% had CT genotype, 20.6% had CC, and 14.7% TT genotype. Sustained viral response (SVR) was achieved in 35.3%. Although statistically significant difference in achieving SVR between the patients with different IL28 genotypes was not found ($\chi^2 = 4.201$, $p > 0.05$), a favorable therapeutic outcome was mostly reported in patients with CC genotype (57.1%), significantly less in patients with CT genotype (36.4%), and was not shown in any patient with TT genotype.

Conclusion: The predominant IL28 genotype in chronically infected patients from our country was CT, and the frequency of C allele was high (85.3%). These results confirm the favorable predictive value of CC genotype on outcome of chronic hepatitis C treatment.

Key words: Hepatitis C virus (HCV), polymorphism IL28, sustained viral response (SVR).

UČESTALOST I KLINIČKE MANIFESTACIJE NEONATALNOG HERPESA KOD ODOJČADI

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Uvod: Neonatalni herpes je ozbiljno oboljenje novorođenčadi. Prouzrokovan je Herpes simplex virusom (HSV) tip 1 ili tip 2. Može se manifestovati kao mukokutana infekcija, CNS infekcija i diseminovana infekcija. Novorođenče se najčešće zarazi prolaskom kroz inficirani porođajni kanal majke. Učestalost ovog oboljenja se vrlo razlikuje po zemljama i češće je povezana sa HSV tip 2 virusnom infekcijom, ali sve više raste učestalost neonatalnog herpesa prouzrokovanog HSV tip 1 virusom.

Cilj rada: Cilj ovog rada jeste da pokaže učestalost i kliničke manifestacije neonatalnog herpesa novorođenčadi u našoj sredini izazvanog Herpes simplex virusom tip 1 i tip 2.

Materijal i metode: Tokom istraživačkog perioda od januara 2010. do novembra 2011. godine, od ukupno 1038 novorođenčadi, 35 je na osnovu kliničkih manifestacija imalo suspektne neonatalni herpes. PCR metodom za HSV tip 1 i tip 2 DNK analizirani su uzorci krvi i/ili likvora i vizuelizovani na agaroznom gelu.

Rezultati: Među 35 uzoraka suspektnih na neonatalni herpes, 11 je bilo pozitivno. HSV-1 pozitivnih bilo je 9 (81,8%). Najviše pozitivnih je bilo sa neonatalnom CNS infekcijom (63,6%). Ukupna incidenca neonatalnog herpesa je 1,06%, a minimalna procena incidence iznosi 7,8 na 100 000 živorođene dece na teritoriji Srbije.

Zaključak: Neonatalni herpes ima značajnu ulogu u morbiditetu i mortalitetu novorođenčadi u Srbiji što ukazuje na značaj razvijanja i primene sistema za prevenciju i praćenje ove bolesti.

Ključne reči: neonatalni herpes, Herpes simpleks virus tip 1 i tip 2, učestalost

INCIDENCE AND CLINICAL MANIFESTATIONS OF NEONATAL HERPES IN NEWBORNS

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Introduction: Neonatal herpes is serious infection of neonates. It is caused by Herpes simplex virus (HSV) type 1 or 2. Disease can be manifested as mucocutaneous infection, CNS and disseminated infection. In most of the cases infant is affected by passing through infected birth channel. Incidence of neonatal herpes varies between different countries and it is more often related to HSV type 2, but there is increasing incidence of neonatal herpes caused by HSV type 1.

The Aim: The aim of this study is to examine the incidence and clinical manifestations of neonatal herpes of neonates in our population caused by Herpes simplex virus type 1 and 2.

Material and methods: During the study period from January 2010 to November 2011, out of 1038 neonates, 35 were suspected for neonatal herpes, according to clinical and laboratory parameters. Diagnose of this infection was assessed using HSV type 1 DNA and HSV type 2 DNA PCR in blood and/or CSF. PCR products were visualized by gel electrophoresis.

Results: Out of 35 neonates with suspected neonatal herpes, 11 were positive. Nine were HSV-1 positive (81,8%). The most of positive neonates had CNS infection (63,6%). Overall incidence in this study was 1,06%, while minimal estimate of incidence was 7,8 per 100 000 live births.

Conclusion: Neonatal herpes has significant role in mortality and morbidity of infants in Serbia and these results point to significance of prevention and monitoring system for this disease.

Key words: neonatal herpes, Herpes simplex virus type 1 and 2, incidence

HUMORALNI IMUNSKI ODGOVOR KOD BOLESNIKA SA HIV INFEKCIJOM

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Uvod: Humoralni imunski odgovor bolesnika u različitim kliničkim stadijumima HIV infekcije razlikuje se u broju, tipu i nivou antitela na pojedinačne virusne antigene.

Cilj rada: Sagledati serološki status anti-HIV1 pozitivnih bolesnika u korelaciji sa kliničkim stadijumom HIV infekcije.

Materijal i metode: Istraživanjem je obuhvaćena grupa ELISA anti-HIV pozitivnih bolesnika (n=71) koji su podeljeni u 3 grupe: bolesnici u akutnoj fazi infekcije, asimptomatskoj (hroničnoj) i simptomatskoj fazi (fazi progresije bolesti). Kod svih bolesnika rađen je Western blot test (NEWLAV BLOT I, BIORAD).

Rezultati: Western blot (WB) bio je pozitivan kod 70(98,59%) bolesnika, dok je 1(1,41%) ispitanik bio WB intermitentan. Svi bolesnici sa asimptomatskom HIV infekcijom imali su antitela na antigene gp160, gp120, p68, p41 i p34. Anti-p24 i anti-p18 antitela otkrivena su kod 44(97,7%), a anti-p52 kod 42(93,3%) bolesnika. Anti-p55 antitela imalo je 40(88,5%), a anti-p40 32(71%) ispitanika. Komparativnom analizom otkrivena je statistički značajno niža prevalenca antitela na pol antigene p34 i p68 kod bolesnika sa akutnom infekcijom u odnosu na bolesnike sa asimptomatskom HIV infekcijom. Prevalenca antitela na gag antigene (p24, p18 i p40) i pol antigen p34 bila je statistički značajno niža kod bolesnika u fazi progresije bolesti u odnosu na bolesnike u asimptomatskoj fazi infekcije.

Zaključak: Većina bolesnika u asimptomatskoj HIV infekciji ima antitela na sve virusne antigene. Odsustvo antitela na pol antigene (p34 i p68) korelira sa akutnom HIV infekcijom, a odsustvo antitela na p24, p18, p34 i p40 sa progresijom bolesti.

Cljučne reci: virus humane imunodeficijencije, western blot, humoralni imunski odgovor.

HUMORAL IMMUNE RESPONSE IN PATIENTS WITH HIV INFECTION

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Introduction: Humoral immune response in patients in various clinical stages of HIV infection differs regarding the number, type, and level of antibodies to individual viral antigens.

Aim of the paper: To assess the serologic status of anti-HIV positive patients in correlation with the clinical stage of HIV infection.

Material and methods. The study included ELISA anti-HIV positive patients (n=71) who were divided into 3 groups: patients in acute phase, asymptomatic and symptomatic phase (disease progression phase). In all of them, Western blot was done (NEWLAV BLOT I, BIORAD).

Results. Western blot was positive in 70(98.59%), while 1(1.41%) patient was WB indeterminate. All the patients with asymptomatic HIV infection had antibodies to gp160, gp120, p68, p41, and p34 antigens. Anti-p24 and anti-p18 were identified in 44(97.7%) and anti-p52 in 42(93.3%) patients. Anti-p55 were detected in 40(88.5%), and anti-p40 in 32(71%) patients. By comparative analysis significantly lower prevalence of antibodies to pol antigens p34 and p68 was detected in patients with acute infection than in patients with asymptomatic HIV infection. The prevalence of antibodies to gag antigens (p24, p18 and p40) and pol antigen p34 was significantly lower in the patients in disease progression phase than in the patients with asymptomatic infection.

Conclusion. The majority of patients with asymptomatic infection had antibodies to all HIV antigens. Absence of antibodies to pol antigens (p34 and p68) correlated with acute HIV infection and absence of antibodies to p24, p18, p34, and p40 correlated with disease progression.

Key words: human immunodeficiency virus, western blot, humoral immune response.

KORELACIJA VIREMIJE, VIRUS SPECIFIČNIH ANTITELA I ALANIN AMINOTRANSFERAZE KOD BOLESNIKA SA HRONIČNOM HEPATITIS C VIRUSNOM INFEKCIJOM

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Uvod: Kod većine bolesnika sa hroničnom HCV infekcijom postoji perzistentna viremija praćena povišenim ili fluktuirajućim vrednostima alanin aminotransferaze (ALT-a) i antitelima na virusne antigene.

Cilj: Cilj rada bio je da se utvrdi korelacija viremije, virus specifičnih antitela i ALT-a kao dijagnostičkih markera kod bolesnika sa hroničnom HCV infekcijom.

Materijal i metode: Istraživanjem je obuhvaćena grupa od 80 ispitanika koji su bili ELISA anti-HCV pozitivni duže od 1,5 godine. Kod svih ispitanika sprovedena je sledeća dijagnostička procedura: 1)Imunoblot test (RIBA HCV2.0, Ortho Diagnostic) za detekciju antitela na virusne antigene c22-3, c33-c, c100-3 i 5-1-1, 2)RT-PCR za detekciju HCV RNK u serumu i 3) merenje vrednosti ALT-a.

Rezultati: RIBA test bio je pozitivan kod 70(87,5%), dok je 10(12,5%) ispitanika bilo RIBA intermitentno.HCV RNK detektovana je kod 69(86,25%) bolesnika i to 64/70 (91,32%) RIBA pozitivnih i 5/10 (50%) RIBA intermitentnih. Analizom serološkog statusa evidentirana je statistički značajna razlika u prevalenci antitela na antigen c22-3 između ispitanika sa viremijom i onih bez viremije.(100% vs 36,36%, p<0,05). Prevalenca povišenih vrednosti ALT-a bila je statistički značajno viša u grupi RIBA pozitivnih u odnosu na RIBA intermitentne bolesnike (93,75% vs 40%, p<0,05), a prevalenca normalnih vrednosti ALT-a u grupi RIBA intermitentnih ispitanika.(60% vs 6,25%, p<0,05).

Zaključak: Korelacija viremije i prisustva antitela na virusne antigene je visoka.Prisustvo antitela na antigen c22-3 značajno korelira sa aktivnom virusnom replikacijom i viremijom.Vrednosti ALT-a koreliraju sa humoralnim imunskim odgovorom na virusne antigene.

Cljučne reci: Hepatitis C virus, imunoblot test, viremija, ALT

CORRELATION OF VIREMIA, VIRUS SPECIFIC ANTIBODIES, AND ALANINE AMINOTRANSFERASE IN PATIENTS WITH CHRONIC HEPATITIS C VIRAL INFECTION

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Introduction: In most patients with chronic HCV infection there is a persistent viremia accompanied by increased or fluctuating values of alanine aminotransferase (ALT-a) and antibodies to viral antigens.

The Aim: To establish the correlation of viremia, virus specific antibodies, and ALT-a as diagnostic markers in patients with chronic HCV infection.

Material and method: The study included 80 examinees who had been ELISA anti-HCV positive for >1.5 years. The following diagnostic procedure was performed: 1)immunoblot test (RIBA HCV2.0, Ortho Diagnostic) to detect antibodies to c22-3, c33-c, c100-3, and 5-1-1 antigens; 2)RT-PCR to detect serum HCV RNA; 3)ALT measurement.

Results: RIBA test was positive in 70(87.5%), while 10 (12.5%) examinees were RIBA indeterminate. HCV RNA was detected in 69(86.25%) patients, with 64/70 (91.32%) RIBA positive and 5/10(50%) RIBA indeterminate. By analyzing a serological status statistically significant difference was found in the prevalence of anti-c22-3 antibodies between the patients with viremia and those without it (100% vs 36,36%, p<0.05). The prevalence of elevated ALT values was significantly higher in RIBA positive patients than in RIBA indeterminate (93,75% vs 40%, p<0,05) and the prevalence of normal ALT values was higher in the group of RIBA indeterminate examinees (60% vs 6,25%, p<0.05).

Conclusion: The correlation of viremia and presence of antibodies to viral antigens was high. The presence of antibodies to c22-3 antigen correlated significantly with active viral replication and viremia. ALT values correlated with humoral immune response to viral antigens.

Key words: hepatitis C virus, immunoblot test, viremija, ALT

ZNACAJ CITOMEGALOVIRUSA U NASTANKU SIMPTOMATSKE KONGENITALNE I PERINATALNE INFЕКCIJE

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Uvod: Citomegalovirus (CMV) je teratogeni virus koji se može preneti intrauterino, na rođenju ili neposredno nakon rođenja (perinatalna infekcija). Infekcija fetusa i novorođenčeta može nastati nakon primarne ili rekurentne infekcije majke.

Cilj rada: Utvrditi učestalost CMV infekcije kod novorođenčadi sa simptomatskom kongenitalnom i perinatalnom infekcijom i proceniti značaj primarne i rekurentne infekcije majke.

Materijal i metode: Istraživanjem je obuhvaćena grupa od 16 novorođenčadi sa simptomima i znacima CMV infekcije. Dijagnoza CMV infekcije postavljena je serološki i testom antigenemije za detekciju antigena p65 u inficiranom leukocitima novorođenčadi.

Rezultati: Aktivna CMV infekcija otkrivena je kod 9(56,25%), a 7(43,75%) novorođenčadi bilo je negativno na CMV. Kod 2 (2/9) novorođenčeta CMV infekcija dijagnostikovana je u drugoj nedelji života (kongenitalna infekcija). Kod 7 (7/9) novorođenčadi aktivna CMV infekcija otkrivena je u period 1-5 meseci nakon rođenja. Primarna CMV infekcija otkrivena je kod majki 2 novorođenčeta (jednog sa kongenitalnom infekcijom). Rekurentna infekcija otkrivena je kod majki 3 novorođenčeta kod kojih su simptomi CMV infekcije evidentirani kasnije. Kod majki 4 dece (jednog sa kongenitalnom infekcijom) nije bilo moguće definisati tip infekcije.

Zaključak: Rezultati rada ukazuju na visoku učestalost CMV infekcije kod novorođenčadi sa simptomatskom kongenitalnom i perinatalnom infekcijom. Pored primarne, i rekurentna infekcija majke može da uzrokuje simptomatsku kongenitalnu i perinatalnu infekciju.

Ključne reci: citomegalovirus, perinatalna infekcija, kongenitalna infekcija.

SIGNIFICANCE OF CYTOMEGALOVIRUS IN THE ONSET OF SYMPTOMATIC CONGENITAL AND PERINATAL INFECTION

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Introduction: Cytomegalovirus (CMV) is a teratogenic virus characterized by intrauterine transmission during delivery, or perinatal transmission. Infection of a fetus or newborn may occur after primary or recurrent maternal infection.

The Aim: To establish the prevalence of CMV infection in newborns with symptomatic congenital or perinatal infection, and to evaluate the significance of primary and recurrent maternal infection.

Material and methods: The study included 16 newborns with symptoms and signs suggestive of CMV infection. The diagnosis of CMV infection was made serologically and using the assay to detect p65 antigen in the infected leukocytes of the newborns.

Results: Active CMV infection was detected in 9(56.25%) and 7(43.75%) newborns were CMV negative. In 2 newborns (2/9), CMV infection was diagnosed in the second week of life (congenital infection). In 7 newborns (7/9), active CMV infection was detected in the period from 1 to 5 months of age. Primary CMV infection was detected in mothers of 2 newborns (one with congenital infection). Recurrent infection was detected in mothers of 3 newborns, in whom the symptoms of CMV infections were observed later. In mothers of 4 newborns (one with congenital infection), it was not possible to define the type of infection.

Conclusion: The results of this paper indicated a high prevalence of CMV infection in newborns with symptomatic congenital and perinatal infection. In addition to primary CMV infection, recurrent maternal infection can cause symptomatic congenital and perinatal infection as well.

Key words: cytomegalovirus, perinatal infection, congenital infection.

ДЕЛЕЦИЈА СТ2 ГЕНА ПОЈАЧАВА УРОБЕНУ АНТИ-ТУМОРСКУ ИМУНОСТ

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Увод: СТ2 молекул је члан интерлеукин-1 фамилије рецептора (ИЛ-1Р), а његов лиганд је члан ИЛ-1 фамилије, ИЛ-33. ИЛ-33/СТ2 сигнални пут регулише имунски одговор у бројним аутоимунским и запаљенским болестима, али улога ИЛ-33/СТ2 сигналног пута у расту тумора и метастазирању је непозната.

Циљ: Циљ нашег истраживања био је испитати да ли делеција СТ2 гена утиче на појаву, раст и метастазирање тумора и анти-туморску имуност у експерименталном моделу тумора дојке.

Материјал и методе: Као експерименталне животиње користили смо БАЛБ/Ц мишеве и СТ2-/- мишеве на БАЛБ/Ц подлози. Тумори су индуковани апликацијом 4Т1 малигнућ ћелија (5 x 10⁴) директно у масно јастуче млечне жлезде. Дванаестог дана експеримента жртвоване су животиње и изоловане слезине. Магнетном сепарацијом изоловане су НК ћелије и ЦД8 лимфоцити и одређивана им је цитотоксичност. Делеција НК ћелија и ЦД8 лимфоцита је постигнута и.п. апликацијом специфичних моноклонских антитела. Функционални фенотип НК ћелија одређиван је проточном цитометријом.

Резултати: Делеција гена за СТ2 успорава раст тумора и успостављање метастаза и појачава цитотоксичну активност укупних спленоцита, НК ћелија и ЦД8+ Т лимфоцита, *in vitro*. *In vivo* делеција ЦД8+ лимфоцита или НК ћелија указује на кључну улогу НК ћелија у појачаној анти-туморској Имуности СТ2-/- мишева. СТ2 дефицијентни мишеви конститутивно имају значајно већи проценат ИФН- γ продукујућих НК ћелија.

Закључци: Показали смо по први пут да се успорен раст тумора дојке и метастазирање код СТ2-/- мишева може делом објаснити појачаном цитотоксичном активношћу туморцидних НК ћелија.

Кључне речи: СТ2, 4Т1 мишији тумор дојке, цитотоксичност, НК ћелије.

ST2 DELETION ENHANCES INNATE ANTI-TUMOR IMMUNITY

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Introduction: ST2 is a member of the IL-1 receptor family and IL-33 was recently identified as its natural ligand. The IL-33/ST2 pathway regulates immune responses in autoimmune and inflammatory conditions, but the role of ST2 signaling on tumor growth and metastasis is unknown.

The Aim: To investigate whether ST2 gene deletion affects tumor appearance, growth and metastasis, and anti-tumor immunity in an experimental metastatic breast cancer model.

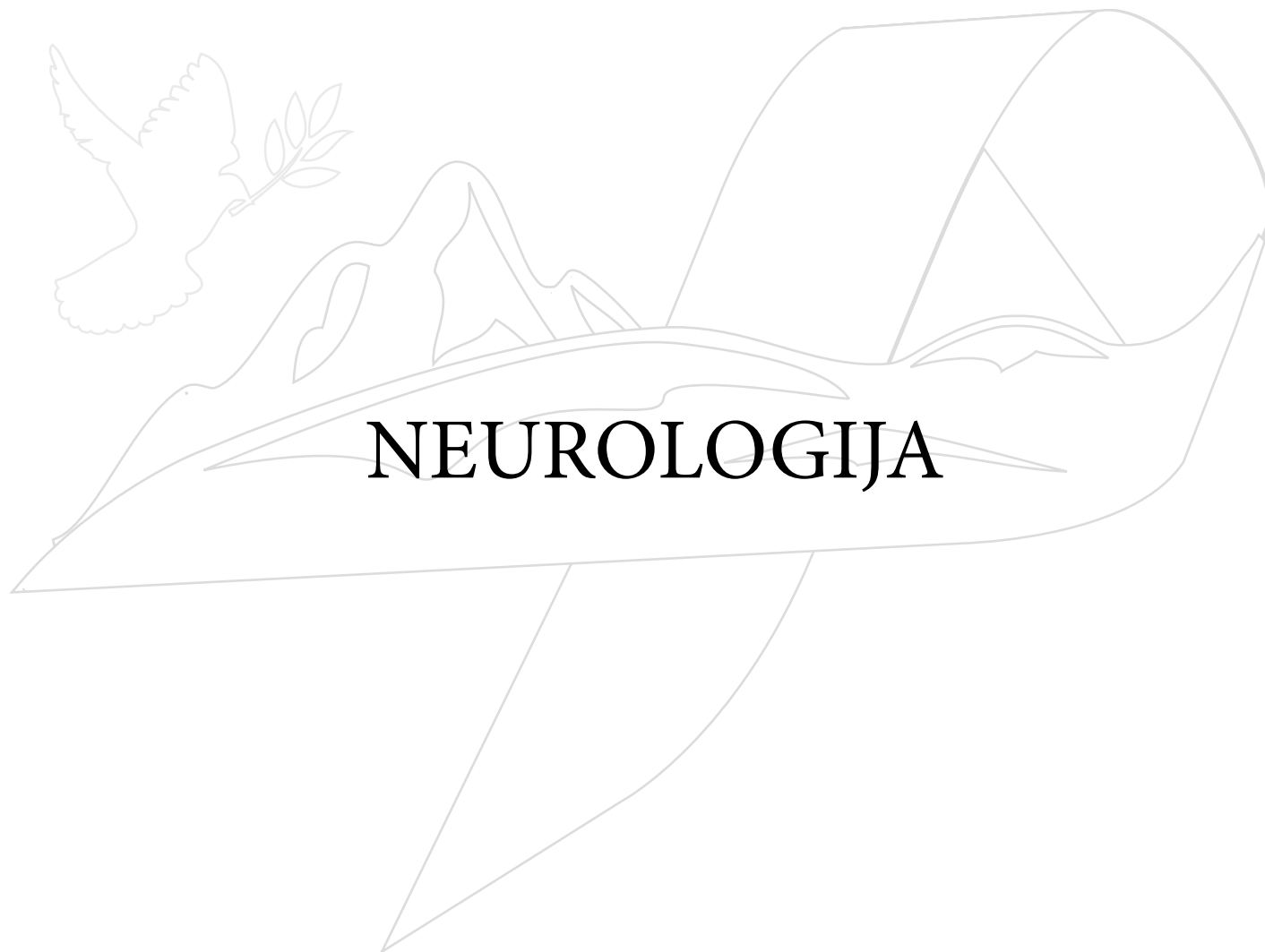
Materials and Methods: We used BALB/c mice and ST2-/- mice on BALB/c background. Mice were injected with 5 x 10⁴ 4T1 breast cancer cells into mammary fat-pad. On day 12 after tumor inoculation, the animals were sacrificed and single-cell suspensions from spleen was obtained. NK and CD8⁺ cells were isolated from spleen by magnetic cell sorting and we estimated their cytotoxicity. NK and CD8⁺ cells depletion was achieved by i.p. application of specific mAbs. Functional phenotype of NK cells was analyzed using flow cytometry.

Results: Deletion of ST2 in mice bearing mammary carcinoma attenuated tumor growth and metastasis, which was accompanied by higher cytotoxic activity of splenocytes, NK cells and CD8⁺ T cells, *in vitro*. *In vivo* depletion of CD8⁺ or NK cells revealed a key role for NK cells in enhanced anti-tumor immunity in ST2^{-/-} mice. ST2^{-/-} mice constitutively had significantly higher percentages of IFN- γ expressing NK cells.

Conclusions: We report for the first time that suppressed breast cancer progression and metastasis in mice lacking ST2 corresponds mainly with enhanced cytotoxic activity of NK cells.

Key words: ST2, 4T1 mouse breast cancer, cytotoxicity, natural killer cells





NEUROLOGIJA

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Uvod: Više istraživanja je pokazalo da je rizik od pogoršanja multiple skleroze manji u toku trudnoće, a veći nakon porođaja, dok neke studije novijeg datuma ovo osporavaju.

Cilj: Cilj našeg rada bio je da se kod pacijentkinja obolelih od multiple skleroze utvrdi tok bolesti u toku trudnoće i godinu dana nakon porođaja, odnosno tok i ishod same trudnoće.

Materijal i metode: Retrospektivnom studijom obuhvaćeno je ukupno 16 trudnoća kod žena obolelih od multiple skleroze porođenih u periodu od 1.1.2002. do 1.1.2012. na Klinici za Ginekologiju i akušerstvo Kliničkog centra Vojvodine. Analizirani su podaci o pogoršanjima multiple skleroze u toku trudnoće i godinu dana nakon porođaja, terminu porođaja, kao i ishoda u smislu postojanja kongenitalnih anomalija, ocene novorođenčeta po Apgaru u prvom i petom minutu života.

Rezultati: Tokom trudnoće jedna žena je imala pogoršanje, a u prvoj godini posle porođaja tri žene imale su pogoršanja, s tim da su sva tri pogoršanja bila u prva tri meseca nakon porođaja. Nije postignuta statistička značajnost u pogledu broja pogoršanja tokom trudnoće i nakon porođaja. Porođaji su svi sem jednog bili u terminu. Telesni parametri novorođenčadi i ocene po Apgar skor u se kretale u opsegu normalnih vrednosti za ročnu novorođenčad zdrave populacije.

Zaključci: Trudnoća nije povezana sa povećanim rizikom od pogoršanja multiple skleroze. Postoji izvestan rizik od pogoršanja u prva tri meseca nakon porođaja, ali on ne dostiže statističku značajnost. Multipla skleroza ne utiče na predviđeni termin porođaja, na pojavu kongenitalnih anomalija i vitalne parametre novorođenčeta.

Ključne reči: multipla skleroza, trudnoća, pogoršanje, novorođenče

MULTIPLE SCLEROSIS AND PREGNANCY

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Introduction: Several studies found lower risk of exacerbation of multiple sclerosis during pregnancy, but increased risk after delivery. However, some recent surveys showed no connection between pregnancy and clinical course of multiple sclerosis.

Aim: The aim was to assess the risk of exacerbation in a group of women with multiple sclerosis during pregnancy and after delivery, as well as the course of pregnancy and its outcome.

Material and Methods: Total of 16 spontaneous pregnancies in women with diagnosed multiple sclerosis, who had delivered in the period from January 1st 2002 until January 2012 at the Clinic of Gynecology and Obstetrics, were analyzed retrospectively. Data concerning exacerbations of multiple sclerosis during pregnancy and one year after the birth, term of birth and outcome including congenital anomalies, Apgar score in the first and fifth minute, were taken in consideration.

Results: During pregnancy one woman experienced exacerbation, but in the year after delivery three women had exacerbation. Nevertheless, the difference of number of exacerbations before and after delivery did not reach the level of statistical significance. All the births but one were full-term. Vital parameters and the Apgar scores were within the range of normal for the termed newborns of the healthy parents.

Conclusion: Pregnancy is not connected with higher risk of exacerbation of multiple sclerosis. Although there is higher risk of exacerbation during first trimester, it is not statistically significant. Multiple sclerosis does not affect the term, congenital anomalies and vital parameters of the newborn.

Key words: multiple sclerosis, pregnancy, exacerbation, newborn

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Uvod: Kod bolesnika sa epilepsijom se, češće nego u opštoj populaciji, javljaju različiti kognitivni ispadi. Faktori rizika za kognitivne smetnje kod osoba sa epilepsijom su brojni i često deluju kumulativno.

Cilj rada: Cilj rada je da proceni značaj oštećenja temporalnog režnja u pojavi poremećaja verbalnog pamćenja kod osoba sa epilepsijom.

Materijal i metode: Ispitivani su bolesnici oba pola, stariji od 18 godina, sa dijagnozom epilepsije i urađenom NMR glave koji su razvrstani u dve grupe. Prvu grupu činili su bolesnici sa lezijom u temporalnom režnju, a drugu grupu bolesnici bez oštećenja temporalnog režnja. Za procenu verbalnog pamćenja korišćen je *Rejov test verbalnog učenja i pamćenja (RAVLT)*, i to tri merenja: neposredno upamćivanje, odloženo prisećanje i rekognicija. Za grubu procenu celokupnog kognitivnog funkcionisanja korišćen je *Mini mental test za demencije (MMSE)*.

Rezultati: Istraživanjem je obuhvaćeno 17 bolesnika sa epilepsijom, 10 (58,82%) žena i 7 (41,18%) muškaraca. U prvoj grupi je bilo 8 (47,1%) bolesnika, po 4 sa lezijom u desnom i levom temporalnom režnju, dok je u grupi bez oštećenja temporalnog režnja bilo 9 (52,9%) bolesnika. Na testu verbalnog pamćenja (RAVLT) bolesnici iz prve grupe imali su statistički značajno slabije skorove na merenju odloženog prisećanja ($t=3,04$; $p=0,029$). U poređenju bolesnika sa različitim lateralizacijom temporalnih lezija, slabije skorove su postigli bolesnici sa oštećenjima levog temporalnog režnja ($t=2,94$; $p=0,026$).

Zaključak: Lezije temporalnog režnja su faktor rizika za razvoj poremećaja verbalnog pamćenja kod osoba sa epilepsijom. Problemi u verbalnom pamćenju izraženiji su ako je lezija u temporalnom režnju levostрана.

Ključne reči: verbalno pamćenje, epilepsija.

EVALUATION OF VERBAL MEMORY OF PERSONS WITH TEMPORAL LOBAR EPILEPSY

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Introduction: Cognitive disorders more frequently occur to patients who suffer from epilepsy than to general population. Risk factors for cognitive difficulties for people with epilepsy are numerous and they often act cumulative.

The Aim: To evaluate significance of temporal lobe injury when there is verbal memory damage of persons with epilepsy.

Materials and methods: Patients of both sex, older than 18 years, who are safely diagnosed with epilepsy and to whom NMR of cranium is done, are included in examination. All are divided in two groups, *first group* includes patients with lesion in temporal lobe, and the *second group* is consisted of patients without temporal lobe damage. The Rey Auditory Verbal Learning Test (RAVLT), is used for evaluation of verbal memory and three processes of measuring are done: indirect memory, delayed recalling and recognition. Moreover, The Mini-mental State Examination (MMSE) is used for rough evaluation.

Results: Research obtains 17 patients with epilepsy, from which 10 of them (58,82%) are women and 7 (41,18%) are men. There were 8 (47,1%) patients in the first group, four in the each, the one with lesion in the right, and the second in the left temporal lobe, whereas 9 (52,9%) of them are in the group of patients without temporal lobe damage. Patients from the first group, according to statistics, had significantly weaker results on the evaluation of delayed recalling ($t=3,04$; $p=0,029$) at the verbal memory test (RAVLT). In addition, the results of patients with the damage of left temporal lobe were weaker ($t=2,94$; $p=0,026$) compared to patients with different lateralization of temporal lesions.

Conclusion: Lesion of temporal lobe are risk factors for development of verbal memory disorder considering patients who suffer from epilepsy. Issues with verbal memory are more expressed if the lesion in temporal lobe is left-sided.

Keywords: verbal memory, epilepsy.

KLINIČKE KARAKTERISTIKE CHARCOT-MARIE-TOOTH-OVE NEUROPATIJE SA MUTACIJAMA U CONNEXIN 32 GENU

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Uvod: Charcot Marie Tooth-ova bolest je progresivna, genetski heterogena neuropatija koja se karakteriše distalnom mišićnom slabošću, atrofijom, arefleksijom, gubitkom senzibiliteta, koštano-zglobnim deformitetima (pes cavus i čekičasti palčevi) i velikim varijacijama u fenotipskom ispoljavanju. X vezana intermedijarna forma bolesti CMTX nastaje kao posledica mutacije gena Cx32, razgraničava dve glavne forme CMT1 i CMT2 i karakteriše se intermedijarnim vrednostima brzine nervne sprovodljivosti, težom kliničkom slikom kod muškaraca i većim fenotipskim varijacijama kod žena.

Cilj rada: Cilj ovog rada je ispitivanje kliničkih karakteristika grupe pacijenata sa CMTX formom.

Materijal i metode: Retrospektivnom studijom obuhvaćeno je 15 pacijenata Klinike za neurologiju i psihijatriju za decu i omladinu sa dijagnostikovanim Cx32 mutacijom i analizirani su njihovi demografski i klinički podaci: opšta neurološka onesposobljenost (NDS skor), subkor mišićnih slabosti (NDS-W), subkor mišićnih refleksa (NDS-R), subkor senzibiliteta (NDS-S), kao i koštanozglobni deformiteti.

Rezultati: Većina dobijenih podataka ukazivala je na težu kliničku sliku kod muškaraca i tipičnu ekspresiju fenotipa vezanu za X nasleđivanje, osim analize refleksa koja nije pokazala teži stepen arefleksije kod muškaraca.

Zaključak: Među našim ispitanicima sa CMT neuropatijom i Cx32 mutacijom pokazano je da su muške osobe imale značajno teže mišićne slabosti i senzitivne deficite ali ne i češću arefleksiju.

Glavne reči: X vezana CMT, Cx32, klinička slika

CLINICAL CHARACTERISTICS OF CHARCOT-MARIE-TOOTH NEUROPATHY WITH CONNEXIN 32 MUTATIONS

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Introduction: Charcot Marie Tooth disease is a progressive, genetically heterogeneous neuropathy characterized by distal muscle weakness, atrophy, areflexia, sensory loss, skeletal deformities (pes cavus and hammer-toes) and great variations in phenotype expression. X-linked intermediate form of disease CMTX is caused by a Cx32 gene mutation, it borders the two main forms CMT1 and CMT2, and is characterized by intermediate forms of nerve conduction velocity, more severe clinical features in male population and greater phenotype variety in female population.

The Aim: The aim of this study is examination of clinical features of a group of CMTX patients.

Materials and Methods: 15 patients of Clinic for Neurology and Psychiatry for Children and Youth diagnosed with Cx32 mutation have been chosen in a retrospective study and analyzed for their demographical and clinical data: Neurological Disability Score (NDS), muscle weakness sub score (NDS-W sub score), tendon reflexes sub score (NDS-R sub score), sensory sub score (NDS-S sub score), skeletal deformities.

Results: Most of the collected data pointed to more severe clinical features in male population group and typical X-linked type of inheritance, except reflex analysis which didn't point to more severe male areflexia.

Conclusion: Amongst our patient group with CMT neuropathy and Cx32 mutation, male patients had more severe muscle weakness and sensory loss, but not more frequent areflexia.

Key words: X-linked CMT, Cx32, phenotype

POKUŠAJ KLASIFIKACIJE KLINIČKE FENOMENOLOGIJE PSIHOGENIH NEPILEPTIČNIH NAPADA KRITERIJUMIMA SEMIOLOŠKE KLASIFIKACIJE EPILEPTIČNIH NAPADA

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Uvod: Psihogeni neepileptički napad (PNEN) je iznenađna promena ponašanja, percepcije, mišljenja ili osjećanja koja je vremenski ograničena i slična je ili se može zameniti sa epilepsijom, ali kod koje ne postoje elektrofiziološke promene koje se registruju EEG-om a koje prate pravi epileptični napad.

Cilj: Semiološka klasifikacija epileptičkih napada daje osnovu da po istim karakteristikama klasifikujemo PNEN, što bi omogućilo da se na tipskom nivou razlikuju pojedinačne forme PNEN-a od epileptičkih napada.

Materijal i metode: Pacijenti sa PNEN-om su identifikovani retrospektivnom analizom elektronske medicinske dokumentacije Klinike za neurologiju i njenih Centra za epilepsije i EEG kabineta. Tražene su dijagnoze: psihogeni neepileptički napadi, pseudonapadi, konvezivni napadi ili psihogene konvulzije, koje su zavedeni pod MKB-10 šiframa F44.5 (psihogene konvulzije) i R55 (konvulzije). U studiju su uključeni bolesnici kod kojih je video-EEG pokazao kliničku sliku PNEN-a sa odsutnim epileptiformnim ictalnim zapisom. Kao osnova za pokušaj klasifikacije PNEN uzeta je semiološka klasifikacija epileptičnih napada (Lüders et al., 1998).

Rezultati: Svih 59 bolesnika sa PNEN-om je moglo da se klasifikuje u glavne motorne kliničke varijante kao hipermotorne (31%), fokalni klonički (20%), bilateralni tonički (sa tremorom) (17%), atonični (12%), bilateralni klonički (7%) i kombinovani obrazac (13%) PNEN-a. Uz to, dialeptička komponenta je uočena kod 57%, senzorna (aura) kod 58%, a autonomna komponenta kod 8% bolesnika.

Zaključak: Klasifikacijom PNEN-a prema analogiji sa semiološkom klasifikacijom epileptičkih napada, zaključili smo da iako postoje manja terminološka ograničenja, PNEN imaju tendenciju da se grupišu u nekoliko karakterističnih kliničkih varijanti koje dosta dobro mogu da se opišu korišćenjem semiološke klasifikacije epileptičkih napada.

Glavne reči: Psihogeni neepileptički napadi, semiološka klasifikacija, kliničke varijante, klasterovanje znakova.

ATTEMPT TO CLASSIFICATE CLINICAL PHENOMENOLOGY OF PSYCHOGENIC NONEPILEPTIC SEIZURES BY CRITERIA OF SEMIOLOGICAL CLASSIFICATION OF EPILEPTIC SEIZURE

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Introduction: Nonepileptic psychogenic seizures (PNES) are sudden change in behavior, perception, thought or feeling that are time limited and similar to or may be confused with epilepsy, but in which there are no electrophysiological changes recorded EEG that accompany a true epileptic seizure.

Aim: The semiological classification of seizures provides a basis to classify PNES by the same characteristics, allowing you to make difference between specific forms of a PNES and epilepsy seizures on type-level.

Materials and methods: Patients with PNES were identified by retrospective analysis of electronic medical records of the Department of Neurology and its Center for Epilepsy and EEG cabinet. Requested the diagnosis: neepileptički psihogeni napadi, pseudonapadi, konverzivni napadi ili psihogeni napadi, which have been classified under the ICD-10 code F44.5 (psychogenic seizures) and R55 (convulsions). The study included patients which video-EEG showed clinical manifestation of PNES and without epileptiform ictal recordings. As basis for the attemptation of classification PNES was taken semiological classification of epileptic seizures (Lüders et al., 1998).

Results: All 59 patients with PNES could be classified into major motor clinical variant as hypermotor (31%), focal clonic (20%), bilateral tonic (with tremors) (17%), atonic (12%), bilateral clonic (7%) and mixed pattern (13%) PNES. In addition, dialeptic component is observed in 57%, sensory (aura) in 58%, and an autonomic component in 8% of patients.

Conclusion: Classifying PNES by analogy with the semiological classification of epileptic seizures, we concluded that although there are some minor terminological restrictions, PNES tend to be grouped into several characteristic clinical variants that may very well be described using a semiological classification of epileptic seizures.

Keywords: nonepileptic psychogenic seizures, semiological classification, clinical manifestations, signs clustering

ZNAČAJ BIOHEMIJSKIH, NEUROFIZIOLOŠKIH I NEURORADIOLOŠKIH PROCEDURA U POSTAVLJANJU DIJAGNOZE PEDIJATRIJSKE MULTIPLE SKLEROZE

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Uvod: Multipla skleroza (MS) je hronično, zapaljensko, autoimuno i demijelinizaciono oboljenje. Dijagnoza MS je veoma kompleksna i obuhvata osim neurološkog nalaza i biohemijske, neurofiziološke i neuroradiološke parametre.

Cilj: Cilj naše studije je bio utvrđivanje značaja dijagnostičkih metoda: izoelektričnog fokusiranja likvora (IEF), vizuelnih evociranih potencijala (VEP) i magnetne rezonance (MR) u postavljanju dijagnoze MS u razvojnom dobu.

Materijal i metode: Istraživanje je rađeno u Klinici za neurologiju i psihijatriju za decu i omladinu Medicinskog fakulteta u Beogradu. U retrospektivnoj studiji je analizirana medicinska dokumentacija 47 pacijenata sa dijagnozom MS koji su se lečili u periodu od 1985-2011. godine. Dijagnoza MS je postavljena na osnovu revidiranih McDonald-ovih kriterijuma iz 2010. godine, a svi pacijenti su u trenutku postavljanja dijagnoze imali manje od 18 godina. Rađena je deskriptivna statistička analiza u cilju poređenja značaja ranije pomenutih dijagnostičkih procedura.

Rezultati: Od 47 pacijenata, 29 (61,7 %) je bilo ženskog pola a 18 (38,3%) muškog. Prosečni uzrast pacijenata je bio 27,4 godine. Od 36 pacijenata kojima je rađen VEP, 23 (63,9%) je imalo pozitivan nalaz, a kod 13 (36,1%) je nalaz bio negativan. Od 32 ispitana pacijenta, nalaz IEF je kod 26 (81,3%) bio pozitivan, a kod 6 (18,7%) negativan. Od 44 pacijenta kojima je rađena MR, kod 43 pacijenta (97,7%) je pokazala pozitivan nalaz, a kod 1 (2,3%) negativan.

Zaključak: Rezultati naše studije su pokazali da je MR senzitivnija metoda u postavljanju dijagnoze MS u odnosu na VEP i IEF.

Ključne reči: multipla skleroza, magnetna rezonanca, vizuelni evocirani potencijali, izoelektrično fokusiranje likvora.

THE SIGNIFICANCE OF BIOCHEMICAL, NEUROPHYSIOLOGICAL AND NEURORADIOLOGICAL PROCEDURES IN THE DIAGNOSIS OF PEDIATRIC MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis (MS) is a chronic, inflammatory, autoimmune and demyelization disease. The diagnosis of MS is a very complex, involving neurological findings, biochemical, neurophysiological and neuroradiological parameters.

The Aim: The aim of our study was to determine the importance of diagnostic procedures: isoelectric focusing of cerebrospinal fluid (IEF), visual evoked potentials (VEP) and magnetic resonance imaging (MRI) in diagnosis of MS in developmental age.

Materials and Methods: The study was conducted at the Clinic of Neurology and Psychiatry for Children and Youth, Medical Faculty, University of Belgrade. In a retrospective study were analyzed medical records of 47 patients with MS, treated since 1985. to 2011. year. The MS diagnosis was based on the revised 2010. McDonalds criteria. All patients at the time of diagnosis had less than 18 years. We used descriptive statistical analysis to compare the importance of the mentioned diagnostic procedures.

Results: Of 47 patients, 29 (61.7%) were females and 18(38.3%) were males. The average age of patients was 27.4 years. Of 36 patients who underwent VEP, 23 (63.9%) had positive findings and 13 (36.1%) negative. Of 32 patients, the IEF findings was positive in 26 (81.3%), in 6 (18.7%) negative. Of 44 patients who underwent MRI, in 43 patients (97.7%) MRI was positive and in 1 (2.27%) negative.

Conclusion: In our study we found that MRI showed a higher sensitivity in a diagnosis of MS compared to VEP and IEF.

Key words: multiple sclerosis, magnetic resonance imaging, visual evoked potentials, isoelectric focusing of cerebrospinal fluid

UČESTALOST I TIP POREMEĆAJA VIŠIH KORTIKALNIH FUNKCIJA TOKOM AURE MIGRENE

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Uvod: Aura se javlja kod 20-30% obolelih od migrene. Tipični simptomi aure su vizuelni i senzitivni fenomeni. Međutim, opisi obolelih od migrene sa aurom ukazuju da su pored primarnih oblasti korteksa prolazno zahvaćeni i ostali kortikalni areali.

Cilj: Cilj ovog rada je da proceni učestalost i tip prolaznih poremećaja govora, praksije, gnozij e i memorije koji se javljaju kao deo vizuelne i/ili senzitivne aure.

Materijal i metode: Ukupno je 60 bolesnika ispitano putem intervju a. Na osnovu dobijenih rezultata pacijenti su podeljeni u dve grupe, sa i bez poremećaja viših kortikalnih funkcija (VKF). Ove dve grupe su međusobno upoređivane po demografskim obeležjima i po osobinama aure. Zatim je Grupa I podeljena na Podgrupu Ia (samo sa vizuelnom aurom) i Podgrupu Ib (sa vizuelnom i/ili senzitivnom aurom). Poređenjem ove dve podgrupe je analizirana razlika u pojavi i tipu poremećaja VKF.

Rezultati: 65% ispitanika je prijavilo najmanje jedan poremećaj VKF, i kod njih je aura značajno duže trajala (28,51 ± 16,39 vs. 19,76 ± 11,23). Ispitanici Podgrupe Ib su imali duže trajanje aure. Takođe, je uočeno da sa dužinom trajanja aure raste i broj ispitanika sa disfazijom. Najčešći poremećaj VKF bila je disfazija motornog tipa (82,05%) i poremećaj nominacije (30,74%). U Podgrupi Ib značajno češće se javljala motorna disfazija (96,30% vs. 50,00%) i anomija (40,74% vs. 8,33%) u poređenju sa Podgrupom Ia.

Zaključak: Dobijeni rezultati jasno ukazuju da su poremećaji VKF značajno češći nego što se smatra, kao i da dužina aure utiče na pojavu poremećaja VKF.

Ključne reči: migrena sa aurom, viši kortikalni poremećaji, disfazija

THE FREQUENCY AND TYPE OF DISORDERS OF HIGHER CORTICAL FUNCTIONS DURING MIGRAINE WITH AURA

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Introduction: Aura occurs in 20-30% of patients with migraine. Typical symptoms of aura are visual phenomena. However, a description of patients suggests that besides primary cortical areas other contiguous cortical parts are also impaired in migraine.

The Aim: The aim of this study was to evaluate the frequency and type of transient disorders of higher cortical functions (HCF) that occur as part of the visual and/or sensory aura.

Materials and methods: 60 patients were examined through an interview. Based on the results patients were divided into two groups, with and without HCF. These two groups were compared with each other by demographic characteristics and characteristics of aura. Then Group I was divided into Subgroup Ia (only with visual aura) and Subgroup Ib (complex aura). Both subgroups were analyzed per occurrence and type of disorders of HCF.

The results: 65% of patients reported at least one disorder of HCF. Aura lasted significantly longer in patients in Group I (28.51 ± 16.39 vs. 19.76 ± 11.23). The most common disorder of HCF was dysphasia-motor type (82.05%), followed by disorder of nominations (30.74%). In the Subgroup Ib were significantly more frequently motor dysphasia (96.30% vs. 50.00%) and anomie (40.74% vs. 8.33%) compared with Subgroup Ia. Subgroups Ib had a longer duration of aura.

Conclusion: The results suggest that disorders of HCF were significantly more frequent than it is considered and the length of the aura affects the appearance of disorders of HCF.

Key words: migraine with aura, disorders of HCF, dysphasia

DEMOGRAFSKE, KLINIČKE I PARAKLINIČKE KARAKTERISTIKE BOLESNIKA SA OBOLJENJIMA IZ SPEKTRA NEUROMIJELITISA OPTIKA

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Uvod: Otkriće autoantitela na akvaporin-4 vodeni kanal (NMO-IgG) u centralnom nervnom sistemu omogućilo je definisanje spektra neuromijelitisa optika (NMO), koji pored NMO obuhvata i longitudinalno-ekstenzivni transverzalni mijelitis (LETM) i rekurentni optički neuritis (RON).

Cilj rada: Analiza demografskih, kliničkih i parakliničkih karakteristika bolesnika sa oboljenjima iz NMO spektra, koji su registrovani u hospitalnom registru na Klinici za neurologiju Kliničkog centra Srbije od 01.01.2009. do 31.12.2011.godine.

Materijal i metode: Kod 19 bolesnika (11 NMO, 3rLETM, 3rON, 2LETM) su analizirane osnovne demografske karakteristike, prisustvo drugih autoimunskih bolesti, osnovne kliničke karakteristike bolesti, godišnja stopa relapsa, stepen neurološkog deficita (izražen proširenom skalom neurološke onesposobljenosti-EDSS), nalazi NMO-IgG, rutinski nalazi u likvoru, nalazi na magnetnoj rezonanci (MR) kičmene moždine i mozga, kao i primenjivana terapija.

Rezultati: Prosečna starost na početku bolesti je iznosila 41,3±14,0 godina, a prosečno trajanje bolesti 6,75±4,8 godina. Bolest je bila češća kod žena (odnos polova žene:muškarci, 8,5:1). Mediana EDSS skora na poslednjem pregledu je bila 5.0 (raspon, 1.5-9.0). Prosečna godišnja stopa relapsa kod bolesnika sa NMO je iznosila 0,93. NMO-IgG je detektovan u serumu 14 bolesnika (10 NMO, 1 LETM, 2 rLETM, 1 rON). Prosečna dužina lezije na kičmenoj moždini je iznosila 8 (raspon, 3-18) vertebralnih segmenata. Relapsi su tretirani visokim dozama kortikosteroida i/ili terapijskom izmenom plazme, a kod 4 bolesnika i intravenskim imunoglobulinima. U terapiji održavanja su primenjivani kortikosteroidi i imunosupresivi.

Zaključak: Klasifikovanje u oboljenje iz spektra NMO podrazumeva razmatranje kliničkih manifestacija, neuroradioloških i laboratorijskih nalaza, a pravovremena dijagnoza je neophodna radi pravovremenog odabira najadekvatnijeg terapijskog pristupa.

Ključne reči: spektar neuromijelitisa optika, NMO-IgG, magnetna rezonanca, terapija

DEMOGRAPHIC, CLINICAL AND PARACLINICAL CHARACTERISTICS OF PATIENTS WITH NEUROMYELITIS OPTICA SPECTRUM DISORDERS

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Introduction: Neuromyelitis optica (NMO) spectrum disorders (NMOSD) includes NMO but also high-risk NMO syndromes such as longitudinally extensive transverse myelitis (LETM) and recurrent optic neuritis (RON). NMO-IgG is a specific laboratory marker of NMOSD which targets aquaporin-4 water channel in the central nervous system.

The Aim: To analyze demographic, clinical and paraclinical characteristics of NMOSD patients who have been registered in the hospital-based registry at the Clinic of Neurology Clinical Center of Serbia, from 01.01.2009. to 31.12.2011.

Material and methods: In 19 NMOSD patients (11 NMO, 3rLETM, 3rON, 2LETM) we analyzed: demographic characteristics, other autoimmune diseases, clinical characteristics of the disease, neurological disability level (using the Expanded Disability Status Scale, EDSS), NMO-IgG, routine cerebrospinal fluid findings, spinal cord and brain magnetic resonance imaging findings and treatment.

Results: Mean age at onset was 41.3 ± 14.0 years and mean disease duration 6.75±4.8 years. Female: male ratio was 8,5:1. Median EDSS score at last examination was 5.0 (range, 1.5- 9.0). The average annual relapse rate in NMO patients was 0.93. NMO-IgG was detected in sera of 14 patients (10 NMO, 1 LETM, 2 rLETM, 1 RON). The average length of spinal cord lesions was 8 (range, 3-18) vertebral segments. Relapses were treated with high doses corticosteroids and/or plasma exchange, in 4 cases also with intravenous immunoglobulins. Corticosteroids and immunosuppressants were used for maintenance therapy.

Conclusion: Clinical characteristics, laboratory and neuroradiological findings are important for the diagnosis of NMOSD. An early diagnosis has important treatment implications.

Key words: neuromyelitis optica spectrum, NMO-IgG, magnetic resonance imaging, treatment

HIPOGONADIZAM I EREKTLNA DISFUNKCIJA KOD BOLESNIKA SA MIOTONIČNOM DISTROFIJOM TIP 1

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Uvod: Miotonična distrofija tip 1 (MD1) je najčešći oblik mišićne distrofije kod odraslih sa karakteristikama multiorganskih poremećaja. Erektalna disfunkcija (ED) je nemogućnost muškarca da ostvari čvrstu erekciju adekvatnu za seksualni čin.

Cilj: Ispitati učestalost ED i hipogonadizma, njihova međusobna povezanost, kao i uticaj ED na kvalitet života bolesnika sa DM1.

Materijal i metode: Analizirana je serija od 25 muškaraca, starosti od 22. do 58. godina sa MD1. Za procenu zahvaćenosti mišića korišćena je Muscular Impairment Rating Scale (MIRS). ED je procenjena pomoću indeksa erektilne funkcije (IIEF). Kod svih bolesnika određivan je nivo sledećih seksualnih hormona u serumu: foliklostimulišućeg hormona (FSH), luteinizirajućeg hormona (LH) i testosterona. Svi pacijenti su popunili srpsku verziju SF-36 upitnika kao meru kvaliteta života vezanog za zdravlje.

Rezultati: Prosečan skor na IIEF testu iznosio je 16,4±6,2. Srednja vrednost nivoa testosterona kod ispitivanih bolesnika sa MD1 bila je u okviru normalnih vrednosti (16,8±6,5 mIU/l). Srednja vrednost za LH iznosila je 11,5±4,4 što je bilo iznad granice referentnog nivoa. Prosečna koncentracija FSH je takođe bila povećana i iznosila je 22,7±14,7 mIU/l. Za poređenje kontinuiranih varijabli korišćen je Mann-Whitney U test, a za poređenje nominalnih i ordinalnih podataka χ^2 test.

Zaključci: Rezultati istraživanja pokazuju značajno oštećenje kvaliteta života, i to naročito u mentalnom domenu, što govori o negativnom psihološkom i socijalnom efektu ED na bolesnika.

Ključne reči: miotonična mišićna distrofija, erektilna disfunkcija, hipogonadizam.

HIPOGONADISM AND ERECTILE DYSFUNCTION PATIENTS WITH MYOTONIC DYSTROPHY TYPE 1

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Introduction: Myotonic dystrophy type 1 (DM1) is the most common form of muscular dystrophy in adults with features multiorganskih disorders. Erectile dysfunction (ED) the inability of man to achieve a firm erection adequate for sexual intercourse.

The Aim: To assess the prevalence of ED and hypogonadism and the impact of ED on quality of life of patients with DM1.

Materials and Methods: This study analyzed a series of 25 men with diagnosis in MD1. To assess the involvement of muscle was used Muscular Impairment Rating Scale (MIRS). ED was assessed using the index of erectile function (IIEF). All patients were determined following levels of sex hormones in serum: follicle hormone (FSH), luteinizing hormone (LH) and testosterone. All patients completed the Serbian version of the SF-36 questionnaire as a measure of quality of life related to health.

Results: The average score on the IIEF test was 16.4 ± 6.2. The mean testosterone level of patients with DM1 was 16.8 ± 6.5 mIU / l. The mean amount of LH was 11.5 ± 4.4. The average concentration of FSH was 22.7 ± 14.7 mIU / l. For comparison of continuous variables used the Mann-Whitney U test, a comparison of nominal and ordinal data χ^2 test.

Conclusion: The results show a significant impairment of quality of life, indicating that the negative psychological and social effects of ED patients.

Keywords: myotonic dystrophy, erectile dysfunction, hypogonadism

ISPITIVANJE PRISUSTVA METABOLIČKOG SINDROMA KOD BOLESNIKA SA MIOTONIČNOM DISTROFIJOM TIP 1

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Uvod: Miotonična distrofija tip 1 (DM1) je autozomno-dominantno nasledna multisistemska bolest. Endokrini poremećaji su česti kod bolesnika sa DM1. Najčešće opisivani među njima su insulinska rezistencija i glukozna intolerancija, koje predstavljaju osnov nastanka metaboličkog sindroma (MetS).

Cilj: Utvrđivanje učestalosti MetS kod bolesnika sa DM1 i identifikacija potencijalnih uzroka ovog sindroma.

Materijal i metode: Istraživanje je obuhvatilo 143 bolesnika sa DM1, hospitalizovanih na Klinici za neurologiju Kliničkog centra Srbije. Svim bolesnicima su pri hospitalizaciji urađene odgovarajuće laboratorijske analize, elektrokardiografija i pregled krvnih sudova očnog dna. Za postavljanje dijagnoze MetS korišćeni su parametri „NCEP–ATP III“ (National Cholesterol Education Program-Adult Treatment Panel III) programa.

Rezultati: Hipertigliceridemija (62,1%) je bila najčešći parametar MetS u grupi naših bolesnika sa DM1. Ostali parametri javljali su se sa sledećom učestalošću: snižen HDL (56,5%), visok BMI (14,7%), hiperglikemija (11%), povišen dijasistolni (11,2%) i sistolni pritisak (10,5%). Od 143 ispitivana DM1 bolesnika, 14% je imalo potreban broj parametara za dijagnozu MetS. Pol bolesnika, forma i stadijum DM1 nisu uticali na pojavu MetS ($p>0,05$). Znake ateroskleroze na krvnim sudovima očnog dna je imalo 15% bolesnika sa MetS, a kod 10% su uočeni znaci ishemijske miokarda na EKG-u. Prisustvo MetS nije imalo značajnog uticaja na pojavu ateroskleroze krvnih sudova očnog dna i infarkta miokarda ($p>0,05$).

Zaključak: MetS je evidentiran kod relativno malog broja naših DM1 bolesnika. Najučestaliji parametri MetS su bili hipertigliceridemija i snižen HDL. Prisustvo MetS nije uticalo na pojavu promena na krvnim sudovima oka i srca.

Ključne reči: miotonična distrofija, metabolički sindrom, gojaznost, dislipidemija, glukoza, krvni pritisak.

EXAMINATION OF PRESENCE OF METABOLIC SYNDROMA IN PATIENTS WITH MYOTONIC DYSTROPHY TYPE 1

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Introduction: Myotonic dystrophy type 1 (DM1) is autosomal-dominant multisystemic disease. Endocrin disorders are very frequent in this patients. The most common are insulin resistance and glucose intolerance, which are the main cause of metabolic syndrome (MetS).

The Aim: To determine frequency and to identify potential causes of MetS in patients with DM1.

Material and methods: The research included 143 patients with DM1, hospitalized at Neurology Clinic Clinical Centre of Serbia. During hospitalization to all patients were done laboratory tests, electrocardiography and examination of blood vessels of eye fundus. Presence of MetS was defined using „NCEP–ATP III“ (National Cholesterol Education Program-Adult Treatment Panel III) parameters.

Results: The most frequent parameter of MetS in DM1 patients was hypertriglyceridemia (62,1%). Other parameters had following frequency: low HDL (56,5%), high BMI (14,7%), hyperglycemia (11%), elevated diastolic (11,2%) and systolic blood pressure (10,5%). MetS was diagnosed in 14% of our patients. Sex of patients, form and severity of DM1 weren't correlated with presence of MetS ($p>0,05$). Signs of atherosclerosis in blood vessels of eye fundus were present in 15% of patients with MetS. Signs of myocardium ischaemia had 10% of them. Presence of MetS wasn't related with atherosclerosis in blood vessels of eye fundus and myocardial infarction ($p>0,05$).

Conclusion: MetS was diagnosed in small number of our DM1 patients. The most frequent parameters of MetS were hypertriglyceridemia and low HDL. Presence of MetS didn't affect on changes in blood vessels of eye and heart.

Key words: myotonic dystrophy, metabolic syndrome, dislipidemia, glucose, blood pressure.

UTICAJ PUŠENJA NA ISHOD BOLESNIKA SA AKUTNIM ISHEMIJSKIM MOŽDANIM UDAROM LEČENIH TROMBOLITIČKOM TERAPIJOM

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Uvod: Akutni ishemijski moždani udar (AIMU) je jedno od najtežih neuroloških oboljenja koje može dovesti do smrtnog ishoda i značajno smanjuje funkcionalne kapacitete bolesnika. Pušenje je dobro poznat faktor rizika za nastanak AIMU, ali podaci koji govore o uticaju pušenja na ishod moždanog udara kod pacijenata lečenih trombolitičkom terapijom su malobrojni i paradoksalni.

Cilj: Cilj našeg istraživanja je da se utvrdi da li pušenje utiče na razlike u ishodu i nastanku komplikacija kod bolesnika sa akutnim ishemijskim moždanim udarom lečenih trombolitičkom terapijom.

Materijal i metode: Istraživanjem je obuhvaćeno 219 bolesnika (147 muškog i 72 ženskog pola) sa AIMU lečenih intravenskom trombolizom. Bolesnike smo podelili u dve grupe, pušače (84; 38,36%) i nepušače (135; 61,64%) između kojih smo dalje vršili poređenje prema funkcionalnom ishodu, smrtnosti i nastanku komplikacija u vidu simptomatskih intracerebralnih hemoragija (sICH).

Rezultati: Naša studija nije utvrdila značajan uticaj pušenja na učestalost odličnog funkcionalnog ishoda AIMU ($p=0,807$), na ostvarivanje funkcionalne nezavisnosti ($p=0,283$), kao ni na prevalencu sICH ($p=0,873$). Smrtni ishod je češći kod nepušača ($p=0,008$), ali multivarijantnom analizom nije pokazan odgovarajući nivo statističke značajnosti ovog rezultata ($p=0,159$; OR 2,75; 95% CI (0,67-11,23)).

Zaključak: Studija je pokazala da pušenje nije faktor koji ima direktan uticaj na ishod AIMU i pojavu sICH kao komplikacije istog.

Ključne reči: akutni ishemijski moždani udar, pušenje, ishod.

THE INFLUENCE OF SMOKING ON THE OUTCOME OF PATIENTS WITH ACUTE ISCHEMIC STROKE TREATED WITH THROMBOLYTIC THERAPY

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Introduction: Acute ischemic stroke (AIS) is one of the most difficult neurological disorders that may lead to death or deminish functional capacity of patients. Smoking is well established risk factor for AIS. However, data about influence of smoking to outcome of AIS among patients treated with intravenous thrombolytic therapy remains scarce and contradictory.

Aim: The aim of this study was to determine the impact of smoking to functional outcome, patient's mortality and occurrence of complications in patients with stroke who received thrombolytic therapy.

Methods: The study included 219 patients (147 male and 72 female) with AIS treated with thrombolytic therapy. Patients were divided in two groups, smokers (84; 38,36%) and nonsmokers (135; 61,64%). Groups were compared on functional outcome, mortality and occurrence of symptomatic intracerebral hemorrhage (sICH).

Results: We found that smoking does not have an influence on achieving excellent functional outcome of AIS ($p=0,807$), functional independency ($p=0,283$), neither on frequency of sICH ($p=0,873$). There is higher mortality rate among nonsmokers ($p=0,008$), but after adjusting for confounders there was no statistical significance of the result ($p=0,159$; OR 2,75; 95% CI (0,67-11,23)).

Conclusion: Our study has shown that smoking is unrelated to outcome of AIS or appearance of sICH.

Key words: acute ischemic stroke, smoking, outcome.

UDRUZENOST MIASTENIJE GRAVIS I EKSTRATIMIČNIH MALIGNITETA

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Uvod: Kod bolesnika sa stečenom autoimunom miastenijom gravis (SAMG), posebno u pacijenata sa timomom registrovano je postojanje sekundarnih, ekstratimičnih maligniteta.

Cilj rada: Cilj našeg rada je bio da se utvrdi učestalost i tip ekstratimičnih malignih tumora, kao i da se identifikuju potencijalni faktori rizika za nastanak maligniteta

Materijal i metode: Studijsku grupu je činilo 390 bolesnika sa SAMG iz Beograda, kod kojih je dijagnoza postavljena na osnovu opšte prihvaćenih dijagnostičkih kriterijuma. Svim ispitanicima je precizno određeno vreme nastanka maligniteta u odnosu na početak SAMG, uz utvrđivanje tipa tumora i ispitivanje uticaja različitih varijabli na nastanak maligniteta.

Rezultati: Postojanje ekstratimičnih maligniteta zabeleženo je kod 10,8% bolesnika. Kod većine obolelih (45,2%) maligna bolest se javila pre pojave SAMG, najčešće kod pacijenata sa timomom (22%). Tumori dojke (21,4%) i pluća (21,4%) bili su najzastupljeniji tipovi maligniteta. Maligni tumori su se češće javljali kod starijih bolesnika ($p<0,01$), kao i onih koji su lečeni imunoglobulinima (Ivlg) ($p<0,05$). Prediktori pojave malignih tumora kod pacijenata sa SAMG bili su stariji uzrast na početku bolesti ($p<0,01$), terapija Ivlg ($p<0,01$), duže trajanje bolesti ($p<0,05$) i postojanje timoma ($p<0,05$).

Zaključak: Prema našim rezultatima, maligni tumori su se češće javljali kod starijih bolesnika sa SAMG u našoj sredini, a duže trajanje bolesti, postojanje timoma i primena Ivlg u terapiji obolelih bili su povezani sa povećanim rizikom za razvoj maligniteta.

Ključne reči: stečena autoimuna miastenija gravis, timom, ekstratimični maligniteti.

ASSOCIATION OF MIASTHENIA GRAVIS AND EXTRATHYMIC MALIGNANCIES

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Introduction: It has been reported that acquired autoimmune myasthenia gravis (AAMG) is associated with extrathymic malignancies, especially in patients with thymoma.

The Aim: To determine the prevalence and type of extrathymic malignancies in patients with AAMG, as well as to identify potential risk factors for development of extrathymic malignancy.

Materials and Methods: The study comprised of 390 patients with AAMG from Belgrade, in which the diagnosis was established based on the commonly accepted diagnostic criteria. In all patients we assessed the time of onset and type of malignancy, likewise the influence of different demographic and clinical variables for increased risk for development of malignancy.

Results: Extrathymic malignancies were present in 10.8% patients. In most patients (45.2%) the tumor appeared before the onset of AAMG, mostly in patients with thymoma (22%). Breast (21.4%) and lung (21.4%) tumors were most frequently detected. Malignant tumors were more frequent in elderly patients ($p<0.01$) and in those who were treated with immunoglobulins (Ivlg) ($p<0.01$). Predictors for occurrence of malignant tumors in patients with AAMG were older age at onset of AAMG ($p<0.01$), Ivlg therapy ($p<0.01$), longer duration of disease ($p<0.05$) and association with thymoma ($p<0.05$).

Conclusion: We found that malignant tumors were more frequent in older patients with AAMG. Longer disease duration, association with thymoma and treatment with Ivlg were related with an increased risk of extrathymic malignancy.

Key words: acquired autoimmune myasthenia gravis, thymoma, extrathymic malignancies.

HIPERGLIKEMIJA KOD PACIJENATA SA AKUTNIM ISHEMIJSKIM MOŽDANIM UDAROM KOJI SU TRETIRANI FIBRINOLITIČKOM TERAPIJOM

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Uvod: Hiperglikemija je česta kod pacijenata sa akutnim ishemijskim moždanim udarom. Povezuje se sa većom stopom smrtnosti, lošijim funkcionalnim ishodom i simptomatskim intracerebralnim hemoragijama.

Cilj rada: Cilj rada je bio da odredimo efekte rane hiperglikemije kod pacijenata sa ishemijskom moždanim udarom na mortalitet, funkcionalni ishod i broj simptomatskih intracerebralnih hemoragija kod kojih je primenjen fibrinolitički tretman.

Materijal i metode: Studija je obuhvatila 422 pacijenta iz 10 centara Srbije. Vrednosti šećera u krvi merene su na prijemu, unutar 3 sata od početka bolesti. Na osnovu vrednosti glikemije pacijenti su podeljeni u dve grupe. U grupi sa normalnim vrednostima glikemije bilo je 170 (40,28%) pacijenata, a u grupi sa povišenim vrednostima glikemije bilo je 252 (59,72%) pacijenta. Klinički ishod koreliran je u odnosu na smrtnost, stepen neurološkog deficita meren NIHSS skalom, funkcionalnu onesposobljenost merenu Rankin skalom i razvojem simptomatskih intracerebralnih hemoragija.

Rezultati rada: Rezultati pokazuju da postoji statistički značajna razlika u broju smrtnih ishoda u grupi pacijenata sa povišenim vrednostima glikemije u odnosu na grupu pacijenata sa normalnim vrednostima glikemije ($p=0,002$). Postoji pozitivna korelacija između rane hiperglikemije u odnosu na funkcionalni ishod merenog NIHSS skalom unutar 24 časa i 30 dana. Funkcionalni ishod posle 90 dana je statistički značajno lošiji u grupi sa hiperglikemijom u odnosu na grupu bez hiperglikemije ($p<0,05$). Nije utvrđena statistički značajna razlika u broju simptomatskih intracerebralnih hemoragija u ispitivanim grupama.

Zaključak: Vrednost glikemije je prediktor nepovoljnog ishoda kod pacijenata sa akutnim ishemijskim moždanim udarom tretiranih fibrinolitičkom terapijom.

Ključne reči: akutni ishemijski moždani udar, hiperglikemija, fibrinolitička terapija

HYPERTHYCEMIA IN PATIENTS WITH ACUTE ISCHEMIC STROKE TREATED WITH FIBRINOLYTIC THERAPY

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Introduction: Hyperglycemia is common in patients with acute ischemic stroke. It is associated with higher mortality, worse functional outcome and symptomatic intracerebral hemorrhages.

The aim: The aim of study was to determine the effects of early hyperglycemia on mortality, functional outcome and the number of symptomatic intracerebral hemorrhages in patients with acute ischemic stroke treated with fibrinolytic therapy.

Material and methods: The study included 422 patients from 10 centers in Serbia. Glucose levels were measured on admission, within 3 hours of onset symptoms. Based on glucose levels patients were divided into two groups. In the group with normal glucose levels were 170 (40,28%) patients and in the group with elevated glucose levels were 252 (59,72%) patients. Clinical outcome was correlated with mortality, the degree of neurological deficit (NIHSS scale), functional disability (Rankin scale) and development of intracerebral hemorrhage.

Results: The results of this study showed statistically significant difference in the number of deaths in group of patients with elevated glucose levels compared to the group of patients with normal glucose levels ($p=0,002$). A positive correlation was found between early hyperglycemia and functional outcome measured by NIHSS scale within 24 hours and 30 days. Functional outcome after 90 days was significantly worse in the hyperglycemia group compared to the group without hyperglycemia ($p<0,05$). No significant difference was found in the number of intracerebral hemorrhage.

Conclusion: Serum glucose level is predictor of adverse outcome in patients with acute ischemic stroke treated with fibrinolytic therapy.

Key words: acute ischemic stroke, hyperglycemia, fibrinolytic therapy

DENTALNI STATUS KOD OBOLELIH OD PARKINSONOVE BOLESTI

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Uvod: Parkinsonova bolest (PB) je hronično progresivno neurodegenerativno oboljenje koje klinički karakterišu motorni, ali i nemotorni simptomi. Kod obolelih mogu da se jave pojačano nakupljanje pljuvačke, smetnje s gutanjem i žvakanjem što bi moglo da utiče na dentalni status obolelih. Međutim, dosadašnja istraživanja pokazala su kontroverzne rezultate.

Cilj rada: utvrditi učestalost dentalnih problema kod obolelih od PB i eventualnih faktora rizika koji doprinose njihovom nastanku.

Materijal i metode: U ispitivanje je uključeno 20 konsekutivnih bolesnika sa Parkinsonovom bolešću i 20 zdravih kontrola koje su mešovane po godinama života. Kod svih ispitanika primenjen je originalni upitnik kojim su dobijeni demografski podaci, podaci o navikama u održavanju oralne higijene i režimu ishrane. Takođe, dobijeni su podaci o dužini trajanja PB i terapiji. Svim ispitanicima urađen je i pregled zuba. U statističkoj obradi podataka primenjeni su parametrijski i neparametrijski statistički testovi.

Rezultati: Poređenje obolelih od PB sa zdravim kontrolama pokazalo je da među grupama nije bilo razlike u broju izgubljenih zuba, broju karioznih zuba kao ni u broju nadonkada. Međutim, oboleli od PB imali su značajno manji broj ispuna u odnosu na zdrave kontrole ($p < 0,05$).

Zaključak: U našoj grupi ispitanika, oboleli od PB nisu imali lošiji dentalni status u odnosu na zdrave kontrole istog životnog doba.

Ključne reči: PB, Dentalni status

DENTAL STATUS IN PATIENTES WITH PARKINSON'S DISEASE

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Introduction: Parkinson's disease (PD) is a chronic progressive neurodegenerative disease clinically characterized by motor, as well as non-motor symptoms. The patients may develop increased accumulation of saliva and interference with chewing and swallowing, which could affect the dental status of patients. However, previous studies have shown controversial results.

The Aim: The aim was to determine the prevalence of dental problems in patients with PD and possible risk factors that contribute to their development.

Material and Methods: The study included 20 consecutive patients with Parkinson's disease and 20 healthy controls, matched by age. Original questionnaire was used on all participants in order to obtain demographic data and information about habits concerning oral hygiene and dietary regime. Also, data was obtained on the length of PB and it's treatment. All subjects were inspected for their dental status. In statistical analysis, parametric and non-parametric statistical tests were used.

Results: Comparison of patients with PD with healthy controls showed that there was no difference between the groups regarding the number of lost teeth, the number of decayed teeth, nor the number of replaced teeth. However, patients with PD had significantly fewer fillings than healthy controls.

Conclusion: In our group of participants, patients diagnosed with PD did not have poorer dental status compared to healthy controls of the same age.

Key words: PD, Dental status

ZNAČAJ PRIMENE KONTRASTNE TRANSKRANIJLANE DOPPLER ULTRASONOGRAFIJE KOD OBOLELIH OD MIGRENE

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Uvod: Migrena predstavlja kompleksnu, rekurentnu, primarnu glavobolju. Svaki deseti stanovnik planete pati od ponavljanih napada migrene. Etiopatogeneza migrene nije u potpunosti razjašnjena. Prevalencija perzistentnog foramena ovale veća je kod osoba obolelih od migrene i može imati uticaja na patofiziološka događanja tokom ataka migrene. Pozitivan TCD bubble test može biti od koristi kao indirektni pokazatelj postojanja perzistentnog foramena ovale.

Cilj: Cilj rada je prikazati kliničku prezentaciju migrenoznog napada i utvrditi stepen povezanosti između pozitivnog TCD bubble testa, kao indirektnog pokazatelja postojanja perzistentnog foramena ovale i migrene.

Materijal i metode: Rađena je retrospektivna studija kojom su obuhvaćena 32 bolesnika sa migrenom. Analizirana je njihova medicinska dokumentacija. Svim pacijentima rađena je transkranijalna Doppler ultrasonografija sa kontrastom (TCD bubble test).

Rezultati: Ukupan ispitivani uzorak sačinjen je od 87% žena i 13% muškaraca, prosečne starosti 36,8 godina (16-62 godine). Migrena sa austom prisutna je kod 21,87% ispitanika, a migrena bez aure kod 78,13%. U kliničkoj slici pored glavobolje najčešće prateće tegobe su: mučnina (68,75%), povraćanje (59,37%) i kombinacija fotofobije sa fonofobijom i osmofobijom (34,40%). Najčešći provocirajući faktori su promena vremena (53,20%), menstrualni ciklus (40,60%) i stres (28,12%). Pozitivan TCD bubble test, kao indirektni pokazatelj prisustva perzistentnog foramena ovale, utvrđen je kod 31,25% ispitivanih (57,14% kod obolelih od migrene sa austom).

Zaključak: Klinička slika obolelih od migrene praćena je simptomima koji su tipični za bolest i dati su eksplicitnim dijagnostičkim kriterijumima Međunarodne klasifikacije glavobolja. Okidači ataka migrene su često prisutni. Dokazana je statistički značajna povezanost između pozitivnog TCD bubble testa, kao indirektnog pokazatelja postojanja perzistentnog foramena ovale i migrene ($p < 0,05$, $\chi^2 = 15,253$).

Ključne reči: migrena, perzistentni foramen ovale, transkranijalna Doppler ultrasonografija sa kontrastom

THE SIGNIFICANCE OF CONTRAST TRANSCRANIAL DOPPLER ULTRASOUND IN PATIENTS WITH MIGRAINE HEADACHE

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Introduction: Migraine is a complex, recurrent, primary headache. One out of 10 in population have repeated migraine attack. Etiopathogenesis of migraine is still unclear. The prevalence of patent foramen ovale is higher at patients with migraine and may have an influence in pathophysiological mechanism of migraine attack. The positive TCD Bubble test could have an important role as an indirect indicator of patent foramen ovale.

Goal: The aim of this study is to give the clinical presentation of migraine attack and to evaluate the significance of TCD bubble test as an indirect indicator of patent foramen ovale in patients with migraine.

Material and Methods: A retrospective study was performed. Medical documentation of 32 migraine patients was analyzed. A Transcranial Doppler with contrast (TCD bubble test) was done to all of these patients.

Results: The study included 87% women and 13% of men. Mean age is 36,8. About 21,87% of patients suffered from migraine with aura, and 87,13% of migraine without aura. Nausea (68,75%), vomitus (59,37%) and combination of photophobia, phonophobia and osmophobia (34,40%) are the most common symptoms beside the headache in clinical presentation of migraine. Weather changes (53,20%), menstrual cycle (40,60%) and stress (28,12%) are the most frequent precipitating factors. The positive TCD bubble test as an indirect indicator of patent foramen ovale was found in 31,25% of cases (57,14% in patients with migraine with aura).

Conclusion: The clinical presentation of migraine headache is characterized by typical symptoms of disease, which are described with explicit diagnostic criteria in The International Classification of Headache Disorders. Precipitating factors are often present. The significant statistical relation is confirmed between positive TCD bubble test as an indirect indicator of patent foramen ovale and migraine ($p < 0,05$, $\chi^2 = 15,253$).

Key words: migraine headache, patent foramen ovale, Transcranial Doppler with contrast (cTCD)

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Uvod: Intracerebralna hemoragija predstavlja spontano, netraumatsko krvarenje iz intraparenhimskih krvnih sudova mozga. Primarne ICH su najčešće i nastaju kao posledica rupture prethodno patološki izmenjenih krvnih sudova dugotrajnom hipertenzijom. Većina studija je dokazala uticaj hipoholesterolemije, hipertrigliceridemije, hipo-HDL i hipo-LDL-holesterolemije kao riziko faktora, dok neke studije daju druge rezultate. Početak kliničke slike je nagao sa daljim pogoršanjem do smrtnog ishoda kod 40-55% bolesnika.

Cilj: Definirati etiološke i kliničke specifičnosti ispoljavanja primarne ICH sa glavnim osvrtom na zastupljenost dislipidemije i tipova HLP, korelaciju lipidnih frakcija i NIHSS, kao i ishod bolesti.

Materijal i metode: Retrospektivno su analizirani podaci iz istorija bolesti 92 bolesnika sa dijagnozom primarne ICH lečenih na Klinici za neurologiju i odeljenju Urgentne neurologije, Kliničkog Centra Vojvodine, u period od avgusta 2010. do avgusta 2011. godine.

Rezultati: Istraživanje je obuhvatilo 51 bolesnika ženskog i 41 bolesnika muškog pola. Prosečna starost iznosila je 67,6 godina. Hiperholesterolemija je registrovana kod 69%, hiper-LDL kod 74%, a hipo-HDL kod 84% bolesnika, dok je nivo triglicerida kod najvećeg broja bio u granicama referentnih vrednosti. Najzastupljenija je bila HLP tip IIa kod 78% bolesnika. U kliničkoj slici najučestalija je bila lezija piramidalnog puta. Letalan ishod zabeležen je kod 25% bolesnika.

Zaključak: Ovaj vid dislipidemije može uticati na nastanak rupture krvnih sudova i uz već postojeću aterosklerozu i hipertenziju dovesti do primarne ICH. S obzirom na dobijene rezultate, opravdano se može postaviti pitanje primene statina u sekundarnoj prevenciji hemoragičnog moždanog udara.

Ključne reči: intracerebralna hemoragija, dislipidemija, ishod

DYSLIPIDEMIA AS A RISK FACTOR FOR PRIMARY INTRACEREBRAL HEMORRHAGE

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Introduction: Intracerebral hemorrhage is spontaneous, non-traumatic bleeding from intraparenchymal blood vessels. Primary ICHs are the most common and are a consequence of blood vessel rupture, resulting from long-standing hypertension. Most studies show that hypocholesterolemia, hypertriglyceridemia, hypo-HDL and hypo-LDL-cholesterolemia are risk factors for ICH, while other literature shows contradictory results. Clinical manifestations appear rapidly with further deterioration leading to death in 40-55% of the cases.

Aim: To define the etiology and clinical manifestations of primary ICH with special attention to the presence of dyslipidemia and types of HLP, the correlation of lipid fractions and NIHSS and the outcome of the disease.

Material and methods: This study was a retrospective analysis based on the medical history of 92 patients with primary ICH, who were treated at the Department of Neurology, Clinical Center of Vojvodina, from August of 2010 to August of 2011.

Results: 41 males and 51 females were enrolled in this study. The mean age was 67.6 years. Hypercholesterolemia was registered in 69%, hyper-LDL-cholesterolemia in 74% and hypo-HDL-cholesterolemia in 84% of patients, while the levels of TGC were normal in most of the cases. The most frequent type of HLP was IIa in 78% of patients. The most common clinical manifestation was pyramidal deficit. Lethal outcome occurred in 25% of patients.

Conclusion: This kind of dyslipidemia can cause rupture of blood vessels and with preexisting atherosclerosis and hypertension can lead to primary ICH. The use of statins in the prevention of secondary ICH should therefore be questioned.

Key words: intracerebral hemorrhage, dyslipidemia, outcome

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Uvod: Ishemijski moždani udar uzrokovan vertebrobazilarnom patologijom čini 20% od svih ishemijskih moždanih udara. Klinička slika ishemijskog moždanog udara u slivu zadnje moždane cirkulacije je vrlo varijabilna, zbog čega je rana dijagnoza često otežana. Loš ishod u smislu visoke stope mortaliteta i funkcionalne onesposobljenosti ukazuju na važnost daljih istraživanja kako bi se blagovremeno postavila dijagnoza, omogućila adekvatna terapija i poboljšao ishod ove teške bolesti.

Cilj: Cilj našeg istraživanja bio je da definišemo kliničku sliku, faktore rizika i ishod ishemijskih moždanog udara uzrokovanih patologijom vertebralne i bazilarne arterije.

Materijal i metode: Retrospektivno su pregledane istorije bolesti 10 pacijenata sa dijagnostikovanim ishemijskim moždanim udarom u slivu zadnje moždane cirkulacije, fokusirajući se pritom na kliničku sliku, faktore rizika i ishod prilikom otpusta.

Rezultati: U kliničkoj slici dominira motorni deficit, koji varira od hemipareze (4/10), kvadrilegije (1/10) do locked in sindroma (2/10), zatim dizartrija (5/10) i ataksija hoda i stajanja (3/10). Udruženost više faktora rizika se sreće kod 9 od 10 pacijenata. Najčešće dokumentovani faktori rizika su hipertenzija (8/10), muški pol (7/10) i poremećaj metabolizma lipida (6/10). Ishod bolesti pri otpustu je nepovoljan kod 7 od 10 pacijenata. Nepovoljniji ishod zapaža se kod žena.

Zaključci: Najčešća klinička manifestacija ishemijskog moždanog udara u zadnjem slivu moždane cirkulacije je motorni deficit, čija je težina veoma varijabilna. Faktori rizika su najčešće udruženi, a to su: hipertenzija, muški pol i poremećaj metabolizma lipida. Pacijenti najčešće napuštaju bolnicu sa značajnim stepenom onesposobljenosti.

Ključne reči: Zadnja moždana cirkulacija, moždani udar, faktori rizika, moždano stablo, ishod

ISCHEMIC SYNDROMES OF POSTERIOR CEREBRAL CIRCULATION IN STROKE UNIT: A CASE SERIES

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Introduction: Ischemic strokes caused by vertebral/basilar pathology accounts for 20% of all ischemic strokes. The clinical picture of ischemic stroke in posterior cerebral circulation is highly variable, which is why early diagnosis is often difficult. Generally poor outcome in terms of high rates of mortality and functional disability emphasizes the importance of further research in order to timely diagnosis, provide adequate therapy and improve the outcome of this devastating disease.

The Aim: The objective of this study was to define the clinical features, risk factors and outcome of ischemic strokes caused by vertebral and basilar pathology.

Materials and Methods: We retrospectively reviewed a series of 10 case histories of patients diagnosed with ischemic stroke in the posterior cerebral circulation, mainly focusing on clinical features, risk factors and outcome at discharge.

Results: The clinical picture is dominated by motor deficits, ranging from hemiparesis (4/10), quadriplegia (1/10) and locked in syndrome (2/10), dysarthria (5/10) and ataxia of walking and standing (3/10). Association of several risk factors were found in 9 of 10 patients. The most common documented risk factors were hypertension (8/10), male (7/10) and disruption of lipid metabolism (6/10). Outcome at discharge was poor in 7 of 10 patients. Poorer prognosis was observed in women.

Conclusion: The most common clinical manifestations of ischemic stroke in the posterior cerebral circulation is motor deficit that is highly variable. Risk factors are frequently associated, and the most often are hypertension, male gender, and lipid metabolism disorders. Patients most often leave the hospital with substantial degree of disability.

Key words: Posterior cerebral circulation, stroke, risk factors, brain stem, outcome

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Uvod: Akutni moždani udar je bolest koja je treći uzrok smrti u svetu, a prvi u našoj sredini. Definiše se kao fokalni ili globalni poremećaj moždane funkcije, naglo nastaje, traje duže od 60 minuta, posledica je poremećaja moždane cirkulacije ili stanja u kome protok krvi nije dovoljan da zadovolji metaboličke potrebe neurona za kiseonikom i glukozom. Suženje na karotidnim arterijama remeti normalan tok krvi, pa može doći do stvaranja tromba koji izaziva cerebrovaskularni insult.

Cilj: Cilj našeg istraživanja je procena uloge karotidne bolesti u etiologiji ishemijskog moždanog udara, utvrditi ultrazvučnim pregledom strukturalni poremećaj i stepen suženja krvnih sudova, utvrditi faktore rizika za nastanak ishemijskog moždanog udara i ishod lečenja.

Materijal i metode: Retrospektivnom studijom obuhvaćeno je 169 bolesnika obolelih od ishemijskog moždanog udara hospitalizovanih na Klinici za neurologiju Kliničkog centra Vojvodine u Novom Sadu, u periodu od 1. septembra do 31. decembra 2011 godine. Podaci su prikupljeni na osnovu medicinske dokumentacije bolesnika.

Rezultati rada: Od ukupnog broja hospitalizovanih 53% je muškog pola, 38% bolesnika ima od 71 do 80 godina, 67% je hospitalizovano u okviru nekoliko sati od nastanka tegoba, najčešće tegobe su slabost ekstremiteta 72%.

Zaključak: Najčešći faktori rizika za ishemijski moždani udar su hipertenzija 93%, hiperlipoproteinemija 47%. Ultrazvučnim pregledom karotidnog sliva u 73% ispitanih su nađene patološke promene na krvnim sudovima, u 41% nesignifikantne stenozе. Duplex scanner karotidnog sliva predstavlja nezamenljivu metodu u dijagnostici moždanog udara, i kao preventivna metoda. Od ukupnog broja lečenih 66% je otpušteno u poboljšanom stanju.

Ključne reči: ishemijski moždani udar, Duplex scanner karotidnog sliva, suženje krvnih sudova.

ROLE OF CAROTID DISEASE IN THE ETIOLOGY OF ISCHEMIC STROKE

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Introduction: Acute stroke is a disease that is the third leading cause of death worldwide and the first in our community. Defined as focal or global disturbance of cerebral function, occurs suddenly, lasts longer than 60 minutes, the result of a cerebrovascular disorder or condition in which blood flow is not sufficient to meet the metabolic needs of neurons to oxygen and glucose. Narrowing of the carotid arteries disrupts the normal flow of blood, and may lead to blood clots that cause stroke.

The Aim : The aim of our study was to evaluate the role of carotid disease in the etiology of ischemic stroke, determined by ultrasound and structural disorder degree of narrowing of blood vessels, identify risk factors for ischemic stroke and outcome.

Materials and Methods: This retrospective study involved 169 patients with ischemic stroke hospitalized at the Clinic for Neurology, Clinical Center of Vojvodina in Novi Sad in the period from 1 September to 31 December 2011. Data were collected using medical records of patients.

Results : Of the total number of hospitalized patients 53% were male, 38% of patients have 71 to 80 years, 67% were hospitalized within a few hours of the occurrence of symptoms, most symptoms are weakness of extremities 72%.

Conclusion: The most common risk factors for ischemic stroke, hypertension 93%, 47% of hyperlipoproteinemia. Ultrasound examination of carotid area in 73% of the pathological changes were found in the blood vessels, in 41% insignificant stenosis. Duplex carotid scanner is an indispensable tool in the diagnosis of stroke, and as a preventive method. Of the total number of treated patients 66% were discharged in improved condition.

Key words: ischemic stroke, Duplex carotid scanner , a narrowing of blood vessels.

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Uvod: Akutni moždani udar je fokalni ili globalni poremećaj moždane funkcije koji naglo nastaje, traje duže od 60 minuta, a posledica je poremećene moždane cirkulacije ili stanja u kome protok krvi nije dovoljan da zadovolji metaboličke potrebe neurona za kiseonikom i glukozom. Kvalitet života može da se objasni kao individualna percepcija sopstvenog funkcionisanja i bitisanja u različitim oblastima života.

Cilj: Rad ima za cilj da se analizom fizičkog i psihičkog stanja, kao i socijalne osposobljenosti bolesnika nakon moždanog udara prouči kvalitet života u smislu individualnog, porodičnog, profesionalnog i života u široj društvenoj zajednici.

Materijal i metode: Radom je obuhvaćeno 23 pacijenta zbog moždanog udara hospitalizovanih na Klinici za neurologiju Kliničkog centra Vojvodine. Na njima je primenjen SIS upitnik i određen je Rankin skor za stanje pre i posle moždanog udara, a zatim su rezultati upoređeni.

Rezultati: Utvrđeno je da 90% pacijenata pre MU spada u domen 0 po Rankin skali, a nakon moždanog udara 60% spada u domen 4 i 5, 10% u domen 3 i 30% u domen 0 i 1. Po rezultatima SIS upitnika, najveća oštećenja pretrpeli su domen snaga, dnevne aktivnosti, pokretljivost, ruka i hendikep.

Zaključak: Istraživanje pokazuje da su oboleli od moždanog udara u najvećem broju slučajeva teško hendikepirani i vrlo ograničeni u pogledu svojih aktivnosti. Dakle, njihov kvalitet života je poprilično pogoršan u svakom domenu.

Ključne reči: moždani udar, kvalitet života, Rankin skala, SIS upitnik.

QUALITY OF LIFE OF PATIENTS AFTER STROKE

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Introduction: Acute stroke is a focal or global disturbance of cerebral function that occurs suddenly, lasts longer than 60 minutes, with the result of impaired cerebral circulation or the condition in which blood flow is not sufficient to supply the metabolic needs of neurons to oxygen and glucose. Quality of life can be explained as individual perceptions of own existence and functioning in different areas of life.

The Aim: The goal of this project is to study the quality of life of patients after stroke in terms of individual, family, career and life in community, by analyzing their physical and mental health and social competence.

Material and methods: The study included 23 patients hospitalized for stroke at the Department of Neurology, Clinical Center of Vojvodina. For them, the SIS questionnaire was applied and Rankin score was determined for the condition before and after the stroke. Then, results were compared.

Results: It was found that 90% of patients before the stroke falls in the domain 0 of Rankin scale, and after the stroke 60% falls within the 4 and 5, 10% in domain 3 and 30% in domain 0 and 1. According to the results of the SIS questionnaire, the greatest damage was found in the domain of power, daily activities, mobility, hand and handicap.

Conclusion: Patients suffering from stroke are the mostly severely handicapped and very limited in their activities. Therefore, the quality of their life is quite deteriorated in each domain.

Key words: stroke, quality of life, Rankin score, SIS – Stroke Impact Scale.

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Uvod: Epilepsija predstavlja jedno od najčešćih hroničnih neuroloških bolesti kod adolescenata. Udruženost epilepsije sa psihijatrijskim poremećajima opisana je u mnogim studijama. Problemi mentalnog zdravlja predstavljaju poremećaje koji su blaži od onih koji zadovoljavaju kriterijume za postavljanje psihijatrijskih dijagnoza i odnose se na širok spektar emocionalnih problema i problema ponašanja koji uzrokuju brigu ili patnju.

Cilj rada: Cilj rada je utvrđivanje prisustva problema mentalnog zdravlja kod adolescenata obolelih od epilepsije, utvrđivanje učestalosti ovih problema uz postavljanje hipoteze da se ovi problemi javljaju češće kod obolelih od epilepsije u odnosu na zdrave adolescente.

Materijal i metode: Istraživanje je vršeno po tipu analitičke kliničke studije. U istraživanje je uključeno ukupno 60 ispitanika uzrasta 10 – 20 godina, 30 sa dijagnozom epilepsije i 30 bez ove dijagnoze. Anketiranje se vršilo pomoću strukturiranog upitnika za dobijanje opštih podataka i podataka o epilepsiji, i upitnika Youth Self Report za procenu problema mentalnog zdravlja.

Rezultati: Ne postoji razlika u učestalosti javljanja problema mentalnog zdravlja između ispitivane i kontrolne grupe. Problemi pažnje se češće javljaju kod bolesnika sa retkim ili čestim epileptičnim napadima nego u kontrolnoj grupi. Mlađi adolescenti (10 – 14 god.) imaju više problema depresivne i anksiozne prirode od starijih (15 – 20 god.), a muški pol ima više socijalnih i eksternalizovanih problema, kao i problema u smislu delinkventnog ponašanja.

Zaključak: Na osnovu rezultata dobijenih u ovom istraživanju ne može se tvrditi da se problemi mentalnog zdravlja češće javljaju kod obolelih od epilepsije u odnosu na zdrave adolescente.

Ključne reči: problemi mentalnog zdravlja, adolescencija, epilepsija

PROBLEMS OF MENTAL HEALTH IN ADOLESCENTS WITH EPILEPSY

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Introduction: Epilepsy is one of the most common chronic neurological diseases in adolescents. The association between epilepsy and certain psychiatric disorders has been described in many studies. Mental health problems are milder disorders than those that meet the criteria of psychiatric diagnoses and include a wide range of emotional and behavioral problems that cause concern or distress.

The aim: To confirm the presence of mental health problems in adolescents with epilepsy, to determine the frequency of these problems and to prove the theory that these problems occur more frequently in patients with epilepsy than in healthy adolescents.

Material and methods: The exploration was conducted as a clinical analytical study. The study included 30 adolescents with the diagnosis of epilepsy and 30 without this diagnosis, aged 10 – 20 years. A structured questionnaire was used for collecting personal data and information about epilepsy, and Youth Self Report Questionnaire for the assessment of mental health problems.

Results: There is no difference in the incidence of mental health problems between the clinical and the control group. Attention problems are more common in patients with frequent seizures than in controls. Younger adolescents (10 – 14 yrs.) have more problems with depression and anxiety than older adolescents (15 – 15 yrs.), while male participants have more social, externalizing, and problems in terms of delinquent behavior.

Conclusion: Based on the results of this study mental health problems do not occur more frequently in patients with epilepsy than in healthy adolescents.

Key words: mental health problems, adolescence, epilepsy

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Uvod: Akutni moždani udar se definiše kao fokalni ili globalni poremećaj moždane funkcije, koji naglo nastaje, traje duže od 60 minuta, a posledica je poremećaja moždane cirkulacije ili stanja u kome protok krvi nije dovoljan da zadovolji metaboličke potrebe neurona za kiseonikom i glukozom. Prema rezultatima populacionih studija između 18% i 29% svih ishemijskih moždanih udara posledica je kardioembolizacije. Atrijalna fibrilacija je najčešći kardijalni faktor rizika za ishemijski moždani udar.

Cilj rada: Cilj je bio utvrditi učestalost kardioembolizacije kao uzroka nastanka ishemijskih moždanih udara, analizirati distribuciju faktora rizika, utvrditi najčešće srčane poremećaje relevantne za cerebralni embolizam i praćenje ishoda Rankinovom skalom funkcionalnog oporavka.

Materijal i metode: Na klinici za neurologiju u periodu od 01.09.2011.- 30.11.2011. lečeno je 180 pacijenata sa dijagnozom ishemijskog moždanog udara, od kojih je 37 (20,6 %) imalo kardioembolizaciju kao uzrok ishemijskog moždanog udara. Detaljna auto ili hetero anamneza i laboratorijske analize.

Rezultati: U našem istraživanju najčešći faktor rizika je arterijska hipertenzija kako je utvrđena kod 32 (86,5%), zatim sledi dislipidemija prisutna kod 27 (73,0%) pacijenata. Atrijalna fibrilacija je najčešće kardiološko oboljenje, kako je utvrđena kod 33 (89,2%) pacijenta. Najviše pacijenata bilo je u kategoriji I (29,7%) i kategoriji III 10 (27%) skale funkcionalnog oporavka.

Zaključak: Kardioembolizacija kao uzrok nastanka IMU utvrđena je kod 37 (20,6%), pacijenata. Atrijalna fibrilacija je najčešće kardiološko oboljenje, kako je utvrđena kod 33 (89,2%) pacijenta. Kod svih pacijenata sa akutnim ishemijskim moždanim udarom potrebno je detaljno kardiološko ispitivanje.

Ključne reči: moždani udar, kardioembolizacija, ishemijski moždani udar, uzroci moždanog udara.

CARDIOEMBOLISM AS A CAUSE OF ISCHEMIC BRAIN STROKE

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Introduction: Acute brain stroke is defined as focal or global cerebral dysfunction, which appears suddenly, lasts more than 60 minutes, caused by disorder in brain circulation or condition in which blood flow is not sufficient to meet the metabolic needs of neurons to oxygen and glucose. According to population surveys, between 18% and 29% of all ischemic strokes are the result of cardioembolization. Atrial fibrillation is commonest cardiac risk factor for ischemic brain strokes.

The Aim: The aim was to determine the frequency of cardioembolization as the cause of ischemic strokes, analyze the distribution of risk factors, to determine the most common cardiac disorders relevant to cerebral embolism and monitoring the outcome by Rankin scale of functional recovery.

Materials and Methods: At the Clinic for Neurology in the period from 01.09.2011. - 30.11.2011. were treated 180 patients diagnosed with ischemic stroke, of whom 37 (20.6%) had cardioembolization as a cause of ischemic stroke. Also auto or hetero detailed medical history and laboratory analysis.

Results: In our research on the most important risk factor is hypertension that was detected in 32 (86.5%), followed by dyslipidemia present in 27 (73.0%) patients. Atrial fibrillation is the most common cardiac disease, as determined in 33 patients (89.2%) patients. Most patients were in category I (29.7%) and category III 10 (27%) of the scale of functional recovery.

Conclusion: Cardioembolization as a cause of ischemic stroke was found in 37 (20.6%) patients. Atrial fibrillation is the most common cardiac disease, as determined in 33 patients (89.2%). All patients with acute ischemic brain stroke should be detailly cardiologically examined.

Key words: stroke, cardioembolization, ischemic stroke, causes of stroke.

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Uvod: Glavobolja je najčešći i najraniji simptom tromboze venskih sinusa. Intrakranijalna hipertenzija, rastezanje venskog zida i tromboza vena, šami, ili u kombinaciji, su verovatno glavni patofiziološki mehanizmi nastanka glavobolje u sklopu cerebralne venske tromboze. Odsustvo specifične kliničke slike otežava postavljanje dijagnoze. Lekar mora uvek razmotriti mogućnost nastanka cerebralne venske tromboze kod pacijenata sa novonastalom glavoboljom čak i u odsustvu neuroloških ispada i urednog CT nalaza.

Cilj rada: Utvrditi učestalost i karakteristike glavobolje kao simptoma kod tromboze venskih sinusa.

Materijal i metode: Retrospektivna i epidemiološka studija obuhvatila je 18 pacijenata sa dijagnozom tromboze venskih sinusa (I 67.6) lečenih na odeljenju neurologije Kliničkog centra Vojvodine u periodu od 2005. do 2011. godine. Ispitivanje je sprovedeno uvidom u istorije bolesti pacijenata.

Rezultati: Studija je obuhvatila 18 pacijenata prosečne starosti 39.06±11.65 godina, pretežno ženskog pola (n=14; 77.78%). Najveći broj pacijenata (n=17; 94.44%) navodi glavobolju kao simptom, dok se ostali simptomi / znaci javljaju sa nešto manjom učestalošću: povraćanje (n=14; 77.78%), neurološki poremećaji (n=12; 66.67%), poremećaj mentalnog stanja (n=7; 38.89%), vrtoglavica (n=6; 33.33%), mučnina (n=6; 33.33%), poremećaji svesti (n=6; 33.33%), epileptični napad (n=5; 27.78%). Najčešće se javila glavobolja u potiljačnom predelu (n=5; 27.78%).

Zaključak: Na osnovu podataka dobijenih ovim istraživanjem može se zaključiti da je glavobolja, u raznolikom kliničkom ispoljavanju cerebralne venske tromboze, najčešći simptom. Zato je od presudnog značaja prepoznati povezanost glavobolje sa ovim oboljenjem, kako bi se postavila ispravna dijagnoza i započeo odgovarajući tretman što je pre moguće.

Ključne reči: glavobolja, cerebralna venska tromboza, simptom.

HEADACHE AS A SYMPTOM OF CEREBRAL VEIN THROMBOSIS

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Introduction: Headache is the most common and earliest symptom of cerebral venous thrombosis. Intracranial hypertension, venous wall distension and venous thrombosis alone or in combination, are probably the major pathophysiological mechanisms of headache in the sinus venous thrombosis. The absence of specific clinical features makes it difficult to diagnose. A doctor must always consider the possibility of venous sinus thrombosis in patients with newly developed headache even in the absence of neurological signs and regular CT findings.

The Aim: To determine the frequency and characteristics of headache as a symptom of venous sinus thrombosis.

Material and methods: Retrospective and epidemiological study included 18 patients diagnosed with venous sinus thrombosis (I 67.6) treated at the Department of Neurology, Clinical Center of Vojvodina in the period since 2005. - 2011. year. The study was conducted by examining the medical history of patients.

Results: The study included 18 patients, average age 39.06±11.65 years, predominantly female (n = 14; 77.78%). Most patients (n = 17; 94.44%) reported headache as a symptom, while other symptoms / signs occur with lesser frequency: vomiting (n = 14; 77.78%), neurological disorders (n = 12; 66.67%), mental status disorder (n=7; 38.89%), dizziness (n=6; 33.33%), nausea (n=6; 33.33%), disturbance of consciousness (n=6; 33.33%), epileptic seizures (n=5; 27.78%). Headache was most common in the occipital region (27.78%).

Conclusion: Based on data obtained in this study it can be concluded that the headache, in the varied clinical manifestation of venous sinus thrombosis, is a stable symptom. It is therefore crucial to identify connectivity headaches with this disease, in order to set the correct diagnosis and appropriate treatment started as soon as possible.

Key words: headache, cerebral venous thrombosis, a symptom.

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Uvod: Moždani udar je klinički sindrom koji se karakteriše akutnim poremećajem fokalne funkcije mozga sa simptomima koji traju duže od 60 minuta ili dovode do smrti, i posledica su vaskularnih uzroka.

Cilj: Utvrditi letalitet i onesposobljenost u kratkoročnom periodu praćenja pacijenata sa teškim formama akutnog moždanog udara, učestalost pojave izabranih komplikacija kao i njihov uticaj na ishod.

Materijal i metode: U ovom istraživanju načinjena je retrospektivna analiza podataka uvidom u medicinsku dokumentaciju pacijenata sa teškim akutnim moždanim udarom koji su lečeni na odeljenju intenzivne nege Klinike za neurologiju u Novom Sadu, u periodu od 01. januara do 30. juna 2011. godine.

Rezultati: Obuhvaćeno je 100 pacijenata, od kojih je 44 ženskog, a 56 muškog pola. Prosečna starost iznosila je 71,09 godina. Kod pacijenata kod kojih su zabeležene skale, najviše je onih sa GCS 3-8, petim stepenom mRS, dok je srednja vrednost NIHSS na prijemu iznosila 17,2, a na otpustu 14,1. Letalan ishod zabeležen je kod 64% pacijenta. Od izabranih komplikacija najčešće se javljala bronhopneumonija, zatim urinarna infekcija, dijareja i plućna tromboembolija. Zapaža se da je najveći broj pacijenata sa urinarnom infekcijom kao komplikacijom egzistirao, i da se smrtni ishod kod ove kao i drugih komplikacija javljao najčešće posle sedam dana.

Zaključak: Pacijenti sa teškim formama akutnog moždanog udara imaju vrlo visok letalitet, invaliditet i funkcionalnu zavisnost u grupi preživelih, kao i visok procenat komplikacija koje utiču na stopu smrtnosti, produžavaju hospitalizaciju i otežavaju oporavak.

Ključne reči: akutni moždani udar, komplikacije, ishod

SEVERE STROKE – EPIDEMIOLOGY, COMPLICATIONS, OUTCOME

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Introduction: Stroke is a clinical syndrome characterized by acute focal disturbance of brain function with symptoms lasting longer than 60 minutes or leading to death, due to vascular causes.

The aim: To determine the mortality rate and disability in the short term treatment of a patient with severe forms of acute stroke, the incidence of selected complications and their impact on the outcome.

Material and methods: This study made a retrospective analysis of data by examining the medical records of patients with severe acute stroke who were treated at the Department of Intensive Care Clinic of Neurology in Novi Sad, from January 1, 2011 to June 30, 2011.

Results: 100 patients were included, 44 females and 56 males. The average age was 71.09 years. In patients where the scales were recorded, most of them had GCS 3-8, fifth grade of mRS, while the median NIHSS on admission was 17.2 and 14.1 at discharge. Lethal outcome was registered in 64% of patients. Complications that were observed, most often occurred bronchopneumonia, then urinary infections, diarrhea and pulmonary thromboembolism. We have noticed that the majority of patients with urinary infection as a complication died, and the death of these and other complications commonly occurred after seven days.

Conclusion: Patients with severe forms of acute stroke have very high mortality rate, disability and functional dependence in survivors, high rate of complications that affect mortality, prolong hospitalization and hamper recovery.

Key words: acute stroke, complications, outcome

TRANSKRANIJALNI PARENHIMSKI ULTRAZVUK U DIJAGNOZI I DIFERENCIJALNOJ DIJAGNOZI PARKINSONOVE BOLESTI I ESENCIJALNOG TREMORA

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Uvod: Transkranijalni ultrazvuk je relativno nova metoda u dijagnostici i diferencijalnoj dijagnostici Parkinsonove bolesti. Esencijalni tremor je benigna bolest koja u ranim fazama i pri atipičnim kliničkim prezentacijama predstavlja najčešći diferencijalno dijagnostički problem u pravcu Parkinsonove bolesti.

Cilj: Cilj našeg istraživanja je bio da pokažemo senzitivnost i specifičnost transkranijalnog ultrazvuka u dijagnostici Parkinsonove bolesti i esencijalnog tremora.

Materijal i metode: Istraživanjem je obuhvaćeno 67 bolesnika sa Parkinsonovom bolešću, 40 bolesnika sa esencijalnim tremorom i 31 zdravih u kontrolnoj grupi. Nalaz hiperehogenosti supstancije nigre veličine $\geq 0,19 \text{ cm}^2$ uzimali smo za signifikantan nalaz.

Rezultati: Zbog okoštalog temporalnog prozora snimanje nije bilo moguće izvršiti kod 10,7% oboljelih od Parkinsonove bolesti, 17,5% bolesnika sa esencijalnim tremorom i 12,9% zdravih kontrola. Signifikantna hiperehogenost supstancije nigre nađena je kod 86,6% bolesnika sa Parkinsonovom bolešću, 12,12% bolesnika sa esencijalnim tremorom i 12,9% zdravih. U Parkinsonovoj bolesti specifičnost je iznosila 85,1%, a senzitivnost 86,2%. U esencijalnom tremoru nije bilo statistički signifikantne razlike u odnosu na zdrave kontrole.

Zaključak: Transkranijalni ultrazvuk je metoda zadovoljavajuće visoke senzitivnosti i specifičnosti u dijagnostici Parkinsonove bolesti i esencijalnog tremora. Naši rezultati slažu se sa podacima iz literature.

Diskusija: Transkranijalni ultrazvuk je neinvazivna, bezbedna, jeftina i pouzdana metoda za dijagnostiku i diferencijalnu dijagnostiku Parkinsonove bolesti i esencijalnog tremora.

Ključne reči: Transkranijalni ultrazvuk, Parkinsonova bolest, esencijalni tremor, senzitivnost, specifičnost.

TRANSCRANIAL SONOGRAPHY IN THE DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF PARKINSON'S DISEASE AND ESSENTIAL TREMOR

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Introduction: Transcranial sonography is a relatively new method used in diagnosis and differential diagnosis of Parkinson's disease. Differential diagnosis between Parkinson's disease and essential tremor in the early stages of the disease, and with and atypical clinical presentation is the most frequent problem.

Goal: The aim of this research was to establish specificity and sensitivity of transcranial sonography in diagnosis of Parkinson's disease and essential tremor.

Material and methods: This research included 67 patients with Parkinson's disease, 40 with essential tremor and 31 healthy in the control group. Area of hyperechogenicity $\geq .19 \text{ cm}^2$ was considered as significant hyperechogenicity.

Results: Due to ossification of the temporal bone window, transcranial sonography could not be performed in 10.7% of the patients with Parkinson's disease, 17.5% of essential tremor and 12.9% of the healthy. Significant substantia nigra hyperechogenicity was found in 86.6% patients with Parkinson's disease, 12.12% patients with essential tremor and 12.9% examinees in the control group. The specificity of the method in diagnosis of Parkinson's disease was 85.1% and sensitivity 86.2%. There was a statistical difference between essential tremor group and the group of the healthy.

Conclusion: Transcranial ultrasound is a method with sufficient sensitivity and specificity in diagnosis of Parkinson's disease, and differential diagnosis towards essential tremor. Our results are in line with the results of other investigators.

Discussion: Transcranial sonography is a noninvasive, safe, cheap and reliable method in diagnosis and differential diagnosis of Parkinson's disease and essential tremor.

Key words: Transcranial sonography, Parkinson's disease, essential tremor, sensitivity, specificity.

CEREBRALNA HEMODINAMIKA U BOLESNIKA SA KAROTIDNIM KINKINGOM I KOILINGOM

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Uvod: Dolichoarteriopatija ili patološka angulacija arterija podrazumeva prisustvo prekomerno dugačke, elongirane arterije u fiksiranom prostoru. Najčešće je zahvaćena arterija karotis interna (AKI), a kod malog broja bolesnika moguća je pojava neuroloških smetnji. U literaturi do sada nije analiziran status intrakranijalne cirkulacije kod bolesnika sa dolichoarteriopatijama AKI.

Cilj rada: da se identifikuju faktori rizika za nastanak dolichoarteriopatije ekstrakranijalne AKI, da se analiziraju hemodinamski parametri dobijeni TCD pregledom i da se ispita povezanost arterijskih elongacija AKI i postojanja neuroloških simptoma.

Materijal i metode: U studiji preseka su upoređeni vaskularni faktori rizika, neurološka klinička slika, ekstra- i intrakranijalni hemodinamski parametri između bolesnika sa i bez dolichoarteriopatije ekstrakranijalnog segmenta AKI.

Rezultati: U studiju je uključeno 38 bolesnika sa kinkingom AKI i 39 osoba bez kinkinga. Svi bolesnici su imali unilateralni kinking. Ni kod jednog bolesnika kinking nije bio hemodinamski značajan. Bolesnici sa kinkingom AKI su bili stariji nego bolesnici bez kinkinga ($p=0,0003$) i češće su imali hipertenziju ($p=0,088$). Nije bilo razlike u kliničkoj prezentaciji između bolesnika sa i bez kinkinga AKI. Srednje brzine protoka nad glavnim intrakranijalnim arterijama su u proseku bile niže kod bolesnika sa kinkingom ($p=0,009$ za srednju cerebralnu arteriju), a indeksi pulsatilnosti su bili viši ($p=0,0025$).

Zaključak: Rezultati našeg istraživanja su pokazali da su bolesnici sa kinkingom ekstrakranijalnog segmenta AKI stariji i češće imaju hipertenziju u odnosu na bolesnike bez kinkinga AKI, što je u skladu sa podacima iz literature. Takođe, kod bolesnika sa kinkingom AKI pokazane su specifičnosti intrakranijalne cirkulacije.

Ključne reči: kinking, arterija karotis interna, transkranijalni Dopler, cerebralna hemodinamika.

CEREBRAL HEMODYNAMIC IN PATIENTS WITH CAROTID KINKING AND COILING

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Introduction: Dolichoarteriopathy or abnormal angulation of the arteries involves the presence of excessively long, elongated arteries fixed in space. Most often the affected internal carotid artery (AKI), with a small number of patients may be associated with neurological disorders. Yet have not been analyzed intracranial circulation in patients with AKI dolichoarteriopathies.

The Aim: to identify risk factors for dolichoarteriopathy AKI, to analyze the hemodynamic parameters obtained by TCD examination and to examine the association between arterial elongation AKI and the existence of neurological symptoms.

Materials and Methods: The study sections are compared vascular risk factors, clinical neurology, extracranial and intracranial hemodynamic parameters between patients with and without AKI extracranial dolichoarteriopathy.

Results: The study included 38 patients with AKI kinking and 39 people without kinking. All patients had unilateral kinking. None of the patients kinking was not hemodynamically significant. Patients with kinking were older than patients without kinking ($p = 0.0003$) and more frequently had hypertension ($p = 0.088$). There were no differences in clinical presentation between patients with and without kinking AKI. Mean flow rates of the major intracranial arteries are, on average, were lower in patients with kinking ($p = 0.009$ for the middle cerebral artery) and pulsatility indices were higher ($p = 0.0025$).

Conclusion: Our study showed that the patients with kinking of the extracranial segment of AKI are older and more likely to have hypertension than patients without kinking AKI, which is consistent with the literature data.

Key Words: kinking, internal carotid artery, transcranial Doppler, cerebral hemodynamic.

CHARCOT MARIE TOOTHOVA NEUROPATIJA SA CONNEXIN 32 MUTACIJAMA: ELEKTRONEUROMIOGRAFSKA STUDIJA

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Uvod: Charcot-Marie-Tooth(CMT) je hereditarna senzomotorna polineuropatija koja se odlikuje progresivnom slabošću, hipotrofijom i poremećajem senzibiliteta predominantno donjih ekstremiteta. Dve glavne grupe CMT su aksonalna(CMT2) i demijelinaciona(CMT2). X vezana CMT pokazuje karakteristike i CMT1 i CMT2 te se stoga svrstava u intermedijalne hereditarne polineuropatije. CMTX nastaje mutacijom u genu za koneksin32(Cx32).

Cilj: Cilj ovog rada je ispitivanje elektromiografskih(EMG) karakteristika bolesnika sa dokazanom mutacijom u koneksin32 genu.

Materijal i metode: Uvidom u medicinsku dokumentaciju 14 pacijenata Klinike za Neurologiju i psihijatriju za decu i omladinu izdvojena je grupa pacijenata sa mutacijom u koneksin32 genu. Analizirani su demografski(pol i godine) i elektromiografski(EMG) podaci: detektabilnost akcionih potencijala senzitivnog nerva (SNAP) za n. medianus i suralis, amplituda dobijenog SNAP i senzitivna brzina provođenja (SBP) za testirane nerve; detektabilnost skupnog mišićnog akcionog potencijala (SMAP) za n. medianus i peroneus, terminalna latenca (TL) i amplituda dobijenog SMAP, kao i motorna brzina provođenja (MBP) testiranih nerava.

Rezultati: EMG parametri su u rasponu od normalnih do patoloških. Patološke vrednosti su odgovarale i demijelinacionim i aksonalnim neuropatijama. Analizirajući EMG parametre u odnosu na pol dobijena su veća odstupanja kod muških osoba (nedetektabilnost SNAP, nedetektabilnost SMAP, Amplituda SMAP, amplituda SNAP, TL, MBP), ali sa dostizanjem statističke značajnosti samo za vrednost MBP za n. peroneus ($p=0,019, p<0,05, CI=95\%$).

Zaključak: Iz priloženih rezultata možemo da zaključimo da osobe ženskog pola pokazuju blaže EMNG-ske karakteristike od osoba muškog pola.

Ključne reči: X vezana CMT, koneksin32, intermedijerna CMT.

CHARCOT MARIE TOOTH NEUROPATHY WITH CONNEXIN 32 MUTATIONS: ELECTROMYOGRAPHY STUDY

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Introduction: Charcot-Marie-Tooth(CMT) is a heterogeneous hereditary motor and sensory neuropathy that is characterized by progressive weakness, hypotrophy and sensory impairment predominantly in the distal part of the legs. Two main types are demyelinating (CMT1) and axonal(CMT2). Due to the fact that X linked CMT shows characteristics of both main types it is usually described as intermediate. It is caused by mutation in Cx32 gene.

The aim: Testing electromyography(EMG) features in patients with mutation in connexin 32 gene.

Material and methods: Researching a medical documentation of 14 patients Clinic for Neurology and Psychiatry for Children and Youth we choosed a group with Cx32 gene mutation. We examined demographic (sex and age) and electromyographic(EMG) features: sensory nerve action potential(SNAP), amplitude of recorded SNAP and sensory nerve conduction velocity (SCV) for the median and sural nerves; compound muscle action potential (CMAP), terminal latency(TL), amplitude of recorded CMAP and motor nerve conduction velocity (MCV) for the median and peroneal nerves.

The results: EMG parameters are in the range of normal and pathological. Pathological values corresponded to the demyelinating and axonal neuropathies. Analyzing EMG parameters in relation to sex were obtained greater differences in male individuals (undetected SNAP, undetected SMAP, the amplitude of SMAP, the amplitude of SNAP, TL, MBP), but with reaching statistical significance only for the value of MBP for peroneal nerve ($p=0,019, p<0,05, CI=95\%$).

The conclusion: From the results we can see that females show less severe EMNG features than males.

Keywords: X-linked CMT, connexin 32, intermediate CMT.

RAZLIKE U KLINIČKIM ISPOLJAVANJIMA KLASTER GLAVOBOLJE KOD ŽENA I MUŠKARACA

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Uvod: Klaster glavobolja je primarna glavobolja koja se karakteriše napadima jakog jednostranog bola glave udruženog sa istostranim autonomnim simptomima. Pripada grupi trigeminalnih autonomnih cefalalgija zbog trigeminalne distribucije bola i prisustva istostranih autonomnih simptoma.

Cilj: Utvrditi da li postoje razlike u kliničkom ispoljavanju i učestalosti klastera kod muškaraca i žena u našoj populaciji.

Materijal i metode: Za istraživanje je korišćena baza podataka Centra za glavobolje KCS, sa podacima od 2000. do 2011. godine. U toku istraživanja upoređivane su sledeće osobine žena i muškaraca obolelih od klaster glavobolje: uzrast u momentu početka bolesti i momentu prvog lekarskog pregleda, osobine klaster perioda i klaster napada, prisustvo autonomnih fenomena, migrenskih simptoma, opresija u oku i ostalih fenomena, prisustvo okidača bolesti i odgovor na akutnu i preventivnu terapiju.

Rezultati: Analizirano je 164 pacijenata sa klaster glavoboljom, 56 (34,15%) žena i 108 (65,85%) muškaraca. U epizodičnoj formi bolesti, muškarci su imali češće veći broj klaster perioda od žena. Muškarci su češće navodili okidač napada od žena, a najčešći trigger je bio alkohol. Drugi ispitivani parametri se nisu razlikovali među rodovima.

Zaključak: Klaster glavobolja je dvostruko češća kod muškaraca nego kod žena. Žene i muškarci ne razlikuju se značajno u kliničkom ispoljavanju klaster glavobolje.

Ključne reči: klaster glavobolja, razlike, žene, muškarci, simptomi

DIFFERENCES IN CLINICAL MANIFESTATIONS CLUSTER HEADACHE FOR WOMEN AND MEN

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Introduction: Cluster headache is a primary headache characterized by strong onsets of unilateral pain joint with ipsilateral autonomic symptoms. It belongs to the group of trigeminal autonomic cephalalgias due to the trigeminal distribution of pain and presence of ipsilateral autonomic symptoms.

The Aim: To determine whether there are any differences in clinical manifestation and cluster frequency with men and women in our population.

Materials and methods: Database of the Headache Center of the CCS, with data from 2000 until 2011, was used for the research. During the research the following characteristics of men and women suffering from cluster headaches were compared: the age at the moment of the beginning of the disease and the moment of the first medical examination, the characteristics of the cluster periods and cluster attacks, the presence of autonomic phenomena, migraine symptoms, oppressions in the eye and other phenomena, the presence of the disease trigger and the answer to the acute and preventive therapy.

Results: We analyzed 164 patients with cluster headache, 56 (34.15%) women and 108 (65.85%) men. In the episodic form of the disease, men had a greater number of cluster periods more often than women. Men are more frequently cited trigger attacks than women, and the most common trigger was alcohol. Other examined parameters didn't differ between sexes.

Conclusion: Cluster headache is twice more common in men than in women. Women and men do not differ significantly in the clinical manifestation of the cluster headache.

Key words: cluster headache, differences, women, men, symptoms

**ODNOS POJAVE GENERALIZOVANIH MOTORNIH NAPADA U ODNOSU
NA OSTALE TIPOVE NAPADA PRI REDUKCIJI ANTIPILEPTIČKE TERAPIJE
TOKOM VIDEO-EEG TELEMETRIJE**

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Uvod: Generalizovani toničko-klonički napadi (GTKN) su najteži tipovi napada koji remete kvalitet života i nose opasnost po zdravlje. Video-EEG telemetrijom (vEEGT) se snimaju epileptički napadi kako bi se utvrdila semiologija i EEG karakteristike u cilju određivanja epileptogene zone, radi eventualnog hirurškog lečenja. Ukidanje anti epileptičkih lekova povećava prinos napada, ali povećava rizik od pojave teških GTKN ili epileptičkog statusa.

Cilj rada: Utvrđivanje proporcije bolesnika sa GTKN, njihove proporcije u odnosu na ostale tipove napada tokom vEEGT i poređenje sa anamnestičkim podacima o pojavi GTKN tokom ranije terapije.

Materijal i metode: Studija obuhvata pacijente podvrgnute vEEGT na Klinici za neurologiju Kliničkog centra Srbije u Beogradu tokom 2011. godine. Podaci su dobijeni pregledom istorija bolesti i izveštaja sa vEEGT.

Rezultati: Od 154 pacijenta epileptički napadi su se javili kod 104 (47 žena, 57 muškaraca) prosečne starosti 40 godina. GTKN su ispoljila 34 (33%) pacijenta: njih 8 izolovane GTKN, 7 sekundarno GTKN i 19 udružene fokalne i GTKN. Samo 9 pacijenata je imalo auru (kod 4 uoči napada). Ni jedan pacijent nije imao komplikacije vezane za epileptičke napade. Svih 34 pacijenata su i ranije imali GTKN. Uz terapiju 7 pacijenata nije imalo GTKN duže od 5 godina, 9 je imalo jednom godišnje, 12 jednom mesečno, a 6 jednom nedeljno.

Zaključak: GTK napadi mogu se očekivati kod 1/3 bolesnika kod kojih se napadi registruju tokom vEEGT, a javljali su i pre vEEGT, ali su samo kod polovine bolesnika mnogo češći nego uz primenu terapije.

Ključne reči: Video-EEG telemetrija, ukidanje terapije, generalizovani toničko-klonički napadi, učestalost, komplikacije

**THE RATIO BETWEEN THE OCCURRENCE OF GENERALIZED MOTOR SEIZURES
AND OTHER TYPES OF SEIZURES IN CASE OF THE REDUCTION OF ANTIPILEPTIC THERAPY
DURING VIDEO-EEG TELEMETRY**

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Introduction: Generalized tonic-clonic seizures (GTCS) are most serious seizure types that carry particularly unfavorable outcome. Video-EEG telemetry (vEEGT) is method for recording seizure semiology and EEG in order to establish epileptogenic zone. Antiepileptic therapy withdrawal increases probability of recording attacks, but increases risk of severe GTCS or status epilepticus.

The Aim: To determine proportion of patients with GTCS, their proportions in comparison to other seizure types during vEEGT and to compare with anamnestic data of GTCS frequency during previous therapy.

Materials and Methods: This study includes patients subjected to vEEGT at Department of Neurology, Clinical center of Serbia in Belgrade during year of 2011. Data were obtained by reviewing medical history and vEEGT reports.

Results: Epileptic seizures occurred in 104 of 154 patients (47 female, 57 male, mean age 40 years). GTCS occurred in 34 (33%) patients: 8 exhibited isolated GTCS, 7 secondary GTCS, and 19 focal and GTCS. Only 9 patients had aura (before seizures in 4). No patient had complications related to seizures. All patients that experienced GTCS during vEEGT had GTCS before. With therapy 7 patients have not had GTCS more than 5 years, 9 had at yearly, 12 at monthly and 6 at weekly intervals.

Conclusion: GTCS can be expected in 1/3 of patients in whom seizures are registered during vEEGT. All of them had experienced GTCS in past, but only in half of them GTCS were significantly more frequent during drug withdrawal for vEEGT.

Key words: Video-EEG telemetry, therapy withdrawal, generalized tonic-clonic seizures, frequency, complications.

**AKUTNI VERTIGINOZNI SINDROM KAO INDIKACIJA ZA HOSPITALIZACIJU
NA NEUROLOŠKO ODELJENJE**

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Uvod: Među najčešćim tegobama koje bolesnike dovode neurologu nalaze se vertigo i gubitak ravnoteže. Uzroci vertiga su brojni a diferencijalna dijagnoza široka. Veliki broj osoba se zbog akutno nastalog vertiga hospitalizuje na neurološkim odeljenjima, ali se samo kod malog broja dijagnostikuje neurološka bolest kao uzrok.

Cilj: Analizirati kliničke osobine i rezultate dijagnostičkih ispitivanja i etiologiju koja je dovela do akutnog vertiga koji je rezultovao prijemom na Kliniku za neurologiju KCS.

Materijal i metoda: Kod 31 konsekutivnog bolesnika primljenih kao hitan slučaj na Kliniku za neurologiju KCS u periodu od 01.01.2011. do 01.01.2012. godine izvršena je analiza demografskih osobina, vaskularnih faktora rizika, kliničke prezentacije i nalaza dopunskih analiza. Klinički parametri obolelih su upoređeni sa 30 zdravih ispitanika.

Rezultati: Kod 26 (80,9%) bolesnika končana neurološka dijagnoza na otpustu je bila periferni vertigo (PV), kod 4 (12,9%) centralni vertigo (CV), a kod jedne osobe (3,2%) radilo se o anksioznom poremećaju sa subjektivnim doživljajem vertiga. Od ukupnog broja dijagnostikovanih bolesnika sa PV, 76,9% je imalo neuronitis vestibularnog nerva, 9,7% benigni paroksizmalni vertigo, 7,7% druge uzroke PV, dok je kod jednog obolelog (3,8%) dijagnostikovano Coganov sindrom. Od ukupnog broja bolesnika sa CV, troje je imalo dijagnozu vertebrobasilarne insuficijencije, a jedan dijagnozu demijelinizacionog oboljenja.

Zaključak: U našoj grupi ispitanika koji su primljeni sa akutnim vertiginoznim sindromom kao hitan slučaj na Kliniku za neurologiju, u najvećem broju slučajeva nije detektovana neurološka osnova poremećaja.

Ključne reči: Vrtoglavica, benigni paroksizmalni pozicioni vertigo, vestibularni neuronitis, Coganov sindrom

ACUTE VERTIGO AS INDICATION FOR HOSPITALIZATION ON NEUROLOGICAL DEPARTMENT

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Introduction: Vertigo and balance loss are the most common symptoms that bring patients to neurologist. The causes of vertigo are numerous and differential diagnosis is wide. Many patients with acute vertigo are hospitalized at neurological wards, although neurological causes of vertigo are found in only a small number of patients.

The aim: To analyze the clinical features and results of diagnostic tests and etiology leading to acute vertigo that resulted in admission to the Department of Neurology, Clinical Centre of Serbia.

Materials and Methods: In 31 consecutive patients hospitalized at the Clinical of Neurology in period January 2011 - January 2012, we analyzed demographic data, vascular risk factors, clinical presentation and results of ancillary tests. Clinical data were compared between patients and 30 healthy controls.

Results: In 26 (80.9%) patients, the final diagnosis on discharge was peripheral vertigo (PV), in 4 (12.9%) central vertigo (CV), and in one case (3.2%) anxiety disorder with subjective experience of vertigo was detected. Of all patients diagnosed with PV, 76.9% had vestibular neuronitis, 9.7% benign paroxysmal vertigo, 7.7% other causes of PV and 3.8% Cogan's syndrome. Of all patients with CV, three had a diagnosis of vertebrobasilar insufficiency, and one patient had demyelinating disease.

Conclusion: In our group of patients admitted to the Clinic of Neurology with acute vertigo as an emergency, no neurological bases of the disorder was detected.

Key words: Vertigo, Cogan, BPPV, Vestibular neuronitis

FAKTORI RIZIKA KOJI SE MOGU KORIGOVATI KOD BOLESNIKA SA AKUTNIM ISHEMIJSKIM MOŽDANIM UDAROM

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Uvod: Faktori rizika su određena oboljenja, patološka stanja, osobine ili navike koje dovode do određene bolesti i njenih komplikacija. Neki faktori za nastanak moždanog udara su potvrđeni, dok je udeo i način delovanja drugih još u ispitivanju. Faktori rizika za moždani udar mogu se podeliti na one na koje se ne može uticati, faktore rizika na koje se može uticati, i još uvek nedovoljno potvrđene faktore rizika.

Cilj rada: Ispitivanje učestalosti hipertenzije, šećerne bolesti, povišenih masti u krvi, atrijske fibrilacije, odnosno faktora rizika koji se nisu korigovali, kod pacijenata sa dijagnostikovanim akutnim ishemijskim moždanim udarom.

Materijal i metode: Studija obuhvata 139 pacijenata sa odeljenja Urgentne neurologije Kliničkog centra Srbije. Podaci o faktorima rizika pomenutih pacijenata, njihovom poznavanju i korekciji pre nastanka bolesti dobijeni su uvidom u njihovu medicinsku dokumentaciju.

Rezultati: Od 139 pacijenata sa akutnim ishemijskim moždanim udarom hipertenzija je potvrđena kod 112. Njih 95 je znalo za prisustvo poremećaja, a 53 ga je lečilo i redovno kontrolisalo. Dijabetes melitus je potvrđen kod 29 pacijenata. Od toga 16 leči i kontrolise poremećaj. Povišene masti u krvi su dijagnostikovane kod 87 pacijenata. Njih 21 je znalo za poremećaj, a 3 ga je lečilo i kontrolisalo. Kod 34 pacijenata je verifikovana atrijska fibrilacija. Istu je lečilo 5 pacijenata.

Zaključak: Ispitivanje je pokazalo učestalost pomenutih faktora rizika koja ne odstupaju od podataka iz svetske literature sa statistički značajnom razlikom. Međutim, evidentan je veliki broj pacijenata koji ne leče pomenute faktore rizika, a oni su im poznati.

Ključne reči: faktori rizika, hiperlipidemija, hipertenzija.

RISK FACTORS THAT CAN BE ADJUSTED IN PATIENTS WITH ACUTE ISHEMIC STROKE

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Introduction: Risk factors are particular disease, pathological disorders, features or habits, which could result illnesses and complications. Some risk factors are confirmed in genesis of stroke, but on the other side, some other factors and their ways of function are in research still. Stroke risk factors are divided on those who can't be effected, those who can be effected, and risk factors not approved yet.

The aim: Study was to investigate frequency of hypertension, DM, hyperlipidemia, atrial fibrillation, respecting risk factors not changed, in patients with diagnosis of stroke.

Materials and methods: Study include 139 hospital patients in the Department of Emergency Neurology. Data of risk factors in patients, their knowledge and correction of risk factors had been acquired from patients medical documents.

Results: In population of 139 patients with stroke, there were 112 with hypertension, from that number 95 patients were inform about disorder and 53 had treatment and regular monitoring. 29 patients had DM and from that number 16 had treatment and regular monitoring disorder. Hyperlipidemia was diagnosed in 87 patients, from that number 21 were informed about disorder, 3 had treatment and regular monitoring. In 34 patients were verified atrial fibrillation and 5 patients were on treatment for disorder.

Conclusion: Research had shown that frequency of risk factors didn't deviate from the data in World literature with statistically major difference. Nevertheless, it is obviously big number of patients who don't have treatment for those risk factors, and they are informed about them.

Key words: Hypertension, risk factors, hyperlipidemia.

FIZIČKA AKTIVNOST I BAVLJENJE SPORTOM DECE I ADOLESCENATA SA EPILEPSIJOM

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Uvod: Sport i fizička aktivnost najčešće imaju važan i pozitivan uticaj na kvalitet života dece i adolescenata sa epilepsijom. Međutim, često ovim osobama nije dozvoljeno da budu fizički aktivne.

Cilj: Naš cilj bio je da utvrdimo koliko se i kojim oblicima fizičke aktivnosti i sporta bave deca i mladi sa epilepsijom u našem društvu.

Materijal i metode: Analizirali smo šest parametara fizičke aktivnosti u grupi od 80 dece i mladih sa epilepsijom i kontrolnoj grupi od 43 zdrave dece i adolescenata. Podaci su prikupljeni specijalno dizajniranim upitnikom i analizirani standardnim statističkim metodama.

Rezultati Grupa od 83.7% dece i mladih sa epilepsijom je učestvovala u nastavi fizičkog vaspitanja, pri čemu nije bilo značajne razlike u poređenju sa kontrolnom grupom. Razlika između grupe obolelih i kontrolne grupe u bavljenju preporučenim vežbama za obolele od epilepsije u nastavi fizičkog vaspitanja visoko je statistički značajna, a u bavljenju potencijalno opasnim vežbama nije značajna. Polovina dece i mladih sa epilepsijom trenirala je neki sport.

Zaključci: Značajan broj dece i mladih sa epilepsijom se ne bavi dovoljno fizičkom aktivnošću uprkos normalnom neurološkom nalazu i dobroj kontroli napada. Takođe, značajan je broj pacijenata koji se bave fizičkim aktivnostima koje nisu preporučljive za osobe sa epilepsijom. Iako su predrasude protiv bavljenja sportom umanjene, fizička aktivnost obolelih od epilepsije mora se i dalje ohrabrivati.

Ključne reči: Epilepsija, sport, fizička aktivnost, deca, omladina.

PHYSICAL AND SPORTING ACTIVITY OF THE CHILDREN AND YOUTH WITH EPILEPSY

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Introduction: Sport and physical activity mostly have an important and positive impact on the quality of life of children and youth with epilepsy. However, these persons are often not allowed to be physically active.

The Aim: To determine the degree and type of physical and sporting activity of the children and youth with epilepsy in our community.

Materials and Methods: We analysed six parameters of physical activity in a group of 80 children and youth with epilepsy and a control group of 43 healthy children and adolescents. We collected data using specifically designed questionnaire and analyzed them using standard statistical techniques.

Results: Group of 83.7% children and youth with epilepsy was included in the school physical education classes, and there was no significant difference compared to the control group. Difference between the two groups in practicing school physical exercises recommended for people with epilepsy was statistically highly significant, but in practicing potentially dangerous exercises wasn't significant. One half of young people with epilepsy practiced some sporting activities.

Conclusion: There's a significant number of children and adolescents with epilepsy who are not engaged enough in physical activity despite of normal neurological status and favourable seizure control. There's also considerable number of patients who deal with physical activities that aren't recommended for people with epilepsy. Although the prejudice against sporting activities become lower, physical activity of patients with epilepsy must be further encouraged.

Keywords: Epilepsy, sport, physical activity, children, youth.

JUVENILNA MIOKLONIČKA EPILEPSIJA – MOGUĆI DIJAGNOSTIČKI IZAZOV

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Uvod: Juvenilna mioklonička epilepsija je čest idiopatski, generalizovani i dobno-zavisni epileptički sindrom, koji čini 5-10% svih epilepsija. Uprkos jasnom kliničkom i EEG nalazu pogrešna ili odložena dijagnoza predstavljaju čestu pojavu.

Cilj: Naš cilj je bio da utvrdimo kolika je učestalost pogrešno dijagnostikovanih pacijenata sa juvenilnom miokloničkom epilepsijom, kao i da utvrdimo razloge koji dovode do pogrešne i odložene dijagnoze.

Materijal i metode: Istraživanje je obuhvatilo 87 bolesnika sa dijagnozom JME lečenih u Klinici za neurologiju i psihijatriju za decu i omladinu u Beogradu. Izdvojena je grupa od 32 bolesnika kod kojih je postavljena pogrešna ili odložena dijagnoza JME. Neurološki nalaz svih bolesnika bio je uredan.

Rezultati: Kod 32/87 (36,8%) bolesnika postavljena je pogrešna početna dijagnoza pa je dijagnoza JME bila odložena. U slučaju greške najčešća početna dijagnoza (46,8% bolesnika) bila je epilepsija bez sindromske dijagnoze. Početna dijagnoza žarišne epilepsije postavljena je kod 18,7% bolesnika, dok je 15,6% bolesnika imalo početnu dijagnozu apsantne epilepsije. Kod 12,5% bolesnika navedena je dijagnoza krize svesti, pretpostavljene epileptičke prirode, a kod dva (6,2%) bolesnika početna dijagnoza je bila glavobolja.

Zaključak: Naši rezultati su pokazali da je najznačajniji uzrok postavljanja pogrešne ili odložene dijagnoze JME neprepoznavanje sindroma i neadekvatno uzimanje podataka o miokloničkim napadima uz čestu pogrešnu interpretaciju epileptičkih događaja od strane lekara.

Ključne reči: Juvenilna mioklonička epilepsija, dijagnostička greška, terapija

JUVENILE MYOCLONIC EPILEPSY – POSSIBLE DIAGNOSTIC CHALLENGE

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Introduction: Juvenile myoclonic epilepsy (JME) is a common idiopathic generalized and age-related epileptic syndrome, which makes 5-10% of all epilepsies. Despite typical clinical and EEG profiles, JME is often misdiagnosed.
Aim: Our aim was to determine what is the frequency of incorrectly diagnosed patients with juvenile myoclonic epilepsy, and to ascertain the reasons which lead to wrong and delayed diagnosis.

Material and methods: The study included 87 patients diagnosed as JME who were treated at the Clinic of neurology and psychiatry for children and youth in Belgrade. There was a group of 32 JME patients initial misdiagnosis. Neurological examination of all patients was normal.

Results: Group of 32/87 (36.8%) patients was diagnosed incorrectly so that the initial diagnosis of JME was postponed. In case of wrong diagnosis the most common initial diagnosis (46.8% of patients) was epilepsy without syndromic classification. Initial focal epilepsy was considered in 18.7% patients, while 15.6% of patients had initial diagnosis of absence epilepsy. Subgroup of 12.5% incorrectly diagnosed patients were diagnosed as crisis of consciousness with the presumed epileptic etiology. In two (6.2%) patients, initial diagnosis was symptomatic headache.

Conclusion: Our results showed the failure in eliciting the history of myoclonic jerks and misinterpretation of epileptic events as the main factors associated with JME misdiagnosis.

Key words: juvenile myoclonic epilepsy, misdiagnosis, treatment

UČESTALOST I FAKTORI RIZIKA ZA NASTANAK HALUCINACIJA U OBOLELIH OD PARKINSONOVE BOLESTI

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Uvod: Halucinacije, kao manifestacija parkinsonove psihoze, spadaju u red čestih neuropsihijatrijskih nemotornih simptoma Parkinsonove bolesti (PB).

Cilj: Proceniti učestalost halucinacija kod pacijenata obolelih od PB i ukazati na faktore rizika za njihov nastanak.
Materijal i metode: Ova studija preseka obuhvata 76 pacijenata obolelih od PB lečenih na Beogradskom Institutu za Neurologiju, Kliničkog Centra Srbije i neurološkog odeljenja KBC „Zvezdara“ u periodu od oktobra 2011. do januara 2012. Svim pacijentima su postavljena pitanja o prisustvu halucinacija. Težina bolesti obolelih procenjena je pomoću Unified Parkinson's Disease Rating Scale (UPDRS), stadijum bolesti prema skali Hoehn I Yahr, depresivnost i anksioznost uz pomoć Hamiltonove skale za procenu depresivnosti i anksioznosti i kognitivni status prema Mini-Mental State Examination testu (MMSE). Takođe su detaljno ispitani o poremećajima spavanja. Korišćene su odgovarajuće statističke metode.

Rezultati: 39 pacijenata (51.3%) je imalo halucinacije sa prosečnim trajanjem od 2.9 godina i to najčešće po tipu vizuelnih (94.9%). Grupa ispitanika potom je podeljena prema prisustvu ili odsustvu halucinacija na halucinatore i nehalucinatore. Otkrivena je visoko statistički značajna razlika ($p < 0.01$) u UPDRS skorima između grupe halucinatora i nehalucinatora kao i u fragmentaciji spavanja. Statistički značajna razlika između grupa ($p < 0.05$) je nađena u Hoehn and Yahr skorima, MMSE skorima, kao i u učestalosti košmarnih snova.

Zaključak: Kod pacijenata koji boluju od PB halucinacije je imalo više od polovine. Halucinatori su imali značajno teži oblik bolesti, lošiji kognitivni status i češće prisustvo košmarnih snova, kao i fragmentacije spavanja od nehalucinatora.
Ključne reči: halucinacije, Parkinsonova bolest, faktori rizika, učestalost.

INCIDENCE AND RISK FACTORS FOR THE DEVELOPMENT OF HALLUCINATIONS IN PATIENTS WITH PARKINSON'S DISEASE

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Introduction: Hallucinations are a common psychiatric non-motoric symptom in Parkinson's disease (PD), which is a result of Parkinson's psychosis.

The Aim: To determine the prevalence and risk factors for the development of hallucinations in patients with PD.
Materials and Methods: This cross-sectional study includes 76 patients with PD treated at the Institute of Neurology, Clinical Center of Serbia and neurological department at KBC "Zvezdara" between October 2011. and January 2012. All patients were interviewed about the presence of hallucinations. Hoehn and Yahr scale was used for the disease staging, while the severity of symptoms was assessed by the Unified Parkinson's Disease Rating Scale (UPDRS), severity of depressive symptoms with the Hamilton Depression Rating Scale and cognitive impairment with Mini-Mental State Examination (MMSE). Additionally, they were interviewed about their sleep problems. Appropriate statistical methods were used.

Results: 39 patients (51.3%) had hallucinations with average length of 2.9 years. Most common were visual hallucinations (94.9%). Group was then divided into hallucinators and non-hallucinators. Highly significant statistical difference ($p < 0.01$) was discovered in the UPDRS score and sleep fragmentation between the groups. Significant statistical difference ($p < 0.05$) was found in Hoehn and Yahr score, MMSE score and prevalence of nightmares between the groups.

Conclusion: Within the patients suffering from PD more than half had hallucinations. Patients with hallucinations had significantly worse form of PD, poorer cognitive status and had nightmares and sleep fragmentation more frequently than the rest.

Key words: hallucinations, Parkinson's disease, risk factors, prevalence.

NEPOSREDNI ISHOD BOLESNIKA OPERISANIH PREDNJOM DVOTREĆINSKOM RESEKCIJOM TEMPORALNOG REŽNJA ZBOG FARMAKOREZISTENTNE TEMPORALNE EPILEPSIJE

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Uvod: Epilepsija je hronični neurološki poremećaj koji u velikoj meri smanjuje kvalitet života obolelog, pa bi trebalo uložiti maksimalne napore u cilju njenog lečenja i adekvatne kontrole napada.

Cilj rada: Cilj ovog istraživanja je sticanje uvida u efikasnost hirurškog lečenja farmakorezistentnih fokalnih epilepsija temporalnog režnja.

Materijal i metode: Posmatrali smo trideset jednu odraslu osobu, oba pola, operisanu parcijalnom prednjom temporalnom lobektomijom sa amigdalo-hipokampektomijom u periodu od 2006. do 2012. godine. Podatke smo dobili iz otpusnih lista i izveštaja epileptološkog konzilijuma, a obradili smo ih metodama deskriptivne statistike. Pre operacije je kod svih bolesnika utvrđeno da se radi o epilepsiji mezijalnog temporalnog režnja na osnovu podudarnosti lokalizacije na osnovu kliničke slike (semiologije) napada, interiktalnog i iktalnog EEG-a i nalaza magnetne rezonance. Za procenu ishoda korištena je klasifikacija po Engelu posle praćenja od 3 do 54 meseca (medijana 9 meseci).

Rezultati: Engel Klasa I (bez napada i bez aura) je obuhvatila 87,1%, u Engel klasi II i III bilo je 9,7%, dok je u Engel klasi IV i V bilo 3,2% ispitanika. Bez komplikacija je prošlo 61,3% svih operacija, dok je 80,6% operacija prošlo bez kasnijeg nastajanja komorbiditetnih stanja.

Zaključak: Podaci pokazuju da je, iako je dužina praćenja još uvek kratka, hirurško lečenje farmakorezistentne epilepsije temporalnog režnja, uspešno i da su komplikacije retke i blage.

Ključne reči: Temporalna epilepsija, operacija, ishod, komplikacije.

IMMEDIATE OUTCOME OF PATIENTS OPERATED BY FRONT TWO - THIRD TEMPORAL LOBE RESECTION DUE DRUG RESISTANT TEMPORAL EPILEPSY

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Introduction: Epilepsy is a chronic neurological disorder that greatly reduces the quality of patient's life, and every effort should be made to her medical treatment and adequate seizure control.

The Aim: The objective of this research is to understand the effectiveness of surgical treatment of focal pharmacoresistant temporal lobe epilepsy.

Material and methods: We observed thirty – one adult, both sexes, the operated partial anterior temporal lobectomy with amygdala – hippocampotomy in the period from 2006. to 2012. We obtained data from release lists and reports of epileptology council, and we processed the data by using descriptive statistics methods. Before surgical treatment in all patients found to be mesial temporal lobe epilepsy based on matching of localization based on clinical picture (semiotics) of attack, interictal and ictal EEG and MRI findings. For assessment of outcome it's used Engel's classification after follow – up of 3 to 54 months (median 9 months).

Results: Engel Class I (without seizures and without auras) included 87,1%, in Engel Class II and III there was 9,7%, and in Engel Class IV and V was 3,2% of respondents. 61,3% of all operations passed without complications, and 80,6% of all operations passed without later emergence of comorbidity states.

Conclusion: Data show that, although the length of follow – up is still short, surgical treatment of pharmacoresistant temporal lobe epilepsy is successful and that complications are rare and mild.

Key words: Temporal epilepsy, surgical treatment, outcome, complications.

MUSK MIJASTENIJA GRAVIS: KLINIČKA EKSPRESIJA, TOK BOLESTI I ODGOVOR NA TERAPIJU

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Uvod: Stečena autoimuna mijastenija gravis (MG) je autoimuno oboljenje koje nastaje kao posledica poremećaja neuromišićne transmisije. Oko 80% pacijenata sa generalizovanom formom MG u serumu ima antitela na nikotinski acetilholinski receptor (AChR), dok su preostalih 20% bolesnika seronegativni. Kod oko 40-50% takozvanih seronegativnih bolesnika detektovan je povećan titar antitela na mišićno-specifičnu tirozin kinazu (MuSK).

Cilj rada: Ispitati kliničku ekspresiju i tok bolesti kod bolesnika sa MuSK MG, i uporediti ove parametre sa drugim imunološkim fenotipovima.

Materijal i metode: Ova retrospektivna studija obuhvatila je 39 bolesnika sa MuSK MG (8 muškaraca i 31 žena) hospitalizovanih na Klinici za neurologiju Kliničkog Centra Srbije. Korišćene su dve kontrolne grupe: grupa bolesnika sa kompletno seronegativnom MG (n=26) i grupa bolesnika sa AChR MG (n=215).

Rezultati: Rezultati našeg istraživanja su pokazali gotovo četiri puta veću učestalost ženskog u odnosu na muški pol kod bolesnika sa MuSK MG. Pacijenti sa MuSK MG su u trenutku pojave prvih simptoma MG bili mlađi od pacijenata iz preostale dve grupe. U piku bolesti najčešće su bili u IIB ili IIIB formi sa značajnim procentom bolesnika u najtežoj formi V prema MGFA klasifikaciji. Pored toga, bolesnici sa MuSK MG imali su nepovoljniji ishod bolesti u odnosu na AChR pozitivnu i seronegativnu MG.

Zaključak: MuSK MG ima težu kliničku sliku, nepovoljniji klinički tok i lošiji odgovor na terapiju od drugih oblika MG. MuSK MG predstavlja poseban entitet u okviru bolesti neuromišićne transmisije.

Ključne reči: mijastenija gravis, MuSK, AChR, seronegativna MG, MGFA

MUSK MYASTHENIA GRAVIS: CLINICAL EXPRESSION, COURSE OF THE DISEASE AND RESPONSE TO THERAPY

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Introduction: Acquired autoimmune myasthenia gravis (MG) is an autoimmune disease characterized by impairment of neuromuscular transmission. Antibodies to the nicotinic acetylcholine receptor (AChR) are detected in about 80% of patients with MG, while the remaining 20% of patients are seronegative. Increased titer of antibodies to muscle-specific tyrosine kinase (MuSK) has been detected in about 40-50% of so-called seronegative patients.

The Aim: To investigate clinical expression and course of MuSK MG, and to compare these parameters with other immunological phenotypes.

Material and methods: Retrospective analysis was performed in 39 patients with MuSK MG (8 males and 31 females) hospitalized at the Neurological Clinic, Clinical Center of Serbia. Two control groups were used: patients with completely seronegative MG (n = 26) and AChR MG patients (n = 215).

Results: The results of our study showed striking prevalence of females in MuSK MG. Age of onset of MuSK MG was lower than in other two groups. In the peak of the disease, they usually were in the form IIB or IIIB with a significant percentage of the most severe form V according to MGFA classification. MuSK MG had more severe clinical course, worse response to therapy and worse prognosis than other two forms.

Conclusion: MuSK MG has more severe clinical presentation, worse clinical course and worse response to therapy than other forms of MG. MuSK MG is a specific entity of neuromuscular transmission disorders.

Key words: myasthenia gravis, MuSK, AChR, seronegative MG, MGFA

ANTIKOAGULANTNA TERAPIJA KOD PACIJENATA SA ATRIJALNOM FIBRILACIJOM I AKUTNIM ISHEMIJSKIM MOŽDANIM UDAROM

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Uvod: Atrijalna fibrilacija (AF) predstavlja najčešći poremećaj srčanog ritma koji se karakteriše brzim i neadekvatnim kontrakcijama pretkomora što dovodi do usporenog toka ili zastoja krvi u njima, i potencijalnog nastanka ugruška koji može izazvati akutni ishemijski moždani udar (AIMU). Redovna i pravilna upotreba antikoagulantnih (OAT) i antiagregacionih lekova deluje preventivno na zgrušavanje krvi i od izuzetnog je značaja u sprečavanju pojave AIMU. **Cilj rada:** Analiza učestalosti i pravilnosti uzimanja lekova sekundarne prevencije kod pacijenata sa verifikovanim AF, kao i razloga za eventualno revidiranje ordinirane terapije.

Materijal i metode: Istraživanje je sprovedeno kao prospektivna studija kojom je obuhvaćeno 69 pacijenata sa AF i AIMU. Za procenu efikasnosti uzimanja OAT korišćena je telefonska anketa, a potom su svi pacijenti pozvani na kontrolni pregled.

Rezultati: Telefonska anketa je obuhvatila 25 pacijenata pri kojoj se 23. (92%) izjasnilo da redovno uzima propisanu terapiju, dok dvoje ne koristi terapiju uopšte. OAT je koristilo 20 pacijenata, a antiagregacionu tri. Vrednost INR-a iznad 2 je zabeležena kod 19 (76%) pacijenata, tri pacijenta nisu znala njegove vrednosti, troje je bilo subdovirano. Anamnezom je utvrđeno da 18 (72%) pacijenata kontroliše INR jednom mesečno, dok 7 to ne čini. Kontrolnim pregledom je utvrđeno da je u terapijskom okviru bilo 8 (36%) pacijenata koji su koristili OAT, dok je 14 (64%) bilo subdovirano.

Zaključak: Sekundarna prevencija AIMU kod bolesnika sa AF primenom OAT se ne sprovodi kod većine bolesnika, a kod bolesnika koji lek uzimaju vrednosti INR-a nisu u terapijskom opsegu.

Ključne reči: Atrijalna fibrilacija, moždani udar, antikoagulantna terapija, komplijansa

ANTICOAGULANT THERAPY IN PATIENTS WITH ATRIAL FIBRILLATION AND ACUTE ISCHEMIC STROKE

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Introduction: Atrial fibrillation (AF) is the most common heart rhythm disorder that is characterized by rapid and inappropriate atrial contractions, leading to slow or halt the flow of blood in them, and the potential occurrence of clots that can cause acute ischemic stroke (stroke). Regular and proper antithrombotic (VKA and ASA) use act on the prevention of blood clotting and is of great importance in stroke prevention.

The Aim: Analysis of the efficiency of secondary prevention medication in patients with AF, and the reasons for possible revision of the assigned therapy.

Materials and methods: Research is conducted as a prospective study which included 69 patients with AF and stroke. In order to assess the effectiveness of medication, we used a telephone survey, and then all patients are invited to control blood examination.

Results: Telephone survey included 25 patients, 23 said they regularly take prescribed therapy, while two did not use at all. Antithrombotic therapy is used by 20 patients, antiplatelet by three. The value of INR above 2 was observed in 19 patients, three patients did not know its value, and in three patients the INR value was sub-dosed. Control showed that the INR value was within therapeutic range in 8 patients who used the antithrombotic therapy, while 14 had sub-dosed INR value.

Conclusion: A secondary stroke prevention in patients with AF using the antithrombotic therapy is not implemented in most patients, INR values of patients which takes therapy are not within the therapeutic range.

Keywords: AF, stroke, anticoagulant therapy, compliance

PROGNOZA RAZVOJA DECE SA HIPOKSIČNO-ISHEMIČNOM ENCEFALOPATIJOM

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Uvod: Hipoksično-ishemična encefalopatija (HIE) je jedan od najčešćih neuroloških poremećaja kod novorođenčadi koji može dovesti do trajnih neuroloških posledica kao što su cerebralna paraliza (CP), mentalna retardacija i epilepsija.

Cilj: Da se kod dece sa HIE ustanovi prognostički značaj neonatalnih parametara (gestacijske zrelosti, telesne mase na rođenju i Apgar indeksa), težine neurološkog nalaza na rođenju, karakteristika ultrazvučnog (UZ) i elektroencefalografskog (EEG) nalaza, kao i KT/MR nalaza u pojavi trajnih neuroloških posledica.

Materijal i metode: Ovom retrospektivnom studijom je obuhvaćeno 45 dece uzrasta od 3 do 8 godina, kod koje je na rođenju postavljena dijagnoza HIE. Kod sve dece su analizirani gestacijska zrelost, telesna masa, petominutni Apgar skor, neonatalni neurološki nalaz, UZ nalazi, EEG nalazi, nalaz KT i MR pregleda mozga, u odnosu na neurološki nalaz u momentu praćenja.

Rezultati: Na uzrastu od 3 do 8 godina neurološki nalaz je bio uredan kod 9 dece, a patološki kod 36 dece. Prosečna gestaciona zrelost grupe je bila 37 GN, telesna masa 2410g, a Apgar skor 7. Blaži stepen HIE je imalo 14 dece, a teži 31 dete. UZ nalaz je bio uredan kod 5 dece, a patološki kod 26 dece, rani EEG je bio uredan kod 10 dece, a patološki kod 33 dece, dok su KT i MR pregled bili uredni kod 4, a patološki kod 26 dece.

Zaključak: Patološki rani EEG i neurološki nalaz su dobri prediktori kasnijeg neurološkog razvoja dece sa HIE.

Ključne reči: Hipoksično-ishemijska encefalopatija, prognoza, EEG.

PREDICTION OF DEVELOPMENT OF THE CHILDREN WITH HYPOXIC-ISCHEMIC ENCEPHALOPATHY

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Introduction: Hypoxic-ischemic encephalopathy (HIE) occurring in the fetus and newborn infant is a major cause of acute mortality and chronic neurological disability (cerebral palsy, epilepsy and mental retardation).

The aim: To discuss neuroprognosis of children with HIE, observing different neonatal parameters (gestational age, birth-weight, low Apgar score), neurological status at birth, ultrasound (US), electroencephalogram (EEG), and also MR/CT findings.

Material and methods: This retrospective study included 45 children (3 to 8 years old) who fulfilled criteria for diagnosis of HIE. We compared prematurity, birth weight, 5-minute Apgar scores, neurological findings, US findings, EEG findings, MR/CT findings with neurological outcome in the moment of this follow-up.

Results: At the age of 3 to 8 years, 9 children had normal, and 36 had pathological neurological findings. These children had an average gestational age of 37 weeks, weighted about 2410g, and had average Apgar score of 7 on birth. First degree of HIE had 14, and II and III degree 31 children. Five children had normal US results, and 26 pathological. Normal EEG findings had 10 children, and 33 pathological. Also, CT and MR findings were normal at 4, and pathological at 26 children.

Conclusion: Abnormal EEG and pathological neurological findings are accurate predictors of neurodevelopmental outcome for infants suffering from HIE.

Keywords: Hypoxic-ischemic encephalopathy, outcome, EEG.

ZNACAJ NOĆNE OKSIMETRIJE U RANOJ DIJAGNOSTICI RESPIRATORNE INSUFICIJENCIJE KOD AMIOTROFIČNE LATERALNE SKLEROZE

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Uvod: Amiotrofična lateralna skleroza (ALS) je progresivno neurodegenerativno oboljenje, sa uporednim ostećenjem i centralnih i perifernih motornih neurona. Približno 75% obolelih ima spinalni početak bolesti dok preostalih 25% ima bulbarni oblik. Bolest ima fatalan ishod, najčešće zbog respiratorne insuficijencije.

Cilj: Praćenje noćne oksimetrije kao pomoćne metode za otkrivanje noćne desaturacije, kao prvog znaka za predstojeću respiratornu insuficijenciju kod obolelih od ALS-a.

Materijal i metode: Retrospektivnom studijom obuhvaćena je grupa 49 ALS pacijenata hospitalizovanih na Klinici za neurologiju KCS u periodu od 2009-2011. godine, kojima je u sklopu procene respiratorne funkcije pored (FVC, PI max, PE max, gasnih analiza) rađena i noćna oksimetrija. Za procenu stepena oštećenja motornih funkcija korišćena je ALSFRS skala.

Rezultati: U grupi od 49 ispitivanih pacijenata sa ALS-om bilo je 25 (49%) žena i 24 (51%) muškaraca. Prosečna starost na početku bolesti je 57 godina dok je u vreme dijagnoze iznosila 59 godina. Bulbarnu početak bolesti evidentiran je u 14 (28,6%) a spinalni u 35 (71,4%) pacijenata. U studiji nije uočena statistički značajna razlika prema: polu ($p>0.05$), formi bolesti na početku (spinalna ili bulbarna), ($p>0.05$) kao i dužine trajanja bolesti sa vrednostima pCO_2 na ishod bolesti. Uočena je visoka statistička značajnost između vrednosti FVC i PI max sa ishodom bolesti ($p<0.05$). Poređenjem vrednosti noćne oksimetrije sa ALSFRS skorom dobijena je visoka statistička značajnost ($p<0,05$)

Zaključci: Praćenje noćne oksimetrije može biti važan instrument za procenu stepena noćne hipoventilacije i potrebe za neinvazivnom ventilacijom (NIV) kod pacijenata sa ALS-om.

Ključne reči: amiotrofična lateralna skleroza, noćna oksimetrija, neinvazivna ventilacija.

THE IMPORTANCE OF NIGHT OXIMETRY IN THE EARLY DIAGNOSIS OF RESPIRATORY INSUFFICIENCY IN AMYOTROPHIC LATERAL SCLEROSIS

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Introduction: Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease, with comparative impairment central and peripheral motor neurons. Approximately 75% of patients have a spinal onset while 25% have bulbar form. The disease is fatal, usually due to respiratory insufficiency.

The Aim: Monitoring of nocturnal oximetry as an auxiliary method for the detection of nocturnal desaturation, as the first sign of impending respiratory failure in patients with ALS.

Materials and Methods: This retrospective study included a group of 49 ALS patients hospitalized at the Clinic of Neurology Clinical Center of Serbia, from 2009-2011. Besides the assessment of respiratory function (FVC, PI max, PE max, gas analysis) was performed and nocturnal oximetry. For estimate degree of motor function impairment was used ALSFRS-R scale.

Results: Examination includes 25 (49%) female and 24 (51%) men. Bulbar onset was recorded in 14 (28.6%) and spinal in 35 (71.4%) patients. No statistically significant difference according to: sex, the form of the disease at the beginning, and disease duration with the values of pCO_2 on the outcome of disease ($p<0,05$). There was a high statistical significance between the values of FVC and PI max with the outcome of disease ($p<0.05$). Comparing the values of nocturnal oximetry with the ALSFRS-R score was highly statistically significant ($p<0.05$)

Conclusion: Monitoring of nocturnal oximetry may be an important instrument for assessing the degree of nocturnal hypoventilation and the need for noninvasive ventilation in ALS patients

Keywords: amyotrophic lateral sclerosis, nocturnal oximetry, noninvasive ventilation

FAKTORI RIZIKA KOD PACIJENATA SA ATRIJALNOM FIBRILACIJOM I AKUTNIM ISHEMIJSKIM MOŽDANIM UDAROM

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Uvod. Atrijalna fibrilacija (AF) predstavlja najčešći poremećaj srčanog ritma kod odraslih čija je najčešća i najteža komplikacija akutni ishemijski moždani udar (AIMU). Za procenu rizika za pojavu moždanog udara najčešće se koriste CHADS2 skor i CHA2DS2-VASc skor koji pored AF prate i pojavu drugih faktora rizika kod bolesnika sa AF. Na osnovu ukupne vrednosti skorova određuje se rizik za pojavu AIMU, koji može biti nizak, srednji i visok.

Cilj rada. Praćenje stope mortaliteta bolesnika sa AF i akutnim ishemijskim moždanim udarom (AIMU) u zavisnosti od broja faktora rizika, tj. vrednosti CHADS2 i CHA2DS2-VASc skora.

Materijal i metode. Istraživanje je sprovedeno kao retrospektivna studija kojom je obuhvaćeno 237 pacijenata sa AF i AIMU. Kod svih pacijenata tom prilikom određene su vrednosti CHADS2 i CHA2DS2-VASc skora.

Rezultati. Najučestaliji faktor rizika je hipertenzija, zatim sledi starost >65 godina, ženski pol, vaskularno oboljenje, kongestivna srčana insuficijencija i diabetes mellitus. Statističkom analizom dobijenih rezultata unutar CHADS2 i CHA2DS2-VASc skora nije pokazano postojanje statistički značajne razlike u odnosu na visinu skora i mortalitet bolesnika. Međutim, broj umrlih pacijenata u odnosu na ukupan broj unutar svake grupe se povećava, što se i očekuje u odnosu na povećanje broja faktora rizika.

Zaključak. Upotreba CHADS2 i CHA2DS2-VASc skora se preporučuje za stratifikaciju rizika i procenu ishoda pacijenata sa AIMU i AF. Veće vrednosti ovih skorova su povezane sa većim rizikom za nastanak ponovnog AIMU, kao i sa većim mortalitetom i težom kliničkom slikom.

Ključne reči: atrijalna fibrilacija, moždani udar, CHADS2, CHA2DS2-VASc

RISK FACTORS AT PATIENTS WITH ATRIAL FIBRILLATION AND ACUTE ISCHEMIC STROKE

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Introduction. Atrial fibrillation (AF) is the most often heart rhythm disorder in adults, whose the most often and the most serious complication is acute ischemic stroke (AIS). To assess a risk for AIS we use CHADS2 and CHA2DS2-VASc scores which, beside AF follow the presence of other risk factors at patients. Based on values of scores we can stratify a risk for AIS on low, middle and high.

The Aim. The aim of our study is to follow the mortality rate at patients with AF and AIS and to compare it with number of risk factors (CHADS2 and CHA2DS2-VASc scores).

Materials and methods. This research is conducted as retrospective study. It includes 237 patients with AF and AIS. For each patient we calculated CHADS2 and CHA2DS2-VASc scores.

Results. The most frequent risk factor is hypertension, then age >65 , female sex, vascular disease, congestive heart failure and diabetes mellitus. Statistical analysis of results didn't show any significant difference between score values and mortality rate. However, higher scores were followed by higher mortality, what was expected.

Conclusion. Use of CHADS2 and CHA2DS2-VASc scores is recommended for risk stratification and for assessment of disease outcome at patients with AF and AIS. Higher score values are followed by higher risk for AIS, higher mortality and worse disease outcome.

Key words. atrial fibrillation, stroke, CHADS2, CHA2DS2-VASc

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Uvod: Multipla skleroza (MS) je hronična demijelinizirajuća bolest centralnog nervnog sistema koja se javlja između 20 i 40 godine, retko u detinjstvu u 3 do 10% slučajeva. MS karakterišu dve vrste kliničkih događaja: relaps i progresija. **Cilj:** Cilj studije je identifikacija kliničkih karakteristika MS kod pacijenata sa početkom do 18. godine kao i ispitivanje korelacije intervala između prva dva ataka bolesti i neurološke onesposobljenosti.

Materijal i metode: U retrospektivnoj studiji analizirana je medicinska dokumentacija 52 pacijenta sa MS koji su ispitivani u Klinici za neurologiju i psihijatriju za decu i omladinu, u periodu od 1986. do 2011. godine. Dijagnoza MS je postavljena na osnovu McDonald dijagnostičkih kriterijuma. Podaci su obrađeni metodama deskriptivne i analitičke statistike. Korišćeni su Studentov T test i Pearson-ov korelacioni test.

Rezultati: Grupu ispitanika čine 21(40,4%) dečak i 31(59,6%) devojčica(odnos polova 1,5:1), prosečne starosti 14,5 ± 2,9. Prosečno vreme između prve dve egzacerbacije bolesti iznosi 2,9 ± 2,3. Relapsno-remitentni tok bolesti ima 48 (92,3%) pacijenata, kod 3 (5,8%) je zabeležen sekundarno progresivni oblik, a 1(1,9%) pacijent je primarno progresivan. Najučestaliji inicijalni simptomi su senzitivni(50%), vizuelni(44%) i motorni(42%). U grupi pacijenata sa više od 2 ataka, prosečan EDSS skor(extended disability status scale) je 5,4 ± 0,9, a prosečan progresivni indeks(PI)1,0 ± 0,8.

Zaključak: Studija pokazuje da se pedijatrijska MS javlja češće u ženskom nego u muškom polu, oblik bolesti je pretežno relapsno-remitentan, najčešći inicijalni simptomi su senzorni, vizuelni i motorni. Postoji inverzna korelacija intervala između prva dva ataka i stepena onesposobljenosti.

Ključne reči: multipla skleroza, detinjstvo, klinička slika.

CLINICAL FEATURES AND COURSE OF PEDIATRIC MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis (MS) is a chronic demyelinating disease of the central nervous system that occurs between 20 and 40 years, rarely in children in 3-10% of cases. MS is characterized with two types of clinical events: relapse and progression.

The Aim: To identify clinical characteristics of patients with pediatric MS; examination of correlation between neurological disability and interval between the first two attacks.

Materials and Methods: In a retrospective study, from 1986 – 2011, we analyzed medical records of 52 patients. The diagnosis of MS was based on the McDonald's diagnostic criteria. Data were analyzed by descriptive and analytical statistics. Student's T test and Pearson's correlation test were used.

Results: Group consists of 21 boys (40.4%) and 31 girls (59.6%) (gender ratio of 1.5:1), mean age 14.5 ± 2.9. The mean time between first two exacerbations of disease is 2.9 ± 2.3. Relapsing-remitting course have 48 patients(92.3%), 3(5.8%) secondary progressive form, and 1 (1.9%) is primary progressive. The most frequent initial symptoms are sensitive(50.0%), visual(44.0%) and motor(42.0%). In the group of patients with more than two attacks, the mean EDSS(extended disability status scale) is 5.46 ± 0.93, and the mean progressive index (PI)1.1 ± 0.8.

Conclusion: The study shows that pediatric MS occurs more often in girls than in boys, course of the disease is predominantly relapsing-remitting, the most common initial symptoms are sensory, visual and motor. There is an inverse correlation between level of disability and interval between the first and second attack.

Keywords: multiple sclerosis, childhood, clinical presentation.

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Uvod: Sindrom krađe krvi potključne arterije nastaje kod stenotskih i okluzivnih lezija potključne arterije pre ishodišta vertebralne arterije. Kliničkom slikom dominiraju simptomi ishemijske ruke i sindroma moždanog stabla. Dijagnoza se postavlja na osnovu radioloških nalaza, karakteristične razlike u arterijskim pritiscima na rukama i ultrazvučnog nalaza inverzije smera protoka krvi u vertebralnoj arteriji.

Cilj: Cilj ovog rada bio je da se na osnovu naših kliničkih iskustava i pregledom raspoložive literature analiziraju epidemiologija, faktori rizika i simptomatologija krađe krvi potključne arterije.

Materijal i metode: U prvom delu rada prikazana su dva slučaja sa različitim kliničkim prezentacijama bolesti. Korišćena je medicinska dokumentacija sa Klinike za neurologiju Kliničkog centra Vojvodine. U drugom delu dat je pregled literature formiran na osnovi pretraživanja PubMeda.

Rezultati: Prikazan je slučaj pedesetogodišnjeg muškarca koji se javlja zbog naglo nastale ataksije, vrtoglavice, smetnje govora i gutanja. MR pregledom i CT angiografijom dokazana je okluzija proksimalnog segmenta potključne arterije, kao i ishemijski moždani udar moždanog stabla i malog mozga u sliivu a. cerebellaris posterior inferior. Dijagnoza krađe krvi potvrđena je ultrazvukom. Drugi je slučaj pedesetosmogodišnjeg muškarca sa postepenim promenama ličnosti i kognitivnim propadanjem. Ultrasonografski dijagnostikovana je inverzija smera protoka krvi u levoj vertebralnoj arteriji i stenoza od oko 70% na potključnoj arteriji. Nalaz je potvrđen subtrakcionom angiografijom. U daljem tekstu dat je pregled literature koja se odnosi na epidemiologiju, faktore rizika i kliničku sliku sindroma krađe krvi potključne arterije. **Zaključci:** Sindromi krađe krvi potključne arterije karakterišu se simptomima zadnje moždane cirkulacije, a ređe su asimptomatski ili daju kortikalne simptome. Faktori rizika se ne razlikuju od faktora rizika za ishemijski moždani udar. **Ključne reči:** sindrom krađe krvi, potključna arterija, inverzija smera protoka krvi, moždano stablo, kora velikog mozga.

CLINICAL PRESENTATION OF SUBCLAVIAN STEAL SYNDROME: REPORT OF TWO CASES AND REVIEW OF THE LITERATURE

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Introduction: Subclavian steal syndrome develops in stenotic and occlusive lesions of proximal part of subclavian artery, before vertebral artery arises. Diagnosis relies on radiological findings, typical difference of arterial pressures on forearms, and inversion of blood flow direction in vertebral artery. Ischemic symptoms of hand and posterior brain circulation are the most frequent clinical presentations. Rarely is it asymptomatic or cortical symptoms appear.

The Aim: To analyze our own clinical experience and the data available in literature, in order to assess epidemiology, risk factors and clinical presentation of subclavian steal syndrome.

Materials and Methods: We presented two clinical cases of subclavian steal syndrome with different clinical presentations using medical documentation. In second part we give review of the literature formed by searching PubMed.

Results: Case of 50 year old man was described, who referred with due to ataxia, vertigo, speech and swallowing disturbances. On MR scan and CT angiography large ischemia in territory of left posterior inferior cerebellar artery was shown. Occlusion of proximal subclavian artery and inversion of blood flow was proven by ultrasound. Other is case of 58 year old man with gradual personality changes and cognitive impairment. Inversion of blood flow direction in left vertebral artery seen on sonography and subclavian stenosis of about 70%, were confirmed by digital subtracted angiography. Review of literature concerning epidemiology, risk factors and clinical presentation of subclavian steal syndrome was done, and presented in the table.

Conclusion: Subclavian steal syndrome is characterised mainly by symptoms of posterior cerebral circulation. Risk factors are identical to ones for ischemic stroke.

Key words: steal syndrome, subclavian artery, inversion of the blood flow, brain stem, cerebral cortex.

FAKTORI KOJI PROVOKIRAJU NAPADE KOD DECE, ADOLESCENATA I MLADIH ODRASLIH OSOBA OBOLELIH OD EPILEPSIJE

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Uvod: Epilepsija je često, hronično neurološko oboljenje koje se karakteriše spontanim ponavljanjem epileptičkih napada usled povremenog i naglog lokalnog električnog pražnjenja sive mase. U odnosu na etiologiju epilepsije mogu biti idioparske, kriptogene, simptomatske i provokirane. Epileptičke napade mogu izazvati različiti unutrašnji i spoljašnji činioci, kao što su psihički stres, nedostatak sna, menstrualni ciklus, zvuk, svetlo, alkohol, psihoaktivne supstance.

Cilj: Cilj rada je utvrđivanje postojanja i učestalosti određenih provokativnih faktora kod dece, adolescenata i mladih odraslih osoba obolelih od epilepsije.

Materijal i metode: Ispitivanje je obuhvatilo grupu od 40 pacijenata, oba pola, uzrasta 6-30 godina koji ispunjavaju kriterijume za dijagnozu aktivne epilepsije i lečeni su na Neurološkoj Klinici Kliničkog Centra Vojvodine u periodu između 1. novembra 2011. i 1. februara 2012. godine. Podaci su prikupljeni putem ankete konstruisane za potrebe ovog istraživanja. Anketu koja je korišćena u ovom istraživanju su popunjavali sami ispitanici

Rezultati: Od ukupno 40 ispitanika, 32 (80%) je primetilo da neki od navedenih provokativnih faktora prethodi epileptičkim napadima. Utvrđeno je da je najviše ispitanika prijavilo deprivaciju sna kao provokativni faktor koji prethodi epileptičkim napadima. Statistički značajne razlike su dobijene poređenjem pola ispitanika i tipa epileptičkog napada kao i etiološkog tipa epilepsije i psihičkog stresa kao provokativnog faktora.

Zaključak: Kod većine ispitanika su prisutni provokativni faktori, a najčešći su deprivacija sna, svetlosni stimuli, psihički stres i alkohol.

Ključne reči: epilepsija, provokativni faktor, deprivacija sna.

FACTORS WHICH PROVOKE SEIZURES IN CHILDREN, ADOLESCENTS AND JOUNG GROWN UPS WITH EPILEPSY

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Introduction: Epilepsy is a common, chronic neurological disease characterized by repeated spontaneous seizures due to sudden and occasional local electrical discharge of gray matter. With regard to etiology of epilepsy can be idiopathic, cryptogenic, symptomatic and provoked. Seizures could be caused by various internal and external factors, such as mental stress, lack of sleep, menstrual cycle, a sound, light, alcohol, psychoactive substances.

Goal: The aim of our studz is to determinate the existence and frequency of certain provocative factors in children, adolescents and jounng grown ups with epilepsy .

Matherial and methods: The study included 40 patients of both gender, aged 6-30 years who fits in the criteria for the diagnosis of active epilepsy and were treated at the Neurological Clinic of the Clinical Center of Vojvodina in the period between 1 November 2011. and 1 February 2012. Data were collected through a survey designed for this research. The questionnaire that was used in this research was filed in by respondents themselves.

Results: Of the 40 respondents, 32 (80%) recognized that some of these provocative factors prior to epileptic seizures. Statistically significant differences were obtained by comparing the gender of the respondents and the type of attack epileptic seizure and etiological types of epilepsy and mental stress as a provocative factor.

Conclusion: Most patients recognized provocative factors, and the most common are sleep deprivation, light stimuli, mental stress and alcohol.

Keywords: epilepsy, provosative factor, sleep deprivation.

REJ-OSTERITOVA (REY-OSTERRIETH) SLOŽENA FIGURA U PROCENI VIZUOKONSTRUKCIONIH, VIZUOSPACIJALNIH FUNKCIJA I VIZUELNOG PAMĆENJA KOD OBOLELIH OD SUPKORTIKALNE ISHEMIJSKE VASKULARNE DEMENCIJE

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Uvod: Vaskularna demencija (VaD) predstavlja klinički sindrom povezan sa kognitivnim padom nastalim u sklopu cerebrovaskularne bolesti. Podtipovi VaD su multi-infarctna demencija i bolest malih krvnih sudova mozga sa demencijom, u literaturi nazivana subkortikalna ishemijska vaskularna demencija (SIVD).

Cilj: Cilj istraživanja je ispitivanje razlika između grupe obolelih od SIVD i kontrolne grupe zdravih u opštem kognitivnom postignuću i pojedinačnim neuropsihološkim funkcijama: vizuelnom pamćenju, vizuospacijalnim i vizuokonstruktivnim funkcijama, kao i ispitivanje povezanosti između postignuća na pojedinačnim neuropsihološkim funkcijama i volumena lezija merenih magnetnom rezonancom.

Materijal i metode: U istraživanju je učestvovalo 61 ispitanik svrstani u dve grupe. U prvoj grupi nalazio se 31 ispitanik oboleo od VaD prema NINDS-AIREN kriterijumima (National Institute of Neurological Disorders and Stroke - Association Internationale et l'Enseignement en Neurosciences). Kontrolnu grupu je sačinjavalo 30 nedementnih dobrovoljaca, očuvanog kognitivnog statusa. Od instrumenata korišćeni su Mini Mental State Examination Test, Rey Osterrieth složena figura (ROCF) i volumeni ishemijskih lezija dobijeni pregledom endokranijuma magnetnom rezonancom.

Rezultat: Postoje statistički značajne razlike između ispitivanih grupa: 1. na Mini Mental Testu, 2. u kvantitativnim skorovima na ROCF, 3. u zastupljenosti pojedinih proceduralnih tipova. Nema statistički značajne korelacije između strategije kopiranja/kvantitativnih skorova na ROCF i volumena lezija unutar grupe obolelih od VaD.

Zaključak: Oboleli od VaD imaju lošije opšte kognitivno postignuće, lošije vizuelno pamćenje, narušene vizuospacijalne i vizuokonstruktivne funkcije. Nedostatak povezanosti između proceduralnog tipa/kvantitativnih skorova i volumena lezija ukazuje na mali poduzorak ili neadekvatnost neuroradiološke metode u cilju procene date korelacije.

Ključne reči: vaskularna demencija, vizuospacijalne funkcije, proceduralni tipovi, volumetrija.

RAY-OSTERRITH COMPLEX FIGURE IN ASSESSMENT OF VISUAL-CONSTRUCTIVE FUNCTIONS, VISUAL-SPATIAL FUNCTIONS AND VISUAL MEMORY IN SUBCORTICAL ISCHEMIC VASCULAR DEMENTIA

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Introduction: Vascular dementia (VaD) represents clinical syndrome associated to cognitive degradation within cerebrovascular disorders. Subtypes of VaD are multi-infarct dementia and small blood vessels disease with dementia, also known as subcortical ischemic vascular dementia (SIVD).

The Aim: To investigate the differences between the group with SIVD and control group of the healthy in general cognitive achievements and partial neuropsychological functions: visual memory, visual-spatial and visual-constructive functions, and achievements in particular neuropsychological functions and lesion volume measured by magnetic resonance.

Materials and Methods: A total of 61 examinees participated in the study, divided in two groups. There were 31 examinees with the diagnosis of VaD according to NINDS-AIREN criteria (National Institute of Neurological Disorders and Stroke - Association Internationale et l'Enseignement en Neurosciences). Control group represented 30 healthy volunteers with preserved cognitive status. The methods used were Mini Mental State Examination Test, Rey-Osterrieth complex figure (ROCF) and volumes of the ischemic endocranium lesions measured by magnetic resonance.

Results: Statistically significant differences between the groups are registered in: 1. Mini Mental State Examination Test, 2. quantitative scores in ROCF, 3. incidence of the particular procedural types. No statistically significant correlation was found between strategy of copying/quantitative scores in ROCF and lesion volumes within group diagnosed of VaD.

Conclusion: People affected by VaD have lower general cognitive achievements, poorer visual memory, damaged visual-spatial and visual-constructive functions. The absence of correlation between procedural type/quantitative scores and lesion volumes indicates the small subsample or inadequacy of neuroradiologic method.

Key words: vascular dementia, visual-spatial functions, procedural types, volumetry

EFEKAT LEČENJA RELAPSNNO-REMITENTNOG OBLIKA MULTIPLE SKLEROZE INTERFERONOM BETA-1B. REZULTATI ŠESTOGODIŠNJEG PRAĆENJA

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Uvod: Imunomodulatorna terapija interferom beta-1b sprovodi se u Klinici za neurologiju u Novom Sadu od 2005. godine. Prethodno sprovedena prospektivna trogodišnja studija pokazala je efikasnost terapije.

Cilj: Pokazati terapijsku efikasnost i imunomodulatorni efekat terapije prateći kliničke parametre tokom šest godina.

Materijal i metode: Uključeno je 18 pacijenata koji su kontinuirano tretirani interferonom beta-1b u periodu od šest godina, a pored njih i pacijenti kod kojih je iz različitih razloga obustavljena terapija, takođe sudetaljno obrađeni. Za kliničku procenu neurološkog deficita korišćena EDSS. Podaci su statističku obrađeni i statistička značajnost izražavana je p vrednošću dobijenom T testom.

Rezultati: Prosečna godišnja stopa relapsa tokom šest godina primanja terapije smanjila se za 62,5% u odnosu na godinu dana pre terapije. Tokom ovog perioda nije došlo ni do značajnije promene EDSS indeksa. Od ukupnog broja pacijenata, koji su konstantno bili na terapiji, kod 61,11% njih nije bilo pogoršanja tokom šestogodišnjeg perioda. Prosečno vreme do prvog pogoršanja je bilo $1,5 \pm 1,06$ godina kod pacijenata koji su imali egzacerbacije. Uočava se da je kod velikog broja pacijenata obustavljena terapija, a najčešći uzrok bio je progresija bolesti u sekundarno progresivnu formu bolesti.

Zaključak: Rezultati ove studije potvrđuju imunomodulatorno dejstvo interferona beta-1b kod pacijenata praćenih tokom relativno dugog vremenskog perioda. Iako saglasni sa navodima iz literature, pri tumačenju rezultata ove studije treba uzeti u obzir mali uzorak i blažu kliničku sliku pri započinjanju terapije.

Ključne reči: multiple skleroza, relapsno- remitentna forma, EDSS, egzacerbacija, interferon beta 1b, imunomodulatorni

EFFECTS OF RELAPSNING-REMITTING MULTIPLE SCLEROSIS TREATMENT WITH INTERFERON BETA-1B. SIX YEAR FOLLOW-UP

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Introduction: Therapy with interferon beta 1b started at Neurology Clinic in Novi Sad in 2005. We prospectively followed a group of 43 patients with relapsing-remitting form of multiple sclerosis that were continuously treated with interferon beta 1b during a six-year period.

The Aim: To assess the effects of the treatment on the clinical course of disease, different variables were observed: annual relapse rate, EDSS changes during the course of the treatment, progression rate using EDSS index (EDSS/ duration of the disease), number of relapse free patients and correlation between duration of the disease and therapeutic effect.

Material and Methods: This study included 18 patients continuously treated with interferon beta 1b during a six-year period. Drop- outs were evaluated as well. In clinical and functional assessment EDSS was used.

Results: The annual relapse rate after six years of treatment decreased by 62.5%. Average EDSS, as well as EDSS index, did not progress significantly during the treatment period. More than 60% of the patients did not experience exacerbation. Among the patients that experienced disease relapse, the mean time to first exacerbation was 1.5 ± 1.06 years. In drop- out patients who progressed to secondary progressive form, we can saw higher EDSS comparing to the group of continuously treated.

Conclusion: We showed immunomodulatory effects of Interferon beta- 1b. Although our results are in line with reports from the literature, the draw- backs of the study, such as small sample and the mild neurological deficit at the baseline, must be concerned.

Keywords: Multiple sclerosis, relapsing- remitting, interferon beta- 1b, immunomodulatory, exacerbation, follow-up.

INTRACEREBRALNA HEMORAGIJA – UČESTALOST FAKTORA RIZIKA I NJIHOV UTICAJ NA LETALITET

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Uvod: Imajući u vidu nižu incidencu hemoragijskih moždanih udara u odnosu na ishemijske a samim tim i manju količinu informacija, postavlja se pitanje značajnosti uticaja faktora rizika na nastanak i ishod intracerebralne hemoragije.

Cilj: Cilj našeg istraživanja je bio da utvrdimo učestalost faktora rizika i njihov uticaj na letalitet, kao i da analiziramo povezanost stanja svesti i letaliteta.

Materijal i metode: Ispitivanjem je obuhvaćeno 146 bolesnika sa intracerebralnom hemoragijom, lečenih na Klinici za neurologiju, Kliničkog centra u Novom Sadu u periodu od 15.02.2010 do 04.11.2011. Kod svih ispitivanih bolesnika registrovani su: pol, starost, faktori rizika, lokalizacija, klinička slika i ishod bolesti.

Rezultati: Najviša incidenca zapaža se u starosnom u uzrastu između 70-74 godine. Letalitet intracerebralne hemoragije iznosi 23,3%. Najzastupljeniji faktori rizika su hipertenzija (91.8%), raniji moždani udari (33.6%), zloupotreba alkohola (23.3%) i pušenje (22.6%). Hipoholesterolemija je registrovana kod 7.5% bolesnika, antikoagulantne lekove je koristilo 4.6% bolesnika. Dva i više faktora rizika je imalo 58.2% bolesnika. Prosečan broj faktora rizika je 1.79 ± 0.07 . Iako je utvrđena značajna razlika u distribuciji faktora rizika među obolelima, nije dokazano da neki od njih značajno utiče na ishod lečenja. Poremećaj svesti primećen je kod značajnog broja obolelih koji su imali letalan ishod ($\chi^2=12,422$).

Zaključak: Najzastupljeniji faktori rizika su hipertenzija, raniji moždani udari, zloupotreba alkohola i pušenje. Nije dokazano da neki faktor rizika značajno utiče na ishod. Prosečan broj faktora rizika je 1.79 ± 0.07 . Poremećaj svesti primećen je kod značajnog broja obolelih koji su imali letalan ishod.

Ključne reči: intracerebralna hemoragija, faktori rizika, poremećaj svesti, ishod

INTRACEREBRAL HEMORRHAGE - THE FREQUENCY OF RISK FACTORS AND THEIR EFFECT ON LETHALITY

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Introduction: Considering lower incidence of hemorrhagic stroke compared to ischemic, and thus a smaller amount of information, the impact of risk factors on the occurrence and outcome of hemorrhagic stroke is still debatable.

The Aim: To determine the frequency and impact of risk factors on the outcome, and to analyze the relationship between the impairment of consciousness and the outcome.

Material and methods: The study involved 146 patients with intracerebral hemorrhage, who were treated at the Clinic for Neurology, Clinical Center of Novi Sad, in the period from 15.02.2010 to 04.11.2011. Every patient was analyzed with regard to: sex, age, risk factors, localization, clinical features and the outcome.

Results: The highest incidence of intracerebral hemorrhage was observed in the group of 70-74 years of age. Lethality was 23.3%. The most common risk factors were hypertension (91.8%), previous stroke (33.6%), followed by alcohol abuse (23.3%) and smoking (22.6%). Hypoholesterolemia was registered in 7.5% while anticoagulant therapy was used in 4.6%. 58.2% of patients had two or more risk factors. Mean value of risk factors was 1.79 ± 0.07 . Although a significant difference in the distribution of risk factors were registered, it wasn't proved that some of them significantly affect the outcome. Impairment of consciousness was observed in a significant number of patients with lethal outcome ($\chi^2=12.422$).

Conclusion: The most common risk factors were hypertension, previous stroke, alcohol abuse and smoking. Mean value of risk factors was 1.79 ± 0.07 . It wasn't proved that a singular risk factor significantly affects the outcome. Impairment of consciousness was observed in a significant number of patients with lethal outcome.

Key words: intracerebral hemorrhage, risk factors, impaired level of consciousness, outcome

EFEKTI LEČENJA RELAPSNNO-REMITENTNE MULTIPLE SKLEROZE INTERFERONOM β -1A: TROGODIŠNJE PRAĆENJE

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Uvod: Interferon beta-1a je terapija prvog izbora za relapsno-remitentni oblik multiple skleroze, čiji su pozitivni efekti jasno potvrđeni u nekoliko randomizovanih studija.

Ciljevi: U cilju procene efekata terapije na klinički tok bolesti posmatrane su različite varijable: godišnji broj relapsa, EDSS promene tokom tretmana, stopa progresije korišćenjem EDSS indeksa (EDSS/trajanje bolesti), broj pacijenata bez relapsa i korelacija između trajanja bolesti i terapijskog efekta.

Materijal i metode: Grupa od 15 pacijenata sa relapsno-remitentnom multiplom sklerozom tretiranih interferonom beta-1a, prospektivno su praćeni tokom tri godine. Za klinička i funkcionalna ispitivanja korišćena je EDSS skala.

Rezultati: Srednja godišnja stopa relapsa u periodu od dve godine pre tretmana bila je 1.67 ± 0.75 , dok je za vreme tretmana pala na 0.37 ± 0.40 ($p < 0.005$). Srednji EDSS nije značajno napredovao tokom tretmana, dok se EDSS indeks značajno smanjio ($p = 0.012$). Više od 50% pacijenata nije imalo egzacerbacije, dok je četiri pacijenta progrediralo u SPMS. Dokazana je korelacija trajanja bolesti do početka terapije sa efektima terapije ($p = 0.400$).

Zaključak: Pokazali smo imunomodulatorna dejstva interferona beta-1a u našoj grupi pacijenata, kao i to da se ranijim uvođenjem terapije postižu bolji efekti. Iako su rezultati u skladu sa drugim literaturnim podacima, treba imati u vidu nedostatke ovog istraživanja, kao što su mali uzorak i blagi neurološki deficit na početku studije.

Ključne reči: multipla skleroza, relapsno-remitentna, interferon beta-1a, imunomodulatorno, egzacerbacija, 'follow-up' studija

EFFECTS OF RELAPSING-REMITTING MULTIPLE SCLEROSIS TREATMENT WITH INTERFERON β -1A: THREE YEAR FOLLOW-UP

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Introduction: Interferon beta-1a is first-line treatment for the relapsing-remitting form of multiple sclerosis. Its immunomodulatory effects have been well established in several controlled randomized trials.

Aims: In order to assess the effects of the treatment on the clinical course of disease, different variables were observed: annual relapse rate, EDSS changes during the course of the treatment, progression rate using EDSS index (EDSS/duration of the disease), number of relapse free patients and correlation between the duration of the disease and therapeutic effect.

Material and Methods: A cohort of 15 patients with relapsing-remitting form of multiple sclerosis treated with interferon beta-1a, were prospectively followed for three years. In clinical and functional assessment EDSS scale was used.

Results: Mean annual relapse rate in two-year period prior to the treatment was 1.67 ± 0.75 , while during the treatment it fell to 0.38 ± 0.40 ($p < 0.005$). Average EDSS did not progress significantly during the course of treatment, whereas EDSS index decreased significantly ($p = 0.012$). More than 50% of the patients did not experience any exacerbations, while 4 patients progressed to the secondary progressive form of MS. Correlation between duration of the disease prior to treatment with the therapy effects has been proven ($p = 0.400$).

Conclusion: We showed immunomodulatory effects of Interferon beta-1a in a group of our patients, as well as the fact that earlier introduction of the treatment gives better therapy effects. Although our results are in line with reports from the literature, the draw-backs of this study, such as small sample and mild neurological deficit at the baseline, have to be taken into account.

Key words: multiple sclerosis, relapsing-remitting, interferon beta-1a, immunomodulatory, exacerbation, follow-up study

SKRINING TEHNIKE U PROCENI KOGNITIVNOG OŠTEĆENJA U AKUTNOJ FAZI MOŽDANOG UDARA

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Uvod: Poremećaj kognitivnih funkcija kao posledica akutnog moždanog udara (AMU) negativno utiče na ishod bolesti i često ostaje nedijagnostikovano. U upotrebi je širok dijapazon testova za skrining kognitivnog oštećenja, kao što su MMSE, CDT i MoCA test. MoCA je noviji test, razvijen kao kratki skrining za detekciju blagog do umerenog kognitivnog oštećenja.

Cilj rada: Utvrditi postojanje kognitivnog oštećenja kod obolelih od AMU primenom MoCA, CDT i MMSE testa. Utvrditi korelaciju između ukupnog MoCA, MMSE skora i CDT. Ispitati povezanost između ukupnog MoCA, MMSE skora i skorova na subtestovima MoCA, kao i lokalizacije moždanih lezija detektovanih kompjuterizovanom tomografijom.

Materijal i metode: U istraživanje je bila uključena grupa od 30 bolesnika sa AMU, 8-15. dana lečenja, starosti od 45-82 god, 8-16 godina obrazovanja. Kontrolnu grupu je sačinjavalo 30 zdravih dobrovoljaca ujednačenih sa grupom AMU po starosti i edukaciji. Prvog dana istraživanja administriran je MMSE i CDT, a narednog dana MoCA kod istog ispitanika.

Rezultati: Poređenjem postignuća na testovima između grupe sa AMU i kontrolne grupe uočena je statistička značajnost ($p < 0.01$) sa boljim postignućem ispitanika u grupi zdravih. Korelacionom analizom između skorova MoCA, MMSE i CDT utvrđeno je pozitivna korelacija između svih analiziranih testova ($r > 0.74$).

Zaključak: Kod obolelih od AMU je utvrđeno postojanje kognitivnog oštećenja primenom MoCA, CDT i MMSE testa. Ustanovljena je povezanost između postignuća na MoCA, MMSE i CDT kod obolelih od AMU. Kortikalne ishemijske su povezane sa nižim skorovima na MMSE, dok je kortikalna atrofija povezana sa lošijim postignućem na MoCA testu.

Ključne reči: kognitivno oštećenje, moždani udar, MoCA, MMSE.

SCREENING TECHNIQUES IN ASSESSMENT OF COGNITIVE IMPAIRMENT IN ACUTE STROKE PATIENTS

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Introduction: Impairment of cognitive functions, which is common in acute stroke, negatively affects the outcome of the disease and often remains undiagnosed. MoCA is a newer test, developed as a brief screening for detection of mild to moderate cognitive impairment.

The Aim: To determine the existence of cognitive impairment in patients with acute stroke using MoCA, CDT and MMSE test. To examine the correlation between total MoCA, MMSE score and CDT. To determine correlation between total MoCA, MMSE score and subtest scores on the MoCA and also with localization of brain lesions detected by CT.

Materials and Methods: The study involved a group of 30 patients with acute stroke, after 8-15 days of treatment, aged 45-82 years, 8-16 years of education. The control group consisted of 30 healthy volunteers. First day of research, MMSE and CDT were administered and MoCA on the following day.

Results: The test results between the group with acute stroke and control group, showed significant difference ($p < 0.01$) with better achievements in the group of healthy subjects. Correlation analysis between the scores of MoCA, MMSE and CDT in the patients with acute stroke established a positive correlation ($r > 0.74$).

Conclusion: Presence of cognitive impairment in patients with acute stroke was determined using MoCA, MMSE and CDT. Positive correlation between MoCA, MMSE and CDT was determined in patients with acute stroke. Cortical lesions are associated with low MMSE score, while cortical atrophy is related with poorer performance on MoCA.

Key words: cognitive impairment, acute stroke, MoCA, MMSE.

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Uvod: Iako je danas poznato da je demencija rastući problem u razvijenim i u zemljama u razvoju, i dalje se smatra da je ovo stanje nedovoljno prepoznato.

Cilj: Cilj rada je procena informisanosti populacije ruralnog područja o postojanju demencija.

Materijal i metode: Istraživanje je obuhvatalo 215 zdravih dobrovoljaca, 119 ženskih i 96 muških osoba, starosti od 20 do 82 godine, stepena obrazovanja od osnovnog do visokog. Primenjena je anketa kojom se ispitivala informisanost ispitanika i njihovo subjektivno zapažanje o postojanju simptoma demencije sa posebnim akcentom na poremećaj pamćenja. Kod 30 ispitanika koji su se deklarirali da imaju smetnje pamćenja i kod 30 koji nemaju, načinjen je Mini Mental Status Examination Test. U statističkoj obradi podataka korišćena je deskriptivna statistička metoda.

Rezultat: 12,1% ispitanika nije prepoznalo da poremećaj pamćenja može biti uvod ili manifestacija bolesti. 55,5% ispitanika je kod sebe ili osoba iz okoline primetilo poremećaj pamćenja. 74% ispitanika izjavljuje da ne želi da se ispituje i leči.

Zaključak: ovo istraživanje je pokazalo da postoji problem opšte informisanosti o demencijama u ruralnoj populaciji, kao i da bez obzira na pokazan značaj problema pamćenja, postoji veliki udeo ispitanika koji ne žele da se ispituju i leče što može imati značajne posledice na obolele pojedince, njihovu okolinu i čitavo društvo.

Ključne reči: opšta informisanost, Alchajmerova bolest, vaskularna demencija, Mini Mental State Examination

GENERAL AWARENESS OF DEMENTIA IN RURAL POPULATION

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Introduction: In spite of fact that dementia is an increasing problem in developed and developing countries, it is still insufficiently recognized in general population.

Goal: The goal of this work is to assess how well the population of rural area is informed about the existence of dementias.

Material and methods: The research comprised 215 healthy volunteers, 119 females and 96 males, aged from 20 to 82, ranging from elementary school to high education. A questionnaire examining the awareness of respondents and their subjective perception of the existence of symptoms of dementia with special emphasis on memory disorder, was used Mini Mental Status Examination Test was applied in 30 respondents stating to have a memory disorder, and for 30 respondents without memory disorder. Descriptive statistical methods were used in statistical analysis.

Results: 12,1% of respondents did not recognize memory disorder a prelude or manifestation of disease. 55,8% noticed memory disorder in themselves or the others. 74% do not want to be tested or treated.

Conclusion: This study showed that there is a lack of general knowledge about dementia in the rural population. Despite the demonstrated importance of the problem of memory, the fact that a large proportion of respondents do not want to be tested or treated, may have serious consequences on individuals, their environment and the society as a whole.

Key words: general awareness, Alzheimer's disease, vascular dementia, Mini Mental State Examination.

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Introduction and goals: Stroke is one of the most alarming issues that concern people nowadays, because of its evolution and complications. Functional walking is essential because it offers the possibility to act independently, improving the quality of life. Stroke patients exhibit varying deficits with significant effects upon walking ability. Our goal is to emphasize that a "tailor made" physiotherapy improves gait coordination after a stroke.

Material: The study took place between April 2011 and November 2011, within the INRMFB and involved 30 patients with sub-acute stroke.

Method: The patients were evaluated before, 2 weeks after and 2 months after the treatment. The clinical-functional evaluation included joints and muscles testing, balance tests, functional performance tests, gait cycle parameters and a quality of life analyze. The treatment implied electrotherapy, thermotherapy, massage-procedures that have a direct effect on the problems but also prepare the body for the oriented kinotherapy.

Results: The patients improved their balance and gait parameters, the inter-limb coordination, an improved pattern of walking with a reduced risk of falling.

Conclusions and discussions: A good individualized treatment is always efficient and helps the patient to regain a unctinal gait. Physiotherapy is essential for the stroke survivors to improve the quality of their lives because it works on their physical, mental, emotional and social health.

Keywords: stroke, gait coordination, oriented strategies, physical treatments.





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Uvod: Najčešće ali i prve metastatske kalcifikacije generalno u celom organizmu, se uočavaju upravo na oku.
Cilj: Izneti specifična iskustva iz dve studije koje su se bavile analizom patoloških promena na prednjem segmentu oka kod pacijenata na hemodijalizi (HD)
Metod: prva je prospektivna studija rađena u periodu februar-mart 2008.g. na 15 od ukupno 18 pacijenata koji su se dijalizirali u jedinom HD centru na Kosovu i Metohiji, u Kosovskoj Mitrovici. Druga studija je sprovedena u periodu april 2000 do marta 2001. u ZC "Studenica" Kraljevo i novembar 2002-avgust 2003. KBC Zemun. Ukupno 81 pacijent. U prvoj studiji je bilo 15 pacijenata (7 muškaraca, 8 žena) prosečna starost 57.5 godina; prosečno vreme provedeno na HD 3,7 godina, dinamika HD 3 puta nedeljno po tri sata; vrsta HD: bikarbonatna). U drugoj studiji je bio 81 pacijent (16 žena i 65 muškaraca) prosečne starosti 58.1 godina, vreme na HD 5.28 g; dinamika 12č/nedeljno.
Rezultati: U obe studije, 67% pacijenata je imalo pigmentaciju kapaka a 73% konjunktive; 33% pingveku, 27% kalcifikacije na tarzalnoj a 54% na bulbarnoj konjunktivi
Zaključak: Nije bilo signifikantnih razlika između nalaza na prednjem segmentu oka između pacijenata iz dve potpuno odvojene studije.
Glavne reči: hemodijaliza, konjunktiva oka.

OPINION OF THE CONDUCTIVA OF THE EYE IN PATIENTS ON HEMODIALYSIS

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Introduction: Most of the first and metastatic calcification in general throughout the body, are observed just in the eye.
Objective: The stated specific experiences from two studies that dealt with the analysis of pathological changes in the anterior segment of the eye in patients on hemodialysis (HD)
Method: The first prospective study was conducted during February-March 2008 in 15 of the 18 patients who were in the only HD dialysis center in Kosovo and Metohija in Kosovska Mitrovica. Another study was conducted from April 2000 to March 2001. the ZC "Studenica" Kraljevo and November 2002-August 2003. KBC Zemun. Total of 81 patients. In the first study were 15 patients (7 men, 8 women), mean age 57.5 years, average time spent on HD 3.7 years, the dynamics of HD 3 times a week for three hours, types of definition: bicarbonate). In the second study was 81 patients (16 women and 65 men) mean age 58.1 godina, time on HD 5:28 g; 12č/weekly dynamics.
Results: In both studies, 67% of patients had pigmentation of the eyelid and conjunctiva, 73%, 33% pingveku, calcification in 27% and 54% tarzalnoj Thebulbar conjunctiva.
Conclusion: There were no significant differences between the findings of the anterior segment of the eye between patients from two completely separate studies.
Keywords: Hemodialysis, conjunctiva of the eye.

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Uvod: Amiodaron je efikasan antiaritmik koji se upotrebljava za lečenje najozbiljnijih poremećaja srčanog ritma. Među neželjena dejstva terapije amiodaronom na oku opisuju se keratopatija, suvo oko, katarakta, optička neuropatija i promene u makuli.
Cilj rada: Analiza promena na očima kod kardioloških bolesnika koji koriste Amiodaron.
Materijal i metode: Na Klinici za očne bolesti Kliničkog centra Niš, ambulantno je pregledano 68 bolesnika (42 muškaraca i 26 žena), starosti 54 do 78 godina (65,38±6,48 godina), od čega je polovina kardioloških bolesnika na terapiji Tabl. Amiodaron® (34 ispitanika). Oftalmološka ispitivanja obuhvatila su: proveravanje postojanja okularnog diskomforta u pacijenata, proveru oštine vida, biomikroskopiju, direktnu oftalmoskopiju, tonometriju, izvođenje objektivnih testova za procenu kvaliteta suznog filma (Schirmer I test, TBUT, bojenje vitalnim bojama - fluorescein i rose bengal).
 Rezultati rada: Obostrana medikamentozna keratopatija nađena je u 97,05% (n=33 pacijenata), okularni diskomfort postojao je u 76,47% (n=26 pacijenata) studijske grupe i 20,59% (n=7 pacijenata) kontrolne grupe, a suvo oko u 17,65% ispitanika (n= 6 pacijenata). Oftalmoskopskim pregledom kod svih pacijenata studijske grupe, sem znakova hipertenzije na krvnim sudovima, nije bilo drugih promena na očnom dnu u području glave optičkog živca i/ili makule vezanih za terapiju lekom.
Zaključak: Najzastupljenije promene na oku u ispitivanih bolesnika su medikamentozna keratopatija i suvo oko. Opravdana je i neophodna svakodnevna upotreba nekog od preparata veštačkih suza koji treba da ublaže tegobe suvog oka u kardioloških pacijenata.
 Monitoring terapije osnova je za detekciju neželjenih reakcija na lek.
Glavne reči: Amiodaron, suvo oko, neželjena dejstva na oku, kardiološki bolesnici.

OCULAR SIDE EFFECTS OF AMIODARONE

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Introduction: Amiodaron is efficient antiarrhythmic which is used for treating the most serious heart rhythm disorders. Side effects of Amiodaron therapy on the eye are: keratopathy, dry eye, cataract, optic neuropathy and changes in the macula.
The Aim: Analysis of ocular changes in cardiac patients using Amiodaron.
Material and methods: On the Clinic for Eye Diseases Clinical Centre Nis are examined 68 patient (42 men and 26 women), aged from 54 to 78 years (65,38±6,48), and half of them are cardiac patients treated with Amiodaron® tablets (34 patients). Ophthalmic examination included: dry eye assessment questionnaire, visual acuity, biomicroscopy, direct ophthalmoscopy, tonometry, performing of objective tests in order to assess the quality of the tear film (Schirmer I test, TBUT, staining with fluorescein and rose bengal).
Results: Bilateral medication keratopathy was found in 97.05% (n=33 patients), ocular discomfort in 76.47% (n=26 patients) of study group and 20.59% (n=7 patients) in examined control group, as well as dry eye was found in 17.65% of respondents (n=6 patients). Ophthalmological examination of all patients in the study group showed signs of hypertension on blood vessels, without other changes in the area of optic nerve's head and/or macula related to drug therapy.
Conclusion: The most common changes in the eye of the patients were medication keratopathy and dry eye. It's reasonable and necessary to daily use artificial tear preparations which should alleviate the symptoms of dry eye in cardiac patients.
 Monitoring of therapy is the basis for the detection of serious drug reactions.
Keywords: Amiodaron, dry eye, ocular side effects, cardiac patients.

ZASTUPLJENOST REFRAKCIONIH ANOMALIJA KOD APSOLVENATA MEDICINSKOG FAKULTETA

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Uvod: Nekorigovana refrakciona anomalija je jedan od vodećih uzroka slabovidosti u svetu.

Cilj: utvrditi prevalencu refrakcionih anomalija kod apsolvenata Medicinskog fakulteta.

Metod: prospektivna studija sprovedena na Očnom odeljenju u ZC Kosovska Mitrovica u januaru 2012. Kod 31 apsolvanta Medicinskog fakulteta u Kosovskoj Mitrovici, koji su dobrovoljno učestvovali u ovoj studiji, je određena nativna vidna oštrina po Snellen-u. Svi studenti su pregledani i na automatskom refraktometru pre određivanja korekcije. Potom im je određena najbolja vidna oštrina uz korekciju.

Rezultati: Ukupno je pregledano 22 žena i 9 muškraca, srednja starosna dob 24.8 ± 1.7 godina. Kod 19 studenata je postojala emetropija (61% svih) a kod 12/31 (39% od svih) je utvrđena miopija i to kod 11 studenata na oba oka. Među kratkovidim apsolvantima, srednji sferni ekvivalent je iznosio $-1.99 D \pm 0.75$ (range -0.5D do -6.5 D)

Zaključak: poredeći dobijene rezultate sa podacima iz literature, prevalenca miopije je nešto niža, ali ne statistički značajno, nego kod studenata evropskih medicinskih fakulteta gde se kreće od 37% do 50%

ključne reči: refrakcione anomalije, studenti, miopija.

REPRESENTATION OF REFRACTIVE ANOMALIES AT FINAL YEAR STUDENTS OF MEDICAL FACULTY

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Introduction: Uncorrected refractive anomaly is one of the leading causes of visual impairment in the world.

The Aim: to determine the prevalence of refractive anomalies on final year students of Medical Faculty.

Materials Method: A prospective study conducted at the ophthalmologist department in the Health Center Kosovska Mitrovica, in January 2012. The native visual acuity determined by Snellen-in. was discovered on 31 final year students of Medical Faculty who voluntarily participated in this study. All students were also reviewed on the automatic refractometer before correction determination. After that, their best visual acuity with correction was determined.

Results: Total number of examined people was 22 female and 9 male, middle age of 24.8 ± 1.7 years. There were 19 students with emmetropia (61% of all) and at 12/31 (39% of all) is determined to myopia, on 11 students on both eyes. Among the final year students who were short-sighted, average spherical equivalent was $-1.99 D \pm 0.75$ (range -0.5D to -6.5 D) **Conclusion:** comparing the derived results with data from the literature, the prevalence of myopia was slightly lower, but not significantly for statistic, than the students of European medical faculties, where the ranges from 37% to 50%

Keywords: refractive anomalies, students, myopia.

KLINIČKI PROFIL OSOBA OBOLELIH OD GLAUKOMA U SRBIJI (PILOT STUDIJA)

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Uvod: Glaukom karakteriše progresivni poremećaj vidne funkcije do slepila, bez odgovarajuće terapije. Rizik od pojave oboljenja povećavaju starost preko 60 godina, dijabetes melitus tip II, arterijska hipertenzija, kratkovidost, pozitivna porodična anamneza, rasa. Statistički podaci o kliničkim i demografskim karakteristikama obolelih od glaukoma u Srbiji su veoma osudni.

Cilj: Cilj ove pilot studije bio je da se na ograničenom uzorku napravi procena udela različitih tipova glaukoma i da se utvrde neke karakteristike vezane za profil bolesnika.

Materijal i metode: Studija je obuhvatila 65 osoba obolelih od glaukoma oba pola. Prikupljeni podaci o pacijentima su: pol, godine starosti, dužina praćenja glaukoma, broj korišćenih različitih vrsta lekova u terapiji glaukoma, izvršena operacija glaukoma, izvršena operacija katarakte, prisustvo arterijske hipertenzije, dijabetes melitus tip II i pozitivne porodične anamneze.

Rezultati: Prosečan broj godina ispitanika bio je 65.46 ± 14.47 . Broj osoba muškog (34) i ženskog pola (31) bio je približno jednak. Vidno je bio veći broj pacijenata kod kojih je od detekcije glaukoma prošlo do jedne ili do dve godine. Statistički visoko značajno češće je dijagnostikovao POAG (43,08%), a zatim sekundarni glaukom (23,08%) i PCAG (12,31%). Kod 92,31% ispitanika bila je propisana neka vrsta medikamentne terapije (kod 35,38% kombinovana terapija sa dva leka, a kod 27,69% monoterapija).

Zaključak: Ovom studijom smo okvirno odredili profil bolesnika sa glaukomom. Studiju je potrebno nastaviti i proširiti sa još relevantnih podataka, i bilo bi od značaja da se ona izvodi kao multicentrična studija, kako bi se dobio približno realan profil glaukomatoznog bolesnika u Srbiji.

ključne reči: glaukom, profil bolesnika, studija preseka

CLINICAL PROFILE OF GLAUCOMA PATIENTS IN SERBIA (PILOT STUDY)

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Introduction: Glaucoma is characterized by a progressive disorder of vision to blindness, without appropriate therapy. The risk factors are age more than 60, diabetes mellitus II, arterial hypertension, myopia, family history of the disease. Statistic informations about clinical and demographic profile of the people with glaucoma are very poor in Serbia.

The Aim: The aim of this pilot study was to make a limited sample estimate of the share of different types of glaucoma, and to determine some patient characteristics.

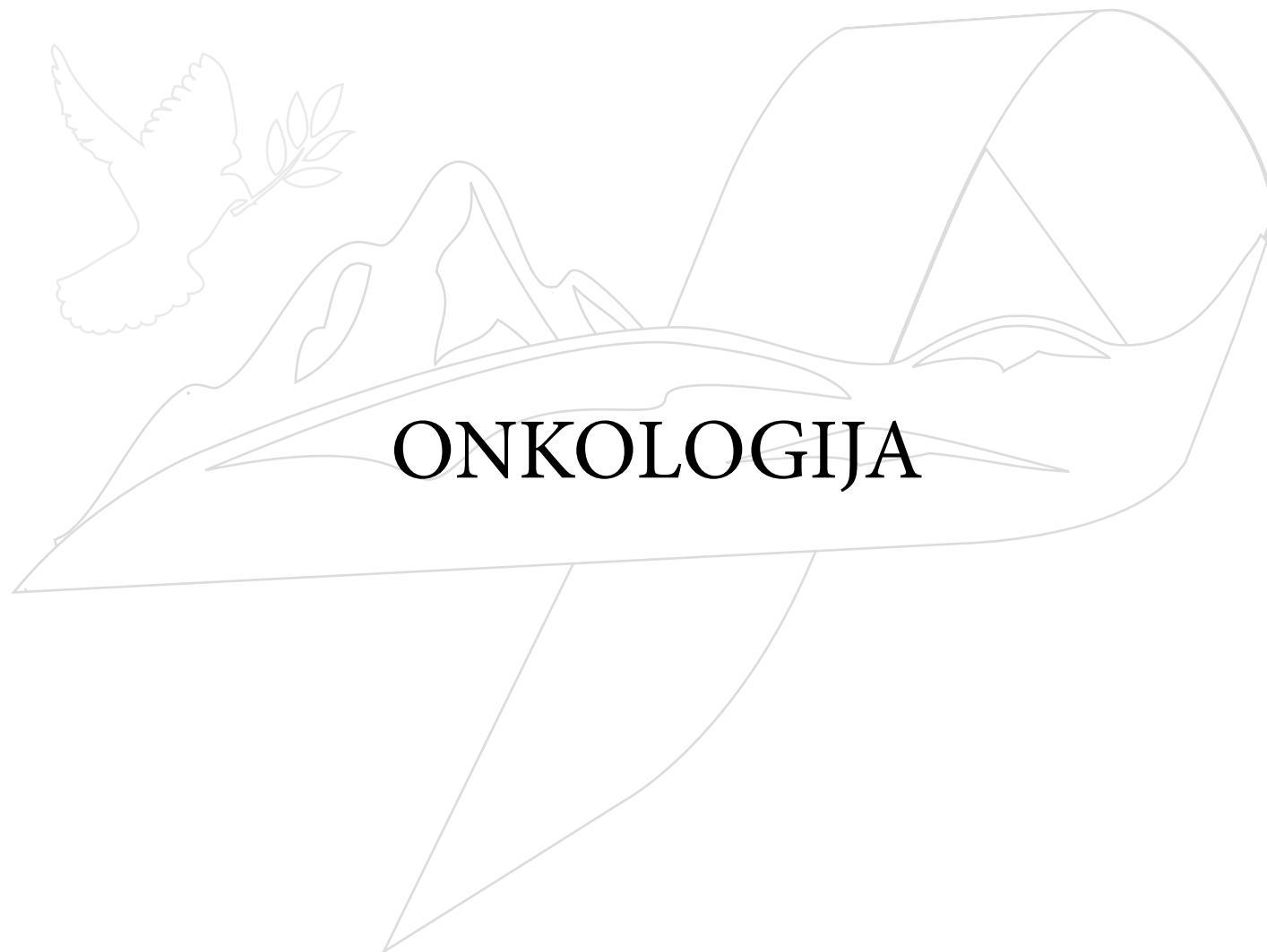
Material and Methods: The study included 65 patients of both sexes. Collected data of the patients were: gender, age, length glaucoma monitoring, number of different types of drugs used in treatment of glaucoma, glaucoma surgery performed, performed cataract surgery, presence of hypertension, type II diabetes mellitus and positive family history.

Results: Average of age of the patients was 65.46 ± 14.47 . Number of men (34) was approximately equal to number of women (31). Number of patients in whom the detection of glaucoma passed to one or two years was visibly higher. Statistical significance of the frequency of POAG (43,08%) was really higher than frequency of secondary glaucoma (23,08%) and PCAG (12,31%). Some sort of drug therapy was prescribed in 92,31% of patients (35,38% combined therapy with two drugs, and 27,69% in monotherapy).

Conclusion: The profile of patients with glaucoma was tentatively determined. The study should be continued and expanded with relevant information as a multicenter study with the aim to get more realistic profile of the patients with glaucoma in Serbia.

Key words: glaucoma, profile of patients, cross sectional study





ONKOLOGIJA

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Uvod: Uprkos velikom napretku u dijagnostici i terapiji raka, on je i dalje glavni uzrok smrti u razvijenim zemljama. Iako je operacija i hemoterapija uspešno lečenje nekih vrsta raka je neophodno u ovih bolesnika uključuju posebnu dijetu za vreme lečenja i posle toga. Budući da postoji mnogo supstance koje izazivaju.

Cilj: Cilj ovog rada je da prikaže dijetu u onkolshkita bolesnika u zavisnosti od faze bolesti i uključivanje tkiva i organa. Da se napravi poređenje između onkoloških pacijenata koji su bili pod posebnom ishranom nakon tretmana i onkoloških pacijenata koji nisu bili pod bilo ishrane posle tretmana.

Materijal i metode: Naše informacije i uspešne priče dolaze iz časopisa pisanih lekari i ljudi koji je posle uspešnog medicinskog tretmana temi pod posebnom ishranom i žele da podeli svoja iskustva sa drugima.

Rezultati: Analizirani 10 pacijenata koji su pod posebnom ishranom i 10 pacijenata koji su posle tretmana ne brinu o njihovoj ishrani. U 4 od 10 pacijenata koji ne brinu o ishrani za manje od godinu dana se pojavio dok je ostatak u onim pacijentima koji su na poseban način ishrane u toku jedne godine samo kod jedan pacijent doslo do recidiv.

Zaključci: Iz prikupljenih podataka i analiza može se zaključiti da ishrana direktno vlijaee u vraćanje bolesti kod onkoloških pacijenata.

KLjučne reči: raka, ishrana, onkologija bolestan.

DIET FOR CANCER PATIENTS

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Introduction: Despite great advances in diagnosis and therapy of cancer, he remains a major cause of death in developed countries. Although surgery and chemotherapy to successfully treat some types of cancer is necessary in these patients include a special diet during treatment and afterwards. Because there are many substances that cause.

The Aim: The purpose of this paper is to present diet in oncolshkita patients depending on their stage of disease and involvement of tissues and organs. To make a comparison between oncology patients who were under special diet after treatment and oncology patients who were not under any diet after treatment.

Materials and Methods: Our information and success stories come from journals written by doctors and people who after successful medical treatment subject under a special diet and wanting to share their experiences with others.

Results: Analyzed 10 patients who were under special diet and 10 patients who after treatment not care about their diet. In 4 of 10 patients who do not care about the diet for less than one year has appeared leftover whereas in those patients who are at special diet during one year only one patient having a relapse occurred.

Conclusion: From the collected data and the analysis can be concluded that diet directly vlijaee in recurrence of disease in oncology patients.

Keywords: cancer, nutrition, oncology ill.

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UVOD: Zahvaljujući velikom potencijalu samoobnavljanja, proliferacije i sposobnosti diferencijacije u sve krvne loze, pluripotentne matične ćelije hematopoze mogu obezbediti repopulaciju košne srži i rekonstrukciju hematopoze, što je i cilj transplantacije matičnih ćelija hematopoze. Prikupljanje matičnih ćelija hematopoze za transplantaciju se vrši multiplim aspiracijama iz sponginoznih delova kostiju ili aferezom nakon njihove mobilizacije u perifernu krv.

CILJ: Utvrđivanje efikasnosti mobilizacije matičnih ćelija hematopoze u zavisnosti od pola, starosti, broja prethodno primenjenih hemioterapijskih protokola, prirode oboljenja, vrste mobilizacionog hemioterapijskog protokola i rednog broja aferezne procedure na dobijanje adekvatnog broja CD34 matičnih ćelija.

MATERIJALI I METODE: Koristili smo rezultate afereza matičnih ćelija hematopoze iz periferne krvi kod 22 bolesnika (ukupno je bilo 35 afereznih postupaka) kojima je rađena autologna transplantacija matičnih ćelija hematopoze. Broj CD34 ćelija je određivan protočnom citometrijskom analizom, a upoređivanjem ovih vrednosti Chi kvadrat testom došli smo do zaključka o statistički značajnoj razlici.

REZULTATI: Medijana dobijenih vrednosti broja CD34 ćelija u perifernoj krvi pre afereze je 28,2 ćelija/ μ l, a u afereznom produktu 3,0x10⁶/kg, uzimajući u obzir sve bolesnike. Statistički značajna razlika nije pronađena ni u jednom poređenju od posmatranih šest parametara. **ZAKLJUČAK:** Starost bolesnika, vrsta mobilizacionog protokola, pol, priroda oboljenja, broj prethodno primljenih hemioterapijskih protokola i redni broj afereznog postupka su bez značajnog uticaja na mobilizaciju matičnih ćelija hematopoze.

KLJUČNE REČI: transplantacija matičnih ćelija hematopoze, mobilizacija, afereza

THE EFFICIENCY OF HEMATOPOIETIC STEM CELLS MOBILIZATION

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INTRODUCTION: Thanks to the great potential of proliferation and self-repair capability of differentiation into all blood cells, pluripotent hematopoietic stem cells may provide repopulation of bone marrow and hematopoietic reconstitution. The collection of hematopoietic stem cell transplantation is performed with multiple aspirations from cancellous bone parts, by apheresis after mobilization into peripheral blood using chemotherapy and/or growth factors.

GOAL: Determination of the effectiveness of hematopoietic stem cells mobilization depending on sex, age, the number of previously received chemotherapy protocols, nature of the disease, kind of the mobilization chemotherapy protocol and the order of the apheresis procedure, on acquiring the adequate number of CD34 cells.

MATERIAL AND METHODS: We used the results of hematopoietic stem cells apheresis from peripheral blood of 22 patients, in total 35 apheresis procedure. The number of CD34 cells was monitored by flow cytometry and by comparing these values using the Chi square test we have reached a conclusion on a statistically significant difference.

RESULTS: Median value of the CD34 cell number in peripheral blood before apheresis is 28,2 cells / μ l, and in the apheresis product 3x10⁶/kg, including all patients. Statistically significant difference has not been found in comparing any of the 6 parameters.

CONCLUSION: Age of the patients, the kind of the mobilization protocol, sex, nature of the disease, the number of previously received chemotherapy protocols and the order of the apheresis procedure do not have a significant influence on the hematopoietic stem cells mobilization.

KEY WORDS: Stem cell transplantation, mobilization, apheresis

MASTEKTOMIJE I PRIMARNE REKONSTRUKCIJE

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Uvod: Subkutana mastektomija podrazumeva odstranjenje tumora i kompletne mlečne žlezde sa očuvanjem kože. Indikacije za subkutanu mastektomiju su: multicentrični, veliki tumor preko 3 cm, ekstenzivan DCIS (Ductal Carcinoma in Situ) ili recidiv nakon poštednih operacija. Obzirom na estetske i psihološke efekte poslednjih godina beleži se stalni porast ovih operacija.

Cilj rada: Analiza učestalosti lokalnih recidiva i preživljavanja pacijentkinja nakon subkutane mastektomije i primarne rekonstrukcije dojke.

Materijal i metode: Istraživanjem je obuhvaćeno 255 pacijentkinja kojima je urađeno 264 (246 unilateralnih i 9 bilateralnih) subkutanih mastektomija na Institutu za onkologiju Vojvodine u periodu od 2004. do 2010.godine. Statistička analiza podataka izvršena je softverskim paketom SPSS verzija 16. Od statističkih procedura korišćeni su deskriptivni statistički pokazatelji, a analize preživljavanja izvedene su Kaplan-Meier-ovom metodom. Nivo značajnosti je određen na 0,05.

Rezultati: Pojava lokalnog recidiva zabeležena je kod 9 bolesnica (3,4%). Prosečno preživljavanje iznosi 50,09 meseci, a medijana preživljavanja je 58 meseci. Ukupno 8-godišnje preživljavanje određeno Kaplan-Meier-ovom metodom iznosi 82%.

Zaključak: Subkutana mastektomija i primarna rekonstrukcija dojke je onkološki bezbedna procedura sa preživljavanjem i pojavom lokalnih recidiva koja se statistički značajno ne razlikuje u odnosu na druge hirurške operacije karcinoma dojke. Pojava lokalnih recidiva češća je kod pacijentkinja sa većim tumorom (T stadijum), dok zahvaćenost limfnih čvorova aksile i postoperativna zračna terapija ne utiču na pojavu lokalnih recidiva.

Ključne reči: subkutana mastektomija, lokalni recidivi, preživljavanje

LOCAL RECURRENCES AND SURVIVAL IN BREAST CANCER PATIENTS AFTER SUBCUTANEOUS MASTECTOMY AND IMMEDIATE RECONSTRUCTION

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Introduction: Subcutaneous mastectomy involves removal of the tumor and the entire mammary gland with preservation of the skin. Indications for operation are: multicentric, large tumors over 3 cm or local recurrences after breast conserving surgery. According to better esthetic and psychological effects number of subcutaneous mastectomies is progressively increasing.

The Aim: Analysis of the incidence of local recurrence and patient survival after primary subcutaneous mastectomy and immediate breast reconstruction.

Materials and Methods: This study included 255 patients who underwent 264 (246 unilateral and 9 bilateral) subcutaneous mastectomies at the Oncology Institute of Vojvodina in the period since 2004. until 2010. Statistical analysis was performed with the software package SPSS version 16. Descriptive statistical indicators were used and survival analyses were performed using the Kaplan-Meier's method. The significance level was set at 0.05.

Results: Local recurrence was diagnosed in 9 patients (3.4%). Average survival was 50.09 months and median survival was 58 months. Overall survival with a 8-year follow-up provided by Kaplan-Meier's method was 82%.

Conclusion: Subcutaneous mastectomy and breast reconstruction is safe procedure with survival and local recurrence not significantly different compared to other breast cancer surgery. The occurrence of local recurrence was more common in patients with larger tumors (T stage), while axillary lymph nodes and postoperative radiotherapy does not influence the occurrence of local recurrence.

Key words: subcutaneous mastectomy, local recurrence, survival

SEKUNDARNI LIMFEDEM RUKU KOD PACIJENTKINJA SA KARCINOMOM DOJKE OPERISANIH U INSTITUTU ZA ONKOLOGIJU VOJVODINE, 2005-2009. GODINE

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Uvod: Kod 5-30% pacijenata operisanih zbog karcinoma dojke razvija se sekundarni limfedem ruke. Ova funkcionalna komplikacija spada u grupu preventabilnih komplikacija.

Cilj: Prikaz incidencije sekundarnog limfedema ruke kod pacijentkinja operisanih od karcinoma dojke u Institutu za onkologiju Vojvodine u periodu od 2005-2009. godine.

Materijal i metode: Retrospektivno je analizirano 188 pacijentkinja sa utvrđenom dijagnozom sekundarnog limfedema ruke u Institutu za onkologiju Vojvodine u Sremskoj Kamenici, u periodu od 1. januara 2005. godine do 31. decembra 2009. godine. Podaci su prikupljeni iz zdravstvenih kartona u Zavodu za rehabilitaciju, gde je pacijentima dijagnostikovano i/ili kontrolisano sekundarni limfedem ruke.

Rezultati: U periodu od 2005-2009. godine od ukupno 2190 pacijenata operisanih od karcinoma dojke, kod 188 njih su se razvili simptomi sekundarnog limfedema ruke. Procentualna zastupljenost edema ipsilateralne ruke u ispitivanom periodu je 8,58%, a kretala se od 5,94%-11,86%. Prosečno vreme izraženo u mesecima, od operacije do pojave sekundarnog limfedema ruke iznosi 16,12 meseci. Većina pacijentkinja je imala promene na levoj ruci (54,26%) u odnosu na pacijentkinje koje su imale zahvaćenu desnu ruku (45,74%).

Zaključak: Implementacija programa rane rehabilitacije, kineziterapija i edukacija pacijenata o faktorima rizika, kao i kontinuirano praćenje, dovelo je do relativno niske incidencije sekundarnog limfedema ruke u odnosu na literaturne podatke.

Ključne reči: karcinom dojke, sekundarni limfedem ruke, incidencija

SECONDARY LYMPHEDEMA OF THE ARM IN PATIENTS WITH BREAST CARCINOMA OPERATED AT THE ONCOLOGY INSTITUTE OF VOJVODINA, 2005-2009. YEAR

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Introduction: Secondary lymphedema of the arm develops in 5-30% of patients after breast cancer surgery. This feature belongs to a group of preventable complications.

The Aim: Review of incidence of secondary lymphedema of the arm in patients with breast carcinoma operated at the Oncology Institute of Vojvodina in the period of 2005-2009 year.

Materials and methods: From 1st January 2005 to 31st December 2009 year, 188 patients with established diagnosis of secondary lymphedema of the arm were analyzed retrospectively at the Institute of Oncology, Sremska Kamenica. Data were collected from medical records at the Department of rehabilitation, where patients were diagnosed and/or received aftercare for secondary lymphedema of the arm.

Results: During the period between 2005. and 2009. a total of 2190 patients had undergone surgery for breast cancer. Symptoms of secondary lymphedema of the arm have developed in 188 of them. Percentage of ipsilateral arm edema during the study period was 8.58%, and ranged from 5.94%-11.86%. The average time expressed in months from surgery to the appearance of secondary lymphedema of the arm was 16.12 months. Most of the patients had changes in the left hand (54.23%) in comparison to patients who have had their right arm affected (45.74%).

Conclusion: Implementation of early rehabilitation program, kinesiotherapy and patient education about risk factors, as well as continuous monitoring, led to a relatively low incidence of secondary lymphedema of the arm compared to a literature data.

Key words: breast cancer, secondary lymphedema of the arm, incidence

KARAKTERISTIKE KARCINOMA DOJKE KOD ŽENA MLAĐIH OD 35 GODINA

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Uvod: Karcinom dojke se u populaciji žena mlađih od 35 godina javlja u svega 2 % slučajeva, ali se veruje da je on u ovoj starosnoj kategoriji agresivnijeg biološkog ponašanja i da ima lošiju prognozu nego kod postmenopausalnih žena.

Cilj: Uvrditi kliničko-patološke i biološke karakteristike karcinoma dojke kod žena mlađih od 35 godina starosti.

Materijal i metode: Istraživanjem su obuhvaćene 93 pacijentkinje sa karcinomom dojke, starosti 35 godina ili mlađe, koje su se lečene na Institutu za onkologiju u Sremskoj Kamenici, u periodu od 2007. do 2011. godine. Korišćeni su podaci iz istorija bolesti i patoloških izveštaja bolesnica, dobijeni retrospektivnom analizom kompjuterske baze podataka Instituta.

Rezultati: Istoriju karcinoma dojke u porodičnoj anamnezi imalo je 19% bolesnica, a 29% istoriju druge maligne bolesti. Najviše pacijentkinja imalo je tumore gradusa 2, dok je najčešći histološki tip tumora bio duktalni invazivni karcinom. Najveći broj bolesnica imalo je tumore veličine između 2 i 5 cm (T2). Limfni čvor „stražar“ bio je pozitivan u 64% slučajeva, a najviše bolesnica bilo je u pN1 stadijumu (36%). Vaskularna invazija bila je prisutna kod 54%, limfovaskularna kod 65%, dok je perineuralna invazija bila prisutna kod 48% pacijentkinja. Estrogenski i progesteronski receptori bili su pozitivni kod 51% pacijentkinja, a HER 2 u svega 28%. Najviše pacijentkinja bilo je u kliničkom stadijumu IIA (30%).

Zaključak: Pojedine kliničko-patološke karakteristike utvrđene u istraživanju saglasne su sa tvrdnjama o agresivnijem biološkom obliku karcinoma dojke kod mlađih žena, dok se o drugim karakteristikama nije mogao doneti konkretan zaključak.

Glavne reči: karcinom dojke, mlade životno doba, kliničko-patološke karakteristike

THE CHARACTERISTICS OF BREAST CANCER IN WOMEN YOUNGER THAN 35

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Introduction: Breast cancer occurs in the population of women under the age of 35 in only 2% of cases, but is believed to have a more aggressive biological behavior and to be associated with a more unfavorable prognosis compared with the disease in older patients.

The Aim: To investigate clinicopathological and biological characteristics of breast cancer in women younger than 35 years of age.

Materials and methods: The research included 93 breast cancer patients, aged 35 or younger, who were treated in the Institute of oncology in Sremska Kamenica, between 2007. and 2011. The data used in this research was obtained from the patients' medical histories and pathological reports, through a retrospective review of the Institute's computerized database.

Results: Family history of breast cancer was present in 19% of the patients, while 29% of them had a family history of other malignant diseases. Most of the patients had grade 2 tumors, and the invasive ductal carcinoma was the most common histological type. The most common tumor size was between 2 and 5 cm (T2). Sentinel lymph node was positive in 64% of the cases, and the majority of the patients were in the pN1 stadium (36%). Vascular invasion was present in 54%, lymphovascular in 65%, while perineural invasion was present in 48% of the patients. Estrogen and progesterone receptors were positive in 51%, while HER 2 receptors were positive in only 28% of patients. Most of the patients were in the IIA clinical stadium.

Conclusion: Some of the clinicopathological features that we researched are in accordance with the claims of a biologically more aggressive breast cancer in younger women, while others didn't lead to a concrete conclusion.

Key words: breast cancer, young age, clinicopathological characteristics

KLINIČKE KARAKTERISTIKE SEKUNDARNOG LIMFEDEMA DONJIH EKSTREMITETA KOD PACIJENTKINJA SA KARCINOMOM CERVIXA

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Uvod: Sekundarni limfedem donjih ekstremiteta predstavlja veliki zdravstveni problem u srednje i visoko razvijenim zemljama. Nastanak sekundarnog limfedema donjih ekstremiteta povezan je sa osnovnom bolesti i faktorima rizika. Ova funkcionalna komplikacija spada u grupu preventabilnih komplikacija.

Cilj: Cilj našeg istraživanja bio je ispitivanje kliničkih karakteristika sekundarnog limfedema kod pacijentkinja koje su lečene od karcinoma cerviksa.

Materijal i metode: Retrospektivno je analizirano 20 pacijentkinja sa dijagnozom sekundarnog limfedema noge u Institutu za onkologiju Vojvodine u Sremskoj Kamenici. Podaci su prikupljeni iz zdravstvenih kartona u Zavodu za rehabilitaciju, od žena lečenih od karcinoma cerviksa.

Rezultati: Starosna struktura ispitivanja u vreme operacije iznosila je u proseku 44,4 godina, a prosečno vreme izraženo u mesecima, od operacije do pojave sekundarnog limfedema iznosi 35,5 meseci. Sekundarni limfedem dijagnostikovao je kod 55% žena gde su operacijom uklonjene materice, jajnici i regionalne limfne žlezde. Prosečno povećanje obima noge najizraženije je na šestom merenom mestu i iznosi 3,92 cm. Najveći procenat pacijentkinja, čak 45% ima povećanje obima noge na drugom merenom nivou. Težak oblik kliničke slike ima 40% pacijentkinja.

Zaključak: Sekundarni limfedem predstavlja tešku postterapijsku komplikaciju, koja se u većem procentu javlja u žena kod kojih je izvršena radikalna operacija i može se javiti i posle više desetina godina nakon lečenja invazivnih formi karcinoma cerviksa.

Glavne reči: karcinom cerviksa, sekundarni limfedem noge, incidencija.

CLINICAL CHARACTERISTICS SECONDARY LYMPHEDEMA OF THE LOWER EXTREMITIES IN PATIENTS WITH CARCINOMA OF THE CERVIX

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Introduction: Secondary lymphedema of the lower extremities is a major health problem in middle and high in some countries. The emergence of secondary lymphedema is associated with underlying diseases and risk factors. These functional complications are among the preventable complications.

The Aim: The aim of this study was to investigate the clinical characteristics of secondary lymphedema in lower extremities in patients who were treated for cervical cancer.

Material and Methods: We retrospectively analyzed 20 patients diagnosed with secondary leg lymphedema at the Oncology Institute in Sremska Kamenica. Data was collected from medical records of women treated for cervical cancer at the Department of Rehabilitation.

Results: The age structure of respondents at the time of surgery was 44.4 years on average, and the average time, expressed in months, from surgery until the occurrence of secondary lymphedema was 35.5 months. Secondary lymphedema was diagnosed in 55% of women where the operation removed the uterus, ovaries and regional lymph nodes. The average increase in circumference is 3,92cm the most prominent value was measured on the sixth measurement point. Most of the patients 45% has increased circumference on the 2nd measurement point. Severe form of the clinical features was found in 40% of the patients.

Conclusion: Secondary lymphedema is a difficult postoperative complication. It occurs in greater percentage in women who had undergone radical surgery procedures and can occur several decades after the treatment of invasive forms of cervical cancer.

Key words: cervical cancer, secondary leg lymphedema, incidence.



OTORINOLARINGOLOGIJA

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Uvod: Akutna gluvoća predstavlja gubitak sluha veći od 30 dB u najmanje 3 subsekventne audiometrijske frekvencije, sa naglim nastankom unutar prethodnih 72 sata. Etiologija oboljenja je uglavnom nepoznata. Najčešće se leči kortikosteroidima, međutim ne postoji važeći konsenzus oko terapijskog protokola. Brojne studije sprovedene su da bi se identifikovali faktori koji bi mogli imati uticaj na oporavak kod akutne gluvoće.

Cilj: Cilj rada je procena prognostičke vrednosti pola, starosti, zahvaćene strane, prisustva tinitusa i vertiga, stepena početnog oštećenja sluha i izgleda audiometrijske krive.

Materijal i metode: U istraživanje su uključeni pacijenti sa dijagnozom akutne gluvoće lečeni na Klinici za bolesti uva, grla i nosa Kliničkog centra Vojvodine u Novom Sadu. Svi pacijenti lečeni su po istom terapijskom protokolu (kortikosteroidi, vazoaaktivni lekovi). Ovo je retrospektivni tip studije na osnovu podataka dobijenih uvidom u istorije bolesti i nalaze tonalne audiometrije.

Rezultati: Kod 48 pacijenata, u 65,3% slučajeva došlo je do oporavka. Nije utvrđena statistički značajna razlika vezana za pol, aficirano uho, prisustvo tinitusa i vertiga između grupe pacijenata koji su se oporavili i onih kod kojih je oporavak izostao. Statistički značajna razlika nije nađena ni za starost pacijenata, početni stepen oštećenja sluha, ni izgled audiometrijske krive između ove dve grupe pacijenata.

Zaključak: Pol, starost, zahvaćena strana, tinitus i vertigo, stepen oštećenja sluha i kriva audiograma nemaju dovoljnu vrednost kao prognostički faktori kod akutne gluvoće.

Ključne reči: akutna gluvoća, prognostički faktori

EXAMINING PROGNOSTIC FACTORS IN SUDDEN DEAFNESS

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Introduction: Sudden deafness is defined by loss of hearing greater than 30 dB in 3 consecutive frequencies that has occurred within the last 72 hours. Etiology of the disease is mostly unknown. It is often treated with corticosteroids, however there is no standing consensus on the treatment protocol. There have been numerous studies to identify the factors which may influence the recovery from acute deafness.

Goal: The goal of the research is to evaluate sex, age, affected side, presence of tinnitus and vertigo, level of initial hearing impairment and the shape of the audiometric curve as prognostic factors.

Materials and methods: Patients diagnosed with sudden deafness treated at the Otorhinolaryngology Clinic, Clinical Center of Vojvodina in Novi Sad, were included in the research. All the patients were treated according to the same protocol (corticosteroids, vasoactive drugs). This is a retrospective study using the data from patient histories and tone audiometry findings.

Results: Out of 48 patients, 65,3% has recovered. Statistically significant differences for sex, affected side, presence of tinnitus and vertigo have not been found between the recovered group of patients and the unrecovered. Statistically significant difference has neither been found for age, initial level of hearing impairment, nor for the shape of the audiometric curve, between these two groups of patients.

Conclusion: Sex, age, affected ear, tinnitus, vertigo, level of hearing impairment and the audiometric curve do not have sufficient value as prognostic factors in sudden deafness.

Key words: sudden deafness, prognostic factors

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Uvod: Papilomatoza larinksa je perzistentna bolest koja zahvata mukozu larinksa i može da se raširi na ceo respiratorni i gornji digestivni put. Karakteriše je nepredvidiv klinički i recidivantni tok. Od tegoba javljaju se promuklost, inspiratorni stridor, hronični kašalj, respiratorni distres i izrazito otežano disanje sa potrebom za traheostomijom. Sa različitim uspehom se koriste različiti vidovi terapije u kojoj centralno mesto ima mikrohirurška terapija. Nedostaju registri ovog oboljenja na nacionalnom i internacionalnom nivou.

Cilj rada: Utvrditi uticaj karakteristika papilomatoznih promena, pola, uzrasta i pušačkih navika pacijenata na pojavu recidiva bolesti.

Materijal i metode: Retrospektivnim istraživanjem u periodu od decembra 2000. do novembra 2011. godine je obuhvaćeno 67 bolesnika sa patohistološki potvrđenom dijagnozom papilomatoze larinksa. Tip papiloma je opisan po Dikkers-ovoj skali. Statistička značajnost je proveravana t-testom i χ^2 testom.

Rezultati: Ispitanici su uzrasta 2-82 godine, Muški pol je pet puta zastupljeniji (56:11), t-test ($p < 0,05$). Svakom četvrtom ispitaniku su ponavljane operacije prosečno dva puta. Predominacija starijih grupa 41-82 godine za ispitanike bez recidiva je potvrđena χ^2 -testom ($p < 0,05$). Vremenski period između dve operacije varira 1-46 meseci, prosečno je 12. Značajne razlike između grupa sa i bez recidiva ne postoje za stepen razvoja papiloma prema Dikkers-ovoj skali. Maligna transformacija je zabeležena kod 18% pacijenata.

Zaključak: Povezanost između karakteristika papiloma, pola, uzrasta i pušačkih navika pacijenata sa pojavom recidiva nije značajna.

Ključne reči: papilomatoza; recidiv; larinks; faktori

LARYNGEAL PAPILOMATOSIS: FACTORS FOR RECURRENCE

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Introduction: Laryngeal papillomatosis is a persistent disease that arises in laryngeal mucous membrane and may spread to respiratory and upper alimentary tracts. It is characterized by a variable course of disease with a high rate of recurrence. Presenting symptoms include hoarseness, inspiratory stridor and acute severe dyspnea requesting tracheostomy. Different therapeutic modalities are used with variable success, but the main stream in the treatment is microsurgery. There is a need for national and international registries for laryngeal papillomatosis.

The Aim: To evaluate the influence of age, gender, tobacco use and features of papillomatosis at the recurrence of the disease.

Materials and Methods: From December 2000 to November 2011, 67 patients with pathological diagnosis of laryngeal papillomatosis were observed retrospectively. The type of papilloma was classified according to Dikkers scale. Statistical significance was evaluated with unpaired t-test and Pearson's χ^2 test.

Results: The age ranges from 2 to 82. Male gender preponderance was strong (56:11) with statistically significant unpaired t-test, $p < 0,05$. Recurrence was found in 25% of patients, with 2 episodes of recidivism in lifetime. Statistical significance of χ^2 -test ($p < 0,05$) showed dominance of age group between 41 and 82 in cases without relapse. Period between surgical procedures varies from 1 to 46 months, on average 12 months. Difference in grades according to Dikkers scale between groups with and without recurrence did not reach statistical significance. Malignant transformation was found in 18% of patients.

Conclusion: No statistical significance was found to prove the influence of age, gender, tobacco use and features of papillomatosis at the recurrence of the disease.

Key words: papillomatosis; larynx; relapse; recurrence; factors

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Uvod: Hronični edemi glasnica (Rajnekeovi edemi) su česti pseudotumori koji se u klinički manifestuju obostranim, difuznim, često asimetričnim otokom. Osnovni simptomi hroničnog edema glasnica su karakterističan duboki glas i različit stepen promuklosti. Postojanje subjektivne ocene kvaliteta sopstvenog glasa veoma je bitan deo savremene laringologije i predstavlja metod za procenu kvaliteta života kod pacijenata sa promuklošću.

Cilj: Analiza poremećaja glasa putem subjektivne ocene glasa kod pacijenata sa Rajnekeovim edemima glasnica, kao i ispitivanje potencijalne korelacije između skora VHI-10 sa stepenom edema glasnica i profesijom bolesnika.

Materijal i metode: Istraživanjem je obuhvaćeno 30 pacijentkinja sa hroničnim edemom glasnica. Klinički stepen edema glasnica je dijagnostikovao mikrolaringoskopijom koji se u zavisnosti od makroskopske slike klasifikuje u jedan od četiri stepena. Svi bolesnici su popunili standardizovani upitnik za procenu kvaliteta života kod pacijenata sa promuklošću, Voice Handicap Indeks -10 na srpskom jeziku.

Rezultati: Umeren poremećaj glasa prema VHI-10 skoru imalo je 33% bolesnika, a težak 47%. VHI-10 skor nije bio u korelaciji sa stepenom edema glasnica ($p>0.05$). Korelacija između profesije koja podrazumeva čestu upotrebu glasa bila je na granici statističke povezanosti sa vrednostima skora VHI-10 ($p=0.05$).

Zaključak: Pacijentkinje sa hroničnim edemom glasnica imaju osećaj hendikepanosti i smanjenje kvaliteta života u 80% slučajeva. Međutim, rezultati ovog istraživanja pokazuju da teži klinički stepen hroničnog edema glasnica ne mora biti uzrok lošije samoprocene glasa. Promuklost jeste bitan uzrok narušavanja kvaliteta života kod bolesnika sa poremećajem glasa, naročito ukoliko često koriste glas u svojoj profesiji.

Ključne reči: Hronični edemi glasnica, Indeks hendikepa glasa -10, promuklost

SELF-PERCEPTION OF VOICE HANDICAP IN FEMALE PATIENTS WITH REINKE'S OEDEMA

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Introduction: Chronic oedema of vocal cords (Reinke's oedema) is a pseudotumor which is manifested with diffuse, bilateral lesions of the membranous part of the vocal cord. The most common symptoms are deepening of the voice, especially in women, and dysphonia. In recent years, beside organic and functional aspects, dysphonic patients' self-perception of their voice became an equally important medical parameter.

The Aim: To analyze the self-perception of a voice handicap in dysphonic patients and to assess the association between VHI-10 total score and the severity of Reinke's oedema.

Materials and methods: This study involved 30 female patients with Reinke's oedema. Laryngomicroscopy was used for grading of Reinke's oedema depending of the severity of the swelling. All patients completed the Serbian version of Voice Handicap Index – 10.

Results: Moderate abnormalities of voice (33%) and severe abnormalities (47%) were frequent.

No correlation between VHI-10 and grading of Reinke's oedema could be found ($p>0.05$). Patients with professional voice scored significantly worse than other patients ($p=0.05$).

Conclusion: Our study showed that 80% of patients had some degree of voice abnormality and loss of quality of life. We also found that patients with even severe Reinke's oedema may have had no worse total VHI-10 score. There was negative impact of voice on the quality of life especially of those patients who had frequent use of voice in their professional life.

Key words: Chronic oedema of vocal cords, Voice Handicap Index – 10, dysphonia

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Uvod: Reinke-ovi edemi glasnica (REG) se karakterišu nakupljanjem tečnosti u površnom sloju lamine proprie, kao nespecifična reakcija na različite štetne faktore.

Cilj: Analiza faktora rizika za nastanak REG kod bolesnica kojima je kliničkim pregledom postavljena dijagnoza i primenjena odgovarajuća terapija.

Materijal i metode: Podaci o faktorima rizika su ispitivani pomoću ankete kod 28 bolesnica koje su se u periodu od maja 2009. do februara 2012. godine javile otorinolaringologu u Službu za ORL i MFH KBC „Zemun“.

Rezultati: Analiziranu grupu činilo je 28 bolesnica, prosečne starosti $55,00 \pm 6,43$ godina. Tri najučestalija simptoma pri prijemu bila su promuklost (26; 92,9%), dubok glas (24; 85,7%) i sužen raspon glasa (18; 64,3%). Pušenje kao faktor rizika je zabeležen kod svih bolesnica, pri čemu je većina (17; 60,71%) konzumirala do jedne pakle cigareta na dan, dok se samo njih 6 (21,4%) izjasnilo da ima pušački staž kraći od 20 godina. Gastro-ezofagusna refluksna bolest je dijagnostikovana kod 11 (39,3%) bolesnica. Aerozagadjenje kao faktor rizika je zabeležen kod više od polovine bolesnica (15; 53,6%). Kod bolesnica čija profesija zahteva preteranu upotrebu glasa je dokazana statistički značajnija učestalost pojave kašlja ($p<0.05$) u odnosu na druge simptome.

Zaključci: Najveći faktor rizika za nastanak REG u našem istraživanju je bilo pušenje do jedne pakle cigareta na dan sa pušačkim stažom dužim od 30 godina. Polovina bolesnica je imala povećano aerozagadjenje u životnom okruženju, dok je blizu 40% imalo potrebu za prekomernom upotrebom glasa u radnom okruženju.

Ključne reči: Reinke-ovi edemi glasnica, dijagnoza, faktori rizika

RISK FACTORS FOR THE OCCURRENCE OF REINKE'S OEDEMA AT FEMALE PATIENTS

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Introduction: Reinke's edema (RE) is characterized with accumulation of fluids on the surface layer of lamina propria. This can be caused with influence of different harmful factors.

The Aim: To analyze risk factors on patients whose diagnosis was set and appropriate therapy was applied after clinical examination.

Materials and Methods: Information about risk factors were investigate using questionnaire introduced to 28 patients who were reported to ORL and MFH Service in KBC „Zemun“ between May 2009. and February 2012.

Results: Investigation group consists of 28 patients, average age $55,00 \pm 6,43$ years. Three most frequent symptoms were hoarseness (26; 92,9%), deep voice (24; 85,7%) and narrow voice range (18; 64,3%). Smoking as factor of risk was noted with all patients. The most of them (17; 60,71%) were consuming one packet of cigarettes per day, while only six of them declared that they have been smoking for less than 20 years. Laryngopharyngeal reflux illness was diagnosed at 11 (39,3%) patients. Air pollution as a risk factor was noted in more than half patients (15, 53,6%). In patients whose profession requires excessive use of voice is proven statistically significant incidence of cough ($p<0.05$) compared to other symptoms.

Conclusion: The greatest risk factor for RE in our study was to smoking one pack of cigarettes per day from smoking period longer than 30 years. Half of patients had increased air pollution in environment, while nearly 40% felt the need for excessive use of voice in workplace.

Key words: Reinke's edema, diagnosis, factor of risks

UČESTALOST AKUTNIH UPALA UŠIJU U ODNOSU NA OSTALA OBOLJENJA GORNJIH RESPIRATORNIH PUTEVA

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Uvod: Akutna u većini slučajeva purulentna inflamacija mukoze kaviteta srednjeg uva uzrokovana virusima ili bakterijama koji iz nazofarinksa dosepevuju do srednjeg uva putem Eustahijeve tube predstavlja akutnu upalu srednjeg uva. Više od 60% dece do svoje šeste godine ima jednu ili više epizoda akutne upale srednjeg uva. Iznenadna jaka i pulzatilna bol, povišena telesna temperaturata, oslabljen sluh konduktivnog tipa kao i iritabilnost i stomadni bolovi čine kliničku sliku ovog oboljenja.

Cilj: je ispitivanje učestalosti akutne upale srednjeg uva u odnosu na pol, uzrast, godišnje doba i pridružene bolesti ORL regije.

Materijal i metode: Retrospektivnom studijom je obuhvaćeno 837 ambulantno dijagnostikovanih akutnih upala srednjeg uva u periodu od godinu dana tokom 2011 godine na ORL odeljenju Zdavstvenog centra u Kosovskoj Mitrovici.

Rezultati: od ukupnog broja pacijenta 497 ili 59,38% je muškog pola i 340 ili 40,62% je ženskog pola. Akutnu upalu srednjeg uva uzrasta do sedme godine života je imalo 539 (64,4 %) pacijenta. U odnosu na godišnje doba najviše akutnih upala srednjeg uva ima u zimskom periodu i to ukupno 331 (39,55%) pacijent a najmanje u letnjem periodu 85 (10,15%) pacijenta. Pridruženih patoloških stanja ORL regije je bilo prisutno u 260 slučajeva ili 31,06%.

Zaključak: Akutna upala srednjeg uva izolovano ili udruženo patološko stanje je često u otorinolaringologiji sa visokom incidencom u predškolskom uzrastu i zimskim mesecima.

KLjučne reči: akutna upala srednjeg uva, uzrast, doba godine, pridružene bolesti.

FREQUENCY OF ACUTE EAR INFECTIONS COMPARED TO OTHER DISEASES UPPER RESPIRATORY WAY

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Introduction: Acute in most cases Purulent inflammation of the mucosa of the middle ear cavity caused by viruses or bacteria from the nasopharynx to reach the middle ear via the Eustachian tube is an acute inflammation of the middle ear. More than 60% of children under the age of six have one or more episodes of acute otitis media. Sudden severe pain and pulzatilna, increased body temperaturata, conductive type of hearing impaired and irritability, and abdominal pain are clinical symptoms of this disease.

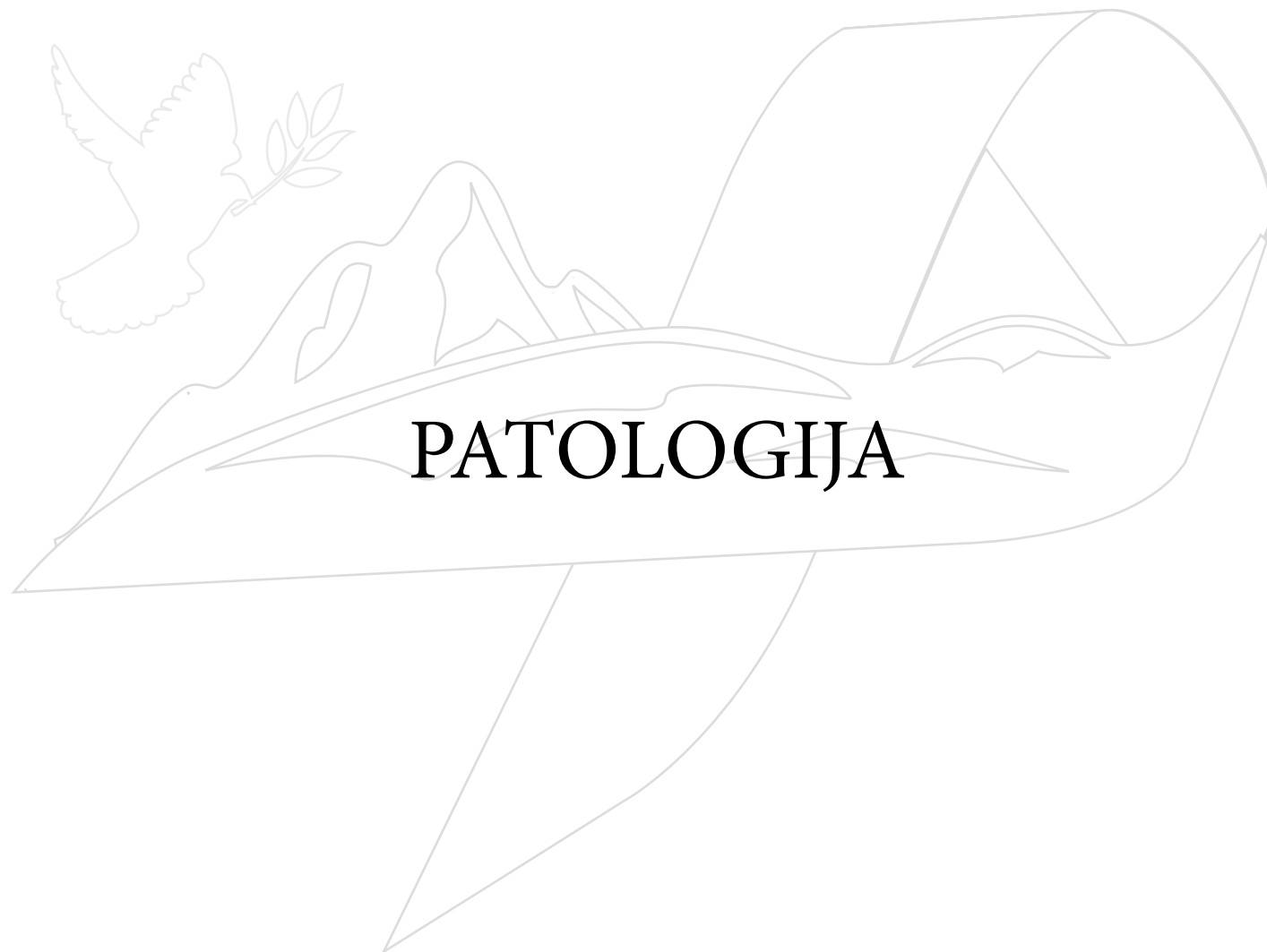
Aim: to examine the incidence of acute otitis in relation to gender, age, season and comorbidities ORL.

Material and Methods: This retrospective study included 837 outpatients with diagnoses of acute otitis in the period of one year during 2011 in the ORL department Zdavstvenog center in K. Mitrovica.

Results: The total number of 497 patients or 59.38% were male and 340 or 40.62% were female. Acute inflammation of the middle ear under the age of seven years of age had 539 (64.4%) patients. In relation to the season most akutih otitis there in the winter and to a total of 331 (39.55%) patients and least in summer 85 (10.15%) patients. Pathological conditions associated ENT region was present in 260 cases or 31.06%.

Conclusion: Acute otitis isolated or associated pathological condition is often in otorhinolaryngology with high incidence in preschool children and winter months.

Keywords: acute otitis, age, time of year, comorbidities.



UČESTALOST EKSPRESIJE ESTROGENSKIH I PROGESTERONSKIH RECEPTORA KOD INVAZIVNOG DUKTALNOG KARCINOMA DOJKE U CRNOJ GORI U PERIODU 2009-2012

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Uvod: Invazivni duktalni karcinom dojke (CDIM) je najčešći rak dojke, sa udjelom preko 75%. Nastaje iz epitela terminalnih kanalića dojke na ulasku u lobule. U cilju dijagnostike, radi se test estrogenskih i progesteronskih receptora, kojim se mjeri broj receptora u tumorskom tkivu. Ako je broj receptora veći, karcinom se može brže razvijati, ali ujedno je i pogodniji za hormonsku terapiju.

Cilj: Cilj ovog rada je da se utvrdi učestalost ekspresije estrogenskih i progesteronskih receptora u CDIM-u, u Crnoj Gori u periodu od 2009-2012.

Materijal i metode: U retrospektivnoj studiji obuhvaćeno je 269 pacijenata oba pola sa patološki verifikovanim CDIM, nliječenih na Odjeljenju za grudnu hirurgiju KBC-a Podgorica u periodu od januara 2009. do kraja decembra 2011. godine. Podaci o tipu CDIM-a, starosti i mjestu prebivališta pacijenata prikupljeni su iz uputnica za histopatološki pregled. Za evidenciju podataka prikupljenih u toku istraživanja korišćeni su posebno dizajnirani istraživački kartoni. Baza podataka formirana je u Excel-u.

Rezultati: U periodu praćenja od 3 godine (2009-2012), kod ispitanika najčešće su bili zastupljeni hormon-senzitivni CDIM ER-/PR+, ER+/PR-, ER+/PR+ (67,28%) u odnosu na nesenzitivne tumore ER-/PR- (32,71%). Po učestalosti, od hormon-senzitivnih najviše su bili zastupljeni ER+/PR+ karcinomi sa 51,3%, zatim ER-/PR- sa 12,26% a najrjeđi su bili ER-/PR+ sa 3,71%. Pozitivan receptorski status je direktno u vezi sa niskim stepenom ćelijske proliferacije i povoljnim prognostičkim faktorima.

Zaključci: Kod ispitanika češće su bili zastupljeni hormon-senzitivni CDIM, u odnosu na hormon-nesenzitivne CDIM. Od hormon-senzitivnih najviše su bili zastupljeni ER+/PR+ karcinomi, zatim ER-/PR-, a najrjeđi su bili ER-/PR+.

Ključne riječi: invazivni, duktalni, receptori, estrogen, progesteron.

EXPRESSION FREQUENCY OF ESTROGEN AND PROGESTERONE RECEPTORS IN DCIM IN MONTENEGRO FOR THE PERIOD OF 2009-2012

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Introduction: Invasive ductal breast carcinoma (CDIM) is the most common type of breast cancer, with the rate of over 75% of all breast cancers. It develops from epithelium of terminal channels of a breast, in the entry of lobules. For the purpose of diagnostics, test of estrogen and progesterone receptors is conducted. If the number of receptors is higher, the cancer could develop faster, but it is also more suitable for hormone therapy.

The aim: The objective of this study was to determine the frequency of expression of estrogen and progesterone receptors in the CDIM, in Montenegro for the period of 2009-2012

Materials and methods: The retrospective/prospective study included 269 patients with pathologically verified CDIM, treated on the Department of Thoracic Surgery of KBC, in the period from January 2009 to December of 2011. The data on the CDIM type, patient's age and residence data were collected from referral histopathological examination. To record data collected during the survey we used specially designed research files. The database was created in Excel.

Results: In follow-up period of 3 years (2009-2012) the most commonly represented were the hormone-sensitive CDIM: ER-/PR+, ER+/PR-, ER+/PR+ (67.28%) compared to non-sensitive tumors ER-/PR- (32.71%). From hormone-sensitive cancers, most common were ER+/PR+ (51.3%), followed by ER-/PR- (12.26%), and the least common were ER-/PR+ (3.71%). Positive receptor status is directly related with low level of cell proliferation and favorable prognostic factors.

Conclusion: The most commonly occurring type of DCIM in patients was the hormone-sensitive CDIM, against the non-sensitive CDIM. Out of hormone-sensitive types the most common were ER+/PR+, followed by ER-/PR- and the least common were ER-/PR+.

Key words: invasive, ductal, estrogen, progesterone.

UČESTALOST KARCINOMA GRLIĆA MATERICE U CRNOJ GORI ZA PERIOD 2009-2012

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Uvod: Cervikalni karcinom je invazivni karcinom. Postoje tri histološka tipa ovog karcinoma: planocelularni, adenokarcinom i adenoskvamozni karcinom.

Cilj: Cilj ovog rada je utvrditi učestalost karcinoma grlića materice u Crnoj Gori u periodu od 2009-2011.

Materijal i metode: U retrospektivnoj studiji ispitano je 57 pacijentkinja sa patološki verifikovanim CA grlića liječene na Ginekološkom odjeljenju KCCG u periodu između 2009-2012. godine. Podaci o tipu CIN-a, starosti i mjestu prebivališta pacijentkinja prikupljeni su iz uputnica za histopatološki pregled. Za evidenciju podataka prikupljenih u toku istraživanja korišćeni su posebno dizajnirani istraživački kartoni. Baza podataka formirana je u Excel-u.

Rezultati: Istraživanje je pokazalo da je u periodu od 2009-2012 oboljelo od karcinoma grlića materice 57 žena. Najučestaliji sa 85,96% bio je planocelularni karcinom, zatim adenokarcinom sa 12,28% dok se adenoskvamozni karcinom javio u svega 0,017%. Invazivni planocelularni karcinomi su registrovani u 63,26% slučajeva, dok su preostali slučajevi (36,74%) pokazivali znake mikroinvazije i lokalne infiltracije. Procenat karcinoma u HG1 stadijumu je 22,8%, HG2 70,18%, HG3 7,02%. Nuklearni gradus se kretao sa NG1 10,53%, NG2 84,21% i NG3 5,26%. Učestalost je najveća među ženama u dobi 40-49 (36,84%) i 50-59 god. (31,58%)

Zaključci: Studija je pokazala da je od svih karcinoma grlića materice najučestaliji planocelularni karcinom, zatim adenokarcinom, te adenoskvamozni karcinom. Učestalost je najveća među ženama u dobi od 40-49 god. i u 50-59 god.

Prema histološkom gradusu najveća učestalost karcinoma je sa HG2, zatim HG1 te HG3. Prema nuklearnom gradusu najveći broj je sa NG2, zatim NG1 te NG3 stadijumom.

Ključne riječi: invazivni, planocelularni.

INCIDENCE OF CERVICAL CANCER IN MONTENEGRO FROM PERIOD 2009-2012

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Introduction: It is invasive cancer with three histological types: squamous cell, adenocarcinoma and adenosquamous. **The aim:** The aim of this study was to determine the incidence of cervical cancer in Montenegro for the period 2009-2011.

Materials and methods: The retrospective study included the 576 patients with pathologically verified cancer, treated on the gynecological department of KCCG in 2009-2011. Data of the types, age and place were collected from referral to histological examination.

For records collected in the course of this research are used specially research files. Database was formed in Excel. **Results:** Research has demonstrated that for the period 2009-2011 by cervical cancer was affected 57 women. The most common was squamous cell carcinoma with 85,96%, following adenocarcinoma with 12,28% while adenosquamous cancer occurred with 0,017%. Invasive squamous cell carcinoma appeared in 63,26%, while microinvasive and infiltrative forms of cancer reported in 36,74%. The study showed cancer in 22,8% of HG1, 70,18% HG2 and 7,02% HG3. Nuclear grade was with 10,53% of NG1, NG2 84,21% and NG3 5,26%. The incidence is highest in 40-49 (36,84%) and in 50-59 years (31,58%).

Conclusion: The study showed that the most common cancer is squamous cell carcinoma, then adenocarcinoma and adenosquamous carcinoma. The incidence is highest among aged 40-49 and 50-59 years. According to the histological grade of cancer has the highest incidence of HG2, then HG3 and HG1 at least. According to the nuclear grade the highest number was of NG2, NG3 and then NG1.

Keywords: invasive, squamous cell.

ISPITIVANJE UČESTALOSTI FETALNIH ANOMALIJA NA AUTOPSIJAMA NAKON IZVRŠENOG PREKIDA TRUDNOĆE IZ MEDICINSKIH RAZLOGA

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Uvod: Fetalne anomalije su razvojne anomalije koje se u zavisnosti od ozbiljnosti dele na major i minor anomalije. Prenatalna dijagnostika omogućava dijagnozu većine anomalija, a fetalne obdukcije omogućavaju dalje dijagnostičke informacije u velikom broju slučajeva.

Cilj: Ispitati učestalost fetalnih anomalija na autopsijama nakon prekida trudnoće iz medicinskih razloga.

Materijal i metode: U retrospektivnoj studiji analizirani su obdukcioni protokoli za period od 1.1.2009. do 21.10.2011. U istraživanje su uključeni slučajevi kod kojih je metodama prenatalne dijagnostike verifikovano postojanje fetalnih anomalija ili hromozomskih aberacija, a potom indukovani abortus odnosno namerni prekid trudnoće. Uzorak obuhvata 167 slučajeva. Za analizu podataka korišćene su deskriptivne statističke metode.

Rezultati: U analiziranom uzorku od 167 protokola fetalnih obdukcija najveći broj fetusa je obdukovano u interval od trećeg do petog dana nakon prekida trudnoće. Raspon godina majki je od 15-43 godine. Najveći broj fetusa (33,5%) je u trenutku prekida trudnoće bio u četvrtom lunarnom mesecu. Obdukcija je pokazala prisustvo jedne ili više fetalnih anomalija u 98 slučajeva. Najčešće fetalne anomalije su anomalije glave i CNSa (33,76%), multiple anomalije (31,16%), anomalije srca (12,99%), anomalije GI Ta (7,79%). U 21om slučaju sa uputnom dijagnozom hromozomskih aberacija obdukcijom je otkriveno prisustvo jedne ili više anomalija.

Zaključak: Autopsija je kao metoda rezultovala u potvrdi ili konstantovanju anomalija u 58,68% slučajeva. Ovaj podatak govori o potrebi daljeg unapređenja obdukcionih tehnika i bolje inetrinstitucionalne saradnje.

Ključne reči: fetus, anomalije, obdukcija

EXAMINING THE INCIDENCE OF FETAL ANOMALIES IN AUTOPSIES PERFORMED AFTER TERMINATION OF PREGNANCY FOR MEDICAL REASONS

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Introduction: Fetal anomalies are developing anomalies that can be divided into major and minor anomalies, depending on the severity. Prenatal diagnostic provides the diagnosis of most anomalies, and fetal autopsies provide further diagnostic information in large number of cases.

The Aim: To examine the incidence of fetal anomalies at autopsy after termination of pregnancy for medical reasons.

Material and methods: In this retrospective study the autopsy protocols were analyzed. The research includes cases that verified existence of fetal anomalies or chromosome aberrations via pre-natal diagnosis method, followed by the induced abortion or deliberate pregnancy termination. The sample included 167 cases. Descriptive statistical methods were used for data analysis.

Results: In the analyzed sample made of 167 protocols fetal autopsies, the largest number of fetuses was obducted in the period from 3th to the 5th day after pregnancy termination. Mother's age range was from 15 till 43 years. At the time of pregnancy termination, the largest number of fetuses (33.5%) was in the fourth lunar month. The autopsy showed one or more fetal anomalies in 98 cases. The most common fetal anomalies are head anomalies and CNSs (33.76%), multiple anomalies (31.16%), heart anomalies (12.99%), GIT anomalies (7.79%). In 21 cases with clinical diagnosis of chromosome aberrations, one or more anomalies was discovered with the autopsy.

Conclusion: The autopsy as a technique was used in the confirmation of anomalies in 58.68% of the cases. This information contributes to further improvement of autopsy methods and greater cooperation between institutions.

Key words: fetus, anomalies, autopsy.

UDRUŽENOST FIBROADENOMA SA HISTOLOŠKIM TIPOVIMA KARCINOMA DOJKE

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Uvod: Fibroadenomom je benigni tumor koji se sastoji iz epitelne i fibrovaskularne komponente. Karcinomi dojke su maligni tumori epitelnog porekla. Dele se na neinvazivne i invazivne od kojih je najčešći invazivni duktalni karcinom NST (nespecifičnog tipa). Postoji blago povišen rizik za razvoj karcinoma u sklopu fibroadenoma, ili za razvoj karcinoma unutar dojki kod pacijenata kod kojih je prethodno tretiran fibroadenomom.

Cilj: Analizirati slučajeve karcinoma dojke koji su udruženi sa fibroadenomom(CF). Uporediti ih prema patohistološkom i imunohistochemijskom nalazu sa kontrolnom grupom (CK) karcinoma koji nisu udruženi sa fibroadenomom .

Materijal i metode: U ovoj retrospektivnoj studiji je statistički analizirano 19 slučajeva sa patohistološki utvrđenim karcinomom dojke koji je udružen sa fibroadenomom (CF). Urađeno je i poređenje sa CK od 19 slučajeva.

Rezultati: Učestalosti u CF su bile sledeće: NST 84,2%, a papilarni, lobularni i tubularni karcinom po 5,26%. 42,1% je gradusa 1, a 57,9% gradusa 2. Limfogene metastaze su pronađene u 31,25%, a fibrocistična promena u 63,15% slučajeva. 53% slučajeva su estrogen, progesteron i HER2 negativni. Prosek godina u ovoj podgrupi je 47, a 77,77% ih ima fibrocističnu promenu. Estrogen negativnih slučajeva ima 10, a prosečna starost tih pacijentkinja je 48,4 godine. Fibrocistična promenase češće javlja u CF. Ekspresija estrogenih receptora je izraženija u CK.

Zaključak: Karcinomi dojke koji su udruženi sa fibroadenomom su manjeg gradusa, ređe limfogeno metastaziraju, češće su udruženi sa fibrocističnom promenom i pokazuju manju ekspresiju estrogenih receptora u odnosu na karcinome dojke uopšte.

Ključne reči: karcinom dojke, fibroadenom, fibrocistična promena, estrogen

ASSOCIATION OF FIBROADENOMA WITH HISTOLOGICAL TYPES OF BREAST CARCINOMA

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Introduction: Fibroadenoma is a benign tumor that consists of epithelial and fibrovascular component. Breast carcinomas are malignant tumors of epithelial origin. They are divided into noninvasive and invasive carcinomas (ductal carcinoma NST - nonspecified type is the most frequent). There is a slightly increased risk for developing cancer within fibroadenoma or in breast of patients previously treated for fibroadenoma.

The aim: Examining the cases of breast carcinoma associated with fibroadenoma(CF). Comparing those with the control group(CK) of carcinoma that are not associated with fibroadenoma, according to pathohistological and immunohistochemical findings.

Material and methods: This retrospective study statistically analyses 19 cases of pathohistologically confirmed CF. Also comparison with CK of 19 cases was made.

Results: Frequencies in CF were: NST 84,2%, papilar, lobular and tubular carcinoma 5,26% each. 42,1% were grade 1 and 57,9% grade 2. 31,25% had lymph node metastases. 63,15% had fibrocystic change. 53% were estrogen, progesteron and HER2 negative. Average age in this subgroup was 47 years and 77,77% of these had fibrocystic change. 10 cases were estrogen negative and average age of these patients was 48,4. Fibrocystic change is more frequent in CF (p<0,01) than in CK. Estrogen markers are more expressed in CK (p<0,01).

Conclusion: Breast carcinomas, associated with fibroadenoma, comparing with breast carcinoma at all, have lower grade, are less likely to metastasize into lymph nodes, have more frequent association with fibrocystic change and lower expression of estrogen receptors.

Key words: breast carcinomas, fibroadenoma, fibrocystic change, estrogen

HISTOLOŠKI TIPOVI KARCINOMA DOJKE I EKSPRESIJA ESTROGENA PROGESTERONA I HER2 ONKOPROTEINA

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Uvod: Karcinom dojke je jedan od najčešćih maligniteta kod žena u Republici Srbiji. Pored histološkog tipa, za predviđanje terapijskog odgovora, neophodno je odrediti ekspresiranost hormonskih receptora (estrogena, progesterona i HER2 onkoproteina) tumorskih ćelija.

Cilj: Utvrditi starosnu i polnu strukturu uzorka. Identifikovati različite histološke tipove karcinoma dojke, njihovu zastupljenost i imunohistohemijski profil. Analizirati gradus i stadijum karcinoma. Utvrditi povezanost različitih tipova karcinoma dojke i ekspresiju estrogena (E), progesterona (P) i HER2 onkoproteina (H).

Materijal i metode: U retrospektivnoj studiji sprovedenoj na Institutu za patologiju Medicinskog fakulteta Univerziteta u Beogradu analizirani su patohistološki izveštaji pacijenata obolelih od karcinoma dojke za period od 01. januara do 31. decembra 2010. godine. Korišćenjem standardnih statističkih metoda analizirani su starosna dob i pol pacijenata, tipovi tumora, njihov gradus, stadijum kao i prisustvo, odnosno odsustvo hormonskih receptora.

Rezultati: U navedenom periodu registrovano je 395 slučajeva karcinoma dojke. Najčešće su dijagnostikovani kod pripadnica ženskog pola (99,75%). Prosečna starost bila je između 62. i 63. godine, a najzastupljeniji je bio NST tip karcinoma (77%). Najveći broj ispitanika je bio gradusa II (78%) i stadijuma III (46%), dok je najzastupljenija receptorska ekspresiranost bila E+P+H- (45%).

Zaključak: Najzastupljeniji su NST tumori koji u velikom broju slučajeva pokazuju pozitivnu ekspresiju estrogenskih i progesteronskih receptora. Zahvaljujući statističkoj metodi regresione analize imamo mogućnost predviđanja ekspresiranosti hormonskih receptora unutar NST-a te možemo videti da na 4000 novih slučajeva NST 1905 tj. 48% će biti E+P+H-, što govori u prilog bolje prognoze za ove pacijente.

KLjučne reči: karcinom dojke, estrogen, progesteron, HER2 onkoprotein.

HISTOLOGICAL TYPES OF BREAST CANCER AND EXPRESSION OF ESTROGENE PROGESTERONE AND HER2/NEU PROTEIN

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Introduction: Breast cancer is one of the most common cancer in women in Republic of Serbia. Histologic type of breast cancer and receptor expression of estrogen (E), progesterone (P) and HER2/neu protein (H) are required for making decision which therapy to choose.

Aim: To identify histological types of breast cancer, their representation and immunohistochemical profile. To determine connection between histologic types and receptor expression of E, P, H.

Material and methods: In retrospective study conducted at Institute of Pathology, Medical School, University of Belgrade, patohistological reports of breast cancer patients were analyzed for period from January 1st till 31st of December 2010. With the insight in reports, following factors were analyzed: patient's age and sex, the types of tumor, their grade, stage, presence or absence of E, P, H receptors. Standard statistical methods were used for data analysis.

Results: 395 cases of breast cancer were registered in the above mentioned period. They are mostly registered with female sex (99,75%). The average age was between 62 and 63 years, and most represented carcinoma was NST type (77%). The greatest number of samples was grade II (78%) and in stage III (46%) with receptors expression E+P+H- (45%).

Conclusion: The most represented histologic type of breast cancer is NST, which is E+, P+. By virtue of statistical methods we are able to predict expression of E, P, H receptors within NST type. Because of that we can see that in next 4000 new cases with breast cancer NST type 1905 (48%) will be E+P+H- which means better prognosis for these patients.

Key words: breast cancer, estrogen, progesterone, HER2/neu protein.

EKSPRESIJA ANTIAPOPTOTSKIH MARKERA U KARCINOMU GORNJEG UROTELIJUMA

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Uvod: Karcinomi gornjeg urotelijuma su relativno retke neoplazme koje čine oko 5% urotelnih karcinoma.

Cilj rada: Cilj rada bio je da uporedi histološki gradus, patološki stadijum, tip rasta, prisustvo limfovaskularne invazije i nekroze, kao i metaplastičnih promena sa ekspresijom Survivina i Bcl-2 kod bolesnika sa karcinomom gornjeg urotelijuma.

Materijal i metode: Autori su analizirali biopsijske uzorke 61 bolesnika sa karcinomom gornjeg urotelijuma. Standardni histološki preseki su korišćeni za analizu patoloških parametara. Ekspresija Survivina i Bcl-2 u tumorima analizirana je imunohistohemijski upotrebom monoklonskog anti-Survivin i Bcl-2 antitela.

Rezultati rada: Analizirano je ukupno 61 bolesnika sa karcinomom gornjeg urotelijuma prosečnog starosnog doba 64.2 ± 11 godina. Većina analiziranih karcinoma bili su *high grade* (59%), *high stage* (69%), solidnog rasta (56%), bez limfo-vaskularne invazije (67%), bez nekroze (59%) i bez metaplastičnih promena (79%). Karcinomi gornjeg urotelijuma pokazivali su alterisanost Survivina u 48%. Karcinomi sa limfovaskularnom invazijom imali su značajno manju alterisanu ekspresiju Survivina (p<0,005) u odnosu na tumore bez limfovaskularne invazije. Izmenjenu ekspresiju Bcl-2 imalo je 15% ispitivanih karcinoma gornjeg urotelijuma i nije nađena signifikantna povezanost između ekspresije Bcl-2 i ispitivanih fenotipskih karakteristika.

Zaključak: Rezultati ove studije ukazuju da alterisanost ekspresije antiapoptotskih markera značajno nije povezana sa fenotipskim karakteristikama karcinoma gornjeg urotelijuma, osim sa limfovaskularnom invazijom.

KLjučne reči: Karcinom gornjeg urotelijuma, patološki parametri, Survivin, Bcl-2

EXPRESSION OF ANTIAPOPTOTIC MARKERS IN UPPER TRACT UROTHELIAL CARCINOMA

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Introduction: Cancers of the upper urinary tract are relatively rare neoplasms that account for about 5% of urotelial cancer.

The Aim: The aim of this study was to compare the histological grade, pathological stage, type of growth, presence of lymphovascular invasion and necrosis, and metaplastičnih change the expression of survivin and Bcl-2 in patients with carcinoma of the urinary tract.

Material and Methods: The authors analyzed the biopsy specimens of 61 patients with carcinoma of the urinary tract. Standard histological sections were used for analysis of pathological parameters. Expression of survivin and Bcl-2 in tumors was analyzed by immunohistochemistry using a monoclonal anti-Survivin and Bcl-2 antibodies.

Results: A total of 61 patients with carcinoma of the urinary tract mean age 64.2 ± 11 years. Most of the analyzed carcinomas were high grade (59%), high stage (69%), solid growth (56%) without lymph-vascular invasion (67%) without necrosis (59%) and no change metaplastičnih (79%). Cancers of the upper urinary tract showed alterisanost survivin in 48%. Carcinomas with lymphovascular invasion had a significantly lower expression of survivin alterisanost (p < 0.005) compared to tumors without lymphovascular invasion. Altered expression of Bcl-2 had 15% of cancers of the urinary tract and found no significant association between the expression of Bcl-2 and examined the phenotypic characteristics.

Conclusion: The results of this study indicate that alterisanost antiapoptotskih marker expression was not significantly associated with the phenotypic characteristics of upper urotelial carcinoma, but with lymphovascular invajiom.

Keywords: Carcinoma of the urinary tract, pathologic parameters, Survivin, Bcl-2

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Uvod: Wilms-ov tumor (WT) ili nefroblastom je najčešći maligni tumor bubrega. Uprkos ogromnom napretku u lečenju, jedan broj WT-a ne reaguje na hemioterapiju ili dolazi do relapsa tumora. Zbog toga je važno uvođenje molekularnih markera koji bi se koristili u prognozi WT-a.

Cilj rada: je da se ispita ekspresija Ki-67 u WT-u kao i odnos ekspresije prema kliničko-morfološkim karakteristikama WT-a.

Materijal i Metode. Analizirali smo 59 slučajeva primarnih WT-a. Za kliničko-morfološke koriscena je SIOP klasifikacija. Imunohistohemijsko bojenje urađeno je streptavidin-biotin tehnikom.

Rezultati. Prosečna vrednost Ki-67 pozitivnih ćelija u tumorskom tkivu kod svih bolesnika je bila (14,5±13,3)%. Ekspresija Ki-67 je bila prisutna u sve tri komponente WT-a. Nije bilo značajne razlike (p=0,580) u prosečnim vrednostima Ki-67 pozitivnih ćelija u tumorskom tkivu i kliničko-morfoloških karakteristika WT-a (stadijumi, p=0,366; histološki tipovi, prognostička grupa, p=0,520). U epitelnoj i blastemskoj komponenti, prosečne vrednosti Ki-67 su bile značajno veće u odmaklim u odnosu na početne stadijume (p=0,03, p=0,04, redom), u tumorima visokog rizika u odnosu na tumore srednjeg rizika (p=0,02, p=0,02; redom) i u tumorima sa difuznom anaplazijom u odnosu na ostale histološke tipove, ali bez značajne razlike (p=0,09, p=0,016, redom).

Zaključak. U epitelnoj i blastemskoj komponenti WT-a prosečne vrednosti Ki-67 su bile značajno veće u odmaklim stadijumima WT-a, značajno veće u grupi visokog rizika i u slučajevima difuzne anaplazije, što ukazuje da povećana ekspresija Ki-67 u ove dve komponente može biti povezana sa nepovoljnom prognozom WT-a.

Ključne reči. Wilms-ov tumor, proliferativni markeri, Ki-67.

INVESTIGATION EXPRESSION OF Ki-67 IN WILMS TUMOR

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Introduction. Nephroblastoma or Wilms tumor (WT) is one of the most common malignant solid tumors of the childhood. Despite enormous progress in treatment, a number of WT does not respond to therapy or tumor relapse occurs. Therefore, it is important to identify molecular markers to be used in the prognosis of a WT.

Aim. The aim of this study was to investigate the expression of Ki-67 in WT, as well as the relation between expression and clinical-morphological characteristics of WT.

Materials and Methods. We analyzed 59 cases of primary WT. For clinical-morphological characteristics we used the SIOP classification. We did immunohistochemical staining via streptavidin-biotin technique.

Results. We found 14,5±13,3% tumor cells to be positive for Ki-67. Ki-67 expression was present in all three components of WT. There was no statistically significant difference in average values of Ki-67 tumor positive cells. No correlation was observed between average values of Ki-67 positive cells and clinical-morphological characteristics of WT (stage, p=0,366; Histological type, prognostic group, p=0,520). Average values of Ki-67 positive cells in epithelial and blastemal components were significantly higher in advanced compared to lower stages of WT (p=0,03, p=0,04, respectively), in high risk tumors compared to low risk tumors (p=0,02, p=0,02; respectively) and in tumors with diffuse anaplasia compared to other histological types (p=0,09, p=0,016, respectively)

Conclusion. In epithelial and blastemal components of WT we observed significantly higher expression of Ki-67 in advanced stages of WT, in the group of high risk WTs and in diffuse anaplastic WTs, which suggest that Ki-67 increased expression may be associated with the unfavorable prognosis.

Key words. Wilms tumor, Proliferative markers, Ki-67 expression.

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Uvod. Wilms-ov tumor (WT) je embrionalni maligni tumor bubrega za čiji nastanak može biti odgovorna disregulacija ekspresije Fas i FasL. Javlja se najčešće kod dece 3-5 godina starosti. Centralna uloga u terapiji pripada hemoterapiji i hirurškom tretmanu.

Cilj. Cilj studije bio je da se ispita ekspresija Fas i FasL u normalnom tkivu bubrega i da se uporedi sa ekspresijom u WT, kao i da se analizira odnos ekspresije sa kliničko-morfološkim karakteristikama WT.

Materijal i Metode. Analizirali smo 28 slučajeva WT, kao i dva uzorka metastaza i normalnog tkiva bubrega. Za određivanje tumorskog stadijuma, histološkog tipa i prognostičke grupe koriscena je SIOP klasifikacija. Uradili smo imunohistohemijsko bojenje streptavidin-biotin tehnikom uz primenu DAKO LSAB+ kit-a.

Rezultati. Unutar 28 uzoraka, 64.3% je ekspimiralo Fas a 53.6% FasL. Ekspresija Fas i FasL je bila prisutnija kod nižih stadijuma nego kod viših (p=0.032 za Fas), kao i kod srednje prognostičke grupe u odnosu na grupu visokog rizika (p=0.007 za Fas). Statistički značajna veza između primene terapije i ekspresije Fas/FasL nije pronađena (p=0.322/ p=0.254), kao ni povezanost ekspresije sa histološkim tipom (p>0.05). Poređenjem sa drugim tipovima, anaplastični tumori su bili Fas-. Bilateralni nefroblastom bio je Fas+ i FasL+, dok su metastaze bile Fas- a samo jedna FasL+.

Zaključak. Smanjena ekspresija Fas i povećana FasL, koja se može videti kod viših stadijuma, visokorizičnih grupa i anaplastičnih tipova može stvoriti osnov za progresiju tumora.

Ključne reči. Wilms-ov tumor, Apoptoza, Ekspresija Fas i FasL.

TESTING OF FAS AND FASL EXPRESSION IN WILMS' TUMOR

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Introduction. Wilms's tumor (WT) is an embryonal tumor of the kidney, where dysregulation of Fas and FasL expression may be responsible for its formation. It occurs most commonly in children 3-5 years of age. The central role in treatment belongs to chemotherapy and surgical treatment.

The Aim. The aim of this study was to investigate the expression of Fas and FasL in normal kidney tissue and to compare it with the expression in WT, and to analyze the correlation between expression and the clinical-morphological characteristics of the WT.

Materials and Methods. We analysed 28 cases of WT, as well as two samples of metastases and normal kidney tissue. For determining tumor stage, histological type and prognostic group we used the SIOP classification. We did immunohistochemical staining via streptavidin-biotin technique using DAKO LSAB+ kit.

Results. Within 28 samples, 64.3% expressed Fas and 53.6% FasL. Fas and FasL were present at lower stages compared to higher (p=0.032 for Fas), as well as in intermediate-risk groups compared to the high-risk groups (p=0.007 for Fas). A significant correlation between the use of therapy and Fas/FasL expression wasn't found (p=0.322/p=0.254), as well as the correlation between expression and histological types (p>0.05). Compared to other types, anaplastic tumors were Fas-. Bilateral nephroblastoma was Fas+ and FasL+, whereas metastases were Fas- and only one was FasL+.

Conclusion. Decreased Fas expression and increased FasL, which can be seen in higher tumor stage, high-risk groups and anaplastic types may provide a base for tumor progression.

Key words. Wilms tumor, Apoptosis, Fas/ FasL expression.

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Uvod: HER2 gen je lokalizovan je na hromozomu 17 i enkodira 185 kD transmembranski glikoprotein sa aktivnošću tirozin kinaze koji funkcioniše kao receptor faktora rasta. U karcinomu dojke pozitivan HER2 status je faktor loše prognoze, ali i pokazatelj tumorske osetljivosti na terapiju Herceptinom - monoklinalnim antitelom koje deluje usmereno protiv HER2 proteina. HER2 genska amplifikacija ili povećana proteinska ekspresija viđa se kod 10-34% karcinoma dojke.

Cilj: Provera učestalosti pozitivnih i negativnih HER2 nalaza u karcinomima dojke testiranim u laboratoriji Instituta za Onkologiju Vojvodine u periodu od januara 2007. do novembra 2011. godine, kao i analiza faktora koji mogu uticati na varijabilnost u dobijenim rezultatima.

Materijal i metode: U ispitivanom periodu HER2 testiranjem su bile obuhvaćene 4350 bolesnice. Vrednosti HER2 skora preuzete su iz izveštaja arhiviranih u godišnjim registratorima. Sve bolesnice su primarno imale nalaze imunohistoheмиjske ekspresije HER2 proteina na osnovu kog su podeljene na jasno pozitivne (imunohistoheмиjski skor 3+), negativne (imunohistoheмиjski skor 0 i 1) i nedefinisane nalaze (imunohistoheмиjski skor 2+) za koje je bilo potrebno CISH retestiranje u cilju utvrđivanja postojanja genske amplifikacije.

Rezultati: Petogodišnja srednja vrednost učestalosti pozitivnog HER2 statusa u ispitivanom uzorku iznosila je 13.4%. Najveća učestalost HER2 pozitivnih karcinoma dojke zabeležena je 2008. godine - 15.3%, dok je najniža učestalost zabeležena 2009. godine - 9.6%.

Zaključak: Učestalost pozitivnog HER2 statusa u karcinomu dojke ustanovljena u laboratoriji Odeljenja za patologiju Instituta za onkologiju Vojvodine je na donjoj granici vrednosti koje se navode u svetskoj literaturi. Brojni preanalitički i analitički faktori su od značaja za rezultate HER2 testiranja i u cilju postizanja veće senzitivnosti i specifičnosti metode potrebna je stalna metodološka kontrola i modernizacija.

Ključne reči: HER2, karcinom dojke, IHH, CISH

HER2 TESTING IN BREAST CANCER: FIVE-YEAR EXPERIENCE ONCOLOGY INSTITUTE OF VOJVODINA

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Introduction: HER2 gene is localized on chromosome 17 and encodes the 185kD transmembrane glycoprotein with tyrosine kinase activity that functions as growth factor receptor. In breast cancer, HER2 positive status is a factor of poor prognosis, but also an indicator of tumor sensitivity to treatment with Herceptin- monoclonal antibody which acts directly against HER2 protein. HER2 genetic amplification, or increased protein expression, is observed in 10 – 34 % of breast cancers.

The Aim: Check the frequency of positive and negative HER2 findings in breast cancer tested in the laboratory of the Institute of Oncology of Vojvodina in the period January 2007 – November 2011, and analysis of factor which may influence the variability in results.

Materials and methods: In the study period HER2 testing were included 4350 patients with breast cancer. The values with HER2 scores were taken from the report archived in annual binders. All patients had been primarily found immunohistochemical expression of HER2 protein on the basis of which are clearly divided into positive (IHH score 3+), negative (IHH score of 0 and 1), and undefined reports (IHH score 2+) that was required retesting in CISH to determine the existence of gene amplification.

Results: 5-year average value for positive HER2 status is 13.4%. The highest frequency of HER2 was recorded in 2008 at 15.3%, whereas the lowest frequency was recorded in 2009 – 9.6%.

Conclusion: The frequency of positive HER2 status in breast cancer determined in the laboratory of the Pathology Department of the Institute of Oncology of Vojvodina is on the lower limit of the value encountered in world literature on the subject. Numerous pre-analytical and analytical factors are significant for the results of HER2 testing and constant evaluation and modernisation are required for the purpose of achieving higher sensitivity and method peculiarities.

Key words: HER2, breast cancer, IHH, CISH

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Uvod: P53 je protein koji obezbeđuje popravku DNK ili započinje smrt ćelije apoptozom. Mutacija p53 proteina predstavlja najčešću genetsku promenu kod tumora ljudi. Visoka ekspresija p53 proteina smatra se češćom kod biološki agresivnijih formi tumora različitih lokalizacija, uključujući karcinom endometrijuma.

Cilj: Određivanje učestalosti ekspresije p53 proteina u karcinomu endometrijuma i ispitivanje postojanja korelacije između povišene ekspresije p53 proteina i pojedinih kliničko-patoloških faktora karcinoma endometrijuma - starosti bolesnica, histološkog tipa, histološkog gradusa tumora i dubine invazije miometrijuma.

Materijal i metode: Ispitivanjem su bila obuhvaćena 34 karcinoma lečenih u Institutu za onkologiju Vojvodine. P53 protein određivan je imunohistoheмиjskom metodom.

Rezultati: Pozitivna imunoreaktivnost p53 proteina dokazana je u ukupno 13 od 34 ispitivana slučaja, odnosno 38,2%. Od toga 7 (27%) karcinoma bilo je endometrioidnog tipa, a preostalih 6 (75%) ne-endometrioidnog tipa. Najveća učestalost p53 pozitivnih tumora zapažena je kod pacijentkinja starijih od 60 godina, ali nije dokazana statički značajna povezanost između životnog doba i p53 statusa. U grupi ne-endometrioidnih adenokarcinoma je u 75% slučajeva ustanovljena pozitivna imunoreaktivnost p53 proteina, za razliku od endometrioidnih karcinoma kod kojih je pozitivan p53 status detektovan u 27%. Povećana ekspresija p53 proteina je utvrđena u 6 (85,7%) od 7 karcinoma endometrijuma lošeg stepena diferencijacije - gradus III, u 3 (20%) od 15 tumora srednjeg stepena histološke diferencijacije - gradusa II i u 4 (36,3%) dobro diferentovana tumora gradusa I.

Zaključak: Statistički značajna povezanost utvrđena je između pozitivne ekspresije p53 proteina i ne-endometrioidnog tipa karcinoma i lošeg stepena histološke diferentovanosti ispitivanih endometrijalnih karcinoma. Nije utvrđena statistički značajna povezanost između ekspresije p53 proteina i starosti pacijentkinja, kao i stepena invazije miometrijuma.

Ključne reči: karcinom endometrijuma, p53, imunohistoheмиja

P53 EXPRESSION IN ENDOMETRIAL CARCINOMA

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Introduction: P53 is a protein that provides the DNA repair or the beginning of cell death by apoptosis. P53 mutation is the most common genetic change that occurs in human cancers. High expression of p53 protein is considered to have higher expression in biologically aggressive tumors of different locales, including endometrial carcinoma.

The Aim: Study goal is to evaluate the level of p53 protein expression in endometrial carcinomas and significant correlation between elevation of p53 protein expression and certain clinical and pathological factors concerning endometrial carcinoma- patient's age, histological type, histological grade and depth of myometrial invasion.

Materials and methods: A total of 34 cases of endometrial carcinoma treated at the surgical clinic for operative oncology, Institute of Oncology Vojvodina, were included in this study. The immunohistochemical staining for p53 protein were evaluated.

Results: Immunoreactivity of p53 proteins has been demonstrated in 13 out of 34 cases (38.2%). Seven of these (27%) are endometrioid, and the remaining 6 (75%) non-endometrioid type of endometrial adenocarcinoma. The highest percentage of p53 expression was observed in women over the age of 60, but there were not statistical significance. Non-endometrioid type of adenocarcinoma showed positive immunoreactivity of p53 in 75% cases, in contrast to the endometrioid type in which the percentage was 27%. Increased expression of p53 protein was detected in 6 (85.7%) out of 7 grade III tumors, in 3 (20%) out of 15 tumors grade II and 4 (36.3%) out of 11 grade I tumors.

Conclusion: Statistically significant correlation has been determined between positive p53 protein expression and non-endometrioid type of carcinoma, and low degree of histological differentiation. There was no statistically significant correlation between p53 protein expression and an older age (women older than 60 years of age) and the degree of myometrial invasion.

Key words: endometrial carcinoma, p53, immunohistochemistry

UČESTALOST CERVIKALNE INTRAEPITELNE NEOPLAZIJE U CRNOJ GORI U PERIODU 2009-2012

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Uvod: Cervikalna intraepitelna neoplazija (CIN) je prvenstveno bolest seksualno aktivnih žena, zbog korelacije s HPV infekcijom. U pitanju je displastična lezija, koja je uvod u karcinom grlića materice.

Cilj: Cilj ovog rada je utvrditi učestalost CIN-a u Crnoj Gori u periodu od 2009-2011.

Materijal i metode: U retrospektivnoj studiji ispitano je 296 pacijentkinja sa patološki verifikovanim CIN-om liječene na Ginekološkom odjeljenju KCCG u periodu od 2009.do kraja 2011.godine. Podaci o tipu CIN-a, starosti i mjestu prebivališta pacijentkinja prikupljeni su iz uputnica za histopatološki pregled. Za evidenciju podataka prikupljenih u toku istraživanja korišćeni su posebno dizajnirani istraživački kartoni. Baza podataka formirana je u Exel-u.

Rezultati: Studija je pokazala da u Crnoj Gori u periodu od 2009. do 2012. Godine oboljelo 296 žena. Od toga CIN I se javio u 28,38% slučajeva, CIN II u 17,9% dok je CIN III pokazao najveću učestalost sa udjelom od 53,72%. Učestalost je najveća među ženama u dobi od 40 – 49 godine (41,22%) i 30-39 god. (29,05%). U odnosu na teritorijalnu distribuciju CIN je bio najučestaliji u centralnom dijelu Crne Gore sa 53,72%, zatim na jugu države sa 29,73%, dok je broj slučajeva u sjevernim regionima bio najmanji sa udjelom od 16,55%.

Zaključak: U posmatranom periodu najviše bio zastupljen CIN III, zatim CIN I, a najmanje CIN II. Prema starosti CIN je najzastupljeniji kod žena u petoj, zatim u četvrtoj deceniji života.

Ključne riječi: displastična lezija, karcinom.

INCIDENCE OF CERVICAL INTRAEPITHELIAL NEOPLASIA IN MONTENEGRO FOR PEWRIOD 2009-2012

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Introduction: Cervical intraepithelial neoplasia (CIN) is primarily disease of sexually active women, because of the correlation with HPV infection. It is a dysplastic lesion, which is an introduction to cervical cancer.

The aim: The objective of this study was computation the incidence of CIN in Montenegro in the period of 2009-2011.

Materials and methods: The retrospective study included the 296 patients with pathologically verified CIN, treated on the gynecological department of KCCG in the period from 2009 -2012.

Data of the types, age and place of residence were collected from referral to histological examination.

For records collected in the course of this research are used especially designed research files. The database was formed in Exel-in.

Results: The study showed that in Montenegro from 2009 - 2012 suffering from CIN 296 women. From that,CIN I occurred in 28,38% cases, CIN II in 17,9% and the CIN III showed the highest frequency with a share of 53,72%. The incidence is highest among women aged 40-49(41,22%) and 30-39 years (29,05%). In relation to the territorial distribution, CIN was more common in central parts of Montenegro with 53,72%, then to the south with 29,73%. The number in northern regions has the smallest share of 16,55 %.

Conclusion: In this period was the most represented CIN III, then CIN I and at least CIN II. By the age CIN is the most common among women in the fifth, then in the fourth decade of life.

Keywords: neoplasia, dyslastic lesions.

ZNAČAJ BAZOCELULARNOG KARCINOMA

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Uvod: Bazocelularni karcinom je maligni tumor kože, koji nastaje kao posledica hroničnog izlaganja kože UV-zracima. Učestaliji kod imunokompromitovanih osoba.

Cilj rada: Cilj rada je bio da se utvrdi njegova distribucija prema polu, uzrastu, najčešća lokalizacija i da se odredi njegova uniformna histopatološka slika.

Materijal i metod rada: Uzorci, prispeli sa Klinike za maksilofacijalnu hirurgiju, sečeni su na uzorke manje debljine, bojeni standardnom hematoksilin i eozin metodom i posmatrani pod svetlosnim mikroskopom.

Rezultati: Bazocelularni karcinom je bio nešto češći kod osoba muškog pola, najčešće u periodu od 60. do 80. godine starosti, sa najčešćom lokalizacijom u predelu grebena nosa, očnih kapaka, okcipitalnog i aurikularnog predela

Zaključak: Dobijeni rezultati su u skladu sa rezultatima objavljenim u zvaničnim literaturama. Statistički nisu uočene značajne razlike.

Ključne reči: bazocelularni karcinom

SIGNIFICANCE OF ODONTOGENIC KERATOCYST

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Introduction: Basal cell carcinoma is a malignant skin tumor that occurs as a result of chronic skin exposure to UV-rays. More frequent in immunocompromised individuals.

Objective: The objective was to determine their distribution by sex, age, their most common sites, the degree of recurrence and to determine the uniform histopathological picture.

Materials and methods: Samples, arrived with the Department of Maxillofacial Surgery, the samples were cut with less thickness, stained with hematoxylin and eosin method and examined by light microscopy.

Results: The results are consistent with results published in the official literature. Statistically significant differences were observed.

Conclusion: Basal cell carcinoma was slightly more common in males, usually a period of 60 to 80 age, commonly found in the area of the ridge of the nose, eyelids, and occipital and auricular regions.

Key words: basal cell carcinoma

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Uvod: Veštački izvori UVA zraka (320-400 nm) koji se često primenjuju u kozmetološke svrhe, imaju veoma štetan uticaj na kožu. Jedan od mehanizama delovanja UVA zraka ogleda se u direktnom oštećenju DNK keratinocita kroz proces stvaranja CPD (ciklobutan-pirimidinskih dimera) i pokretanja apoptoze, koja se histološki manifestuje pojavom diskeratotičnih „sun burn“ ćelija u epidermu.

Cilj: Cilj našeg eksperimentalnog istraživanja bio je utvrđivanje prisustva diskeratoze u epitelu kože miševa zračenih UVA zracima.

Materijal i metode: Eksperiment se sastojao u zračenju ženki BALBc soja miševa u solarijumu UVA lampama fluksa zračenja 21.71 mW/cm², 5x nedeljno u toku 10 nedelja, do ukupne doze zračenja od 7800J/cm², koja je postizana za 2 časa ekspozicije. Pre izlaganja zračenju životinje eksperimentalnih grupa (njih 24) su brižane 3x nedeljno, a polovini životinja je pola sata pre ekspozicije nanošena fotoprotektivna krema sa zaštitnim UVA filterom i SPF 50. Kontrolnu grupu činilo je 13 životinja, brižanih kada i životinje eksperimentalnih grupa. Nakon klasične pripreme tkiva za histološku analizu, preparati su bojeni HE metodom, analizirani, statistički obrađivani, a dobijeni rezultati prikazani su fotografijama i grafički.

Rezultati: U našem istraživanju prisustvo diskeratoze statistički je značajno učestalije kod zračene i nemazane eksperimentalne grupe životinja u odnosu na eksperimentalnu grupu mazanih (p<0.05), kao i u odnosu na kontrolnu grupu životinja (p<0.001).

Zaključak: Dobijeni rezultati su očekivani i u skladu sa literalnim podacima, s obzirom na višestruko štetno dejstvo i veliki mutageni potencijal UVA zračenja, kao i dokazan povoljan efekat upotrebe fotozaštitnih preparata.

Ključne reči: UVA zraci, solarijum, diskeratoza, fotoprotektivna krema

EFFECT OF RADIATION IN THE PRESENCE OF UVA DYSKERATOSIS IN THE EPITHELIUM OF MOUSE SKIN

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Introduction: Artificial source of UVA (320-400 nm) which is often applied in cosmetic purposes, has a very detrimental effect on the skin. One of the mechanisms of UVA rays is reflected in direct damage to DNA of keratinocytes through the process of creating a CPD (ciklobutan-pyrimidine dimers) and the initiation of apoptosis, which is histologically manifested by the appearance dyskeratotic “sun burn” cells in epidermis.

Aim: The aim of our experimental study was to determine the presence of dyskeratosis in the epithelium of the skin of mice which was radiated UVA rays.

Material and method: The experiment consisted in radiation female BALBc strain of mice in a solarium lamps UVA radiation flux 21.71 mW/cm², 5x a week for 10 weeks, to a total dose of radiation 7800J/cm², which were achieved by 2 hours of exposure. Before irradiation, the animals of the experimental group (24) were shaved 3x a week and half of the animals half an hour before being exposed to inflicted fotoprotective cream with UVA protection and SPF filter 50th. The control group consisted of 13 animals, that were also shaved at the same time as the animals of the experimental group. After the routine preparation of tissue for histological analysis, samples were stained with HE, analyzed, statistically treated, and the results are shown in photographs and graphics.

Results: In our study the presence of dyskeratosis was significantly more common in irradiate experimental group of animals on which fotoprotective cream was not applied, than in the experimental group with fotoprotective cream (p <0.05), as well as compared to the control group (p <0.001).

Conclusion: The results were as expected and in accordance with the literal data, given the multiple adverse effects and high mutagenic potential of UVA radiation, as well as a proven beneficial effect of using sunscreens.

Keywords: UVA rays, solarium, dyskeratosis, fotoprotective cream.

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Uvod: Mikrocelularni (“small cell”) karcinom pluća spada u neuroendokrine plućne tumore. Razdvajanje “small cell” od “non-small cell” karcinoma pluća na bronhoskopskoj biopsiji je ključalno zbog specifičnih terapijskih modaliteta.

Cilj rada: Cilj ovog rada je morfološka i imunohistoheimska analiza “small cell” karcinoma i diferenciranje od planocelularnog karcinoma pluća na bronhoskopskim biopsijama.

Materijal i metode: Bronhoskopski biopsije, fiksirane u formalinu i kalupljene u parafinu, 20 pacijenata sa mikrocelularnim karcinomom i 20 pacijenata sa planocelularnim karcinomom pluća su izdvojene iz plućnog arhiva Instituta za patologiju Medicinskog fakulteta Univerziteta u Nišu. Serijski histološki iseći debljine 4 μm su bojeni hematoxilin-eozinom i imunohistoheimskom metodom DAKO LSAB+/HRP za bojenje ChrA, synaptophysina, LCA, CKAE1/AE3, TTF-1, CKHMW i CK5/6 antitela.

Rezultati: Pozitivna imunoreaktivnost na ChrA nađena je kod 80% mikrocelularnih karcinoma (16/20), a na sinaptofizin kod 85% (17/20) ispitivanih slučajeva. Nijedan mikrocelularni karcinom nije bio pozitivan na LCA (0/20), dok je svih 100% (20/20) bilo pozitivno na CKAE1/AE3. 90% mikrocelularnih karcinoma (18/20) je bilo pozitivno na TTF-1, nijedan planocelularni karcinom nije pokazivao imunoreaktivnost na TTF-1 (0/20)(p<0,01). Inverzni imunofenotip nađen je za CKHMW i CK5/6; 100% planocelularnih karcinoma (20/20) je bilo pozitivno na CKHMW, a 90% (18/20) na CK5/6, dok su svi mikrocelularni karcinomi bili negativni na oba ova markera (0/20)(p<0,01).

Zaključak: Imunohistoheimska analiza je dopunska metoda u diferenciranju mikrocelularnog od planocelularnog karcinoma pluća na bronhoskopskim biopsijskim uzorcima.

Ključne reči: Imunohistohemija, “small cell” karcinom pluća, planocelularni karcinom

PATHOHISTOLOGICAL AND IMMUNOHISTOCHEMICAL FEATURES OF SMALL CELL LUNG CARCINOMA

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Introduction: Small cell lung cancer is one of the pulmonary neuroendocrine tumors. Distinction of small cell from non-small cell lung cancer on bronchoscopic biopsy is crucial because of specific therapeutic modalities.

The Aim: The aim of this study was morphologic and immunohistochemical analysis of small cell lung carcinoma and differentiation from squamous cell lung carcinoma on bronchoscopic biopsies.

Material and methods: Formalin-fixed, paraffin-embedded bronchoscopic mucosal samples from 20 patients with small cell carcinoma and 20 patients with squamous cell lung carcinoma, retrieved from pulmonary pathology archives at Institute of Pathology, Medical Faculty University of Nis. Serial histologic sections of 4 μm thickness were stained with hematoxilin-eosin and immunohistochemical method DAKO LSAB+/HRP for ChrA, synaptophysin, LCA, CKAE1/AE3, TTF-1, CKHMW and CK5/6 antibodies.

Results: Positive immunoreactivity for ChrA was found in 80% of small cell lung carcinomas (16/20), and for synaptophysin in 85% (17/20) of tested cases. None small cell carcinoma was positive for LCA (0/20), but (20/20) were positive for CKAE1/AE3. 90% of small cell carcinomas (18/20) were positive for TTF-1, none squamous cell carcinoma showed immunoreactivity for TTF-1 (0/20)(p <0.01). The inverse immunophenotype was found for CKHMW and CK5/6; 100% of squamous cell carcinomas (20/20) were positive for CKHMW and 90% (18/20) for CK5/6, while all cases of small cell carcinomas were negative for both markers (0/20) (p <0.01).

Conclusion: Immunohistochemical analysis is ancillary tool in distinguishing small cell carcinoma from squamous cell lung carcinoma on bronchoscopic biopsy specimens.

Key words: Immunohistochemistry, small cell lung carcinoma, squamous cell lung carcinoma

PATOHISTOLOŠKE I IMUNOHISTOHEMIJSKE KARAKTERISTIKE "NON-SMALL CELL" KARCINOMA PLUĆA

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Uvod: "Non small cell" karcinom pluća obuhvata planocelularni karcinom, adenokarcinom i makrocelularni karcinom. Subtipizacija "non small cell" karcinoma pluća na bronhoskopskoj biopsiji je od presudnog značaja za terapiju.

Cilj rada: Cilj ovog rada je morfološka i imunohistohemijska analiza "non small cell" karcinoma pluća na bronhoskopskim biopsijama.

Materijal i metode: Bronhoskopski biopsije, fiksirane u formalinu i kalupljene u parafinu, 20 pacijenata sa planocelularnim karcinomom i 20 pacijenata sa adenokarcinomom pluća su izdvojene iz plućnog arhiva Instituta za patologiju Medicinskog fakulteta Univerziteta u Nišu. Serijski histološki iseći debljine 4 µm su bojeni hematoxilin-eozinom, histohemijskom AB-PAS (PH=2,5) i imunohistohemijskom metodom DAKO LSAB+HRP za bojenje TTF-1, CK 5/6 i CK HMW (34 ßE12) antitela.

Rezultati: Pozitivna imunoreaktivnost na CK5/6 nađena je kod 90% planocelularnih karcinoma (18/20) i 5% adenokarcinoma (1/20) (p<0,01), dok su svi planocelularni karcinomj 100% (20/20) i 80% adenokarcinoma (16/20) bili pozitivni na CKHMW. Kod 80% adenokarcinoma (16/20) nađen je pozitivan TTF-1 imunofenotip, dok su svi planocelularni karcinomi bili negativni na ovaj marker (0/20) (p<0,01).

Zaključak: Imunohistohemijska analiza sa panelom antitela CK5/6 i TTF-1 je korisna dopunska metoda u diferenciranju planocelularnog od adenokarcinoma karcinoma pluća na bronhoskopskim biopsijskim uzorcima.

Glavne reči: Imunohistohemija, „non small cell“ karcinom pluća, planocelularni karcinom, adenokarcinom

PATOHISTOLOGICAL AND IMMUNOHISTOCHEMICAL FEATURES OF NON-SMALL CELL LUNG CARCINOMA

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Introduction: "Non small cell" lung carcinoma includes squamous cell carcinoma, adenocarcinoma and large cell carcinoma. Subtyping "non small cell" lung cancer in bronchoscopic biopsy is essential for therapy.

The Aim: The aim of this study was morphologic and immunohistochemical analysis of non small cell lung carcinoma on bronchoscopic biopsies.

Material and methods: Formalin-fixed, paraffin-embedded bronchoscopic mucosal samples from 20 patients with squamous cell lung carcinoma and 20 patients with adenocarcinoma of the lung were retrieved from pulmonary pathology archives at Institute of Pathology, Medical Faculty University of Niš. Serial histologic sections of 4 µm thickness were prepared for staining with hematoxylin and eosin, AB-PAS (PH=2,5), and immunohistochemical method DAKO LSAB + / HRP for staining TTF-1, CK 5/6 and CK HMW (34 ßE12) antibodies.

Results: Positive immunoreactivity for CK5/6 was found in 90% of squamous cell carcinomas (18/20) and in 5% of adenocarcinomas (1/20) (p<0,01), while all squamous cell carcinomas (20/20) and 80% of adenocarcinomas (16/20) were positive for CKHMW. In 80% of adenocarcinomas (16/20) was found a positive TTF-1 immunophenotype, while all squamous cell carcinomas were negative for this marker (0/20) (p<0,01).

Conclusion: Immunohistochemical analysis (panel CK5/6 and TTF-1) is useful ancillary tool in distinguishing squamous cell lung carcinoma from adenocarcinoma in bronchoscopic biopsy specimens.

Key words: Immunohistochemistry, non small cell lung carcinoma, squamous cell lung carcinoma, adenocarcinoma

UČESTALOST KARCINOMA PLUĆA U CRNOJ GORI, U PERIODU 2009-2011.GOD

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Uvod: Karcinomi predstavljaju većinu (90-95%) svih tumora pluća. Klasifikovani su na četiri histološka podtipa: adenokarcinom, planocelularni, sitnoćelijski i nesitnoćelijski karcinom. Većina karcinoma pluća je izazvana duvanskim dimom. Prognoza je jako loša i petogodišnje preživljavanje iznosi samo 10%.

Cilj: Cilj ovog rada je da se ustanovi učestalost obolijevanja od karcinoma pluća u Crnoj Gori, u periodu od 2009-2011godine.

Materijal i metode: U retrospektivnoj studiji ispitano je 429 pacijenata oba pola, sa patohistološki verifikovanim karcinomom pluća, koji su liječeni na Klinici za grudnu hirurgiju u KCCG i u SB za plućne bolesti 'Dr Jovan Bulajić' Brezovik, u periodu od januara 2009. do kraja decembra 2011. godine. Podaci o starosti pacijenata prikupljeni su iz uputnica za histopatološki pregled.

Rezultati: U periodu praćenja od 3 godine (2009-2011), najpogođenija starosna grupa je od 50-59 (35,43%) i od 60-69 godina (34,73%), zatim 70-79 (19,81%) i 40-49 (6,75%), a najrjeđe pogođena starosna grupa je od 90-93 (0,23%), od 30-39 (1,3%) i od 80-89 godina (1,63%).

Zaključak: Najčešće oboljeli pacijenti su bili starosti od 50-69.godine, u odnosu na druge životne dobi. Najmanja zastupljenost u dobi od 90-93 godine se može objasniti relativno malim brojem ispitanika.

Glavne riječi: Karcinom pluća, duvanski dim, loša prognoza, učestalost po starosti.

INCIDENCE OF LUNG CANCER IN MONTENEGRO, IN 2009-2011 YEAR

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Introduction: Cancers are the majority (90-95%) of all lung tumors. Lung cancers are generally classified into four histopathological subtypes: adenocarcinoma, planocellular, large cell, and small cell carcinoma. Prognosis of lung cancer is very bad and five-year survival rate is only 10%.

The Aim: The Aim of this study is to determine the incidence of lung cancer in Montenegro in the period from 2009- 2011 year.

Materials and methods: The retrospective study included 429 patients of both genders, with histologically verified lung cancer, who were treated at the Clinic of Thoracic surgery in KCCG and in the SC for lung diseases 'Dr Jovan Bulajić' Brezovik, in the period from January 2009. by the end of the December 2011.year. Data about age were collected from referral to histological examination.

Results: By retrospective analysis of 3 years (2009- 2011), most affected age group is 50-59 (35.43%) and 60-69 (34.73%), followed by 70-79 (19.81%) and 40-49 (6.75%). The least affected group by the age is 90-93 (0.23%), 30-39 (1.3%) and 80-89 (1.63%).

Conclusion: The most often suffering patients were aged 50-69, compared to other ages. The lowest representation in the age 90-93 can be explained by the relatively low number of respondents.

Keywords: Lung cancer, tobacco smoke, bad prognosis, incidence by age.

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Uvod: U normalnom, neizmenjenom srčanom tkivu nije prisutna apoptoza ili se nalazi maksimalno 28 pozitivnih ćelija na milion kardiomiocita. Iz tog razloga povećan broj apoptotičnih ćelija se nalazi u patološkim stanjima kakva je dilataciona kardiomiopatija (DKM).

Cilj rada: Utvrditi apoptotski indeks (AI) i uporediti ga među različitim morfološkim stadijumima DKM.

Materijal i metod: Ispitivanjem je obuhvaćeno 30 bolesnika oba pola sa kliničkom dijagnozom DKM, i to 2 (6.7%) žene i 28 (93.3%) muškaraca. Prosečna starost pacijenata je 44 godina. Za utvrđivanje apoptotskog indeksa korišćen je TUNEL metod.

Rezultati: Prosečne vrednosti AI kod bolesnika sa DKM su iznosile $5,41 \pm 9,33$ (Med=3,75). Poređenjem prosečnih vrednosti AI različitih morfoloških stadijuma DKM nije uočena statistički značajna razlika ($p=0,312$). Analizom vrednosti ovog parametra, posmatrano po pojedinačnim grupama, statistički značajna razlika nije dobijena ni u jednom slučaju: između ispitnika sa umereno odmaklom DKM i ispitnika sa početnom DKM ($p=0,930$), odmaklom ($p=0,769$) i izraženom DKM ($p=0,152$); ispitnika sa početnom DKM: i odmaklom ($p=0,517$) i izraženom DKM ($p=0,252$); kao ni između ispitnika sa odmaklom i izraženom DKM ($p=0,145$).

Zaključak: Naše istraživanje je pokazalo da ne postoji statistički značajna razlika u vrednostima AI između različitih morfoloških stadijuma obolelih od DKM. Iz tog razloga, buduće prospektivne studije koje bi poredile AI i prognozu pacijenata sa DKM daće odgovor i u vezi sa kliničkim značajem apoptoze.

Ključne reči: apoptoza, TUNEL, dilataciona kardiomiopatija

APOPTOSIS TESTING IN PATIENTS WITH DILATED CARDIOMYOPATHY

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Introduction: In healthy heart tissue, usually you can't find apoptotic cardiomyocytes, or you can find max. 28 positive cells comparing to million cardiomyocytes. For that reason increased number of apoptotic cells can be found in pathology, such as dilated cardiomyopathy (DCM).

The Aim: To determine apoptotic index (AI) and to compare AI of different morphologic stadiums of DCM.

Materials and Methods: The research included 30 patients, both genders with clinical diagnosis of DCM. It included 2 (6.7%) females and 28 (93.3%) males. Average age of our patients is 44 years. We used TUNEL method to detect AI.

Results: Approximate AI value of patients with DCM was $5,41 \pm 9,33$ (Med=3,75). Comparing approximate AI value of different morphologic stadiums of DCM, we didn't find any significance ($p=0,312$). We didn't find significance between AI of patients with early DCM ($p=0,930$), progressive ($p=0,769$) and terminal DCM ($p=0,152$); patients with early DCM and progressive DCM ($p=0,517$) and terminal DCM ($p=0,252$); also we didn't find difference between patients with progressive and terminal DCM ($p=0,145$).

Conclusion: Our research has shown that there isn't significant difference between AI value of patients with different DCM stadiums. For that reason, future prospective studies which will compare AI and prognosis of patients with DCM could give us answer considering clinical significance of apoptosis.

Key words: apoptosis, TUNEL, dilated cardiomyopathy

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Uvod: Miokarditis (MK) predstavlja zapaljensku infiltraciju srčanog mišića praćenu oštećenjem miocita neishemijske etiologije. Apoptoza je programirana smrt ćelije kojom se putem eliminacije neželjenih ćelijskih elemenata održava normalna gustina ćelijske populacije. Danas se smatra da apoptoza ima značajnu ulogu u patogenezi različitih kardiovaskularnih oboljenja kao što su miokarditis, infarkt, srčana insuficijencija, itd.

Cilj: Cilj naučnog rada je da se odredi apoptotski indeks (AI) kod pacijenata obolelih od virusnog miokarditisa (VMK) i ispita odnos AI kod različitih morfoloških oblika VMK.

Materijal i metode: Ispitivanjem je obuhvaćeno 30 bolesnika oba pola sa kliničkom dijagnozom miokarditisa, i to 13 žena (43.3%) i 17 muškaraca (56.7%). Za postavljanje patohistološke dijagnoze MK korišćena je modifikacija Dallas-ovih kriterijuma, a za detekciju apoptoze TUNEL metoda.

Rezultati: Prosečne vrednosti AI u grupi od 30 pacijenata sa MK bile su $4,23 \pm 12,16$ (Med=0,005). U grupi ispitnika koji su imali fokalni miokarditis, AI je iznosio 10,99, što je bila i najveća izmerena vrednost. U grupi ispitnika sa "healing MK" AI je imao najnižu vrednost 1,55, a u grupi sa akutnim i "borderline MK" izmereni AI je iznosio 3,32, odnosno 3,40.

Zaključak: Naše istraživanje je pokazalo da je najveća vrednost AI uočena kod fokalnog MK ali nije bilo statistički značajne razlike između njega i vrednosti AI kod ostalih stadijuma bolesti, kao ni kod međugrupnog poređenja vrednosti AI. Naši rezultati ukazuju na potrebu proširivanja istraživanja na većem broju ispitnika primenu i dodatnih metoda, pored TUNEL metode, za detekciju apoptoze kod MK.

Ključne reči: apoptoza, TUNEL, miokarditis

EXPLORATION OF THE ROLE OF APOPTOSIS IN VIRAL MYOCARDITIS

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Introduction: Myocarditis is an inflammatory disease of cardiac muscle that is associated with non-ischemic myocyte injury. Apoptosis is defined as programmed cell death which eliminates most of the damaged and non-functional cells, managing the normal density of cell population in human tissues. Apoptosis of cardiomyocytes has been reported to be involved in pathogenesis of cardiovascular diseases like infarction, myocarditis, heart failure.

The aim: The aim of this study was to determine apoptotic index (AI) in patients with viral myocarditis and to compare the rate of AI in groups with different morphological stages of myocarditis.

Materials and methods: Research included 30 patients diagnosed with myocarditis; 13 women (43.3%) and 17 men (56.7%). All 30 patients fulfilled modified histopathological Dallas criteria, while apoptosis was detected using TUNEL method in myocardial tissue sections.

Results: The group of 30 patients with myocarditis demonstrated an elevated rate of AI 4.23 ± 12.16 (Med=0,005). The group of subjects diagnosed with focal myocarditis demonstrated the highest rate of AI (10.99). In subjects diagnosed with „healing myocarditis“ the rate of AI was 1.55. Increased rates of apoptosis were also found in borderline myocarditis (3.40) and acute (3.32) myocarditis.

Conclusion: Our research has indicated the highest rate of apoptosis in patients with focal myocarditis. The rate of AI in focal myocarditis was not significantly increased when compared to AI of other groups. The rate of AI was not significantly increased when we compared results amongst groups with different morphological stages of myocarditis.

Key words: apoptosis, viral myocarditis, TUNEL method.

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Uvod: Kolorektalni karcinom (KRK) je najčešći uzrok smrti od kancera, koji nisu direktno povezani sa pušenjem cigareta. Najveća incidenca KRK beleži se u SAD-u. Glavni faktori rizika su uzrast, prethodni KRK, ulcerozni kolitis, Kronova bolest, genetski faktori i ishrana siromašna u vlaknastim materijama.

Cilj: Analiza morfoloških karakteristika KRK, polne i starosne distribucije, lokalizacije, makroskopskog izgleda, veličine tumora, simptoma bolesti i dužine trajanja, histološkog gradusa i kliničkog stadijuma.

Materijal i metode: Biopsijski materijal Instituta za patologiju Medicinskog fakulteta u Prištini-Kosovska Mitrovica od 2004. do 2011. godine. Deskriptivno-retrospektivna metoda.

Rezultati: Ispitivan je 51 resecirani kolon sa adenokarcinomom. Kod muškaraca je nađeno 29 (56,86%), a kod žena 22 (43,14%) KRK. Prosečna starost osoba oba pola bila je 65,66 god. (min: 26g., max: 79g.). KRK bio je pretežno lokalizovan u rektosigmoidnom delu: 34 (66,67%), najčešće od 53. do 79. god. Makroskopski, preovlađivao je infiltrativno-stenozirajući tip u 48 (94,12%) slučajeva. Prosečna veličina KRK bila je 6,4 cm (min: 2 cm; max: 14 cm). Glavni simptomi bolesti bili su bolovi u stomaku, rektalno krvavljenje i meteorizam u 24 (47,05%) slučajeva i nisu trajali duže od 2 godine. U svim slučajevima dijagnostikovano je adenokarcinom kao jedini histološki tip, pretežno gradusa II. Prema Aster-Coller metodi 28 (54,9%) KRK dijagnostikovano je u stadijumu B2, a 15 (29,41%) KRK u stadijumu C1. Angioin vazija i perineuralna invazija nađeni su u 40 (78,43%) KRK.

Zaključak: KRK je u našem materijalu dijagnostikovano u oba pola, prosečne starosti 65,66 godina, najčešće u rektosigmoidnom delu, pretežno u stadijumu B2.

Ključne reči: Kolorektalni karcinom, morfologija, histo-patologija.

HISTO-PATHOLOGICAL AND CLINICAL-MORFOLOGICAL CHARACTERISTICS OF COLORECTAL CARCINOMA

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Introduction. Colorectal carcinoma (CRC) is the most frequent carcinoma, which is not directly connected with cigarette smoking. The overall incidence of CRC is in USA. The main risk factors are age, previously CRC, colitis ulcerosa, Crohn disease, genetics and nutrition with low grade fiber materials.

The aim of study. The analysis of morphological characteristics of CRC, gender and age distribution, localisation, macroscopical characteristics, tumor size, symptoms and their duration, histological grade and clinical stage.

Material and methods. Biopsy material from Institute of pathology, Medical Faculty Priština-Kosovska Mitrovica, from 2004. till 2011. Descriptive-retrospective method.

Results. We analyzed 51 dissected colons with adenocarcinoma. There were 29 (56.86%) at male and 22 (43.14%) CRC at female patients. The average age of both gender was 65.66 years (min. age-26, max. age-79). CRC was most frequently located at the rector sigmoid junction 34 (66.67%), often from 53. till 79. years old. Macroscopically, infiltrative-stenosing type was predominated in 48 (94.12%) specimens. The average size of CRC was 6.4 cm (min: 2 cm, max: 14 cm). The main symptoms were pains in stomach, rectal bleeding and meteorism in 24 (47.05%) patients, and they didn't last longer than 2 years. All of analyzed CRC were histologically classified as adenocarcinomas, most of them as grade II. According to the Astler-Coller method, 28 (54.9%) CRC were stage B2 and 15 (29.41%) were stage C1. Angioinvasion and perineural invasion were found in 40 (78.43%) CRC.

Conclusion. CRC was diagnosed in both gender, middle age 65.66 years old, mostly in rector sigmoid junction, stage B2.

Keywords: Colorectal carcinoma, morphology, histo-pathology.

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Uvod: Kolorektalni karcinom je treći najučestaliji karcinom kod oba pola i drugi najčešći uzrok smrtnosti od maligniteta u razvijenim zemljama. Neuroendokrine ćelije, koje nastaju od matične endodermalne ćelije, čine 2% ukupne populacije epitelnih ćelija debelog crijeva. One proizvode hormone i biogene amine, regulišući brojne fiziološke procese u debelom crijevu kao što su dioba matične ćelije, apsorpcija i motilitet crijeva.

Cilj: Analiza udjela neuroendokrinih ćelija u kolorektalnom karcinomu.

Metode: Reprezentativni uzorci ne-nekrotičnog tumorskog tkiva su fiksirani u 10% formalinu i ukalupljeni u parafinske blokove. Detekcija ekspresije Synaptofizina (SYN) vršena je Streptavidin- biotin peroksidaza tehnikom, po standardnoj LSAB+ proceduri (DAKO). Prema procentu tumorskih ćelija koje su pokazivale pozitivnu imunohistohemijsku reakciju uzorci su podijeljeni na tri grupe: **grupa 1-** u tumoru nije bilo ćelija koje su pokazivale ekspresiju synaptofizina A; **grupa 2-** manje od 10% tumorskih ćelija pokazuje pozitivnu imunohistohemijsku reakciju; **grupa 3-** više od 10% tumorskih ćelija pokazuje pozitivnu imunohistohemijsku reakciju

Rezultati: Pozitivna ekspresija (grupa 2 i 3) SYN uočena je kod 74 (82%) bolesnika, kod 16 (18%) ispitanika nije bilo ekspresije ovog markera (grupa 1). U grupi bolesnika koji su pokazivali pozitivnu imunokoloraciju kolorektalnog karcinoma SYN-om, visok nivo ekspresije (grupa 3) uočen je kod 38 (42%) bolesnika, dok je umjerenu ekspresiju (grupa 2) imalo 36 (40%) ispitanika.

Zaključak: Neuroendokrina diferencijacija je prisutna kod 80% ispitivanih kolorektalnih adenokarcinoma, pri čemu su pozitivnu imunohistohemijsku reakciju najčešće dali SYN

IMMUNOHISTOCHEMICALLY EXAMINATION SYNAPTOPHIZINE LEVEL NEUROENDOCRINE DIFFERENTIATION IN COLORECTAL ADENOCARCINOMA

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Introduction: Colorectal cancer is the third most common cancer in both sexes and the second leading cause of death from malignancy in developed countries. Neuroendocrine cells, which arise from stem cells endodermalne, make 2% of the total population of epithelial cells of the colon. They produce hormones and biogenic amines, regulating numerous physiological processes in the colon, such as separation of stem cells, intestinal absorption and motility.

Objective: Analysis of the proportion of neuroendocrine cells in colorectal cancer.

Methods: Representative samples of non-necrotic tumor tissue were fixed in 10% formalin and embedded in paraffin blocks. expression Synaptophysin Detection (SYN) was performed Streptavidin-biotin peroxidase technique, the procedure standard LSAB + (DAKO). According to the percentage of tumor cells showed positive immunohistochemical reaction samples were divided into three groups: Group 1 - tumor was not in the cells that showed expression of synaptophysin A, Group 2 - less than 10% tumor cells showed positive immunohistochemical reaction; Group 3 - more 10% of tumor cells showed positive immunohistochemical reaction

Results: Positive expression (group 2 and 3) SYN was observed in 74 (82%) patients, 16 (18%) patients there was no expression of this marker (group 1). In patients who showed positive colorectal cancer immunokoloration SYN-om, high expression levels (group 3) was observed in 38 (42%) patients, while moderate expression (group 2) had 36 (40%) patients.

Conclusion: Neuroendocrine differentiation is present in 80% of the examined colorectal adenocarcinomas, with positive reaction usually gave immunohistochemical SYN.

TUMORI VELIKIH PLJUVAČNIH ŽLEZDA KOD OSOBA MLAĐIH OD 35 I STARIJIH OD 65 GODINA

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Uvod: Tumori pljuvačnih žlezda obuhvataju 1-4% svih tumora glave i vrata. Tumori velikih pljuvačnih žlezda češći su od tumora malih pljuvačnih žlezda, najveći broj primarnih epitelnih tumora lokalizovan u parotidnoj žlezdi, submandibularnoj a najmanji broj u sublingvalnoj žlezdi.

Cilj: Ispitivanje kliničkih i patoloških karakteristika tumora velikih pljuvačnih žlezda kod ispitanika mlađih od 30 i starijih od 65 godina.

Materijal i metod: Korišćena je baza podataka primarnih epitelnih tumora pljuvačnih žlezda patohistološke laboratorije Klinike za otorinolaringologiju i maksilofacijalnu hirurgiju Kliničkog centra Srbije u Beogradu koja je obuhvatila ispitanike sa dijagnostikovanim i lečenim tumorima u periodu od 01.01. 2001. do 31.12. 2011. godine. Uključeni su podaci o polu, uzrastu ispitanika, lokalizaciji tumora i patohistološke dijagnoze tumora velikih pljuvačnih žlezda.

Rezultati: Od 436 ispitanika obolelih od tumora pljuvačnih žlezda, 311 ispitanika bolovalo je od tumora velikih pljuvačnih žlezda. 87% tumora je bilo benigno, a 13% maligno. Od benignih najzastupljeniji je pleomorfni adenom, dok su od malignih podjednako bili zastupljeni adenoid-cistični karcinom i mioepitelni karcinom.

Zaključak: Tumori su najređi kod ispitanika mlađih od 30 godina. Kod mlađih od 30 godina i starijih od 65 godina, tumori su najčešći u parotidnoj žlezdi; najčešća dijagnoza je pleomorfni adenom (kod mlađih od 30 godina) i Warthinov tumor (kod starijih od 65 godina). Najčešći maligni tumor kod mlađih od 30 godina je mioepitelni karcinom a kod starijih od 65 godina adenoid-cistični karcinom.

Ključne reči: velike pljuvačne žlezde, pleomorfni adenom, mioepitelni karcinom, adenoid cistični karcinom.

TUMORS OF MAJOR SALIVARY GLANDS AT PATIENS YOUNGER THEN 35 AND OLDER THEN 65 YEARS

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Introduction: Tumors of the salivary glands comprise 1-4% of head and neck tumors. Tumors of major salivary glands are more common than tumors of minor salivary glands, largest number of primary epithelial tumors localized in the parotid gland, submandibular and the lowest number in sublingual gland.

Objective: Examination of clinical and pathological features tumors of major salivary glands in patients younger than 30 and older than 65 years.

Materials and Methods: Data base of primary epithelial tumors of salivary gland histopathological laboratory of the Clinic for Otorhinolaryngology and Maxillofacial Surgery, Clinical Center of Serbia, which included those with tumors diagnosed and treated in period from 01.01. 2011th to 31.12. 2011th. Included are data on sex, age of respondents, tumor localization, histopathological diagnosis tumors of major salivary glands.

Results: Of 436 patients suffering from salivary gland tumors, 311 patients suffered from major salivary gland tumors. 87% tumors were benign and 13% malignant. The most common benign -pleomorphic adenoma, while the malignant were represented adenoid-cystic carcinoma and myoepithelial carcinoma.

Conclusion: The rarest tumors in patients younger than 30 years. Younger than 30 years and older than 65 years, the most common tumors of the parotid gland, the most common diagnosis was pleomorphic adenoma (younger than 30 years) and tumor Warthinov (older than 65 years). The most common malignant tumor in younger than 30 years, myoepithelial carcinoma in patients over 65 years adenoid-cystic carcinoma.

Keywords: major salivary gland, pleomorphic adenoma, myoepithelial carcinoma, adenoid cystic carcinoma.

AUTOPSIJSKA ANALIZA SLUČAJEVA SA KLINIČKIM PODATKOM O PARKINSONIZMU

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Uvod: Parkinsonizam je sindrom okarakterisan poremećajem držanja tela i poremećajem pokreta u vidu hipomimije, rigiditeta, hipokinezije, poremećajem hoda (magnetni hod) i tremora u miru. Parkinsonova bolest je progresivno neurodegenerativno oboljenje koje je najčešći uzrok parkinsonizma. Parkinsonova bolest nastaje usled degeneracije dopaminergičkih neurona supstancije nigre i posledičnog smanjenja količine dopamina u striatumu. Težina simptoma je proporcionalna stepenu deficita dopamina. Najpouzdaniji način utvrđivanja etiologije parkinsonizma je postmortalna patohistološka analiza mozгова obolelih mozgov.

Cilj rada: Ispitivanje kliničko-patološke korelacije, patohistoloških promena u centralnom nervnom sistemu, osnovnih bolesti, uzroka smrti, distribucije po polu i uzrastu u autopsijskom materijalu osoba sa kliničkim podatkom o parkinsonizmu.

Materijal i metode: U ovoj retrospektivnoj studiji analizirani su svi protokoli o izvršenim obdukcijama na Institutu za patologiju Medicinskog fakulteta Univerziteta u Beogradu u šestogodišnjem periodu koji su sadržali klinički podatak o parkinsonizmu. Pored kliničko-patološke korelacije analizirane su patohistološke promene centralnog nervnog sistema, osnovna oboljenja, uzroci smrti i distribucije po polu i uzrastu.

Rezultati: Od obdukovanih 3587 slučajeva, 14 su imali klinički podatak o parkinsonizmu. Najučestalija osnovna oboljenja osoba sa kliničkim podatkom o parkinsonizmu su bili Parkinsonova bolest i bronhopneumonija. Fibrinozno-purulentna bronhopneumonija je vodeći uzrok smrti osoba sa kliničkim podatkom o parkinsonizmu. Klinički navedena Parkinsonova bolest u 8 slučajeva je patohistološki potvrđena u 5 slučajeva.

Zaključak: Naše istraživanje ukazuje da Parkinsonova bolest predstavlja najčešći uzrok parkinsonizma, a bronhopneumonija je vodeći uzrok smrti obolelih od parkinsonizma i Parkinsonove bolesti u autopsijskom materijalu.

Ključne reči: Parkinsonizam, Parkinsonova bolest, autopsija, kliničko-patološka korelacija

AUTOPSY ANALISIS OF CASES WITH CLINICAL DATE ON PARKINSONISM

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Introduction: Parkinsonism is a clinical syndrome characterized by diminished facial expression, stooped posture, slowness of voluntary movement, festinating gait, rigidity, and a "pill-rolling" tremor. Parkinson's disease is a neurodegenerative disease which is the most common cause of parkinsonism. Degeneration of dopaminergic neurons of the substantia nigra is associated with a reduction in the striatal dopamine content. The severity of the motor syndrome is proportional to the dopamine deficiency. The most reliable diagnostic method for Parkinson's disease is postmortally brain dissection followed by microscopic examination.

The Aim: Examination of clinical-pathological correlation, histopathological changes in central nervous system, main illness, cause of death, distribution of sex and age among the cases.

Material and methods: In this retrospective study were analysed all autopsy protocols in Institute of Pathology, School of medicine, University of Belgrade in six-year period which contained clinical data of parkinsonism. We examined clinical-pathological correlation, histopathological changes in central nervous system, main illness, cause of death, distribution of sex and age among cases.

Results: Among 3587 autopsy cases, 14 had clinical data of parkinsonism. The most frequent main disease between cases with clinical data of parkinsonism were Parkinson's disease and bronchopneumonia. Fibrinous-purulent bronchopneumonia is leading cause of death in cases with clinical information of parkinsonism. We confirmed pathohistologically the diagnosis of Parkinson's in 5 of 8 clinically diagnosed cases.

Conclusion: Parkinson's disease is the most common cause of parkinsonism and bronchopneumonia is leading cause of death of people with parkinsonism and Parkinson's disease.

Key words: Parkinson's disease, parkinsonism, autopsy, clinical-pathological correlation

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Uvod: Tumori malih pljuvačnih žlezda su mnogo ređi od tumora velikih pljuvačnih žlezda i obuhvataju 10-15% svih tumora pljuvačnih žlezda. Proporcija malignih tumora pljuvačnih žlezda zavisi od lokalizacije; najčešći maligni tumor je mucoepidermoidni karcinom. Od benignih tumora je najčešći pleomorfni adenom. Dijagnoza tumora malih pljuvačnih žlezda postavlja se kliničkim pregledom, vizualizacionim tehnikama i patohistološkim pregledom. Lečenje benignih tumora obavlja se potpunom hirurškom ekscizijom, a malignih ekscizijom i dodatkom radioterapije i hemioterapije.

Cilj: Ispitivanje kliničkih i patoloških karakteristika tumora malih pljuvačnih žlezda dijagnostikovanih i lečenih tokom desetogodišnjeg perioda.

Materijal i metod: Za potrebe rada korišćena je baza podataka primarnih epitelnih tumora pljuvačnih žlezda patohistološke laboratorije Klinike za otorinolaringologiju i maksilofacijalnu hirurgiju Kliničkog centra Srbije. Za potrebe statističke analize primenjen je SPSS program i sledeći statistički testovi: studentov t test i Hi-kvadrat test.

Rezultati: Tokom desetogodišnjeg perioda na Klinici za otorinolaringologiju i maksilofacijalnu hirurgiju Kliničkog centra Srbije dijagnostikovano je i lečeno 436 ispitanika obolelih od tumora pljuvačnih žlezda. 103 ispitanika (23.6%) bolovalo je od tumora malih pljuvačnih žlezda. Statistički ne postoji značajna razlika u prosečnoj starosti i lokalizaciji tumora malih pljuvačnih žlezda u odnosu na pol. Postoji visoka statistički značajna povezanost malignih i benignih tumora malih pljuvačnih žlezda sa lokalizacijom.

Zaključak: Maligni tumori malih pljuvačnih žlezda najčešće su lokalizovani u nosu i paranazalnim šupljinama, a benigni najčešće u usnoj šupljini i na nepcu. Najčešćaliji benigni tumor malih pljuvačnih žlezda je pleomorfni adenom, a maligni je adenoid-cistični karcinom.

Ključne reči: maksilofacijalna regija, male pljuvačne žlezde, pleomorfni adenoma.

SMALL SALIVARY GLANDS TUMORS IN MAXILLOFACIAL REGION

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Introduction: Small salivary gland tumors are less frequent than large salivary gland tumors, make up 10-15% of all salivary gland tumors. Proportion of malignant tumors is in direct correlation with localization; the most frequent malignant tumor is mucoepidermal cancer. Pleomorphic adenoma is the most frequent benign tumor. Diagnosis of small salivary gland tumors is made by clinical exam, visual techniques, patohistological exam. Treatment of benign tumors is done via complete surgical excision, and the malignant ones have radio-therapy and hemio-therapy with that.

The Aim: The examination of clinical and pathological characteristics of small salivary gland tumors, diagnosed and treated during ten year period.

Material and method: For this paper, primary epithelial salivary gland tumors data base has been used from the histopathological laboratory at clinical center Serbia. For statistical analysis needs SPSS program was used, students T-test, Hi-squared test.

Results: During a ten year period at the clinic for otolaryngology and maxillofacial surgery at clinical center Serbia, 436 patients were diagnosed and treated for salivary gland tumors. 103 patients (23.6%) were diagnosed with small salivary gland tumors. Statistically there were no significant differences in localization with correlation to gender. There is a high statistical correlation between malignant and benign tumors of small salivary gland tumors and localization.

Conclusion: Small salivary glands malignant tumors are most frequent in nose and paranasal cavity, benign in oral cavity and palate. Most frequent benign salivary gland tumor is pleomorphic adenoma, the malignant is adenoid-cystic carcinoma.

Key words: maxillofacial region, small salivary glands, pleomorphic adenoma

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Uvod: Divertikularna bolest creva je najčešće stečena bolest koja nastaje hernijacijom mukoze i submukoze kroz mišićne slojeve (lažna ili pseudodivertikuloza), a najznačajnije komplikacije ove bolesti su: divertikulitis, krvarenje, abces, fistule, strikture.

Cilj rada: Analiza učestalosti i lokalizacije divertikularne bolesti creva, postojanje njenih komplikacija i njihovog uticaja na uzrok smrti na autopsijama.

Materijal i metode: Retrospektivna studija je zasnovana na analizi protokola i izveštaja sa obdukcija Instituta za patologiju Medicinskog fakulteta Univerziteta u Beogradu za trogodišnji period, od 2008–2010 godine. Za detaljniju analizu, koristeći metode deskriptivne statistike, uzeti su slučajevi kod kojih su na obdukciji makroskopski dokazani divertikulumi u nekom segmentu tankog i/ili debelog creva.

Rezultati: U periodu od 2008-2010 godine na obdukcijama su dijagnostikovana 74 slučaja sa divertikulumima creva. Divertikularna bolest creva je bila nešto češća kod osoba ženskog pola - 43 (58,1%), a prosečna starost obdukovanih pacijenata iznosila je $77,6 \pm 7,4$ godina. Bolest se isključivo javljala kod pacijenata starije životne dobi, a najzastupljenija je bila u osmoj deceniji života. Najčešća lokalizacija divertikuluma bila je u sigmoidnom kolonu, i to: u 35 (47,3%) slučajeva samo na ovoj lokalizaciji, a u manjem broju slučajeva su bili udruženi sa divertikulumima descendentnog kolona i rektuma. Divertikuloza celog kolona je nađena u 19 (25,7%) slučajeva. Od komplikacija koje prate divertikularnu bolest creva, divertikulitis je histološki dijagnostikovano u samo 6 (8,1%) slučajeva.

Zaključak: Divertikularna bolest je multifaktorska bolest, gde je prevencija koja pre svega podrazumeva promene u navikama ishrane, jedini lek.

Ključne reči: divertikulum, divertikulitis

DIVERTICULAR DISEASE OF INTESTINE IN AUTOPSY

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Introduction: Colonic diverticulosis is, in general, most commonly an acquired disease, developing as mucosal and submucosal herniations through the circular muscle layer (false or pseudo-diverticulosis). The most significant complications are: diverticular bleeding, diverticulitis, abcess, fistulas, strictures.

The Aim: To investigate the frequency and localization of diverticular disease, becoming its complications and their impact on the cause of death in autopsies.

Material and methods: Retrospective study was based on the analysis of protocols and reports from the autopsies of the Institute of Pathology, Faculty of Medicine University of Belgrade, during the period of three years, from 2008-2010. Causes with macroscopic proven diverticula in one segment of the small intestine and/or colon were taken for a more detailed analysis. Data were processed by descriptive statistics.

Results: During the period 2008-2010, 74 cases with intestinal diverticula were diagnosed. Diverticular disease was slightly more common in females - 43 (58,1%). The average age of the autopsied patients was $77,6 \pm 7,4$ years. The disease is only observed in elderly patients, and the most was in eight decade of life. The most common location of disease was the sigmoid colon, where 35 (47,3%) had diverticula only in this location, and a smaller number of cases were associated with diverticula in descending colon and rectum. Diverticulosis in entire was found in 19 (25,7%) cases. From complications associated with diverticular disease, diverticulitis was histologically confirmed in only 6 (8,1%) cases.

Conclusion: Diverticular disease is multifactorial disease which prevention primarily involves changes in eating habits.

Key words: diverticulum, diverticulitis

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Uvod: Incidenca limfoma raste na globalnom nivou sa preko 280 000 novih slučajeva godišnje. Non-Hodgkin limfomi B-ćelijskog porekla čine preko 90% svih limfoidnih neoplazmi i predstavljaju oko 4% svih novih malignih tumora godišnje na svetskom nivou, pri čemu je folikularni limfom drugi po učestalosti sa udelom od oko 30%.

Cilj rada: Cilj našeg rada bio je da istakne razlike u histopatološkim i imunofenotipskim karakteristikama između reaktivne folikularne hiperplazije i folikularnog limfoma.

Materijal i metode: Analiziran je biopsijski materijal 17 pacijenata. Nakon klasične laboratorijske obrade i HE bojenja, urađena je imunohistohemijaska analiza reprezentativnih uzoraka. Korišćen je EnVision sistem, a od imunohistohemijskih markera CD20, CD3, bcl-2, bcl-6, CD10 i Ki-67.

Rezultati: Antiapoptotski bcl-2 protein se ne ekspirira u germinativnim centrima reaktivnih folikula, dok se ekspirira kod svih analiziranih slučajeva folikularnog limfoma.

Zaključak: Imunohistohemijaska analiza je neophodna za postavljanje precizne dijagnoze folikularnog limfoma i diferencijalnu dijagnozu u odnosu na reaktivnu folikularnu hiperplaziju.

Ključne reči: Folikularni limfom, reaktivna folikularna hiperplazija, histopatologija, imunohistohemija.

DIFERENTIAL DIAGNOSIS BETWEEN FOLICULAR HYPERPLASIA AND FOLLICULAR LYMPHOMA

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Introduction: Lymphoma incidence grows on global level at about 280 000 new cases per year. B-cell Non-Hodgkin lymphoma are over 90 % of all lymphoid tumors, and they represent about 4 % of all new malignant tumors per year, on a global level, and follicular lymphoma is second by its frequency, which is at about 30 %.

The Aim: The aim of our work was to point out some differences in histopathology and immunofenotype features of follicular hyperplasia and follicular lymphoma.

Material and methods: Biopsy material of 17 patients has been analysed after classical laboratory procedure and HE coloring, and an immunohistochemical analysis of representative samples has been done. EN Vision system has been used together with immunohistochemical markers : CD-20, CD-3, bcl-2, bcl-6, CD-10, and Ki-67.

Results: Anti-apoptotic bcl-2 protein has not been expressed in germinative centres of reactive follicles, while it has been expressed in all analysed cases of follicular lymphoma

Conclusion: Immunohistochemical analysis is necessary for making precise diagnosis of follicular lymphoma and differential diagnosis related to reactive follicular hyperplasia.

Key words: Follicular lymphoma, reactive follicular hyperplasia, histopathology, immunohistochemistry.

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Uvod: Želuđani karcinom je četvrti po učestalosti maligni tumor, a drugi, odmah iza karcinoma pluća, uzrok smrtnosti od kancera na globalnom nivou. Radi se o multifaktorijalnoj bolesti sa upadljivim geografskim varijacijama, uticajem migratornih efekata, sa dobro proučenim histološkim i patofiziološkim stadijumima razvoja na koje utiču faktori okoline, način života, ishrana i nasledni faktori. Najznačajniji pomak u proučavanju epidemiologije adenokarcinoma želuca je saznanje o njegovoj povezanosti sa Helicobacter pylori infekcijom. Mucini su najzastupljenija komponenta mukusa koji prekriva i štiti želuđanu sluzokožu. Promene u mucinskoj ekspresiji utiču na ćelijski rast, diferencijaciju, transformaciju, adheziju, invazivnost i imunološku kontrolu pa time i na razvoj kancera, te se njihovo ispitivanje koristi u dijagnostičke svrhe.

Cilj rada: Histohemijsko ispitivanje mucina u tkivu želuđanih karcinoma i korelacija njihove ekspresije i histološkog tipa karcinoma.

Materijal i metode: Analiziran je operativni materijal 27 pacijenata sa dijagnozom karcinoma želuca resekovanih na Hirurškoj klinici Kliničkog centra u Nišu. Nakon klasične obrade i HE bojenja, birani su reprezentativni uzorci za histohemijsku analizu. Korišćene su sledeće kombinovane histohemijske metode: 1. AB-PAS i 2. HID-AB.

Rezultati: Epidemiološki podaci iz našeg istraživanja (uzrastna i polna struktura) se uklapaju u literaturne podatke, a rezultati histohemijske analize i dominantna kisela sekrecija kod intestinalniog tipa adenokarcinoma želuca ukazuju na značaj upotrebe ove metode u rutinskom radu.

Zaključak: Primena histohemijskih metoda za neutralne (PAS), slabo kisele (AB) i jako kisele (HID) mucine doprinosi lakšem diferentovanju dva osnovna histološka tipa želuđanih karcinoma i postavljanju preciznije dijagnoze.

Ključne reči: Karcinom želuca, histoheemija, AB-PAS, HID-AB.

HISTOCHEMICAL STUDY OF MUCINS IN GASTRIC CANCER

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Introduction: Gastric cancer is the fourth most frequent malignant tumor and the second tumor by its mortality rate on the global level right after lung cancer. It is a multifactorial disease with specific geographical variations and well known influence of migratory effects. Histological and pathophysiological stages of disease development, significantly influenced by environmental factors, life style, nutrition and hereditary factors, have been established. The biggest advance in epidemiologic study of gastric adenocarcinoma has been made by the discovery of its association with Helicobacter pylori infection. Mucins represent dominant and most abundant component of mucus that covers and protects gastric mucosa.

Aim: Histochemical study of mucins and gastric cancer tissue and corelation of their expresion and histological type of cancer.

Material and methods: Operative material obtained from 27 patients that were diagnosed and surgically treated for gastric cancer has been analyzed. After conventional processing and HE stain, specimens have been selected for histochemical analysis. The following combined histochemical methods AB-PAS and HID-AB have been used.

Results: Epidemiological datas from our research has matched with reference datas, and the results of histochemical analysis and dominate acid secretion in intestinal type of gastric adenocarcinoma are showing that the usage of this method in routine work is very important.

Conclusion: The usage of histochemical methods for neutral (PAS), lightly acid (AB) and intensively acid (HID) mucins is important for diferentiation of two basic hystological types of gastric cancer, and also giving the precise diagnosis.

Key words : Gastric cancer, histochemistry, AB-PAS, HID-AB.

PATOHISTOLOŠKE KARAKTERISTIKE HRONIČNIH PERIAPIKALNIH LEZIJA

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Uvod: Hronične periapikalne lezije (HPIL) predstavljaju patološke tvorevine, lokalizovane oko vrha koren(ov)a avitalnih zuba. Oskudne su simptomatologije, a radiološki se manifestuju rasvetljenjima različitih oblika i dimenzija. Mikroskopskim pregledom se jedino može postaviti njihova definitivna dijagnoza.

Cilj rada: Cilj rada bio je odrediti najzastupljeniji oblik hronične periapikalne lezije, odrediti pouzdanost do sada poznatih patohistoloških kriterijuma za njihovu dijagnostiku i ispitati njihove patohistološke karakteristike.

Materijal i metod rada: Istraživanje je sprovedeno u protekle dve godine, na Odeljenju za patohistologiju Stomatološkog fakulteta, Univerziteta u Beogradu. Studijom je obuhvaćeno 92 pacijenta, sa dijagnostikovanom 101. HPIL koji su na Kliniku za oralnu hirurgiju bili poslani radi njenog uklanjanja. Uzorci tkiva, dobijeni ekstrakcijom zuba ili apikotomijom su iskorišćeni za pravljenje patohistoloških preparata. Pregledom preparata, pod svetlosnim mikroskopom, postavljena je definitivna dijagnoza. Za svaki preparat, notirani su parametri: prisustvo/odsustvo epitela, kvalitet i kvantitet zapaljenskog infiltrata, stepen zastupljenosti fibroplazije i prisustvo/odusustvo granulomatoznog zapaljenja.

Rezultati: U najvećem procentu, bili su zastupljeni periapikalni granulomi. Zapaljenski infiltrat je bio najčešće snažan i mešovit. Granulacija je bila prisutna kod svih granuloma, a najčešće je bila blago izražena. Fibroplazija granuloma je najčešće bila snažna. U 94% slučajeva, kod radikularne ciste je nađena granulacija koja je bila umerena. Zapaljenski infiltrat je najčešće bio snažan i mešovit. Fibroplazija cisti je bila snažna.

Zaključak: Histopatološki, HPIL sačinjavaju tri elementa hronične inflamacije: granulacija, zapaljenski infiltrat i fibroplazija

Ključne reči: HPIL

PATHOHISTOLOGICAL CHARACTERISTICS OF CHRONIC PERIAPICAL LESION

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Introduction: Chronic periapical lesions (HPIL) are pathological formations, localized around the tip of the root (s) and nonvital teeth. Symptoms are scarce, and the radiological manifest illuminating different shapes and dimensions.

The aim of study : The objective was to determine the most common form of chronic periapical lesions, determine the reliability of known histologic criteria for their diagnosis and to examine their pathological characteristics.

Materials and methods: The study was conducted over the past two years, the Department of pathohistological, School of Dentistry, University of Belgrade. The study included 92 patients diagnosed with one hundred and first HPIL the sun and the Department of Oral Surgery were sent to her removal. Tissue samples, obtained by extraction or apicoectomy teeth are used for making histopathological specimens. A review of preparations under the light microscope, put a definitive diagnose.

Results: The largest percentage, were represented periapical granulomas. Inflammatory infiltrate was the most powerful and mixed. Fibroplasia granuloma was the most powerful. In 94% of cases with radicular cyst was found that grit was moderate. Inflammatory infiltrate the most powerful and was mixed. Fibroplasia cyst was strong.

Conclusion: Histopathological, HPIL consists of three elements of chronic inflammation: granulation, inflammatory infiltrate and fibroplasia.

Key words: HPIL

ZNAČAJ LIMFOMA OROFACIJALNE REGIJE

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Uvod: Limfomi su solidni tumori koji nastaju nekontrolisanim umnožavanjem limfocitnog i histiocitnog tkiva. Javljaju se najčešće u obliku ograničenih tumora limfnih žlezda, slezine i limfocitnih ploča digestivnog trakta, ali se takođe mogu javiti i na nekim drugim organima i tkivima. S toga mesto njihove primarne lokalizacije može biti i maksilofacijalna regija

Cilj rada: Cilj rada je bio da se utvrdi njihovu distribuciju prema polu, uzrastu, najčešći oblik i najčešća lokalizacija.

Materijal i metod rada: Uzorci, prispeli sa Klinike za maksilofacijalnu hirurgiju, sečeni su na uzorke manje debljine, bojeni standardnom hematoksilin i eozin metodom i posmatrani pod svetlosnim mikroskopom.

Rezultati: Limfomi su u maksilofacijalnoj regiji podjednako zastupljeni kod oba pola srednje i starije životne dobi. Najčešći tipovi limfoma su prema učestalosti javljanja non Hodgkin limfomi – difuzni limfom krunih B ćelija, maltom i znatno ređi folikularni limfom i Hodgkin limfom tip nodularne skleroze.

Zaključak: Dobijeni rezultati su u skladu sa rezultatima objavljenim u značajnim literaturama. Statistički nisu uočene značajne razlike.

Ključne reči: limfomi, maksilofacijalna regija

SIGNIFICANCE OF LYMPHOMAS IN OROFACIAL REGION

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Introduction: Lymphomas are solid tumors arising from uncontrolled lymphocyte proliferation. They occur most often in the form of limited tumor of the lymph glands, spleen and digestive tract lymphocyte panel, but can also occur in other organs and tissues. In addition to their primary place of localization can be and maxillofacial region.

Objective: The objective was to determine their distribution by sex, age, and their most common sites.

Materials and methods: Samples, arrived with the Department of Maxillofacial Surgery, the samples were cut with less thickness, stained with hematoxylin and eosin method and examined by light microscopy.

Results: Lymphoma in the maxillofacial region are equally present in both sexes middle-aged and elderly. The most common types of lymphoma, according to the frequency of non Hodgkin lymphoma - diffuse large B cell lymphoma, Malta and much less frequent follicular lymphoma and Hodgkin lymphoma, nodular sclerosis type.

Conclusion: The results are consistent with results published in the official literature. Statistically significant differences were observed.

Key words: lymphomas, maxillofacial area

ZNAČAJ ODONTOGENE KERATOCISTE

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Uvod: Keratociste spadaju u grupu razvojnih odontogenih cisti. Po najnovijoj klasifikaciji ubrajaju se u odontogeni keratocistični tumor.

Cilj rada: Cilj rada je bio da se utvrdi njihova distribucija prema polu, uzrastu, njihova najčešća lokalizacija, stepen recidiviranja i da se odredi uniformna patohistološka slika.

Materijal i metod rada: Uzorci, prispeli sa Klinike za maksilofacijalnu hirurgiju, sečeni su na uzorke manje debljine, bojeni standardnom hematoksilin i eozin metodom i posmatrani pod svetlosnim mikroskopom.

Rezultati: Dobijeni rezultati su u skladu sa rezultatima objavljenim u zvaničnim literaturama. Statistički nisu uočene značajne razlike.

Zaključak: Keratociste su najagresivnije od svih epitelnih cisti vilica i imaju sposobnost brzog uništavanja velike površine kosti i penetriranja u susedna tkiva. Teško se uklanjaju i imaju visok stepen recidiva posle operacije

Ključne reči: keratociste, vilica

SIGNIFICANCE OF ODONTOGENIC KERATOCYST

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Introduction: The keratocysts are a group of developmental odontogenic cysts. According to the latest classification are among the keratocistični odontogenic tumor.

Objective: The objective was to determine their distribution by sex, age, their most common sites, the degree of recurrence and to determine the uniform histopathological picture.

Materials and methods: Samples, arrived with the Department of Maxillofacial Surgery, the samples were cut with less thickness, stained with hematoxylin and eosin method and examined by light microscopy.

Results: The results are consistent with results published in the official literature. Statistically significant differences were observed.

Conclusion: The keratocysts are the most aggressive of all epithelial cysts and are capable of rapid destruction of large areas of bone and penetration into adjacent tissues. It is difficult to remove and have a high degree of recurrence after surgery.

Key words: Odontogenic keratocyst, jaw

POVEZANOST IMUNOHISTOHEMIJSKE EKSPRESIJE P53 I HER2 SA PATOHISTOLOŠKIM KARAKTERISTIKAMA KARCINOMA ŽELUCA

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Uvod: Karcinom želuca je drugi najčešći karcinom kod ljudi. Njegova prognoza delom zavisi od specifičnih parametara koji se mogu analizirati imunohistohemijskim tehnikama. Jedni od najvažnijih gena uključenih u karcinogenezu i tumorsku progresiju želučadnog karcinoma su P53 i HER2.

Cilj rada: Utvrđivanje učestalosti ekspresije P53 i HER2 proteina u karcinomima želuca, kao i njihova korelacija sa kliničko – patološkim karakteristikama tumora.

Materijal i metode: Istraživanjem je obuhvaćeno 53 pacijenta, dijagnostikovanih na Institutu za onkologiju Vojvodine u Sremskoj Kamenici, u periodu od januara 2009. do januara 2011. godine. Materijal je obrađen imunohistohemijskom procedurom, pri čemu su korišćena antitela na protein P53 i HER2. Takođe su analizirani i sledeći kliničko – patološki parametri: pol, starost, tip karcinoma po *Lauren*-u, lokalizacija, histološki gradus, endoskopski oblik, vaskularna i neuralna invazija, dubina tumorske infiltracije i udaljene metastaze.

Rezultati: Ispitivano je 33 muškarca i 20 žena, 78% je bilo dobi iznad 60 godina. Procenat pozitivne imunohistohemijske ekspresije P53 i HER2 bio je 47,17% i 6,52%. P53 ekspresija pokazuje značajnu statističku korelaciju ($p < 0,05$) u odnosu na pol, starost, tip karcinoma po *Lauren*-u, lokalizaciju, vaskularnu invaziju i dubinu invazije tumora, dok je HER2 ekspresija statistički značajno povezana ($p < 0,05$) u odnosu na endoskopski oblik karcinoma i vaskularnu invaziju.

Zaključak: P53 je češće pozitivan kod pacijenata muškog pola, mlađih od 60 godina, u karcinomima intestinalnog tipa, i lokalizovanih u korpusu želuca. Ustanovljena je statistički značajna razlika u ekspresiji oba markera u karcinomima difuznog izgleda, kao i u odnosu na prisustvo i odsustvo vaskularne invazije.

Ključne reči: Karcinom želuca, p53, HER2, c-erbB2

CORRELATION OF IMMUNOHISTOCHEMICAL EXPRESSION OF P53 AND HER2 WITH PATHOHISTOLOGICAL CHARACTERISTICS OF GASTRIC CARCINOMA

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Introduction: Gastric cancer is the second most common cancer in humans. Prognosis mainly depend on specific parameters that can be analyzed by immunohistochemical techniques. Some of the most important genes involved in carcinogenesis and tumor progression are HER2 and p53.

The Aim: Determining the frequency of P53 and HER2 protein expression in gastric carcinoma and their correlation with clinical - pathological characteristics of tumor.

Materials and Methods: Study included 53 patients diagnosed with gastric carcinoma. The material was immunohistochemically analyzed, using antibodies to protein P53 and HER2. Following clinical - pathological parameters were also analyzed: gender, age, type of cancer by *Lauren*, localization, histological grade, endoscopic type, vascular and neural invasion, depth of tumor invasion and distant metastasis.

Results: We examined 33 men and 20 women, 78% were aged over 60 years. The percentage of positive immunohistochemical expression of P53 and HER2 was 47.17% and 6.52%. P53 expression showed statistically significant relevance ($p < 0.05$) with respect to gender, age, histological type of cancer, localization, vascular invasion and depth of infiltration. HER2 over expression is statistically relevant ($p < 0.05$) compared to endoscopic type of cancer and vascular invasion.

Conclusion: P53 is frequently positive in male patients, younger than 60 years, in the intestinal type carcinomas, localized in the gastric corpus. Statistically significant difference in expression of both markers is determined in cancers with diffuse appearance and presence of vascular invasion.

Key words: gastric cancer, p53, HER2, c-erbB2

IMUNOHISTOHEMIJSKA EKSPRESIJA HER2 U TKIVU KARCINOMA ŽELUCA I KORELACIJA SA DEMOGRAFSKIM I KLINIČKO-PATOLOŠKIM KARAKTERISTIKAMA

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Uvod: Karcinom želuca je drugi najčešći karcinom u svetu. U nastanku i progresiji karcinoma želuca veliki značaj pridaje se mutacijama različitih gena kao što su HER2, p53, E-Cadherin i dr. Gen odgovoran za sintezu HER2 proteina pripada familiji proto-onkogene, naziva se Her2 gen ili cerbB2. HER2 je receptor humanog epidermalnog faktora rasta (EGFR/ErbB) koji se pojačano eksprimira na tumorskim ćelijama želučadnog karcinoma što se smatra značajnim za bilošku agresivnost tumora.

Cilj: Ispitati učestalost ekspresije HER2 proteina u karcinomima želuca i statistički značaj ekspresije HER2 u odnosu na demografske i kliničko-patološke parametre.

Materijal i metode: Istraživanje je obuhvatilo 53 pacijenta sa karcinomom želuca dijagnostikovanim na Institutu za onkologiju Vojvodine u Sremskoj Kamenici, u periodu od januara 2009. do januara 2012 godine. Svi demografski i kliničko-patološki podaci preuzeti su retrospektivno. Uzorci tkiva su bojeni rutinskom metodom HE i imunohistohemijskom metodom, pri čemu je kao primarno antitelo korišćeno antitelo na HER2 protein.

Rezultati: Procenat pozitivne imunohistohemijske ekspresije HER2 iznosi 6,52%. Ekspresija HER2 proteina statistički je relevantna ($p < 0,05$) u odnosu na endoskopski izgled karcinoma, prisustvo vaskularne invazije, prisustvo udaljenih metastaza i tumorskog tkiva na resekcionim ivicama. Drugi ispitivani parametri i pored visoke pozitivnosti nisu pokazali statistički značajnu korelaciju.

Zaključak: HER2 je češće pozitivan kod muškaraca starijih od 60 godina, intestinalnog tipa karcinoma, korpusne lokalizacije i histološkim gradusom 2, ali je statistički značajna povezanost dokazana samo sa endoskopskim oblikom, prisustvom vaskularne invazije, prisustvom udaljenih metastaza i prisustvom tumorskog tkiva na resekcionim ivicama.

Ključne reči: karcinom želuca, HER2, cerbB2 gen

IMMUNOHISTOCHEMICAL EXPRESSION OF HER2 IN THE TISSUE OF GASTRIC CANCER AND CORRELATION WITH DEMOGRAPHIC AND CLINICAL-PATHOLOGICAL CHARACTERISTICS

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Introduction: Gastric cancer is the second most common cancer in the world. The onset and progression of gastric cancer depends on mutations of various genes such as HER2, p53, E-cadherin. Gene responsible for synthesis of HER2 protein is proto-oncogene, named HER2 or cerbB2 gene. HER2 protein is a receptor of human epidermal growth factor and is sometimes overexpressed in tumor cells of gastric carcinoma, which is considered relevant for tumor aggressiveness.

The Aim: Determining the frequency of HER2 expression in gastric carcinomas and statistical significance of HER2 expression regarding variety of demographic and clinical-pathological parameters.

Materials and methods: The study included 53 patients with gastric cancer diagnosed at Institute of Oncology, Sremska Kamenica, from January 2009. to January 2012. All demographic and clinical-pathological data were obtained retrospectively. Tissue samples were stained using routine HE staining and immunohistochemically, using antibody to the HER2 protein.

Results: The percentage of positive immunohistochemical expression of HER2 is 6.52%. HER2 overexpression is statistically significant ($p < 0.05$) compared to endoscopic type of cancer and vascular invasion, presence of distant metastases and presence of tumor of resection edges. Other parameters, despite the high positivity didn't show statistical significance.

Conclusion: HER2 is more often positive in men older than 60 years, intestinal type carcinoma, carcinomas localized in gastric corpus and histological grade 2, but statistical significance was demonstrated only with endoscopic type of tumor growth, presence of vascular invasion, distant metastasis and presence of tumor on edges of resection.

Key words: gastric cancer, HER2, cerbB2.

PATOHISTOLOŠKE KARAKTERISTIKE ATROFIČNIH GASTRITISA U ODRASLOJ POPULACIJI

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Uvod: Hronični gastritis je zapaljenje sluznice želuca. Prema patohistološkim karakteristikama deli se na atrofični i neatrofični. Atrofija predstavlja gubitak normalnih želučanih žlezda. Atrofični gastritis je češće lokalizovan u antralnoj sluznici i uglavnom je povezan sa *Helicobacter pylori* infekcijom, dok je atrofija korpusne sluznice pretežno autoimune prirode. Hronični atrofični gastritis igra vodeću ulogu u razvoju intestinalnog karcinoma želuca koji je najčešći tip gastričnog karcinoma i jedan je od vodećih uzroka smrti u svetu.

Cilj: Prikazati patohistološke i demografske karakteristike atrofičnih gastritisa.

Materijal i metode: Analizirani su patološki izveštaji 100 pacijenata sa atrofičnim gastritisom čije je karakteristike ocenio patolog koristeći semikvantitativnu skalu Sidnejskog sistema klasifikacije gastritisa. Prikupljeni podaci su statistički obrađeni, tabelarno i grafički predstavljeni korišćenjem softverskog paketa Microsoft Office. Za procenu značajnosti učestalosti između pojedinih parametara korišćen je χ^2 test.

Rezultati: U pojavi atrofičnog gastritisa vezano za pol nema statistički značajne razlike. Prosečna starost pacijenata

je iznosila $63,79 \pm 13,5$ godina. Razlika u odnosu na distribuciju je statistički značajna u korist antruma. Između pacijenata koji imaju atrofiju sa *Helicobacter pylori* infekcijom i intestinalnu metaplaziju i onih koji metaplaziju nemaju, utvrđena je visoko statistički značajna razlika.

Zaključci: Atrofični gastritis je češće lokalizovan u antrumu želuca i pretežno je posledica *Helicobacter pylori* infekcije. Učestalost se povećava sa starošću, dok pol ne utiče na pojavu atrofičnih gastritisa.

Ključne reči: gastritis, atrofični, metaplazija, *Helicobacter pylori*

HISTOPATHOLOGICAL CHARACTERISTICS OF ATROPHIC GASTRITIS IN ADULT POPULATION

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Introduction: Chronic gastritis is an inflammatory condition of the gastric mucosa. In histological terms, it can be divided into two main categories, non-atrophic and atrophic. Atrophy is defined as the loss of appropriate glands. Atrophic gastritis is the most frequently located in the antral mucosa and it is consequence of *Helicobacter pylori* infection. In the corpus mucosa, atrophy is caused by autoimmune etiology. Chronic atrophic gastritis plays a crucial role in the development of intestinal gastric cancer.

The Aim: The aim of this study was to describe histopathological and demographic characteristics of atrophic gastritis.

Materials and methods: We assessed the pathological reports of 100 patients with atrophic gastritis whose characteristics were evaluated by pathologist who was using a semiquantitative scale of Sidney system of classification and grading of gastritis. Collected data were statistically analyzed, tabulated and presented graphically using Microsoft Office software package. To assess the significance between the incidence of various parameters we used the χ^2 test.

Results: We found that the difference in frequency of atrophic gastritis between men and women was not statistically

significant. The average age of patients was $63,79 \pm 13,5$ years. The difference in distribution is statistically significant in favor of the antrum. Among patients who have atrophy with *Helicobacter pylori* infection and intestinal metaplasia and those who do not have metaplasia, it was found that the difference is highly statistically significant.

Conclusion: The most frequent localisation of atrophic gastritis is the antral mucosa. There is no difference between men and women in frequency of atrophic gastritis, while the aging is related with more often occurrence of atrophic gastritis.

Key words: gastritis, atrophic, metaplasia, *Helicobacter pylori*

ISPITIVANJE AKUTNOG TOKSIČNOG DEJSTVA DAKARBAZINA NA EKSPERIMENTALNOM MODELU

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Uvod: Terapija uznapredovalih mekotkivnih sarkoma skoro redovno uključuje *dakarbazin*, alkilirajući agens koji vrši metilaciju DNK i deluje u svim fazama ćelijskog ciklusa. Najčešće nuspojave kod primene ovog leka su mučnina, povraćanje, poremećaj funkcija jetre i bubrega, mijelosupresija, pneumonija. U dostupnoj literaturi se ne navode tačne histološke i hematološke promene nastale primenom dakarbazina.

Cilj rada: Cilj našeg eksperimenta bio je da se istraže hematološke, organske i promene na tumoru, koje izaziva Dakarbazin i da se utvrdi *minimalna antiproliferativna doza* ovog leka.

Materijal i metode: Eksperiment je obuhvatao 5 odraslih jedinki zlatnog sirijskog hrčka, kojima su supkutano inokulisane tumorogene BHK ćelije. Četrnaestog dana nakon inokulacije tumorogenih BHK ćelija, hrčki su tretirani *Dacarbazine*-om u dozama od: 0 (kontrola), 1400, 1600, 1800 i 2000 mg/m². Sedam dana nakon aplikacije leka životinje su žrtvovane nakon čega su procesuirani uzorci krvi, srca, pluća, slezine, tankog creva, bubrega, jetre i tumora. Mitoze su brojane posebnim okularnim nastavkom sa ugraviranim ramom.

Rezultati: Kod hrčaka sa fibrosarkomom uočena je anemija, trombocitopenija i leukocitoza, dok su se kod životinja sa fibrosarkomom koje su tretirane Dakarbazinom razvile anemija, trombocitopenija i leukopenija. Citostatik je pogoršao intersticijalnu pneumoniju, koja je prisutna kod svih jedinki, a *per se* izazvao blagi hepatitis. Na tumorskim ćelijama Dakarbazin je prouzrokovao „balonirajuću degeneraciju jedara“ koja se karakteriše zaobljavanjem nukleusa i kondezacijom hromatina pri čemu jedro optički izgleda prazno. Broj mitozu se smanjio proporcionalno dozi leka.

Zaključak: Opisani poremećaji posledica su mijelotoksičnosti i hepatotoksičnosti Dakarbazina. Histološki poremećaji izazvani njegovim dejstvom na fibrosarkom prvi put su proučeni.

Glavne reči: Dakarbazin, BHK, fibrosarkom, citostatik.

INVESTIGATION OF ACUTE TOXIC EFFECT OF DACARBAZINE ON EXPERIMENTAL MODEL

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Introduction: The therapy of soft-tissue sarcomas usually involves Dacarbazine – an alkylating agent which works by methylation of DNA. Side effects of Dacarbazine therapy include gastrointestinal, liver and kidney problems, myelosuppression and pneumonia. The precise hematological and histological changes that occur during Dacarbazine aren't described in available literature.

The Aim: The goal of our experiment was to study changes of hematologic parameters, organs and tumor caused by Dacarbazine, and to determine *minimal antiproliferative dose* of this drug.

Materials and methods: The experiment involved 5 adult Golden Syrian hamsters. BHK cells were inoculated to them, and two weeks later they were given different doses of Dacarbazine: 0 (control), 1400, 1600, 1800 and 2000 mg/m². Seven days later, they were sacrificed with ether, and their blood, heart, lung, liver, kidney, small intestine, spleen and tumor samples were proceeded. We used special ocular accessory with engraved chamber to count mitoses in tumor.

Results: Dacarbazine *per se* caused leucopenia and toxic hepatitis. Together with fibrosarcoma, it caused anemia and thrombocytopenia. Interstitial pneumonia was secondary manifestation of primary illness – fibrosarcoma, but Dacarbazine made it more severe. Fibrosarcoma nuclei were rounded with condensed chromatin, leaving optically empty space inside nucleus, so we named this process “ballooning degeneration of nuclei”. Number of mitosis is lowered relatively to Dacarbazine dose.

Conclusion: Described morphological and hematological changes are due to hepatotoxicity and myelotoxicity of Dacarbazine. Histological changes of tumor's cells caused by Dacarbazine are first time described.

Key words: Dacarbazine, BHK, fibrosarcoma, cytostatic drug.



**PATOLOŠKA FIZIOLOGIJA
I NUKLEARNA MEDICINA**

UTICAJ JEDNOKRATNE FIZICKE AKTIVNOSTI NA OKSIDACIONU MODIFIKACIJU LIPIDA,
PROTEINA I PROMENU UKUPNOG ANTIOKSIDACIONOG KAPACITETA

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Uvod: Dobro je poznato da fizička aktivnost različitog intenziteta i trajanja može da dovede do povećane produkcije slobodnih radikala kako kod ljudi tako i kod životinja.

Cilj: Cilj istraživanja je bio da se prouči uloga vezbanja do iscrpljenosti (plivanje) na oksidacionu modifikaciju lipida, proteina i promenu ukupnog antioksidacionog kapaciteta.

Materijal i metode: U ispitivanje je bilo uključeno 10 zamoraca oba pola, starosti 3 mesec. Test opterećenja određen je metodom plivanje do iscrpljenosti. Test je prosečno trajao 45 minuta i prekida se kada bi životinje po treći put potonule u vodu, što je definisano kao trenutak postizanja iscrpljenosti. Uzorci venske krvi metodom venepunkcije uzimani su u fazi mirovanja i neposredno nakon testa fizičkog opterećenja. Iz dobijenih uzoraka venske krvi određivani su sledeći parametri: indikatori procesa lipidne peroksidacije, lipidni peroksidi; određivanje koncentracije ukupnih tiola; određivanje ukupnog antioksidacionog kapaciteta plazme.

Rezultati: Istraživanje je pokazalo da promena koncentracije lipidnih hidroperoksida nije bila statistički značajna (256,36;200,9 nmol/protein) ali je koncentracija SH grupa bila značajno niza neposredno nakon testa (15,305 nmol/g protein) u odnosu na bazalnu vrednost (25,354 nmol/g protein). Promene ukupnog antioksidacionog kapaciteta nije pokazivala statistički značajnost, upoređivanjem vrednosti dobijenih u stanju mirovanja (19,42 mmol/gr protein) sa vrednostima dobijenih odmah nakon završetka testa (18,50 mmol/gr protein).

Zaključak: Možemo da zaključimo da vezbanje do iscrpljenosti indukuje nastanak oksidacionog stresa tako što stimuliše proces oksidacione modifikacije proteina. Iako promena antioksidacionog kapaciteta nije pokazivala statistički značajnost, ipak možemo da zaključimo da je tokom oksidativnog stresa izazvano jednokratnom intenzivnom fizičkom aktivnošću, doslo do aktiviranja zaštitničkih mehanizama antioksidativnog stresa.

KLjučne reci: Oksidacioni stres, slobodni radikali, vezbanje.

INFLUENCE OF EXERCISE TO EXHAUSTION ON OXIDATIVE MODIFICATION OF LIPIDS,
PROTEINS AND CHANGE OF THE TOTAL ANTIOXIDATIVE CAPACITY

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Introduction: It has been shown that exercise of various intensity and duration serves as a sufficient to invoke increase RONS production in both animals and humans.

Aim: The goal of the research was to explore the role of exercise to exhaustion (swimming) on oxidative of lipids, proteins and change of total antioxidative capacity.

Materials and methods: The research included 10 guinea pigs of both genders, 3 months age. Test load was performed by the method of swimming to exhaustion. Test approximately lasted 45 min and it was terminated on the moment when animals sank for third time under water, which was defined by the test as the moment of reaching the exhaustion. Venous blood samples have been taken before test and immediately after the exercise test. From the venous blood samples were measured the following parameters: the lipid peroxidation process indicators-lipid hydroperoxides; and protein SH groups; and total antioxidative capacity.

Results: The research showed that the concentration of lipid hydroperoxides didn't show significant difference in all measured times (256,35;200,9 nmol/g protein) but the concentration of proteins SH group was significantly lower immediately after test compared with basal level (25,354 nmol/g protein). The total antioxidative capacity didn't show significant difference, comparing the basal values (19,42 mmol/g protein) with values immediately after the test (18,50 mmol/g protein).

Conclusion: We can conclude that the exercise to exhaustion induce the oxidative stress generation by stimulating the process of oxidative modification of proteins. Although the antioxidative capacity didn't show significant difference we can conclude that during oxidative stress caused by exercise to exhaustion were activated the protection mechanisms of antioxidative system.

Keywords: Oxidative stress, free radicals, exercise

UTICAJ JEDNOKRATNE FIZICKE AKTIVNOSTI NA OKSIDACIONU MODIFIKACIJU LIPIDA,
PROTEINA I AKTIVNOST ENZIMSKOG PEROOKSIDANS KANTIN OKSIDAZE

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Uvod: Povećana fizička aktivnost kod savremenog čoveka je postala deo njegovog životnog stila (rekreacija), a vrlo često se koristi i kao terapijski postupak ili kao preventiva različitih oboljenja. Intenzivno ili dugotrajno vezbanje povećava stvaranje slobodnih radikala u meri koja prevazilazi postojeću antioksidacionu odbranu.

Cilj: Cilj istraživanja je bio da se prouči uloga vezbanja do iscrpljenosti (plivanje) na oksidacionu modifikaciju lipida, proteina i aktivnost enzimskog prooksidansa ksantin oksidaze.

Materijal i metode: U ispitivanje je bilo uključeno 10 zamoraca oba pola, starosti 3 meseca. Test opterećenja određen je metodom plivanje do iscrpljenosti. Test je prosečno trajao 45 minuta i prekida se kada bi životinje po treći put potonule u vodu, što je testom definisano kao trenutak postizanja iscrpljenosti. Uzorci venske krvi metodom venepunkcije uzimani su u fazi mirovanja, neposredno nakon testa fizičkog opterećenja i 24 časa nakon testa fizičkog opterećenja. Iz dobijenih uzoraka venske krvi određivani su sledeći parametri: indikatori procesa lipidne peroksidacije-lipidni peroksidi; određivanje koncentracije ukupnih tiola; određivanje aktivnosti prooksidacionog enzima ksantin oksidaze.

Rezultati: Istraživanje je pokazalo da promena koncentracije lipidnih hidroperoksida nije bila statistički značajna (256,36; 200,9; 154,1 nmol/g protein u tri merena vremena respektivno), ali je koncentracija SH grupa bila značajno niza neposredno nakon testa (15, 305 nmol/g protein) i 24 časa nakon testa (10,709 nmol/g protein) u odnosu na bazalnu vrednost (25,354 nmol/g protein). Dobijena razlika u aktivnosti ksantin oksidaze u stanju mirovanja (160,61 mU/g protein) i neposredno nakon završetka testa (244,42 mU/g) je bila statistički značajna, isto kao i vrednost dobijena neposredno nakon završetka testa sa (244,42 mU/g) (100,14 mU/g)

Zaključak: Ovi rezultati pokazuju da vezbanje do iscrpljenosti stimuliše proces oksidacione modifikacije proteina, i ukazuje na značaj ishemijsko-reperfusionih mehanizama i ulogu leukocita u oksidacionom stresu.

KLjučne reci: Oksidacioni stres, slobodni radikali, vezbanje.

INFLUENCE OF EXERCISE TO EXHAUSTION ON OXIDATIVE MODIFICATION OF LIPIDS,
PROTEINS AND ACTIVITY OF THE ENZYMATIC PROOXIDANT XANTHIN-OXIDASE

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Introduction: Enhanced exercise became part of the life style (recreation) of the modern men, and it is very often used as a therapy or prevention to different diseases. Intensive or prolonged exercise could lead to the increase of the production of free radicals to the level which goes beyond existing antioxidative defence.

Aim: The goal research was to explore the role of exercise to exhaustion (swimming) on oxidative modification of lipids, proteins and activity of the enzymatic xanthin-oxidase.

Materials and methods: The research included 10 guinea pigs of both genders, 3 months age. Test load was performed by the method of swimming to exhaustion. Test approximately lasted for 45 minutes and it was terminated on the moment when animals sank for the third time under the water, which was defined by the test as the moment of reaching the exhaustion. Venous blood samples have been taken before test, immediately after the exercise test and 24 hours after the exercise test. From the venous blood samples were measured the following parameters: the lipid peroxidation process indicators- lipid hydroperoxides; protein SH groups; the activity of prooxidant enzyme xanthin-oxidase.

Results: The research showed that the concentration of lipid hydroperoxides didn't show significant difference in all measured times (256,35; 200,9; 154,1 nmol/g protein) but the concentration of proteins SH group was significantly lower immediately after test and 24 hours after test (15,305; 10,709 nmol/g protein) compared with basal level (25,354 nmol/g protein). The change of the activity of xanthin-oxidase before the test (160,61 mU/g protein) and immediately after the test (244,42 mU/g protein) was significantly different, as well as the activity immediately (244,42 mU/g protein) comparing to the results 24 hours after the test (100,14 mU/g protein).

Conclusion: These results show that exercise to exhaustion increased process of oxidative modification of proteins, and indicates the significant mechanisms of ischemic reperfusion and the role leukocytes in oxidative stress.

Keywords: oxidative stress, free radicals, exercise.

POVEZANOST MORFOLOŠKIH I PATOHISTOLOŠKIH KARAKTERISTIKA POLIPA ŽUČNE KESE

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Uvod: Polipi žučne kese su izrasline mukoznog dijela sluznice žučne kese. Glavni oblici polipoidnog rasta uključuju holesterozu, holesterozu sa fibroznom displazijom žučne kese, adenomiomatozu, hiperplastičnu holecistozu i adenokarcinom. Utvrđeno je da ishrana sa visokim sadržajem masti povećava rizik od nastanka polipoza. Takođe su od značaja starosna dob i genetska predispozicija.

Cilj: Cilj ovog istraživanja bio je da se ispituju i uporede odnosi morfoloških i patohistoloških karakteristika polipa žučne kese.

Materijal i metode: Metode ispitivanja uključivale su anketiranje, laboratorijske pretrage (vrijednosti ukupnog holesterola, HDL, LDL i triglicerida, glikemije), ultrasonografiju, hiruršku obradu, histopatološku analizu polipa žučne kese i statističku obradu (Statistica, PASW 18).

Rezultati: Utvrđeno je da je najzastupljeniji patohistološki nalazi bili multipli holesterolni polipi (42,1%), i holesteroloza žučne kese (39,5%). Takođe 34% ispitanika uz primarni nalaz imalo je i holelitijazu. Nađeno je da je odnos između broja polipa i kalkuloze žučne kese, te broja polipa i debljine žučne kese visoko statistički značajan ($p < 0,01$), dok je odnos između broja polipa i HDL statistički značajan ($p < 0,05$).

Zaključci: Na osnovu rezultata našeg rada možemo zaključiti da su kalkuloza i debljina zida žučne kese u direktnoj korelaciji sa brojem polipa, kao i da je koncentracija HDL u krvi takođe povezana sa brojem polipa. Polipoza žučne kese je klinički važan faktor u daljem mogućem nastajanju tumora žučne kese te stoga ju je potrebno na vrijeme dijagnostifikovati i liječiti.

Ključne reči: polipi, žučna kesa, kalkuloza.

CORRELATION OF MORPHOLOGICAL AND PATHOHISTOLOGICAL CHARACTERISTICS OF GALLBLADDER POLYPS

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Introduction: Polyps of gallbladder are tumour-like lesions of this organ. Main pathohistological lesions include cholesterol polyp/cholesterosis, cholesterosis with fibrous dysplasia of gallbladder, adenomyomatosis, hyperplastic cholecystosis, and adenocarcinoma. It has determined that high fat diet increase the risk of gallbladder polyps. Besides that age and genetic predisposition are also some of the factors that are included.

The Aim: The Aim of this research was to examine and compare morphological and pathohistological characteristics of gallbladder polyps.

Materials and Methods: Methods of this research included survey and family history, laboratory tests (values of total cholesterol, HDL, LDL and triglycerides, glucose), ultrasonography, surgical treatment, histopathology of polyp of the gallbladder and the statistical analysis (Statistica, PASW 18).

Results: It was found that the most common histopathological findings were polypus cholesterol polyps (42.1%), and cholesterosis of gallbladder (39.5%). Also 34% of the respondents had additionally cholelithiasis. It was found that the relationship between the number of polyps and gall bladder calculi, and the number of polyps and thickness of the gallbladder is highly statistically significant ($p < 0.01$), while the ratio between the number of polyps and HDL was statistically significant ($p < 0.05$).

Conclusion: Based on the results of our study we can conclude that calculosis and wall thickness of the gallbladder is in direct correlation with the number of polyps, and that the concentration of HDL in the blood is also associated with the number of polyps. Polyps of the gallbladder is a clinically important factor in possible future emerging gallbladder cancers and therefore it is necessary to diagnose them and treat in due time.

Keywords: polyps, gall bladder, calculosis.

DEJSTVO NISKE KONCENTRACIJE JONA MAGNEZIJUMA NA PARAMETRE INDUKOVANOG REPETITIVNOG PRAŽNJEJA RECIJUSOVH NEURONA PIJAVICE

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Uvod: Karakteristika epileptičke aktivnosti neurona na ćelijskom nivou jeste pojava paroksizmalnog talasa depolarizacije sa serijom šiljag potencijala na njemu (paroxysmal depolarization shift – PDS). Smatra se da je u najvećem broju slučajeva u pitanju Ca^{2+} -zavisni proces, usled sinaptičke aktivacije jonotropnih glutamatnih receptora i voltažno-zavisnih Ca^{2+} kanala. Međutim, pokazano je da se ritmička oscilatorna aktivnost neurona može indukovati i primenom neorganskih blokatora voltažno-zavisnih Ca^{2+} kanala, kao što su joni Ni^{2+} .

Cilj rada: Utvrditi da li niska koncentracija jona Mg^{2+} suzbija niklom indukovane Ca^{2+} -nezavisne PDS-ove Recijusovih neurona pijavice.

Materijal i metode: Ogledi su izvođeni na Recijusovim neuronima pijavice *Haemopsis sanguisuga*. Korišćena je klasična elektrofiziološka tehnika intracelularnog registrovanja potencijala pomoću mikroelektroda. Mereni su parametri niklom indukovano repetitivno pražnjenja neurona: frekvencija, trajanje i amplituda sporih talasa depolarizacije i broj šiljaka po sporom talasu, pre i posle dodavanja $3\text{mmol/L } Mg^{2+}$ u Ni^{2+} Ringer rastvor.

Rezultati: Perfuzija Ringerovim rastvorom sa $3\text{mmol/L } Ni^{2+}$ indukovala je malu početnu depolarizaciju membrane praćenu razvojem spontane oscilatorne aktivnosti u obliku plato talasa depolarizacije sa repetitivnim pražnjenjem akcionih potencijala. Dodavanje $3\text{mmol/L } Mg^{2+}$ u rastvor smanjuje frekvenciju sporih talasa depolarizacije sa $6,29 \pm 1,24$ na $2,51 \pm 0,56$ u minuti ($p < 0,05$), njihovo trajanje sa $4,78 \pm 0,47\text{s}$ na $3,55 \pm 0,40\text{s}$ ($p > 0,05$), amplitudu PDS-a sa $8,75 \pm 1,38\text{mV}$ na $5,75 \pm 0,49\text{mV}$ ($p > 0,05$), i broj šiljaka po sporom talasu sa $7,50 \pm 1,26$ na $4,50 \pm 0,96$ ($p > 0,05$).

Zaključak: Niska koncentracija od $3\text{mmol/L } Mg^{2+}$ suzbija niklom indukovano repetitivno pražnjenje, statistički značajno smanjujući samo njegovu učestalost.

Ključne reči: repetitivno pražnjenje, Recijusov neuron pijavice, nikl, magnezijum

EFFECTS OF LOW DOSE MAGNESIUM ON PARAMETERS OF NICKEL INDUCED BURSTING ACTIVITY OF RETZIUS NEURONS OF THE LEECH

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Introduction: On cellular level epileptic activity is characterized by paroxysmal depolarization shifts (PDS). It is generally considered that PDSs develop through Ca^{2+} -dependent process of synaptic activation of ionotropic glutamate receptors and voltage-gated Ca^{2+} channels. It is shown that neuronal rhythmic bursting activity can also be induced via Ca^{2+} independent mechanism, using inorganic Ca^{2+} channels blockers, such as nickel.

The Aim: To establish whether low concentration of magnesium ions suppresses Ni^{2+} induced epileptiform activity of the Retzius nerve cells.

Materials and Methods: The experiments were performed on the Retzius nerve cells of the leech *Haemopsis sanguisuga*. Membrane potential recording was performed using intracellular microelectrodes. Parameters of nickel induced oscillatory epileptiform activity of Retzius nerve cells were measured: number of waves of depolarization per minute, wave amplitude and duration, and number of spikes per wave, prior to and during application of $3\text{mmol/L } Mg^{2+}$ in Ni^{2+} Ringer solution.

Results: Superfusion by $3\text{mmol/L } Ni^{2+}$ induced minor initial membrane depolarization, followed by spontaneous development of oscillatory activity in leech Retzius nerve cells, represented by slow waves of depolarization in a form of a plateau, upon which bursts of action potentials appeared. Addition of $3\text{mmol/L } Mg^{2+}$ into the solution suppressed the number of waves of depolarization per minute from $6,29 \pm 1,24$ to $2,51 \pm 0,56$ ($p < 0,05$), reduced slow wave duration from $4,78 \pm 0,47\text{s}$ to $3,55 \pm 0,40\text{s}$ ($p > 0,05$), diminished wave amplitude from $8,75 \pm 1,38\text{mV}$ to $5,75 \pm 0,49\text{mV}$ ($p > 0,05$), and decreased number of spikes per wave from $7,50 \pm 1,26$ to $4,50 \pm 0,96$ ($p > 0,05$).

Conclusion: Low concentration of 3mmol/L magnesium suppresses bursting activity induced by Ca^{2+} channel blocker nickel on Retzius nerve cells of the leech, significantly reducing only its frequency.

Key words: bursting activity, Retzius nerve cells, nickel, magnesium

EFEKAT HRONIČNE IZLOŽENOSTI STALNOM MAGNETNOM POLJU NA HEMATOLOŠKE PARAMETRE, CELULARNOST SLEZINE I TIBIJE STARIH PACOVA

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Uvod: Statična magnetna polja (SMP) su vremenski nezavisna polja konstantne snage koja slobodno prolaze biološka tkiva. Pored prirodnih SMP u savremenom svetu su rasprostranjena i veštačka SMP i neophodno je sprovesti dugoročne eksperimente da bi se procenio hronični efekat izloženosti.

Cilj rada: Ispitati delovanje dugotrajnog izlagnja SMP na parametre krvi, celularnost slezine i tibije kod starih pacova. **Materijali i metode:** Mužjaci Wistar soja pacova stari trideset šest nedelja su podeljeni u dve grupe (9 po grupi). Prva grupa je izlagana SMP intenziteta 30 mT celodnevno tokom 10 nedelja. Druga grupa pacova je činila kontrolu. Na kraju eksperimenta svi pacovi su žrtvovani, a krv, slezina i tibija uzete su za dalju analizu.

Rezultati: U eksperimentalnoj grupi došlo je do smanjenja broja trombocita i limfocita, a povećao se broj neutrofila u krvi u odnosu na kontrolnu ($p < 0.01$). Takođe statistička analiza je pokazala značajno povećanje celularnosti i slezine i tibije. Broj limfocita u slezini eksperimentalne grupe je bio statistički značajno veći ($p < 0.05$), a broj eritrocita značajno niži u odnosu na kontrolnu grupu ($p < 0.05$). Nije pokazana značajna razlika u broju granulocita između grupa.

Zaključak: Naš eksperiment je pokazao smanjenje broja limfocita i trombocita zajedno sa povećanjem broja neutrofila u perifernoj krvi, kao i redistribuciju eritrocita između krvi i slezine što odgovara promenama u okviru opšte reakcije organizma na stres. Izlaganje SMP dovelo je do pozitivnog efekta u smislu poboljšanja celularnosti slezine, a samim tim i funkcije ovog tkiva kao hematopoetskog organa kod starih pacova.

Ključne reči: Statično magnetno polje, hematološki parametri, celularnost slezine i tibije

AKTIVNOST ALFA NAFTIL ACETAT ESTERAZE U HUMANOM KAROTIDNOM PLAKU RAZLIČITE MORFOLOGIJE

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Uvod: Uprkos neprestanom ovladavanju biomedicinskim znanjima i tehnikama, naučnici su još uvek daleko od potpunog razumevanja poremećaja molekularskih funkcija i njihovog značaja u aterogenezi. U tom smislu, posebno polje istraživanja predstavljaju ćelijske nespecifične esterase, s obzirom na ulogu koju imaju u širokom spektru bolesti, uključujući i aterosklerozu.

Cilj: U našoj studiji vršeno je ispitivanje aktivnosti alfa naftil acetat esterase (ANAE) u imprintima karotidnih plakova pacijenata sa aterosklerozom različitih morfoloških grupa ($n=100$), kao i u kontrolnoj grupi pacijenata sa kinkingom i/ili koilingom karotidnih arterija ($n=25$).

Materijal i metode: ANAE status u imprintima normalnog i aterosklerozno izmenjenog tkiva humane karotidne arterije je određivan primenom citoheimijskog scoring sistema (metoda po Higiju, Barnsu i Hejhou, koju su modifikovali Cvetković, Radak i Đorđević-Denić).

Rezultati: Naši rezultati uglavnom pokazuju da postoji statistički značajna razlika relativne vrednosti ANAE esteraznog skora u karotidnim arterijama/plakovima između ispitivanih grupa pacijenata.

Zaključci: Ovi rezultati mogli bi da ukažu na značaj ANAE u procesu aterogeneze.

Ključne reči: alfa naftil acetat esteraza (ANAE), aterosklerozna, karotidni plak, kinking, koiling

EFFECTS OF CHRONICALLY EXPOSURE TO STATIC MAGNETIC FIELD ON HEMATOLOGICAL PARAMETERS, SPLEEN AND TIBIA CELLULARITY IN OLD RATS

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Introduction: The static magnetic field (SMF) is time-independent constant strength field that freely pass biological tissue. Besides natural, artificial SMF are widely distributed in contemporary world and it is necessary to implement long-term experiments to evaluate the effect of chronic exposure.

Aim: To examine the effects of long-term SMF exposure on the parameters of blood, spleen and tibia cellularity in old rats.

Materials and Methods: Wistar rats, 36 weeks old, were divided into two groups (9 per group). The first group was exposed to 30 mT intensity SMF all day for 10 weeks. The second group was non-exposed, control group. At the end of the experiment all rats were sacrificed and the blood, spleen and tibia were taken for analysis.

Results: There was significant reduction in the number of platelets and lymphocytes, and increased number of neutrophils in the experimental group ($p < 0.01$). Spleen and tibia cellularity also increased. The number of lymphocytes in the spleen of exposed rats was significantly higher ($p < 0.05$), while the number of red blood cells was lower than in the control ($p < 0.05$).

Conclusion: Reduction in number of lymphocytes and platelets together with the increased number of neutrophils in the peripheral blood, and redistribution of red cells between the blood and spleen reflects changes in the general reaction to stress. Exposure to long-term SMF has led to a positive effect in improving the cellularity of the spleen, and consequently the function of this hematopoietic organ in old rats.

Key words: The static magnetic field, hematology, spleen and tibia celularity.

ACTIVITY OF ALPHA NAPHTHYL ACETATE ESTERASE IN HUMAN CAROTID PLAQUE DIFERENT MORPHOLOGIES

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Introduction: Inspite the constantly growing body of biomedical knowledge and techniques, scientists are still far from a complete understanding of molecular system dysfunctions and their relevance in atherogenesis. Accordingly, cellular non-specific esterases represent a special field of research, due to their role in a wide range of diseases, including atherosclerosis.

The Aim: In our study analysis of α -naphthyl acetate esterase (ANAE) cytochemical activity was performed in imprints of carotid plaques obtained from patients with different morphological groups of atherosclerotic lesions ($n=100$), as well as in control group of patients with kinking and/or coiling of carotid arteries ($n=25$).

Materials and Methods: ANAE status in imprints of normal and atherosclerotic human carotid tissue was determined by cytochemical scoring system (Higgy, Burns and Hayhoe's method modified by Cvetković, Radak and Đorđević-Denić).

Results: Our results mostly show that there is statistically significant difference in relative score value of ANAE activity in carotid artery/plaque tissue between investigated groups of patients.

Conclusion: This findings may indicate importance of ANAE in atherogenesis.

Keywords: α -naphthyl acetate esterase (ANAE), atherosclerosis, carotid plaque, kinking, coiling

ZNAČAJ „ALD/NAFLD INDEKSA“ (ANI) U RAZLIKOVANJU ALKOHOLNE OD NEALKOHOLNE MASNE BOLESTI JETRE

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Uvod: Masna promena jetre javlja se u okviru alkoholne bolesti jetre (alcoholic liver disease-ALD), uzrokovane prekomernim unosom alkohola, ili nealkoholne masne promene jetre (non-alcoholic liver disease-NAFLD), čiji je osnovni uzrok gojaznost/insulinska rezistencija. Cilj ovog rada bio je da se ispita pouzdanost ALD/NAFLD indeksa (ANI) kao neinvazivne metode za razlikovanje alkoholne od nealkoholne masne bolesti jetre.

Materijal i metode: 112 bolesnika (76 muškaraca i 36 žena) je na osnovu patohistološkog nalaza klasifikovano u dve grupe, ALD i NAFLD. Parametri neophodni za izračunavanje ANI su: aspartat aminotransferaza (AST), alanin aminotransferaza (ALT), prosečni volumen eritrocita (MCV), telesna visina, telesna težina i pol. Za izračunavanje vrednosti ANI korišćen je kalkulator preporučen na zvaničnom sajtu klinike Mayo.

Rezultati: Na osnovu naših rezultata, dokazana je visoko statistički značajna razlika vrednosti ANI između bolesnika sa ALD i NAFLD ($p<0,01$). Vrednost ANI >0 govori u prilog dijagnozi ALD, dok se ANI <0 odnosi na veću verovatnoću dijagnoze NAFLD. Ovaj test pokazao je visoku senzitivnost (93%) i visoku specifičnost (88%). Analizom pouzdanosti ANI scoring sistema ukoliko su vrednosti ANI $<-2,2$ ili $>2,2$ ustanovljena je senzitivnost od 97% i specifičnost od 90%. Razlike u distribuciji pola, vrednosti BMI-a, MCV-a i AST/ALT odnosa između bolesnika sa ALD i NAFLD pokazuju visoku statističku značajnost ($p<0,01$).

Zaključak: Na osnovu naših rezultata pokazana je visoka statistička značajnost razlike vrednosti ANI između ALD i NAFLD. Iako se postavljanje dijagnoze ALD i NAFLD zasniva na korelaciji patohistoloških i kliničkih nalaza, ANI predstavlja visoko pouzdan neinvazivni dijagnostički metod za razlikovanje ALD od NAFLD.

KLjučne reči: ALD, NAFLD, ALD/NAFLD indeks (ANI)

SIGNIFICANCE OF “ALD/NAFLD Index” (ANI) IN DISTINGUISHING ALCOHOLIC FROM NONALCOHOLIC FATTY LIVER DISEASE

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Introduction: Fatty liver disease appears in alcoholic liver disease (ALD), induced by excessive alcohol consumption, or in non-alcoholic fatty liver disease (NAFLD), which main cause is obesity/insulin resistance. The aim of this study was to test reliability of ALD/NAFLD Index (ANI) as non-invasive method for distinguishing alcoholic from non-alcoholic liver disease.

Material and methods: 112 patients (76 men and 36 women) were classified in two groups, ALD and NAFLD, according to pathological results. Parameters needed for calculating ANI: aspartate aminotransferase (AST), alanine aminotransferase (ALT), mean corpuscular volume (MCV), height, body weight and sex. For calculating ANI was used online calculator recommended on the official site of Mayo Clinic.

Results: Our results have shown highly statistically significant difference of ANI values between patients with ALD and NAFLD ($p<0.01$). ANI >0 incrementally favoured a diagnosis of ALD, while ANI <0 corresponded to a higher likelihood of a diagnosis of NAFLD. This test has shown high sensitivity (93%) and high specificity (88%). The analysis of reliability of ANI <-2.2 or >2.2 corresponded with sensitivity of 97% and specificity of 90%. Differences in sex distribution, values of BMI, MCV and AST/ALT rate among patients with ALD and NAFLD have also been highly statistically significant ($p<0.01$).

Conclusion: Our results have shown high statistical significance of difference in ANI values between patients with ALD and NAFLD. Although the final diagnosis ALD or NAFLD depends on pathohistological and clinical findings, ANI is found as reliable non-invasive diagnostic method in distinguishing ALD from NAFLD.

Keywords: ALD, NAFLD, ALD/NAFLD indeks (ANI)

UTICAJ DIJETE BOGATE OMEGA 3 MASNIM KISELINAMA NA AKTIVNOST ANTIOKSIDATIVNIH ENZIMA U FRONTALNOM KORTEKSU STARIH PACOVA

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Uvod: Omega 3 masne kiseline su esencijalne nezasićene masne kiseline. Omega 3 masne kiseline imaju dejstvo na mnoge organske sisteme. Antioksidacijski zaštitni sistem čine molekuli sposobni da intereaguju sa slobodnim radikalima i redukuju njihovu količinu u našem telu.

Cilj rada: Cilj ovog istraživanja bio je da utvrdimo uticaj dijetne bogate omega 3 masnim kiselinama na aktivnost antioksidativnih enzima u frontalnom korteksu starih pacova

Materijal i metode: U eksperimentu su korišćeni Wistar albino pacovi, stari 18 meseci (stari) i stari 4 meseca (mladi). Svaka od ovih grupa je bila podeljena na po dve grupe od kojih je jedna jela standardnu pacovsku hranu, a drugoj je dodeljeno 5 kapi ribljeg ulja. Nakon 6 nedelja tretmana životinje su žrtvovane cervikalnom dislokacijom, uzeti su im mozgovi, odvojen frontalni korteks i analizirana aktivnost SOD, MDA i katalaze.

Rezultati: Koncentracija MDA kod starih bila je statistički značajno veća u odnosu na mlade ($p<0.05$). Mladi su imali visoko statistički značajno veću koncentraciju katalaze u odnosu na ostale grupe ($p<0.01$). Koncentracija SOD kod starih bila je statistički značajno niža u odnosu na ostale grupe ($p<0.05$), međutim koncentracija SOD kod starih na dijeti bogatoj omega 3 masnim kiselinama bila je statistički značajno viša u odnosu na ostale grupe ($p<0.05$).

Zaključak: Koncentracija SOD kod starih pacova na dijeti bogatoj omega 3 masnim kiselinama bila je značajno veća u odnosu na mlade pacove.

KLjučne reči: Omega 3 masne kiseline, antioksidanti, pacov, starenje

THE INFLUENCE OF A DIET RICH IN OMEGA 3 FATTY ACIDS ON ANTIOXIDANT ENZYMES IN THE FRONTAL CORTEX OF OLD RATS

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Introduction: Omega 3 fatty acids are essential fatty acids. Omega-3 fatty acids also have beneficial effects on many humerous systems. An antioxidant is a molecule capable of inhibiting the oxidation of other molecules.

The aim: The aim of this study was to determine the influence of a diet rich in omega 3 fatty acids on antioxidant enzymes in the frontal cortex of old rats

Material and methods: Wistar albino rats, were divided into two groups, one of 18 month old rats, and the other 4 month old rats. Each of these groups was divided into two subgroups, the first was on a standard food, and the other was on a diet rich in omega 3 fatty acids.

After 6 weeks of treatment, the rats were sacrificed cervical dislocation, their brains were extracted, separated by the frontal cortex and the activity of SOD, MDA and catalase was analyzed.

Results: The concentration of MDA in the elderly was significantly higher than in young ($p <0.05$). Young rats had a statistically significant higher concentration of catalase in comparison to the other groups ($p <0.01$). The concentration of SOD in the elderly was significantly lower compared to other group ($p <0.05$), but the concentration of SOD in the elderly on a diet rich in omega 3 fatty acids was significantly higher compared to the other groups ($p <0.05$).

Conclusion: The concentration of SOD in old rats on a diet rich in omega 3 fatty acids was significantly higher than in young rats.

Key words: Omega 3 fatty acids, antioxidants, rats, aging

UTICAJ STALNOG MAGNETNOG POLJA RAZLIČITE ORIJENTACIJE NA DISTRIBUCIJU TKIVNIH OLIGOELEMANATA KOD MIŠEVA

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Uvod: Stalna magnetna polja (SMP) su vremenski nezavisna polja, čiji intenzitet može biti prostorno zavisan. Zbog raširene primene magnetnog polja u nauci, tehnologiji, medicini, neophodno je detaljno ispitati uticaj magnetnog polja na organizam.

Cilj rada: Cilj ovog rada je da ispitamo uticaj SMP-a različite orijentacije, intenziteta 15 mT na distribuciju oligoelemenata (Fe, Cu, Zn) u tkivima (jetra, slezina i mozak) i serumu.

Materijal i metode: U ovom istraživanju su korišćeni mužjaci miševa Swiss-Webster soja, stari 6 nedelja. Životinje su bile podeljene u 3 grupe, prva izložena SMP-u orijentacije sever, druga SMP-u orijentacije jug, kontinuirano 28 dana, a treća grupa, neizložena je služila kao kontrola. Kao izvor stalnog magnetnog polja korišćene su MADU trake.

Rezultati: Kod životinja izloženih SMP-u ustanovljeno je smanjenje vrednosti Fe u jetri i mozgu sa porastom gvožđa u serumu i slezini ($p < 0.05$). Sadržaj cinka kod izloženih životinja je bio značajno manji u jetri ($p < 0.01$), a veći u mozgu ($p < 0.05$), u odnosu na kontrolu. Uočeno je smanjenje vrednosti Cu u jetri i mozgu ($p < 0.01$) kod izloženih životinja.

Zaključak: Ovi rezultati sugerišu da je kod životinja izloženih severnom polu SMP-a došlo do redistribucije gvožđa iz njegovih depoa (jetra i mozak) ka hematopoetskom organu (slezina), što dodatno potvrđuje i porast vrednosti serumskog Fe. To bi moglo da ukazuje na eventualni stresogeni efekat stalnog magnetnog polja. Dalje rezultati potvrđuju da se cink i bakar nalaze u konkurenciji za mesta u tkivima i da cink može da smanji toksičnost teških metala zahvaljujući tome.

Ključne reči: stalno magnetno polje, gvožđe, cink, bakar

PREDNOSTI NOVOG EKSPERIMENTALNOG MODELA PERITONEUMSKE DIJALIZE

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Uvod: Peritoneumska dijaliza (PD) je metoda lečenja bolesnika sa uremijom. Dugotrajna PD povezana je sa strukturnim i funkcionalnim promenama peritoneumske membrane (PM) zbog izloženosti bioinkompatibilnim rastvorima za PD. Iako postoji veliki broj eksperimentalnih modela, nema konsenzusa o jedinstvenom eksperimentalnom modelu.

Cilj rada: Naš cilj je bio da se razvije novi, modifikovani eksperimentalni model PD koji bi bio praktičan, jednostavan za izvođenje, relativno jeftin i pogodan za istraživanje dugotrajnog uticaja rastvora za PD na PM.

Materijal i metod rada: Eksperiment je izveden na šest zečeva rase Činčila oba pola. Za anesteziju je korišćen Thiopental injection 1BP, davan intravenski (0,5 mol/kg). Modifikovan kateter za PD napravljen od infuzionog sistema Tro-soluset (Tröge Medical GMBH, Hamburg, Nemačka). Kateter za PD je u toku hirurške intervencije uveden kroz tunel od vrata do abdomena životinje i plasiran na dno peritoneumske duplje. U toku hirurške intervencije plasiranja i uklanjanja katetera uzimani su uzorci tkiva peritoneuma za histološke analize. Životinje su se oporavljale sedam dana, a zatim je narednih dvadeset osam dana svakodnevno instiliran dijalizni rastvor. Tokom svih pet nedelja eksperimenta vođen je dnevnik promena za svaku životinju.

Rezultati: Životinje su konstantno dobijale na telesnoj masi, temperatura je bila u fiziološkim granicama i nisu zabeležene značajne komplikacija. Uzorci PM bili su adekvatni za histološke analize.

Zaključak: Modifikovani model PD je praktičan, jednostavan, ne zahteva sofisticiranu tehnologiju, a životinje ga odlično podnose. Stoga je pogodan za dalja istraživanja dugotrajnih efekata dijaliznih rastvora na PM zečeva.

Ključne reči: peritoneumska dijaliza, eksperimentalni model, zečevi.

STATIC MAGNETIC FIELD OF DIFFERENT ORIENTATION INFLUENCE ON REDISTRIBUTION OF TISSUE OLIGOELEMENTS IN MICE

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Introduction: Static magnetic fields (SMFs) are time-independent fields with spatially dependent intensity. Because SMFs are widely used in science, technology, medicine, it has become necessary to elucidate the influence of SMF on the body.

The aim: To investigate influence of differently oriented SMF of 15 mT at oligoelements distribution (Fe, Cu, Zn) in tissues (liver, spleen and brain) and serum of exposed animals.

Materials and methods: Male Swiss-Webster mice, 6 weeks old were used. Mice were randomly divided into three groups. The first group was exposed to the North pole SMF, the second group to the South pole SMF, continuously for 28 days. The third, unexposed group served as a control. Exposure to SMF was conducted using two MADU stripes.

Results: Significant decrease ($p < 0.05$) of iron was observed in brain and liver with concomitant increase of iron in serum and spleen in exposed animals. Zinc content in exposed animals was significantly lower in the liver ($p < 0.01$), and higher in the brain ($p < 0.05$), compared to control. Significant decrease ($p < 0.05$) was observed in liver and brain Cu content in exposed animals.

Conclusion: These results from the animals exposed to the North pole SMF may suggest relocation of iron from storage in liver and brain to spleen, which further confirms the increase in serum Fe. This could indicate a possible stressful effect of SMF. Further results confirm competitive role of zinc and copper in tissues and that zinc can reduce the toxicity of heavy metals.

Key words: static magnetic field, iron, zinc, copper

THE ADVANTAGES OF NEW METHOD OF PERITONEAL DIALYSIS

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Introduction: Peritoneal dialysis (PD), is method of medical treatment of uremic patients. Long-term PD is associated with morphofunctional changes of peritoneal membrane (PM) due to use of bioincompatible dialysis solutions. There is a variety of PD experimental models but without consensus on the ideal model so far.

The Aim: We aimed to develop a new, modified experimental rabbit model of PD which would be practical, easy to conduct, relatively inexpensive and convenient to study long-term effects of dialysis solution on PM.

Materials and Methods: This study was performed on six healthy Chinchilla rabbits of both sexes. After i.v. Thiopental injection BP 1G, 0.5 ml/kg body mass, a catheter, specially made from Tro-soluset (Tröge Medical GMBH, Hamburg, Germany) infusion system, was surgically tunneled from animals' neck to abdomen and inserted at the bottom of the peritoneal cavity. During peritoneal catheter placement and removal peritoneal biopsies were taken for histological examination. After one week recovery period, dialysate instillations were performed for four weeks. A follow-up diary was kept for whole experimental period.

Results: All procedures were well tolerated by the animals. Rabbits gained body weight, had normal body temperature and no complications were noted. Peritoneal biopsies were adequate for histological analysis.

Conclusion: The presented modified PD model is practical, reproducible, does not require sophisticated technology and is well tolerated by the animals. That's why it is convenient for studying long-term effects of dialysate on rabbit PM.

Key words: peritoneal dialysis, experimental model, rabbit

HEMATOLOŠKI PARAMETRI, CELULARNOST SLEZINE I TIBIJE MLADIH PACOVA POSLE DUGOTRAJNOG IZLAGANJA STALNOM MAGNETNOM POLJU

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Uvod: Stalna magnetna polja (SMP) su vremenski nezavisna polja konstantne snage koja slobodno prolaze kroz tkiva. Sva živa bića su konstantno izložena Zemljinom prirodnom geomagnetnom polju intenziteta od oko 0,03 do 0,07 mT. Najveći generatori magnetnog polja su aparati za magnetnu rezonancu koji generišu od 150 do 9000 mT.

Cilj: Da se ispituju hematološki parametri, celularnost slezine i tibije kod mladih pacova nakon hroničnog izlaganja SMP.

Materijal i metode: Korišćeni su mužjaci Wistar soja pacova stari 10 nedelja. Nasumično su podeljeni u dve grupe od po 9 jedinki (kontrolnu i eksperimentalnu koja je celodnevno bila izložena SMP). Ogljed je trajao 10 nedelja. Eksperimentalna grupa je bila izložena SMP intenziteta 30 mT. Po završetku ogljeda svi pacovi su žrtvovani u etarskoj anesteziji cervikalnom dislokacijom. Za analizu je korišćena periferna krv, slezina i tibija.

Rezultati: Došlo je do značajnog porasta celularnosti slezine i tibije ($p < 0.01$). Celularnost slezine se povećala zahvaljujući povećanju procenta eritrocita ($p < 0.05$). Istovremeno je u slezini došlo do pada procenta limfocita ($p < 0.05$).

U perifernoj krvi je došlo do neutrofilije i limfocitopenije ($p < 0.01$), a bila je i prisutna tendencija pada broja leukocita.

Zaključak: Hronično izlaganje SMP dovodi do pozitivnog efekta na hematopoetske organe i aktivira adaptivnu reakciju organizma na hroničan stres.

Ključne reči: stalno magnetno polje, hronično izlaganje, mladi pacovi, hematološki parametri

HEMATOLOŠKI PARAMETRI SPONTANO HIPERTENZIVNIH PACOVA POSLE IZLAGANJA STALNOM MAGNETNOM POLJU U TRAJANJU OD 30 DANA

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Uvod: Stalna magnetna polja (SMP) su vremenski nezavisna polja čiji intenzitet može biti prostorno zavistan.

Cilj rada: Cilj ovog rada je bio da se ispita uticaj stalnog magnetnog polja na hematološke parametre kod spontano hipertenzivnih pacova.

Materijal i metode: Spontano hipertenzivni pacovi su podeljeni u dve grupe: 1. grupa izložena SMP; 2. kontrolna, neizložena grupa. Kao izvor magnetnog polja korišćene su MADU trake, a izloženi pacovi su pod njihovim uticajem bili 30 dana. Nakon tog perioda su žrtvovani i sakupljena je krv za dalje analize.

Rezultati: Hematološki parametri su promenjeni na sledeći način: smanjuje se broj leukocita na račun smanjenja broja limfocita u grupi koja je bila izložena uticaju SMP-a u odnosu na kontrolnu (neizloženu) grupu, a broj eritrocita ne pokazuje razlike među grupama. Kod životinja koje su bile pod uticajem SMP-a dolazi do smanjenja broja trombocita u odnosu na životinje koje nisu bile pod uticajem ovog polja. Vrednost MCHC je veća među izloženim pacovima SMP-u u odnosu na neizložene pacove.

Zaključak: Stalno magnetno polje uzrokuje promene hematoloških parametara kod spontano hipertenzivnih pacova, u smislu smanjenja broja ukupnih leukocita i limfocita, što se objašnjava stresogenim uticajem ovog polja na organizam u celini. Izlaganje SMP-u ne uzrokuje promenu broja eritrocita u krvi kod eksperimentalnih životinja.

Ključne reči: SMP, spontano hipertenzivni pacovi, hematološki parametri

HEMATOLOGICAL PARAMETERS, SPLEEN AND TIBIA CELLULARITY CHANGES IN YOUNG RATS CHRONICALLY EXPOSED TO STATIC MAGNETIC FIELDS

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Introduction: The static magnetic fields (SMF) are time-independent constant strength fields that freely pass biological tissues. All living creatures are exposed to Earth's natural geomagnetic field which ranges from 0.03 to 0.07 mT. The biggest generators of magnetic fields are magnetic resonance devices and they produce fields ranging from 150 to 9000 mT.

Goal: To examine the effects of chronic SMF exposure on the parameters of blood, spleen and tibia cellularity in young rats.

Materials and Methods: Wistar rats, who were 10 weeks old, were used. They have been randomly divided into 2 groups, 9 per group (control and experimental group which was exposed to SMF all day). Experiment lasted for 10 weeks. Experimental group was exposed to 30 mT intensity SMF. At the end of the experiment all rats were sacrificed. We used peripheral blood, spleen and tibia for analysis.

Results: There was a statistically significant increase of spleen and tibia cellularity ($p < 0.01$). Spleen cellularity increased thanks to red blood cells percentage increase ($p < 0.05$). Percentage of lymphocytes decreased in spleen cellularity ($p < 0.05$). Neutrophilia and lymphocytopenia were detected in peripheral blood ($p < 0.01$), and also the tendency of white blood cells number decrease.

Conclusion: Chronical exposure of SMF has positive effect on the function of the hematopoietic organs and activates the adaptive reaction upon chronic stress.

Keywords: Static magnetic field, chronic exposure, young rats, parameters of the blood

HEMATOLOGICAL PARAMETERS SPONTANEOUSLY HIPERTENSIVE RATS AFTER EXPOSURE TO STATIC MAGNETIC FIELD IN 30 DAYS

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Introductions: Static magnetic fields (SMFs) are time-independent fields whose intensity can be spatially dependent.

The Aim: Our study investigates influence of exposure SMF on hematological parameters in spontaneously hypertensive rats.

Materials and methods: Rats were divided in two groups: 1. group exposed to SMF; 2. unexposed group (control). As a source of SMF were used MADU stripes, and exposed rats were 30 days under their influence. Following this period, all rats were sacrificed and blood was collected for further analyses.

Results: Hematological parameters were changed as follows: decreased number of leukocytes at the expense of decreased number of lymphocytes in the group that was exposed to the SMF, compared to the control (unexposed) group, and a the number of red blood cells showed no difference between the groups. There was a decrease in platelets count in animals that were under the influence of SMF compared to animals that were not under the influence of this field. The value of MCHC was higher in rats exposed to the SMF compared to unexposed rats.

Conclusion: Static magnetic field causes the changes in hematological parameters in spontaneously hypertensive rats, in which decreased number of total leukocytes and lymphocytes could be explained by its stressful impact on the organism as a whole. SMF does not cause changes in the number of erythrocytes in the blood of experimental animals.

Keywords: SMF, spontaneously hypertensive rats, hematological parameters

UDRUŽENOST DISLIPIDEMIJE I KORONARNE BOLESTI SRCA U POSTMENOPAUZALNIH ŽENA

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Uvod: Dosadašnja istraživanja pokazuju da je koronarna bolest srca (KBS) vodeći uzrok smrti u većini zemalja sveta, kako za muškarce, tako i za žene. Incidenca KBS među ženama se posle menopauze značajno povećava.

Cilj rada: Cilj ovog rada je ispitivanje udruženosti dislipidemije i koronarne bolesti srca (KBS) u postmenopausalnih žena sa dislipidemijom i KBS i utvrđivanje njene prevalencije u odnosu na postmenopausalne žene sa dislipidemijom bez KBS.

Materijal i metode: Ispitivanje je obuhvatilo 40 bolesnica, podeljenih u 2 grupe: I 20 postmenopausalnih sa dislipidemijom i koronarnom bolesti i II 22 postmenopausalne žene sa dislipidemijom bez koronarne bolesti. Urađen je kompletan klinički pregled i laboratorijske analize.

Rezultati: Srednje vrednosti lipidnih markera odstupale su od poželjnih u obema grupama, ali su vrednosti ukupnog holesterola, LDL-H i triglicerida kod postmenopausalnih žena sa dislipidemijom i KBS bile znatno više. Isto važi i za lipidne indekse (LDL-H/HDL-H i Hol/HDL-H). Ne-lipidni faktori rizika: dijabetes, gojaznost i hipertenzija su takođe prisutniji u postmenopausalnih žena sa dislipidemijom i KBS.

Zaključak: Dislipidemija predstavlja vodeći faktor rizika za nastanak KBS u postmenopausalnih žena.

KLjučne reči: menopauza, dislipidemija, koronarna bolest srca

ASSOCIATION OF DYSLIPIDEMIA AND CORONARY ARTERY DISEASE IN POSTMENOPAUSAL WOMEN

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Introduction: Previous studies show that coronary artery disease is the leading cause of death in most countries, for both, man and women. The incidence of CAD among women after menopause increases significantly.

The aim: The aim of this study was to examine the association between dyslipidemia and coronary artery disease in postmenopausal women with dyslipidemia and coronary artery disease, and to establish its prevalence in relation to postmenopausal women with dyslipidemia without coronary artery disease.

Materials and methods: This study included 40 patients, divided into 2 groups: I 20 premenopausal with dyslipidemia and coronary artery disease and II 20 postmenopausal women with dyslipidemia without coronary artery disease. The complete clinical examination was carried out, the same as laboratory analyses.

Results: The average levels of lipid atherogenic markers deviated from those wanted ones in both groups, but in a group of postmenopausal women with dyslipidemia and coronary artery disease levels of total cholesterol, LDL-H and triglycerides were significantly higher. Similar, was established for lipid indexes (LDL-H/HDL-H and Hol/HDL-H). The others, non-lipid factors: diabetes, obesity and hypertension, were more present in a group of a postmenopausal women with dyslipidemia and coronary artery disease.

Conclusion: Dyslipidemia is a leading risk factor for CAD in postmenopausal women.

Keywords: menopause, dyslipidemia, coronary artery disease

PROCENA ENDOTELNE FUNKCIJE KOD BOLESNIKA SA STABILNOM KORONARNOM BOLEŠĆU NAKON PROGRAMA AEROBNOG FIZIČKOG TRENINGA

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Uvod: Redovna fizička aktivnost je dobro poznati i prihvaćeni faktor koji smanjuje ukupan mortalitet i poboljšava ishod brojnih oboljenja.

Cilj rada: Ispitati efekat umerenog aerobnog fizičkog treninga na kardiovaskularne pokazatelje, lipidni status i endotelnu funkciju u bolesnika sa stabilnom koronarnom bolešću (SKBS).

Pacijenti i metode: U istraživanje je uključeno 150 bolesnika obolelih od koronarne bolesti podeljenih u dve grupe (82 bolesnika sa SKBS i redovnim aerobnim fizičkim treningom (3 puta nedeljno po 45 minuta hodanja na traci, vožnje bicikla ili hodanja) tokom 6 nedelja i kontrola- 68 bolesnika sa SKBS koji u poslednjih 6 meseci nisu upražnjavali fizički trening). Kardiovaskularni, lipidni parametri i koncentracija azot oksida (NO) su određivani na početku i kraju ispitivanog perioda i upoređivani između grupa.

Rezultati: Efekat fizičkog treninga se nije odrazio na promenu telesne težine, obima struka i odnosa struk/kuk, ali je značajno redukovao indeks mase tela u odnosu na početne vrednosti i kontrolu ($p < 0.05$). U grupi sa fizičkim treningom dolazi do značajnog pada sistolnog i dijastolnog krvnog pritiska i srčane frekvencije ($p < 0.05$) nakon sprovedenog programa rehabilitacije fizičkom aktivnošću. Efekat šestonedeljnog programa kardiovaskularne rehabilitacije na lipidne parametre je vidljiv u značajnoj redukciji triglicerida (TG) i porastu NO i HDL-C u grupi sa fizičkim treningom u odnosu na početne vrednosti i kontrolu ($p < 0.05$).

Zaključak: Fizička aktivnost dovodi do povoljnih promena kardiovaskularnih i lipidnih pokazatelja i popravljanja endotelne funkcije u sekundarnoj prevenciji koronarne bolesti.

KLjučne reči: fizička aktivnost, krvni pritisak, gojaznost, lipidi, NO

THE ASSESSMENT OF ENDOTHELIAL FUNCTION IN PATIENTS WITH STABLE CORONARY DISEASE AFTER REGULAR AEROBIC PHYSICAL TRAINING

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Introduction: Regular physical activity is widely accepted as factor that reduces all-cause mortality and improves a number of health outcomes.

The Aim: Investigate the effects of aerobic exercise training on cardiovascular parameters, lipid profile and endothelial function in patients with stable coronary artery disease (CAD).

Patients and methods: The study included 150 patients suffering from coronary artery disease. Patients were divided into two groups: I group- 82 patients with CAD and with regular aerobic physical training (3 times a week for 45 minutes of walking on the treadmill, room bicycle or walking) for 6 weeks, and II control group -68 patients with CAD and sedentary lifestyle. Cardiovascular, lipid parameters and the concentration of nitric oxide (NO) were determined at the beginning and end of the examination period and compared between groups.

Results: The exercise training didn't reflected the change in body weight, waist obime and waist/hip ratio ($p < 0.05$). Physical training significantly reduced body mass index, compared to starting and control values. Physical training significantly reduced systolic and diastolic blood pressure and heart rate ($p < 0.05$). The effect of six week program of cardiovascular rehabilitation on lipid parameters was evident in the significant reduction in triglyceride (TG) and increase in NO and HDL-C in the group with physical training compared to starting and control values ($p < 0.05$).

Conclusion: Physical activity leads to favorable changes in lipid parameters and cardiovascular and endothelial function in the secondary prevention of coronary heart disease.

Key words: physical activity, blood pressure, obesity, lipids, NO

AKTIVNOST DIPEPTIDIL PEPTIDAZE IV U KULTURI LIMFOCITA BOLESNIKA SA TIPOM 2 DIJABETES MELITUSA

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Uvod: Dipeptidil peptidaza IV (DPP IV) je imunomodulatorni ektoenzim lokalizovan na površini limfocita, kao i na drugim tkivima. DPP IV razlaže glukagonu-sličan peptid 1 (GLP-1), gastrointestinalni hormon, koji podstiče oslobađanje insulina i izaziva osećaj sitosti. Primećeno je da je nivo GLP-1 snižen kod tip 2 dijabetičara (T2DM) nakon oralnog opterećenja glikozom, što može biti u vezi sa patogeneзом T2DM i biti od značaja u terapiji tipa 2 dijabetesa. **Cilj rada:** Cilj ovog istraživanja bilo je određivanje nivoa enzimske aktivnosti dipeptidil peptidaze IV u gojaznih bolesnika sa tipom 2 dijabetesa i kod ispitanika kontrolne grupe, kako bi se razjasnili neki od elemenata patogeneze T2DM.

Materijali i metode: U istraživanje je uključeno 16 gojaznih osoba sa tipom 2 dijabetes melitusa i 12 zdravih osoba (kontrolna grupa), kojima su određeni bazični klinički i laboratorijski parametri kao i aktivnost enzima DPP IV u kulturi limfocita, u nestimulisanim, ConA i PMA stimulisanim limfocitima.

Rezultati rada: Aktivnost DPP IV nestimulisanih i Con A stimulisanih limfocita bolesnika sa tipom 2 DM i kontrolne grupe nije se statistički razlikovala. U PMA stimulisanim limfocitima, aktivnost DPP IV bila je signifikantno povišena ($p < 0,005$ u odnosu na kontrolnu grupu).

Zaključak: Aktivnost DPP IV bila je signifikantno povišena u stimulisanim limfocitima ispitanika sa tipom 2 DM u odnosu na kontrolnu grupu, što može biti od patogenetskog značaja u tipu 2 DM i imati uticaja na izbor terapijskog agensa kod ovih bolesnika.

Ključne reči: T2DM, DPP-IV, GLP-1, insulinska rezistencija

THE ACTIVITY OF DIPEPTIDYL PEPTIDASE IV IN CULTURED LYMPHOCYTES OF PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Introduction: Dipeptidyl peptidase IV (DPP IV) is an immunomodulatory ectoenzyme on a lymphocyte surface, and in other tissues, which splits up glucagon-like peptid 1 (GLP-1). GLP-1 is a gastrointestinal hormone, mainly secreted in nutrient-dependent manner, which enhances glucose induced insulin secretion and induces satiety. The reduction of oral glucose-stimulated active GLP-1 levels in T2DM could contribute to the pathogenesis of hyperglycemia in T2DM.

The Aim: The aim of this study was to determine the enzymatic activity of the DPP IV in cultured lymphocytes of obese patients with type 2 diabetes and in the control subjects, in order to get better insight into pathogenetic importance of DPP IV in T2DM.

Materials and Methods: This investigation included 16 obese patients with T2DM (clinical group) and 12 healthy subjects (control group). Basic laboratory and clinical parameters were determined in both groups. The activity of DPP IV was measured in non-stimulated, ConA-stimulated and PMA-stimulated cultured lymphocytes of healthy subjects and type 2 diabetics.

Results: The activity of DPP IV in non-stimulated and in Con A-stimulated lymphocytes of T2DM patients was not statistically different between patients with T2DM and control group subjects. In PMA-stimulated lymphocytes, the activity of DPP IV was significantly higher in T2DM in comparison to the control group ($p < 0.005$).

Conclusion: Based on the results of this study, we can conclude that the increased activity of DPP IV found in stimulated lymphocytes of type 2 diabetics could be important for selection of appropriate oral treatment of T2DM.

Keywords: T2DM, DPP-IV, GLP-1, insulin resistance

AKTIVNOST AMINOPEPTIDAZE N (CD13) U KULTURI LIMFOCITA BOLESNIKA SA TIPOM 2 DIJABETES MELITUSA

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Uvod: Aminopeptidaza N (APN) je enzim koji pripada grupi egzopeptidaza, enzima koji hidrolizuju i inaktiviraju neke od peptida (substancija P, somatostatin, angiotenzin III, vazopresin, kalidin, dinorfin, leu- i met-enkefalin) koji utiču na nutritivni status i energetske balans kod čoveka. Uloga APN u patogenezi T2DM nije razjašnjena, mada je uočena povišena enzimiska aktivnost APN i kolokalizacija sa DPP IV kod tip 2 dijabetičara.

Cilj: Cilj ovog istraživanja je određivanje nivoa enzimske aktivnosti aminopeptidaze N u gojaznih bolesnika sa tipom 2 dijabetesa i kod ispitanika kontrolne grupe, kako bi se razjasnili neki od elemenata patogeneze T2DM.

Materijali i metode: U istraživanje je uključeno 16 gojaznih osoba sa tipom 2 dijabetes melitusa i 12 zdravih osoba (kontrolna grupa), kojima su određeni bazični klinički i laboratorijski parametri. Mononuklearne ćelije periferne krvi su izolovane iz 10 ml sveže uzete heparinizovane krvi. Nakon odgovarajuće inkubacije merena je aktivnost aminopeptidaze N u nestimulisanim, ConA i PMA stimulisanim limfocitima zdravih osoba i tip 2 dijabetičara.

Rezultati: Vrednosti APN u nestimulisanim, ConA stimulisanim i PMA stimulisanim limfocitima, bile su statistički signifikantno više kod bolesnika sa T2DM, u odnosu na kontrolnu grupu.

Zaključak: Aktivnost APN u limfocitima T2DM bila je statistički signifikantno povišena, što može biti od značaja za patogenezu i terapiju tipa 2 DM.

Ključne reči: T2DM, aminopeptidaza N/CD13, insulinska rezistencija, nutritivni status

THE ACTIVITY OF AMINOPEPTIDASE N IN CULTURED LYMPHOCYTES OF PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Introduction: Aminopeptidase N is an ectoenzyme, capable of releasing free amino acids as the final product of peptide hydrolysis. Several peptides (substance P, somatostatin, etc.) hydrolyzed by APN are known to exert effect on nutritional status and energy balance. Role of APN in pathogenesis of T2DM is still unknown, although some data suggest that its increased activity and colocalization with CD 26 (DPP-IV) are present in T2DM.

The Aim: The aim of this study was to determine the enzymatic activity of the APN in cultured lymphocytes of obese patients with type 2 diabetes and in the control subjects, in order to get better insight into pathogenetic importance of APN in T2DM.

Materials and Methods: This investigation included 16 obese patients with T2DM (clinical group) and 12 healthy subjects (control group). Basic laboratory and clinical parameters were determined in both groups. Mononuclear cell from the peripheral blood were isolated out of 10 ml fresh heparinized blood. After appropriate incubation time, the activity of APN was measured in non-stimulated, ConA-stimulated and PMA-stimulated cultured lymphocytes.

Results: APN level was significantly higher in type 2 diabetics in comparison to the control group (in non-stimulated, Con A stimulated and PMA stimulated lymphocytes ($p < 0.05$)).

Conclusion: Based on the results of this study, we can conclude that the increased activity of APN measured in cultured lymphocytes of type 2 diabetics could be important for pathogenesis of T2DM. More extensive research is essential for better understanding of these result.

Key words: T2DM, aminopeptidase N, insulin resistance, nutritivni status

MARKERI INTOKSIKACIJE OHRATOKSINOM A KOD BOLESNIKA SA KARCINOMOM GORNJEG UROTELA

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Uvod: Povećana učestalost karcinoma pijelona i uretera nađena je kod bolesnika sa endemskom nefropatijom (EN). Pravi uzrok nastanka EN je nepoznat. Najveći broj istraživača smatra primarnim dejstvo činioca životne sredine. Posebnu pažnju je izazvalo proučavanje uticaja mikotoksina (Ohratoksin A, OTA).

Cilj rada: Određivanje markera intoksikacije OTA u tkivu karcinoma urotela u odnosu na prisustvo ili odsustvo EN.

Materijal i metode: Studijom je obuhvaćeno 60 operisanih pacijenata sa tumorom gornjeg urotela sa i bez EN, gde je urotelni karcinom potvrđen patohistološkim nalazom. Mikromorfološka analiza vršena je na standardnim HE preparatima. Imunohistoheimska Avidin-Biotin Complex metoda korišćena je za detekciju proliferativne i nuklearne aktivnosti ubikvitin konjugujućeg enzima E2 (UBE2N), intraćelijske membranske aktivnosti hipoksijom pozitivno regulisanog proteina 1 (HYOU1), i nuklearne aktivnosti eukariotskog translacionog faktora 5A-1, (EIF5A).

Rezultati: Mikromorfološke karakteristike karcinoma gornjeg urotelija nisu predstavljene statistički značajnim razlikama. Citoplazmatska aktivnost UNE2N bila je značajno pojačana u tkivu EN ispitanih ($p < 0,01$). Njegova ekspresija u jedru nije pokazala vrednosti veće od graničnih kod svih ispitanika. Povišena aktivnost retikularnog markera HYOU1 u citoplazmi značajno je utvrđena u tkivu EN pacijenata ($p < 0,01$). Vrednosti transkripcionog faktora EIF5A u jedru ćelija karcinoma EN pacijenata bile su takođe značajno povišene ($p < 0,05$).

Zaključak: Ćelijski proteinski markeri karakteristični za metabolizam OTA (UBE2N, HYOU1, EIF5A) prisutni su značajno u tkivu tumora gornjeg urotelija EN pacijenata. Nalaz ovih markera ukazuje na potencijalnu ulogu toksina u razvoju kasnih komplikacija EN-a, kao što je pojava karcinoma gornjeg urotela.

Ključne reči: endemska nefropatija, karcinom gornje urotela, ohratoksin A

KARIOMETRIJSKA ANALIZA MUKUSNIH ĆELIJA RESPIRATORNOG EPITELA KOD BOLESNIKA SA BRONHIJALNOM ASTMOM I ALERGIJSKIM RINITOM

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Uvod: Najčešće alergijske reakcije su alergije disajnih puteva, sa astmom i alergijskim rinitisom kao dva ključna klinička entiteta. Teškoće pri njihovom dijagnostičkom razlikovanju se pripisuju njihovoj patofiziologiji, kliničkoj manifestaciji i terapiji.

Cilj: Predmet studija je da se odredi kvantitet i da se uporede nazalne mukozne ćelije epitela karakteristične za pacijente sa bronhijalnom astmom i alergijskim rinitisom.

Matrijal i metode: Uzorci citologije nazalne mukoze su dobijeni nazalnim brisom 20 pacijenata sa astmom i 14 pacijenata sa rinitisom. Svi uzorci su bojeni hematoksilin-eozin metodom i ispitani pomoću Olympus BX50 mikroskopa. Vidljiva polja su nasumično izabrana i digitalizovana. Analizirali smo sledeće parametre: oblast jedra, dužine najduže i najkraće ose jedra, odnos između najduže i najkraće ose jedra, obim jedra, oblina jedra, gustina jedra i površina mnogougaoe ravni.

Rezultati: Citološki uzorci su pokazali velik broj mukoznih ćelija, neutrofila, par plazma ćelija i eozinofila. Svi ispitani parametri pokazuju značajnu razliku između ispitanih grupa. Prosječna površina jedra mukoznih ćelija; najduža i najkraća osa, obim jedra, gustina i površina poligonalne ravni su veće; dok su odnos najduže i najkraće ose kao i oblina jedra manje u pacijentima sa alergijskim rinitisom.

Zaključak: Naša studija pokazuje da se kariometrijski parametri mukoznih ćelija između pacijenata sa astmom i alergijskim rinitisom razlikuju, što može biti pripisano različiti aktivnosti ovih ćelija. Kariometrijska analiza mukoznih ćelija može pomoći u slučajevima dijagnostičke neodoumice između ove dvije bolesti.

Ključne riječi: kariometrija, bronhijalna astma, rinitis, mukozne ćelije, alergija

MARKERS OF OCHRATOXIN A INTOXICATION IN PATIENTS WITH UPPER UROTHEL CARCINOMA

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Introduction: Increased incidence of pyelon and ureter carcinoma was found in patient with endemic nephropathy (EN). Real causes of EN are still unknown. Researchers considered the environmental factors as major one. Particular attention was given to the impact of mycotoxins (such as Ochrotoxin, OTA).

The Aim: Determination of OTA intoxication markers in urothel carcinoma tissues from patients with/without EN.

Materials and methods: The study included 60 surgically treated patients with upper urothel tumors with/without EN, whereas diagnose was confirmed histologically. Micromorphological analyses were performed on standard HE slides. Immunohistochemical Avidin-Biotin Complex method was used for detection of proliferative activity of Ubiquitin-conjugating enzyme E2 N (UBE2N), intracellular membranes activities of hypoxia up-regulated protein 1 *HYOU1 and nuclear activities of eukaryotic translational initial factor 5A-1 (EIF5A).

Results: Micromorphological characteristics of upper urothel carcinoma were not significantly different among experimental groups. Cytoplasmatic activity of UNE2N was stronger in tissues from EN patients ($p < 0,01$). Its nuclear expressions were not above the defined limits in all examinees. Higher activity of reticular marker HYOU1 in cytoplasm was significant in samples from EN patients ($p < 0,01$). EIF5A values as transcriptional factor were significant in nuclei from tissues from EN patients ($p < 0,05$).

Conclusion: Cellular proteins markers which are characteristic for OTA metabolism (UBE2N, HYOU1, EIF5A) are presented significant in upper urothel tumours tissues from EN patients. Detection of these markers indicates the potential role of toxins in the development of EN late complications such as appearance of upper urothel carcinoma.

Key words: endemic nephropathy, upper urothel carcinoma, ochratoxin A

KARYOMETRIC ANALYSIS OF GOBLET CELLS IN PATIENTS WITH BRONCHIAL ASTHMA AND ALLERGIC RHINITIS

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Introduction: The most frequent allergic diseases are respiratory allergic diseases, with asthma and allergic rhinitis as the two most important clinical entities. Difficulties in their diagnostic differentiation are due to similarity in their pathophysiology, clinical manifestations, and therapy.

The Aim: The study objective was to quantify and compare nasal epithelium goblet cells nuclei characteristics in patients with bronchial asthma and allergic rhinitis.

Material and methods: The nasal mucosa cytology specimens were obtained by nasal smear from 20 asthma patients and 14 patients with rhinitis. All samples were stained by hematoxylin-eosin method and examined using an Olympus BX50 microscope. Visual fields were randomly selected and digitalized. The following parameters were analysed: nuclear area, longest and shortest nuclear axis, ratio of longest axis to shortest axis, nuclear perimeter, nuclear roundness, nuclear density, and area profile on polygonal plane.

Results: The cytology samples showed a large number of goblet cells, neutrophils, a few plasma cells and eosinophils. All examined parameters showed significant difference between analysed groups. Average nuclear area of goblet cells, longest and shortest axis lengths, nuclear perimeter, nuclear density and area-polygon were larger; while longest axis to shortest axis ratio and nuclear roundness were smaller in patients with rhinitis allergica.

Conclusion: Our study showed that goblet cells karyometric parameters differ among patients with asthma and allergic rhinitis, which might be ascribed to the difference in activity of these cells.

Karyometric examination of goblet cells could help in cases of diagnostic uncertainty between these diseases.

Key words: karyometry, bronchial asthma, rhinitis, goblet cells, allergy

UTICAJ HIPERTIREOIDIZMA NA POKAZATELJE BUBREŽNE FUNKCIJE

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Uvod: S obzirom na uticaj hipertireoidizma na nivo cistatina C i kreatinina, postavlja se pitanje mogućnosti pravilne procene jačine glomerulske filtracije (JGF) kod ovih bolesnika.

Cilj: Cilj rada je ispitivanje uticaja hiperfunkcije štitaste žlezde na serumske koncentracije cistatina C i kreatinina.

Materijal i metode: U ispitivanje je uključeno 30 bolesnika sa novodijagnostikovanom hipertireozom sa prethodno isključenom bubrežnom bolešću. Kontrolnu grupu sačinjavalo je 20 zdravih ispitanika koji odgovaraju ispitivanoj grupi prema starosti i polu. Svim ispitanicima određivana je koncentracija FT3, FT4, TSH, kreatinina i cistatina C. Vrednost JGF procenjena je jednačinama baziranim na serumskim koncentracijama kreatinina (MDRD i CKD-EPI) i jednačinom baziranom na vrednosti cistatina C.

Rezultati: Značajno više vrednosti cistatina C su nađene u grupi hipertireoidnih bolesnika u odnosu na kontrolnu grupu ($1,35 \pm 0,29$ vs. $0,89 \pm 0,15$; $p < 0,01$). Vrednosti kreatinina statistički su značajno niže u grupi hipertireoidnih bolesnika u odnosu na kontrolnu grupu ($60,2 \pm 10,2$ vs. $76,4 \pm 8,6$; $p < 0,01$). Između grupe hipertireoidnih bolesnika i kontrolne grupe ispitanika nađena je statistički značajna razlika u vrednostima JGF procenjene prediktivnim jednačinama MDRD ($102,3 \pm 21,04$ vs. $88,1 \pm 9,1$ ml/min/1,73m²; $p < 0,01$) i CKD-EPI ($101,43 \pm 14,2$ vs. $92,3 \pm 10,3$ ml/min/1,73m²; $p < 0,01$), kao i jednačinom baziranom na vrednostima seruskog cistatina C ($56,39 \pm 19,71$ vs. $107,7 \pm 29,1$ ml/min/1,73m²; $p < 0,01$).

Zaključak: Ukoliko je kod bolesnika sa hipertireoidizmom JGF procenjena na osnovu vrednosti kreatinina i cistatina C, trebalo bi ponoviti merenja ovih parametara i određivanja JGF nakon uspostavljanja eutireoidnog statusa. Prilikom procene JGF na osnovu cistatina C i kreatinina trebalo bi imati u vidu funkcijsko stanje štitaste žlezde.

KLjučne reči: hipertireoidizam, cistatin C, kreatinin, JGF

IMPACT OF HYPERTHYROIDISM ON RENAL FUNCTION INDICATORS

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Introduction: Hyperthyroidism affects serum cystatin C and creatinine levels, so the question is whether it is possible to accurately estimate glomerular filtration rate (GFR) in such patients.

Goal: To determine influence of hyperthyroidism on serum cystatin C and creatinine levels.

Material and methods: The study included 30 patients with newly diagnosed hyperthyroidism and 20 healthy age and gender matched controls. Serum concentrations of TSH, FT3, FT4, creatinine and cystatin C were measured in all subjects. GFR was estimated using the Modification of Diet in Renal Disease (MDRD), the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) and cystatin C-based equations.

Results: Serum cystatin C levels were significantly higher in hyperthyroid patients compared to controls (1.35 ± 0.29 vs. 0.89 ± 0.15 ; $p < 0.01$). Serum creatinine levels were significantly lower in hyperthyroid subjects compared to controls (60.2 ± 10.2 vs. 76.4 ± 8.6 ; $p < 0.01$). GFR estimated with the MDRD equations was significantly higher in hyperthyroid patients compared to controls (102.3 ± 21.04 vs. 88.1 ± 9.1 ml/min/1.73m²; $p < 0.01$), as well as GFR estimated with the CKD-EPI equations (101.43 ± 14.2 vs. 92.3 ± 10.3 ml/min/1.73m²; $p < 0.01$). GFR estimated with the cystatin C-based equation was significantly lower in hyperthyroid subjects compared to controls (56.39 ± 19.71 vs. 107.7 ± 29.1 ml/min/1.73m²; $p < 0.01$).

Conclusion: If the GFR in hyperthyroid patients is estimated by the values of creatinine and cystatin C, the determination of these parameters and GFR should be repeated after the re-establishment of euthyroid status. During determination of GFR based on cystatin C and creatinine values, the condition of the thyroid gland should be taken into account.

Keywords: Hyperthyroidism, Cystatin C, Creatinine, Glomerular Filtration Rate

KORELACIJA SCINTIGRAFIJE SA 99mTc-TEKTRTYDOM I HROMOGRANINA A KOD PACIJENATA SA KARCINOIDNIM TUMOROM

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Uvod: Karcinoidi su grupa tumora sa neuroendokrinom diferencijacijom koju odlikuje niska incidenca, spori rast i metastaziranje.

Cilj: Cilj ovoga rada je bio da utvrdi dijagnostički značaj scintigrafije somatostatin receptora sa 99mTc-EDDA-HYNIC-TOC (99mTc-Tektrotyd) kao i vrednosti biološkog markera hromogranina-A (CgA) kod pacijenata sa karcinoidnim tumorima.

Materijal i metode: Ispitivano je 55 pacijenata (29 muškaraca i 26 žena) sa dokazanim ili suspektim karcinoidima. Kod svih pacijenata je rađena analiza krvi na CgA a zatim scintigrafija sa somatostatin analogom 99mTc-EDDA-HYNIC-TOC (99mTc-Tektrotyd). Kod pacijenata je rađeno opešno ispitivanje prisustva tumora i metastaza korišćenjem različitih vizuelizacionih metoda kao i nuklearno-medicinskih metoda uključujući scintigrafiju koštanog sistema sa 99mTc-DPD, scintigrafiju štitaste žlezde sa 99mTc-pertechnetatom i 99mTc-MIBI, scintigrafiju paratireoidne žlezde sa 99mTc-MIBI, scintigrafiju sa 131I-MJBG i pozitronsku emisiju tomografiju sa 18F-FDG.

Rezultati: Ukupna senzitivnost 99mTc-Tektrotyd skena po pacijentu je iznosila 86%, specifičnost 78%, pozitivna prediktivna vrednost 80% a negativna prediktivna vrednost 84%. Dobijene vrednosti za CgA su iznosile: senzitivnost 67%, specifičnost 76%, negativna prediktivna vrednost 77%, pozitivna prediktivna vrednost 76% i u značajnoj meri su bile više od nalaza skena. Dobijena je signifikantna korelacija nalaza skena ($R 0,570$, $p < 0,001$) i biološkog markera ($R 0,426$, $p < 0,001$) u odnosu na konačnu dijagnozu.

Zaključak: Rezultati ukazuju da scintigrafija somatostatin receptora sa 99mTc-Tektrotydom kao i biološki marker CgA pouzdano oslikavaju klinički status pacijenata sa karcinoidom i da mogu biti izuzetno korisni u dijagnostici i monitoringu pacijenata sa ovim tumorima.

KLjučne reči: karcinoid, hromogranin A, somatostatin receptor

CORRELATION SCINTIGRAPHY WITH 99mTc-TEKTRTYD AND CHOMOGRANIN A TO PATIENTS WITH CARCINOID TUMOR

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Introduction: Carcinoids are a group of tumors with neuroendocrine differentiation characterized by a low incidence, slow growth and metastasis.

Objective: The objective of this study was to determine the diagnostic significance of somatostatin receptor scintigraphy with 99mTc-EDDA-HYNIC-TOC (99mTc-Tektrotyd) and the value of biological markers-chromogranin A in patients with carcinoids.

Materials and methods: 55 patients (29 men and 26 women) with proven or suspected carcinoid were examined. Blood tests on CgA and scintigraphy with the somatostatin analogue, 99mTc-EDDA-HYNIC-TOC (99mTc-Tektrotyd), were done in all patients. Patients were subject to extensive testing on the presence of tumors and metastases, using various imaging methods and nuclear medicine methods including skeletal imaging with 99mTc-DPD, thyroid scintigraphy with 99mTc-pertechnetate and 99mTc -MIBI, parathyroid scintigraphy with 99mTc-MIBI, scintigraphy with 131I-MJBG and positron emission tomography with 18F-FDG.

Results: The overall sensitivity of 99mTc-Tektrotyd scan per patient was 86%, specificity 78%, positive predictive value 80% and negative predictive value 84%. The obtained values of CgA were: sensitivity 67%, specificity 76%, negative predictive value 77%, positive predictive value 76% and were significantly higher than the findings of the scan. In comparison with final diagnosis, significant correlation of the scan findings ($R 0.570$, $p < 0.001$) and biological markers ($R 0.426$, $p < 0.001$) was obtained.

Conclusion: The results indicate that somatostatin receptor scintigraphy with 99mTc-Tektrotydom as a biological marker CgA, reliably reflect the clinical status of patients with carcinoid and can be extremely useful in the diagnostics and monitoring of patients with these tumors.

Key words: carcinoid, chromogranin A, somatostatin receptor

ZNAČAJ SCINTIGRAFIJE SA ^{99m}Tc-TEKTROTYDOM KOD PACIJENATA SA KARCINOIDNIM TUMOROM

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Uvod: Karcinoidi su grupa tumora sa neuroendokrinom diferencijacijom koju odlikuje niska arcinoma, spori rast i metastaziranje.

Cilj: Cilj ovoga rada je bio da ispita mogućnosti obeleženog analoga somatostatina ^{99m}Tc-EDDA-HYNIC-TOC (^{99m}Tc-Tektrotyd) u detekciji i određivanju stepena proširenosti karcinoidnih tumora.

Materijal i metode: Ispitivano je 55 pacijenata sa dokazanim ili suspektnim karcinoidom (29 muškaraca i 26 žena). Kod svih pacijenata je rađena scintigrafija sa somatostatin analogom dva sata nakon aplikovanja ^{99m}Tc-EDDA-HYNIC-TOC (^{99m}Tc-Tektrotyd), zatim imunohistohemijska analiza na sinaptofizin i hromogranin A kao i određivanje proliferacionog indeksa ki67.

Rezultati: Karcinoidni tumor je bio prisutan kod 53 od 55 ispitanika, od toga kod 36 se radilo o dobro diferentovanim tumorima sa niskim proliferacionim indeksom Ki67, njih 11 imalo je karakteristike dobro diferentovanih arcinoma dok je 6 imalo slabo diferentovane karcinome sa proliferacionim indeksom preko 15%. Kod 21 pacijenta je negativan nalaz skena korelirao sa negativnim nalazom dobijenim drugim metodama, dok je kod 24 pacijenta sa pozitivnim scintigrafskim nalazom potvrđena bolest. Šest ispitanika je imalo lažno negativan nalaz skena, a 4 pacijenta lažno pozitivne promene. Najveća učestalost stvarno pozitivnih nalaza od 71% je dobijena kod pacijenata sa niskim proliferacionim indeksom ispod 2% dok je 4 od 6 lažno negativnih imalo proliferacioni indeks preko 15%.

Zaključak: Rezultati ukazuju da je somatostatin receptor scintigrafija sa ^{99m}Tc-Tektrotydom senzitivna i specifična metoda za dijagnostikovanje i stadiranje pacijenata sa dobro diferentovanim karcinoidnim tumorima. Međutim, kod slabo diferentovanih karcinoidnih tumora sa visokim ki67 proliferacionim indeksom treba raditi dodatna ispitivanja radi preciznog stadiranja.

Ključne reči: karcinoid, somatostatin receptor, ^{99m}Tc-Tektrotyd

SIGNIFICANCE OF SCINTIGRAPHY WITH ^{99m}Tc-TEKTROTYD IN PATIENTS WITH CARCINOIDS

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Introduction: Carcinoids are a group of tumors with neuroendocrine differentiation characteristic by the low incidence, slow growth, and metastasis.

Aim: The aim of this work is to investigate the possibilities of the marked analog somatostatin ^{99m}Tc-EDDA-HYNIC-TOC in order to detect the extent of carcinoid.

Materials and methods: 55 patients with carcinoid, either proved or suspected, were investigated (29 men and 26 women). All the patients had scintigraphy with somatostatin analog for two hours after applying ^{99m}Tc-EDDA-HYNIC-TOC, and then immunohistemic analysis on synaptophysin and chromogranin A, as well as determining proliferational index ki67.

Results: Carcinoid tumor was present at 53 out of 55 patients, and 36 patients had a well differentiated tumors with a low proliferational index ki67, 11 patients had the characteristics of well differentiated tumors, while 6 patients had poorly differentiated carcinomas with the proliferational index above 15%. The negative scan results of 21 patients were correlated with the negative results obtained by some other methods, while 24 patients, whom scintigraphic results turned positive, were confirmed to be ill. 6 patients, who were investigated, falsely received the negative result of the scan, and 4 patients had positive changes which were false.

Conclusion: The results show that the somatostatin receptor scintigraphy with ^{99m}Tc-Tektrotydom is a sensitive and specific method used for the diagnosis of patients with well differentiated carcinoids. However, when mentioning weakly differentiated carcinoid tumors with high proliferational index ki67 it should be noted that some additional tests should be done.

Key words: carcinoid, somatostatin receptor, ^{99m}Tc-Tektrotyd

Uloga scintigrafije sa ^{99m}Tc (V)-(DMSA) u vizualizaciji primarnog medularnog karcinoma štitaste žlezde

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Uvod: U vreme dijagnoze medularnog tireoidnog karcinoma (MTK) mnogi pacijenti već imaju regionalne ili udaljene metastaze. Scintigrafija tumorotropnim radiofarmacima omogućava vizuelizaciju primarnog MTK i njegovih metastaza, na osnovu čega se određuje način lečenja.

Cilj rada: Sagledavanje uloge scintigrafije celog tela sa pentavalentnim ^{99m}Tc-dimerkaptosukcinatom [^{99m}Tc (V)-DMSA] u vizuelizaciji primarnog medularnog karcinoma tireoideje.

Materijal i metode: Scintigrafija sa ^{99m}Tc (V)-DMSA urađena je kod 17 pacijenata sa kliničkim (tiroidni nodus) i biohemijskim (povišen serumski nivo kalcitonina ili karcinoembrionalnog antigena; kalcitonin: 5,0-2630 pg/ml, karcinoembrionalni antigen: 5,0-85,0 ng/ml) nalazima suspektnim na primarni MTK. Kod 16-oro pacijenata dijagnoza je postavljena nakon tireoidektomije, biopsije ili aspiracione citologije tireoidnog čvora, a kod jedne pacijentkinje na osnovu nalaza dva ^{99m}Tc (V)-DMSA scintigrama, konstantno visokih nivoa kalcitonina i kliničkih simptoma progresije bolesti. Fokus povećane akumulacije radiofarmaka na scintigramu smatrani su pozitivnim nalazom.

Rezultati: Osam od 17 pacijenata imalo je MTK. Senzitivnost i specifičnost ^{99m}Tc (V)-DMSA scintigrafije za vizuelizaciju primarnog tumora je 87,5% i 77,8%. Lažno pozitivni nalazi dobijeni su kod dva pacijenta sa papilarnim tiroidnim karcinomom koji su imali lako povišen nivo kalcitonina. Lažno negativan nalaz dobijen je kod jedne pacijentkinje sa tiroidnim nodusom manjim od 10 mm u prečniku. Metastaze u cervikalnim limfnim nodusima vizualizovane su kod dva od četiri pacijenta, a udaljene metastaze (u kostima) kod jedne pacijentkinje.

Zaključak: Dobijeni nalazi pokazuju da ^{99m}Tc (V)-DMSA scintigrafija ima visoku senzitivnost za vizuelizaciju primarnog MTK. Kako se njome mogu prikazati i udaljene metastaze, teba je rutinski koristiti za planiranje terapije.

Ključne reči: medularni tiroidni karcinom, kalcitonin, ^{99m}Tc (V)-DMSA scintigrafija

The role of ^{99m}Tc (V)-(DMSA) scintigraphy in visualisation of primary medullary thyroid carcinoma

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Introduction: At time of diagnosis of medullary thyroid carcinoma (MTC) many of patients already have regional or distant metastases. Scintigraphy with tumor-avid radiopharmaceuticals enables visualisation of primary MTC and its metastases. Based on it, therapy approach may be selected.

The Aim: Evaluation of the role of pentavalent ^{99m}Tc-dimerkaptosuccinic acid [^{99m}Tc (V)-DMSA] whole-body scintigraphy in visualisation of primary MTC.

Materials and methods: ^{99m}Tc (V)-DMSA scintigraphy was performed in 17 patients with clinical (thyroid nodule) and biochemical (elevated serum calcitonin or carcinoembryonic antigen levels; calcitonin: 5.0-2630 pg/ml, carcinoembryonic antigen: 5.0-85.0 ng/ml) findings suggestive of primary MTC. In 16 patients diagnosis was established after thyroidectomy, biopsy or aspiration cytology of thyroid nodule, but in one patient upon the basis of repeated ^{99m}Tc (V)-DMSA scintigram, high calcitonin levels and signs of disease progression. The foci of increased radiopharmaceutical uptake on scintigram were considered as positive finding.

Results: Eight of 17 patients had MTC. The sensitivity and specificity of ^{99m}Tc (V)-DMSA scintigraphy for primary tumor visualisation was 87.5% and 77.8%. False-positive findings were obtained in two patients with papillary thyroid carcinoma. False-negative finding was found in one patient with thyroid nodule smaller than 10 mm in diameter. Cervical lymph node metastases were visualized in two of four patients, and distant metastases (in bones) in one patient.

Conclusion: The findings showed that ^{99m}Tc (V)-DMSA scintigraphy has high sensitivity for primary MTC visualisation. Since the method can also show distant metastases, should be routinely used for treatment planning.

Key words: medullary thyroid carcinoma, calcitonin, ^{99m}Tc (V)-DMSA scintigraphy

ZNAČAJ SCINTIGRAFIJE SA ^{99m}Tc (V)-DMSA ZA DETEKCIJU METASTAZA MEDULARNOG TIREOIDNOG KARCINOMA KOD PACIJENTA SA HIPERKALCITONINEMIJOM NAKON OPERATIVNOG LEČENJA

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Uvod: Bez obzira na primenu novijih vizuelnih metoda, scintigrafija sa petovalentnim ^{99m}Tc-dimerkaptosukcinatom [^{99m}Tc (V)-DMSA] se često primenjuje za postoperativnu lokalizaciju tumorskih fokusa kod pacijenata sa medularnim tireoidnim karcinomom (MTK) koji imaju konstantno povišen nivo kalcitonina (Ct) u serumu.

Cilj rada: Evaluacija scintigrama sa ^{99m}Tc (V)-DMSA kod pacijenata sa medularnim karcinomom štitaste žlezde koji su imali permanentnu hiperkalcitoninemiju nakon tireoidektomije.

Materijal i metode: Nalazi 22 scintigrama celog tela sa ^{99m}Tc (V)-DMSA dobijeni kod 11 pacijenata sa povišenim kalcitoninom nakon tireoidektomije zbog MTK (6 žena, starost: 27-65 god., nivo Ct: 21.0-20610 pg/ml) upoređeni su sa nalazima drugih scintigrafskih i radioloskih metoda koje su korišćene za lokalizaciju metastatskih lezija. Patološkim nalazom ^{99m}Tc (V)-DMSA scintigrama smatrani su fokusi povećane akumulacije radiofarmaka.

Rezultati: Bilo je 10 stvarno pozitivnih, 10 lažno negativnih i 2 stvarno negativna ^{99m}Tc (V)-DMSA scintigrama što je rezultovalo u senzitivnosti i specifičnosti metode od 50,0% i 100% za detekciju metastaza na osnovu nalaza pacijenata. Na scintigramima je vizualizovano ukupno 47 (83,9%) od 56 metastatskih lezija MTK, koje su detektovane pomoću svih ostalih metoda snimanja. Najbolji rezultati su dobijeni kod pacijenata sa kostnim i metastazama u limfnim nodusima.

Zaključak: Rezultati ove studije su pokazali da ^{99m}Tc (V)-DMSA scintigrafija ima visoku specifičnost za detekciju metastatske bolesti na osnovu nalaza pacijenata, kao i zadovoljavajuću opštu senzitivnost za postoperativnu detekciju metastaza, te je treba primenjivati nakon operativnog lečenja medularnog tireoidnog karcinoma kod pacijenta sa hiperkalcitoninemijom.

Glavne reči: medularni tireoidni karcinom, metastaze, kalcitonin, ^{99m}Tc (V)-DMSA scintigrafija

THE ROLE OF ^{99m}Tc (V)-DMSA SCINTIGRAPHY FOR MEDULLARY THYROID CARCINOMA METASTASES DETECTION IN PATIENTS WITH HYPERCALCITONINEMIA AFTER OPERATION

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Introduction: Despite newer imaging methods, scintigraphy with pentavalent ^{99m}Tc-dimerkaptosuccinic acid [^{99m}Tc (V)-DMSA] is often performed for postoperative localization of tumor foci in patients with medullary thyroid carcinoma (MTC) who have permanently elevated serum calcitonin (Ct) levels.

The Aim: Evaluation of ^{99m}Tc (V)-DMSA scintigrams in patients with medullary thyroid carcinoma who had hypercalcitoninemia after thyroidectomy.

Materials and methods: Results of 22 follow-up ^{99m}Tc (V)-DMSA scintigrams of 11 patients with MTC and persistently elevated postoperative calcitonin levels (6 females, age range 27-65 yr, Ct range 21.0-20610 pg/ml) were compared with results of other scintigraphic or radiological imaging methods. The foci of increased radiopharmaceutical uptake on scintigram were considered as pathological finding.

Results: There were 10 true-positive, 10 false-negative and 2 true-negative ^{99m}Tc (V)-DMSA scintigrams resulting in sensitivity and specificity of 50.0% and 100% for metastatic diseases detection on patient base. ^{99m}Tc (V)-DMSA showed 47 (83.9%) out of 56 MTC lesions visible by all other imaging methods together. The best results were obtained in patients with bone and lymph node metastases

Conclusion: Findings of this study showed that ^{99m}Tc (V)-DMSA scintigraphy has satisfactory overall sensitivity for MTC postoperative metastases detection on lesion base and a high specificity for metastatic diseases detection on patient base. Based on these results, it should be used following surgery for medullary thyroid carcinoma in patients with hypercalcitoninemia.

Key words: medullary thyroid carcinoma, metastases, calcitonin, ^{99m}Tc (V)-DMSA scintigraphy





PEDIJATRIJA

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Uvod: Bakterijski meningitis predstavlja zapaljenje moždanih opni u toku koga dolazi do stvaranja gnojnog eksudata u subarahnoidalnom prostoru, a klinički se karakteriše pojavom meningealnih znakova i simptoma. Predstavlja jedno od najurgentnijih stanja u pedijatriji i zahteva brzu dijagnostiku i efikasno lečenje kako bi se sprečile ozbiljne neurološke sekvale i letalni ishod.

Ciljevi rada: Određivanje najčešćih etioloških uzročnika bakterijskog meningitisa i uticaj promenjenog režima vakcinacije na zastupljenost najčešćih prouzrokovaca kao i na ishod bakterijskog meningitisa.

Materijal i metode: Analizirani su podaci 170 pacijenata lečenih pod kliničkom slikom meningitisa u Univerzitetskoj dečjoj klinici u periodu 1997-2010. Pacijenti si bili podeljeni u dve grupe. Prvu su činili pacijenti lečeni u periodu 1997-2006, period pre uvođenja imunizacije protiv H. influenzae tip b, a drugu pacijenti lečeni u periodu 2007-2010.

Rezultati: Analiza je pokazala da se učestalost H. influenzae tip b smanjila od uvođenja obavezne vakcinacije, kao i da su se učestalosti S. pneumoniae i N. meningitidis povećale, ali značajnih razlika među upoređivanim grupama nije bilo. Analizom rezultata pokazano je da su se smrtni ishodi znatno češće javljali u drugoj grupi bolesnika. Pacijenti lečeni antimikrobnim lekovima pre hospitalizacije imali su znatno češću smrtnost u odnosu na pacijente koji nisu lečeni pre hospitalizacije. Smrtnost uzrokovana meningitisom sa negativnom kulturom likvora je bila veća nego smrtnost uzrokovana meningitisom sa poznatim uzročnikom.

Zaključak: Vakcinacijom protiv H. influenzae tip b redukovan je broj meningitisa izazvanih ovom bakterijom. Ovo saznanje podstiče što skorije uvođenje vakcine protiv S. pneumoniae i N. meningitidis u kalendar obavezne imunizacije.

Glavne reči: gnojni meningitis, H. Influenzae tip b, S. pneumoniae, N. meningitidis, imunizacija

ETIOLOGY OF ACUTE BACTERIAL MENINGITIS IN CHILDRENS POPULATION IN PERIOD 1997/2010

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Introduction: Acute bacterial meningitis represents inflammation of the meninges, and is characterized with appearance of meningeal signs and symptoms. It is one of the most urgent conditions in pediatrics which demands early diagnostics and adequate treatment or it could lead to severe sequelae or death.

Aim: Determination of most frequent causes of acute bacterial meningitis and the effects of changed vaccination calendar on incidence of most frequent causes.

Material and methods: We analyzed data for 170 patients with clinical signs of meningitis which were treated in University Childrens Hospital between 1997 and 2010. Patients were divided into 2 groups. First group consisted of patients treated in period 1997-2006, whilst in second group we had patients treated between 2007-2010.

Results: Statistic analysis showed that incidence of H.influenzae type b have decreased since beginning of immunisation, but it also showed increased incidence of meningitis caused by S. pneumoniae and N. meningitidis. It also showed significant higher lethality in second group of patients. Patients treated with oral antibiotics before definitive diagnosis had significantly higher lethality. Patients that had negative CSF culture had significantly higher lethality than patients who had meningitis with positive CSF culture.

Conclusion: With vaccination we almost managed to eradicate H. influenzae as the causative agent of bacterial meningitis. This knowledge encourages the efforts on the introduction of vaccines against S. pneumoniae and N. meningitidis as well.

Key words: purulent meningitis, H.influenzae type b, S.pneumoniae, N.meningitidis, immunisation

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Uvod: Akutni pijelonefritis je jedna od najčešćih bakterijskih infekcija kod dece. Dijagnoza akutnog pijelonefritisa se postavlja kod deteta sa signifikantnom bakteriurijom, koje je febrilno (>38°C), ima bolnu osetljivost u kostovertebralnom uglu i pozitivne reaktante akutne faze.

Cilj: Ova studija ispituje kliničke karakteristike prve urinarne infekcije po tipu akutnog pijelonefritisa (APN) u dece hospitalizovane na nefrološkom odeljenju Univerzitetske dečje klinike u Beogradu (UDK) u periodu od 2005. do 2012. godine.

Materijal i metode: Studija je delom retrospektivna (za period od 2005. do 2010. godine), delom prospektivna (tokom 2011. godine). Korišćeni su podaci iz istorije bolesti pacijenata. Uzorci urina dobijeni su metodom srednjeg malza posle prethodnog pranja genitalija ili iz sterilne kesice uz nadgledanje medicinske sestre. Ultrasonografski pregled urinarnog trakta urađen je kod 626 pacijenata. Mikciona urociografija (MUCG) urađena kod 449 pacijenata. Statistički podaci obrađeni u programu SPSS 19 za Microsoft Windows, upotrebljena je Spearman-ova neparametarska korelacija ranga.

Rezultati: U studiji je učestvovalo 673 pacijenata, od toga 284 dečaka i 389 devojčica, uzrasta od dva meseca do 18 godina. Prilikom poređenja kliničkih parametara i MUCG i ultrasonografskog nalaza utvrđeno je postojanje statistički značajnih korelacija između MUCG nalaza i broja leukocita, MUCG nalaza i vrednosti CRP, kao i ultrasonografskog nalaza i broja granulocita.

Zaključak: Najveća učestalost javljanja APN bila je u toku 2009. i 2011. godine. Većina pacijenata bilo je ženskog pola. Kao uzročnik najčešće je izolovana E. coli. Najčešća anomalija urinarnog sistema otkrivena ultrasonografijom bila je jednostrana dilatacija pijelokaliksog sistema, a pomoću MUCG vezikoureteralni refluks.

Glavne reči: Akutni pijelonefritis, MUCG, ultrasonografija.

CLINICAL CHARACTERISTICS OF THE FIRST URINARY TRACT INFECTION IN CHILDREN

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Introduction: Acute pyelonephritis is one of the most common bacterial infections in children. Diagnosis of acute pyelonephritis is established in children with significant bacteriuria, which was febrile (>38 °C), had tenderness in costovertebral corners and positive acute phase reactants.

Objective: This study follows clinical characteristics of the first acute pyelonephritis, in children hospitalized in the nephrology ward of the Univeristy Children's Hospital in Belgrade from 2005. until 2012.

Material and methods: The study was partly retrospective (from 2005. until 2010), and partly prospective (during 2011). Data were obtained from medical records of patients. Urine samples were obtained by midstream clean catch or sterile bags. Ultrasonographic examination of the urinary tract was performed in 626 patients. Voiding cystourethrography (VUCG) was performed in 449 patients. Statistical data were analyzed in SPSS 19 for Microsoft Windows, using Spearman's non-parametric rank correlation.

Results: 673 patients participated in the study, 284 boys and 389 girls, aged from 2 months to 18 years. Comparing clinical parameters and data obtained by visualization methods (ultrasonography and VUCG), a statistically significant correlation was shown between VUCG results and leukocytes number, VUCG results nad CRP values and ultrasonographic findings and the number of granulocytes.

Conclusion: The highest frequency of APN was in the year 2009. and 2011. Most of the patients were female. The majority of infections were caused by E. coli. The most common urinary tract anomalies detected by ultrasonography was unilateral dilatation of pyelocalic's system, and by VUCG vesicoureteral reflux.

Key words: acute pyelonephritis, VUCG, ultrasonography.

ANTIBIOTSKA REZISTENCIJA BAKTERIJSKIH UZROČNIKA PRVOG AKUTNOG PIJELONEFRITISA KOD DECE

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Uvod: Infekcija urinarnog trakta (IUT) je druga po učestalosti bakterijska infekcija kod dece. Rastuća antibiotska rezistencija bakterijskih uzročnika, naročito pojava uropatogenih sojeva koji proizvode proširen spektar β -laktamaza, ugrozila je efikasnost terapije IUT kod dece.

Cilj rada: Ispitati promenu trenda lokalnih oblika rezistencije uropatogena na najčešće korišćene antibiotike kod dece obolele od akutnog pijelonefritisa u periodu od 2005. do 2011. godine.

Materijal i metode: Naša studija je delom retrospektivnu, a delom prospektivna kohortna studija. U analizu je uključeno 673 pacijenta mlađih od 18 godina, koji su lečeni na odeljenju nefrologije Univerzitetske dečje klinike u Beogradu. Poređena je rezistencija kod dve grupe pacijenata, prva grupa su pacijenti lečeni u period od 2005. do 2008. godine, a druga grupa pacijenti lečeni u period od 2009. do 2011. godine.

Rezultati: Najčešći izazivač akutnog pijelonefritisa kod dece u svim uzrastima je E.coli. Antibiotik koji se najčešće koristi u terapiji je ceftriakson, a zatim aminoglikozid amikacin. Najviše uropatogena je rezistentno na primenu ampicilina.

Zaključak: Rezistencija uropatogena na antibiotike progresivno raste iz godine u godinu.

Glavne reči: infekcija urinarnog trakta, akutni pijelonefritis, antibiotik, deca

POREĐENJE AKSILARNE I REKTALNE TEMPERATURE KOD NOVOROĐENČADI

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Uvod: I pored određenog broja radova na datu temu i dalje postoji dilema koje merenje je preciznije i da li je aksilarna temperatura verodostojan pokazatelj unutrašnje temperature.

Cilj: Utvrđivanje preciznosti aksilarnog i rektalnog načina merenja telesne temperature kod novorođenčadi i uticaja telesne mase i donosenosti na njihove vrednosti.

Materijal i metode: Merenja su sprovedena standardnim staklenim živinim termometrom kod 30 novorođenčadi na odeljenju neonatologije.

Rezultati: Opseg temperatura bio je $36,0^{\circ}\text{C}$ do $36,9^{\circ}\text{C}$ (\bar{x} (SD) = $36,58$ (0,26)) za aksilarnu i $36,2^{\circ}\text{C}$ do $37,4^{\circ}\text{C}$ (\bar{x} (SD) = $36,89$ (0,35)) za rektalnu temperaturu. Aritmetička sredina (SD) razlika između rektalne i aksilarne temperature je $0,31^{\circ}\text{C}$ (0,29) (min = -0,3; max = 1,1). Postoji veće variranje u vrednostima aksilarne (SD = 0,37) i rektalne temperature (SD = 0,38) kod pretermijskih u odnosu na termisku novorođenčad (SD(AT) = 0,23; SD(RT) = 0,32). Postoji visoko statistički značajna povezanost između aksilarne temperature i telesne mase ($r = 36,48$; $p < 0,0001$) i između rektalne temperature i telesne mase ($r = 36,63$; $p < 0,0001$). Uočena je pozitivna korelacija ($r = 0,59$; $p = 0,0006$) između aksilarne i rektalne temperature.

Zaključak: Utvrđena je korelacija telesne temperature i telesne mase tako da je telesna temperatura viša što je veća telesna masa. Uočeno je da postoji veća varijabilnost telesne temperature u grupi nedonoščadi. Rezultati ovog istraživanja sugeriraju da bi aksilarna temperatura mogla da se koristi kao prihvatljiva alternativa za rektalnu temperaturu u datim mikroklimatskim uslovima.

Glavne reči: aksilarna temperatura, rektalna temperatura, telesna masa, novorođenčad

ANTIBIOTIC RESISTANCE OF BACTERIAL PATHOGENS IN FIRST ACUTE PYELONEPHRITIS IN CHILDREN

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Introduction: Urinary tract infection (UTI) is the second most common bacterial infection in children. The growing antibiotic resistance of bacterial pathogens, particular the occurrence of uropathogenic strains which produce extended spectrum of β -lactamases jeopardize the efficiency of the therapy UIT in children.

The Aim: Examine the change in the trend of local forms of resistance of uropathogens to the commonly used antibiotics in children with acute pyelonephritis from 2005. through 2011. year.

Materials and Methods: This research included 673 patients younger than 18 years old with UTI, who were treated at the Nephrology unit of University children's hospital in Belgrade. Resistance at antibiotics was compared between two groups of patients; the first group of patients was treated in the period 2005 - 2008, and the second group of patients was treated in the period 2009 – 2011 year.

Results: The most common cause of acute pyelonephritis in children is E.coli. Antibiotic which is mostly used in the treatment of acute pyelonephritis is ceftriaxone, and aminoglycoside antibiotic amikacin. The most uropathogens were resistant to ampicillin use.

Conclusion: Resistance of uropathogens to the antibiotics progressively increases from year after year.

Key words: urinary tract infection, acute pyelonephritis, antibiotics, children

COMPARISON OF AXILLARY AND RECTAL TEMPERATURE IN NEWBORNS

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Introduction: Beside numerous studies in available literature on given topic there is still dilemma which measurement is more precise and whether the axillary temperature is an acceptable alternative to rectal temperature.

The Aim: To determine precision of axillary and rectal temperature measurement in neonates and influence of body mass and prematurity on their values.

Materials and Methods: Measurements were done using mercury-in-glass thermometers in 30 neonates.

Results: Temperature range was $36,0^{\circ}\text{C}$ - $36,9^{\circ}\text{C}$ (\bar{x} (SD) = $36,58$ (0,26)) for axillary and $36,2^{\circ}\text{C}$ - $37,4^{\circ}\text{C}$ (\bar{x} (SD) = $36,89$ (0,35)) for rectal temperature. The mean (SD) difference between rectal and axillary temperatures was $0,31^{\circ}\text{C}$ (0,29) (min = -0,3; max = 1,1). There is higher variation of values of axillary (SD = 0,37) and rectal temperature (SD = 0,38) in the group of preterm comparing to term neonates (SD(AT) = 0,23; SD(RT) = 0,32). There is highly statistically significant relationship between axillary temperature and body weight ($r = 36,48$; $p < 0,0001$), same for rectal temperature ($r = 36,63$; $p < 0,0001$). Positive correlation was observed between these measurements ($r = 0,59$; $p = 0,0006$).

Conclusion: There is correlation of body temperature of neonates and body weight in mean that body temperature is higher if body weight is higher. Higher variability of body temperature is found in group of preterm neonates. This study suggest that axillary temperature might be acceptable alternative for rectal temperature in the given microclimatic conditions.

Keywords: axillary temperature, rectal temperature, body weight, neonates

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Uvod: Febrilnim epileptičkim statusom (FES) se označavaju febrilni napadi trajanja najmanje 30 minuta ili serije kraćih napada između kojih ne dolazi do oporavka svesti bolesnika.

Materijal i metode: Obrađeno je 182 pacijenta ispitivanih i lečenih u periodu od 1987. do 2011. Analizirani su podaci o trudnoći i porođaju, porodičnoj anamnezi, uzrastu prvog napada, neurološkom statusu, EEG nalazu, preporučenoj terapiji i kasnijoj pojavi epilepsije.

Rezultati: Od 182 pacijenta 51,1% je muškog i 49,9% ženskog pola. Uzrast javljanja prvog napada kretao se od 3. do 153. meseca života. Kod 82,3 % pacijenata zabeležen je dobar ishod, kod 17,7% dolazi do kasnije pojave epilepsije. Pacijenti kod kojih se prvi napad javio u uzrastu pre pete godine života, češće su imali dobar ishod što je bilo visoko statistički značajno ($p=0,001$). Kod 79% ispitanika neurološki nalaz je bio uredan. Kod 39,6% porodična anamneza je bila pozitivna. Od svih ispitanih pacijenata njih 23,6% je imalo afebrilne napade. Više od jednog napada imalo je 14,8% ispitanika i takvi pacijenti češće su obolevali od epilepsije. Trudnoća i porođaj su bili uredni kod 93,2%, bilo je 4,5% preterminske dece, dok se kod 2,3% radilo o patološkoj trudnoći. Bez terapije je bilo 35,9% pacijenata, intermitentnu terapiju je primalo 35,4%, a kontinuiranu 28,7%.

Zaključak: FES nije samo urgentno stanje u pedijatriji, već u kombinaciji sa ostalim precipitirajućim faktorima (izmenjen neurološki nalaz, pojava afebrilnih napada, pozitivna porodična anamneza, izmenjen EEG nalaz) povećava verovatnoću nastanka epilepsije u kasnijem životnom dobu.

Ključne reči: febrilni epileptični status, febrilne konvulzije, epilepsija, neurološki status, afebrilni napadi

CLINICAL-EPIDEMIOLOGIC ANALYSIS OF PATIENTS WITH FEBRILE EPILEPTIC STATUS

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Introducción: Febrile epileptic status (FES) is a medical emergency associated with significant morbidity and mortality. FES is defined as a continuous seizure lasting more than 30 min, or two or more seizures without full recovery of consciousness between any of them.

The Aim: Clinical-epidemiologic analysis of patients with FES

Material and Methods: One hundred eighty two patients were examined and treated in the period 1987-2011. Data concerning pregnancy and delivery, family history, onset of first seizure, neurologic status, EEG finding, recommended therapy and later occurrence of epilepsy were analyzed.

Results: 51.1 % out of 182 patients are males and 49.9 % are females. Seizure onset was between from 3 months to 12 years and 9 months and it was related to later occurrence of epilepsy. The good outcome was found in 82.3%, while later occurrence of epilepsy was noticed in 17.7%. Neurologic status was normal in 79%, while 21% had abnormal neurologic finding, and it was related with later occurrence of epilepsy. 39.6% of family history was positive. 23.6% of examined patients had afebrile seizures. 14.8% of them had more than one seizure. Pregnancy and delivery were normal with 93.2%, 4.5% was pre-term babies, 2.3% was pathologic pregnancy. 35.9% of the patients was without therapy, 35.4% was on intermittent therapy, while 28.7% had a continuous therapy.

Conclusion: FES in combination with other, precipitating factors (abnormal neurologic status, afebrile seizures, positive family history, abnormal EEG finding) increases the risk of epilepsy appearance in elderly.

Keywords: febrile epileptic status, febrile convulsions, epilepsy, neurologic finding, afebrile seizure

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Uvod: Konvulzije su najčešći neurološki problem u detinjstvu. Prevalenca epilepsije u prvoj godini života iznosi 95 – 190 na 100000 odojčadi.

Cilj rada: Cilj ovog rada je da se utvrdi etiologija, kliničke karakteristike i prognoza afebrilnih konvulzija odojčeta, sa posebnim osvrtom na faktore rizika i efikasnost terapije.

Materijal i metode: U ovoj retrospektivnoj studiji ispitivano je 90 dece sa afebrilnim konvulzijama u uzrastu od 1 do 12 meseci. Iz studije su isključeni bolesnici sa prethodnim febrilnim konvulzijama i povredama glave, sa sumnjom na postvakcinalnu reakciju, kao i svi bolesnici sa hipoglikemijom, hipokalcijemijom i akutnim hidroelektrolitnim disbalansom. Grupa od 53 dece praćena je tokom pet godina od uvođenja terapije.

Rezultati: Epileptičke napade imalo je 67 % odojčadi. Najčešći su bili infantilni spazmi, a najređi mioklonički napadi. Značajni riziko faktori za epilepsiju u prvoj godini života bili su perinatalni i neonatalni problemi, kao i usporen psihomotorni razvoj. MR pregledom endokranijuma potvrđena je simptomatska epilepsija u 55% bolesnika. Ponovljene afebrilne konvulzije uz normalni ili nespecifično izmenjen EEG nalaz imala je trećina dece. Tokom petogodišnjeg perioda praćeno je 53 bolesnika lečenih antiepilepticima. Kod 32% je završeno sa antikonvulzivnom terapijom. Na uspeh terapije uticali su etiologija i vrsta epilepsije, kao i neurorazvojni status odojčeta.

Zaključak: U periodu odojčeta afebrilne konvulzije se javljaju relativno retko, ali su vezane za ozbiljne moždane poremećaje i razvojne probleme. Terapija dece sa psihomotornom retardacijom i sa simptomatskom epilepsijom uglavnom je složena i duga.

Ključne reči: afebrilne konvulzije, epilepsija, odojčad

AFEBRILE SEIZURES IN THE FIRST YEAR OF LIFE

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Introduction: Convulsions are the most common neurological disorder in childhood. The prevalence of epilepsy in infancy is estimated to be 95-190 per 100000 .

The Aim: The aim of this paper is to establish etiology, clinical characteristics and prognosis of afebrile seizures in infants, especially risk factors and treatment efficacy.

Materials and methods: This retrospective study included 90 children with afebrile seizures between 1 and 12 months of age. Infants with previous febrile convulsions, head trauma, postvaccinal complications, hypoglycemia, hypocalcemia and acute hydro-electrolyte dysbalance, were excluded. A group of 53 children was followed up during a 5-year-period.

Results: Epileptic seizures were diagnosed in 67 % of infants. Infantile spasms were the most common, while myoclonic seizures were the least common type. Perinatal and neonatal problems, as well as delayed psychomotor development, were considered as risk factors of infants epilepsy. MRI findings revealed symptomatic epilepsy in 55 % of our patients. In one third of infants recurrent afebrile seizures with normal or nonspecifically disturbed EEG findings were found. Follow-up of 53 infants treated with antiepileptic drugs revealed cessation of anticonvulsive therapy in 32 %. Treatment efficacy was related to etiology, type of seizures, and neurodevelopmental characteristics.

Conclusion: Afebrile seizures are relatively rare in the first year of life, but they are associated with serious brain disturbances and developmental problems. The majority of children with psychomotor retardation and symptomatic epilepsy have complicated and prolonged treatment.

Key words: afebrile seizures, epilepsy, infants

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Uvod: Različite vrste alergijskih reakcija na lekove danas su veoma česte. Na osnovu vremenskog intervala od administracije leka do pojave reakcije dele se na rane i kasne.

Cilj rada: Ispitivanje učestalosti alergijskih reakcija kod dece na: beta laktame, makrolide, nesteroidne antiinflamatorne lekove (NSAIL), anestetike i antikonvulzive tokom 6 godina praćenja.

Materijal i metode: Ispitivana populacija obuhvata grupu od 600 dece suspektne na alergijske reakcije na neke od ispitivanih grupa lekova. Kao izvor podataka korišćena je baza podataka Univerzitetne dečije klinike u Beogradu. Za potvrdu alergijske reakcije rađena su kožna testiranja (prick, intradermalni i patch testovi), doznoprovokativni test i *in vitro* ispitivanja (esej serum-specifičnog IgE i test aktivacije bazofila – BAT, test limfocitne transformacije – LTT)

Rezultati: Od početnog broja dece, alergija na lekove je potvrđena kod 129. Od ukupnog broja testirane dece, 258(43%) je bilo muškog, a 342(57%) ženskog pola. Srednja vrednost starosne dobi je iznosila 6,1. Na beta laktame je bilo pozitivno 51,87%, 19,38 % na NSAIL, 16,35% na anestetike, na makrolide 6,98% i 5,42% na antikonvulzive. Pojedinačni predstavnici sa najvećom učestalošću bili su procain-benzilpenicilin (jugocilin) (12,40%), ibuprofen (brufen) (17,83%), lidokain (6,98%), eritromicin (3,10%) i lamotrigin (3,10%).

Zaključak: U ovoj studiji pokazano je da beta laktami, NSAIL i anestetici najčešće izazivaju alergijske reakcije na lekove u dečijoj populaciji. Makrolidi i antikonvulzivi su procentualno manje zastupljeni u detekciji alergija u populaciji dece obuhvaćenoj ovim radom. Ovo može imati prediktivnu vrednost u pogledu očekivanja pojave alergija na lekove na decu i stoga racionalniju primenu.

Ključne reči: Alergija na lekove, doznoprovokativni test, beta laktami

FREQUENCY OF ALLERGIC REACTIONS TO DRUGS IN CHILDHOOD

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Introduction: Nowadays, frequency of various allergic reactions to drugs is increasing. Based on time period between drug administration and onset of symptoms, allergic reactions are classified as immediate or delayed.

The aim: Examination of beta lactams, macrolides, nonsteroid antiinflammatory drugs (NSAID), anaesthetics and anticonvulsives allergic reactions frequency in children population during 6 year period.

Materials and methods: Studied population includes 600 children suspected to have allergic reaction to some drugs within our study. Belgrade University children's Hospital database was used as source of information. Tests for confirming allergic reactions were: skin tests (prick, intradermal and patch test), drug provocation and *in vitro* tests (assay of serum – specific IgE and basophile activation test – BAT, lymphocyte transformation test – LTT).

Results: Out of total number of children, allergic reaction was confirmed in 129. In the studied population, 258 (43%) were male, and 342 (57%) were female. Mean age was 6,1. Percentage of positive allergic reactions were: 51,87%(beta lactams), 19,38(NSAID), 16,35%(anaesthetics), 6,98%(macrolides), 5,42%(anticonvulsives). Representatives with the highest frequency were procain-benzylpenicillin (12,40%), ibuprofen (17,83%), lidocaine (6,98%), eritromicine (3,10%) and lamotrigine (3,10%)

Conclusion: In this study, we showed that beta lactams, NSAID and anaesthetics are the most common cause of allergic reactions to drugs in children population. Macrolides and anticonvulsives showed less frequency of allergic reactions. These results can be useful in predicting allergic reactions to medications in children population, thus contributing to more rational drug use.

Key words: Allergic reactions, drug provocation test, beta lactams

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Uvod: Dermatitis atopica je hronično-recidivirajuće oboljenje kože koje karakteriše jak svrab i javlja se kod osoba koje su sklone atopiji. Bolest je česta i u stalnom je poprastu. Klinička slika atopijskog dermatitisa se razlikuje kod odojčeta, malog deteta i odraslih. Mnogobrojni faktori učestvuju u nastanku atopijskog dermatitisa. Naime, kod genetski predisponiranih osoba, a pod dejstvom faktora spoljašnje sredine dolazi do ispoljavanja bolesti.

Cilj: Cilja rada je da pokažemo koja terapija daje dobre rezultate u lečenju atopijskog dermatitisa i da li primena imunosupresivnih kalcineurinskih lekova ima svoje mesto u lečenju atopijskog dermatitisa.

Materijal i metode: Uradili smo retrospektivnu studiju lečenja atopijskog dermatitisa kod 45-oro dece na Univerzitetnoj dečjoj klinici, Tiršova 10, Beograd uzrasta od 3 meseca do 17 godina. Monoterapija: topikalni kortikosteroidi, kalcineurinski inhibitori, dijeta i antihistaminici je primenjivana kod 23 (51.11%), a kombinovana sa dva ili više medikamenta kod 18 (40%), a bez terapije 4 (8.89%). Pored ove terapije primenjivane su neutralne kreme i saveti za negu kože.

Rezultati: Topikalni kortikosteroidi primenjivani su kod 15 bolesnika kao monoterapija ili kao kombinovana terapija i pozitivan rezultat je postignut kod 13 (86.67%). Kalcineurinski inhibitori primenjeni su kod 10 bolesnika i pozitivan efekat je postignut kod 9 (90%).

Zaključak: Rezultati su pokazali da ne postoji jedinstvena i sigurna metoda lečenja i da je lečenje individualno i zavisi od kliničke slike i uzrasta. Kortikosteroidi i kalcineurinski inhibitori su dali približno iste rezultate lečenja kao mono ili kao kombinovana terapija.

Ključne reči: deca, atopija, dermatitis, terapija

NEW THERAPY METHOD OF ATOPIC DERMATITIS IN CHILDREN

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Introduction: Dermatitis atopica (AD) is a chronic-recurrent skin disease characterized by severe itching and occurs in people who are prone to atopy. Clinical features of AD different for infants, small children and adults. Multiple factors are involved in the development of AD. Manifestation of the disease occurs in genetically susceptible persons under the influence of environmental factors.

Aim: The aim of this paper is to show which therapy gives good results in the treatment of AD and whether the use of calcineurin immunosuppressive drugs have their place in the treatment of AD.

Material and methods: We performed a retrospective study of treatment of AD in 45 children at the University Children's Hospital, Tirsova 10, Belgrade aged 3 months to 17 years. Monotherapy: topical corticosteroids, calcineurin inhibitors, antihistamines and diet was administered in 23 (51.11%), we combined two or more medication in 18 (40%), without therapy was 4 (8.89%). In addition to these therapies were applied neutral creams and skin care tips.

Results: Topical corticosteroids are applied at 15 patients as monotherapy or as a combined therapy and positive effect was achieved in 13 (86.67%). Calcineurin inhibitors were applied in 10 patients positive effect was achieved in 9 (90%).

Conclusion: The results showed that there isn't unique and safe method of treatment of AD and the treatment is individual and depends on the clinical picture and age. Calcineurin inhibitors and corticosteroids were given approximately the same results as monotherapy or combined therapy.

Key words: children, atopia, dermatitis, therapy

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Uvod: Alergija na kravlje mleko se definiše kao stanje izmenjene reaktivnosti, u kome atopičari, tj. oni koji imaju sklonost ka alergiji na kontakt sa alergenima iz kravljeg mleka, reaguju preosetljivo stvaranjem IgE antitela. Za alergijsku reakciju su odgovorni proteini: laktoglobulin, laktalbumin, kazein i kravljji albumin.

Cilj rada: Da kožnim probama i/ili određivanjem specifičnih IgE antitela uz korelaciju kliničke slike dokažemo prisustvo I tipa alergijske reakcije na proteine kravljeg mleka kod dece.

Materijal i metode: Ispitivanje je sprovedeno u Univerzitetnoj dečjoj klinici u Beogradu od januara 2007. do decembra 2011. godine. Ispitivanjem je obuhvaćeno šezdeset osmoro dece, uzrasta od dva meseca do 15 godina. Svoj deci su rađeni kožni prik prik testovi svežim kravljim mlekom, kao i specifična IgE antitela na alergene kravljeg mleka. Kožnim prik prik testovima potvrđujemo prisustvo specifičnih IgE kao i in vitro određivanjem IgE.

Rezultati: Ispitivanje obuhvata 23 devojčice (33,8 %) i 45 dečaka (66,2%). Testiranjem specifičnih IgE antitela, smo došli do rezultata da je klasa 1 zastupljena u 7,57 %, klasa 2 u 25,75%, klasa 3 u 7,57 %, klasa 4 u 4,54%, klasa 5 u 6,06 % i klasa 0 je 9,09 %. S obzirom da je u pitanju I tip alergijske reakcije, najzastupljenije promene su: urtikarija kod pedeset šestoro dece (74 %), angioedem kod petoro dece (7,35 %), vizing kod dve devojčice (5,35 %) i ekcem kod devetoro dece (13,2 %).

Zaključak: kožnim probama i određivanjem specifičnih IgE dokazali smo prisustvo I tipa alergijske reakcije na proteine kravljeg mleka kod dece.

Ključne reči: mleko, alergija, protein, deca.

COW MILK ALLERGY IN EARLY CHILDHOOD

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Introduction: Cow's milk allergy is defined as a state of changed reactivity in which atopic creating a hypersensitive reaction with creating IgE antibodies. For allergic reactions are responsible proteins: lactoglobulin, lactalbumin, casein, albumin.

Aim: To evidence of the presence of type I allergic reactions to cow's milk proteins with skin test and / or determination of specific IgE antibodies in children correlated with clinical.

Material and methods: The study was conducted at the University Children's Hospital in Belgrade since January 2007. by December 2011. The study involved sixty-eight children, aged two months to 15 years. They were all made skin prick tests with fresh cow's milk, as well as specific IgE antibodies to allergens of cow's milk. Prick tests and in vitro determination of IgE confirm the presence of specific IgE.

Results: The study includes 23 girls (33.8%) and 45 boys (66.2%). Testing of specific IgE antibodies, we obtain the results that the class 1 represented the 7.57%, class 2 in 25.75%, class 3 in 7.57%, class 4 at 4.54%, class 5 in 6.06 %, and class 0 is 9.09%. Considering that this is a type of allergic reaction, the most common changes include: urticaria with fifty six children (74%), angioedema in five children (7.35%), wheezing with two girls (5.35%) and eczema in nine children (13.2%).

Conclusion: skin tests and determination of specific IgE we have proved the presence of type I allergic reactions to cow's milk proteins in children.

Key words: milk allergy, protein, children.

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Uvod: Stenoza plućne arterije (PS) predstavlja urođenu srčanu manu (USM) koja se javlja sa učestalošću do 10% svih USM. Balon valvuloplastika (BVP) je metoda izbora u lečenju PS u poslednjih 30-ak godina.

Cilj: Procena uspešnosti i bezbednosti BVP u našoj sredini.

Materijal i metode: Studijom je obuhvaćeno 95 pacijenata sa dijagnozom PS. U ispitivanoj populaciji analizirani su hemodinamski parametri na interventnoj kateterizaciji kao i ehokardiografski parametri (neposredno pre, 24-36h posle BVP i na kraju praćenja). U cilju analize istih parametara pacijenti su podeljeni u tri grupe na osnovu težine stenoze. Pacijenti su takođe bili podeljeni u tri uzrasne grupe u cilju ispitivanja učestalosti komplikacija.

Rezultati: Prosečna starost pacijenata iznosila je 5,04±4 godine. Odmah nakon dilatacije došlo je do značajnog pada srednjeg gradijenta pritiska (PG) preko pulmonalne valvule (PV) kod svih pacijenata. Postoji visoko statistički značajan ($p < 0,001$) pad PG preko PV nakon BVP kod sve tri grupe pacijenata. Komplikacije u toku kateterizacije najčešće su se javljale u najmlađoj uzrasnoj grupi (ventrikularna tahikardija-5,3% i supraventrikularna tahikardija-10,5%). Incidenca pojave insuficijencije PV posle dilatacije iznosila je 6,6% i dominantno se javljala kod dece starosti do jedne godine života. Značajna TR pre dilatacije bila je prisutna kod 32,2% pacijenata. Kod 93 pacijenta (97,9%) PS je otklonjena nakon BVP i tokom praćenja nije bilo značajne rezidualne stenoze.

Zaključak: BVP je bezbedan i efikasan metod lečenja izolovane PS kod dece. Podjednako je siguran i efiksan kako u lečenju lakih i umerenih stenoza kao i najtežih formi bolesti u svim uzrasnim grupama.

Ključne reči: balon pulmonalna valvuloplastika, pulmonalna stenoza, pulmonalna insuficijencija

EFFICACY AND SAFETY OF BALLOON VALVULOPLASTY IN TREATMENT OF PULMONARY STENOSIS IN CHILDREN AND ADOLESCENTS

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Introduction: Pulmonary artery stenosis (PS) is congenital heart defect which occurs in 10% of cases. Pulmonary balloon valvuloplasty (BVP) is the preferable treatment of PS in the last 30 years.

The aim: The purpose of this study was to evaluate the success of BVP in our Institution.

Materials and method: The study included 95 patients diagnosed with PS. Hemodynamic measurements and echocardiography results (before, 24-36h after BVP and during follow-up) were recorded. Patients were divided into 3 groups regarding the severity of stenosis. The patients were also divided into 3 age groups in order to evaluate complications of BVP.

Results: The studied group aged 5,04±4 years. Immediately after BVP, a significant decrease of pressure gradient (PG) across pulmonary valve (PV) was recorded in all patients and this result was similar in all 3 groups of patients regarding the severity of stenosis ($p < 0,001$). Complications of BVP occurred most commonly in children up to 1 year of age (ventricular tachycardia-5,3% and supraventricular tachycardia-10,5%). Pulmonary valve insufficiency occurred in 6,6% of cases, most commonly in the youngest age group. Before BVP tricuspid regurgitation (TR) occurred in 32,2% of cases. In 93 patients BVP was a definite solution and significant residual stenosis was not recorded during follow-up.

Conclusion: BVP is safe and effective to resolve isolated PS regardless of severity of stenosis but also regardless of age.

Key words: balloon pulmonary valvuloplasty, pulmonary stenosis, pulmonary insufficiency

RANA PROGNOZA KOD DECE SA KOMPLEKSNOM TRANSPOZICIJOM KRVNIH SUDOVA

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Uvod: Transpozicija velikih krvnih sudova (TGA) je često udružena sa kardiovaskularnim anomalijama koje mogu imati hemodinamski, klinički i prognostički značaj.

Cilj rada: Cilj rada je ispitati ishod dece sa kompleksnom TGA i uticaj pojedinih perioperativnih varijabli. Ispitivani su: preoperativni tretman, perioperativne komplikacije i mortalitet, dužine intenzivne terapije, prisustvo značajnih hemodinamskih rezidua.

Materijal i metode: Retrospektivnom studijom je obuhvaćeno 50 dece uzrasta 158,5 dana sa kompleksnom TGA, koja su operisana u Univerzitetskoj dečjoj klinici-Beograd u periodu januar 2000 - decembar 2011.

Rezultati: 23 pacijenta (46 %) je pored TGA imalo ventrikularni septalni defekt (VSD), 12 pacijenata (24 %) VSD i stenozu pulmonalne arterije (PS), 7 pacijenata (14%) VSD sa koarktacijom aorte (CoAo), petoro dece (10%) PS, 2 pacijenta (4%) udruženu koarktaciju aorte (CoAo), 1 dete (2%) je imalo PS i CoAo. Kod 45 (90%) dece kompleksna TGA je operisana arterial switch tehnikom (ASO), kod 3 pacijenta (6%) Rastelli-jevom i kod 2 pacijenta (4%) Senning-ovom operacijom. Od 6 pacijenata koja su umrla na operaciji ili u ranom postoperativnom toku 5 je operisano ASO i 1 dete Rastelli-jevom operacijom.

Ozbiljne komplikacije u ranom postoperativnom toku je imalo 19 bolesnika (38%) - najčešće su bile krvarenje (8%), poremećaji srčanog ritma (36%), bubrežna insuficijencija (4%) pneumotoraks 8%, respiratorni distres 6%.

Postoperativno su registrovane značajne hemodinamske rezidue kod 23 bolesnika (46%)- rezidualni VSD 24%, pulmonalna stenozna 14%, aortna stenozna 6% i insuficijencija trikuspidne valvule 6%.

Zaključak: Kompleksna transpozicija predstavlja ozbiljan pedijatrijski izazov koji ima relativno dobru krajnju prognozu.

Ključne reči: transpozicija krvnih sudova, udružene anomalije, prognoza

ETIOLOGIJA CEREBROVASKULARNIH INSULTA KOD DECE

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Uvod: Cerebrovaskularni insult kod dece nije čest poremećaj, ali je značajan uzrok hroničnog morbiditeta, odnosno invalidnosti. U oko 40% slučajeva i pored primene savremenih dijagnostičkih procedura osnovni patofiziološki mehanizam ostaje nepoznat, a time se propušta i šansa za brzo i adekvatno lečenje i izlečenje bez sekvela.

Cilj: Cilj ovog rada je istraživanje uzroka cerebrovaskularnih insulata kod dece hospitalizovane na neurološkom odeljenju Univerzitetske dečje klinike u Beogradu.

Materijal i metode: Studijom je obuhvaćeno 8 pacijenata, starosti u vreme javljanja tegoba od 3 meseca do 14 godina, hospitalizovanih u periodu od 2001. do 2010. godine. Dijagnoza cerebrovaskularnog insulata je postavljena na osnovu kliničke slike i neurovizuelizacionih dijagnostičkih metoda (kompjuterizovana tomografija i magnetna rezonanca).

Rezultati: Sedam bolesnika je imalo ishemijski CVI a samo jedno dete je imalo hemoragijski CVI. Kod 62,5% pacijenata otkriven je uzrok, što je u skladu sa drugim studijama. Kod jedne pacientkinje, genetskim ispitivanjem potvrđeno je prisustvo MTHFR C677T i PAI1 mutacije i postojanje atrijalnog septalnog defekta. Drugo dete je imalo neaterosklerotsku arteriopatiju sa suženjem ACM, treće Moyamoya sindrom, četvrto atrijalni septalni defekt sa desno-levim šantom. Uzrok hemoragijskog CVI bio je venski angiomi. Najveći broj insulata (62,5%) bili su lokalizovani u irigacionom području a. cerebri media. Kod 75% dece ostaju neurološki defekti.

Zaključak: Faktori rizika, simptomatologija, zbrinjavanje i prevencija CVI kod dece nisu sistematski istraživani i aktuelne preporuke se zasnivaju na rezultatima studija kod odraslih ili na mišljenjima eksperata. Zbog toga su neophodne multicentrične, nacionalne, prospektivne studije ovog problema.

Ključne reči: cerebrovaskularni insult, tromboza, hemoragija, deca, faktori rizika.

EARLY PROGNOSIS IN CHILDREN WITH COMPLEX TRANSPOSITION OF THE GREAT ARTERIES

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Introduction: Transposition of great arteries (TGA) is frequently associated with cardiovascular abnormalities that may have hemodynamic, clinical and prognostic significance.

The Aim: Aim of this study was to examine the outcome of children with complex TGA and impact of certain perioperative variables. Following parameters were evaluated: preoperative treatment, perioperative complications and mortality, length of intensive therapy and presence of significant hemodynamic consequences.

Materials and Methods: This retrospective study included 50 children aged 158.5 days with complex TGA, operated in the University Children's Hospital in Belgrade-period January 2000 - December 2011th.

Results: 23 patients (46%) in addition to TGA had ventricular septal defect (VSD), 12 patients (24%) VSD and pulmonary artery stenosis (PS), 7 patients (14%) VSD with coarctation of the aorta (CoAo), five children (10%) PS, 2 patients (4%) CoAo, and 1 child (2%) PS and CoAo. 45 (90%) children had arterial switch operation (ASO), 3 patients (6%) Rastelli and 2 patients (4%) Senning's procedure. From 6 patients who died in surgery or in early postoperative period 5 underwent ASO and 1 child Rastelli procedure. Serious complications in early postoperative period had 19 patients (38%) - the most frequent were bleeding (8%), heart rhythm disorders (36%), renal insufficiency (4%) pneumothorax 8%, respiratory distress 6%. Postoperatively, there was significant hemodynamic residues in 23 patients (46%) - 24% residual VSD, pulmonary stenosis 14%, 6% aortic stenosis and tricuspid valve regurgitation 6%.

Conclusion: Complex transposition is serious pediatric challenge that has relatively good final prognosis.

Keywords: transposition of blood vessels, associated anomalies, outcome

ETIOLOGY OF CEREBROVASCULAR INSULTS IN CHILDREN

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Introduction: Stroke in children is not a common disorder, but it is an important cause of chronic morbidity and disability. The opportunity for a prompt and adequate treatment and recovery without sequelae is missed because underlying mechanism remains unknown in about 40% of cases.

The Aim: The aim of this study was to investigate the causes of cerebrovascular insult in children hospitalized at the neurological department of the University Children's Hospital in Belgrade.

Materials and Methods: The study included eight patients (from 3 months to 14 years old), hospitalized during the period from 2001. to 2010. The diagnosis of cerebrovascular insult was based on clinical and neuro visual diagnostic methods (CT and MRI).

Results: Seven patients had ischemic stroke and one child had a hemorrhagic stroke. In 62.5% of patients the cause is revealed, which is consistent with other studies. One patient had MTHFR C677T and PAI1 mutations, the second had nonaterosclerotic arteriopathy, third moyamoya syndrome, fourth atrial septal defect. The cause of hemorrhagic stroke was venous angioma. 75% of children stroke manifested with hemiparesis. The largest number of strokes (62.5%) was localized in the area supplied by a. cerebra media. In 75% of children remain neurological defects.

Conclusion: Risk factors, symptoms, care and prevention of stroke in children have not been systematically studied and current recommendations are based on the results of studies in adults or on expert opinions. Therefore, multicentric, national, prospective studies should be carried out.

Keywords: stroke, thrombosis, hemorrhage, children, the risk factors.

NAPOROM INDUKOVANI VENTRIKULARNI POREMEĆAJI RITMA KOD DECE SA PROLAPSOM MITRALNE VALVULE

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Uvod: Prolaps mitralne valvule (PVM) je klinički sindrom izazvan izbočenjem ili delimičnim izvrtnjem jednog ili oba kuspisa u petkomoru tokom sistole. Često se dovodi u vezu sa poremećajima srčanog ritma kod dece.

Cilj: Ciljevi studije su bili: određivanje incidence naporom indukovanih ventrikularnih aritmija (NIVA) kod dece sa PVM, praćenje njihovog ishoda, utvrđivanje da li PVM povećava rizik od pojave NIVA i naporom izazvane iznenadne srčane smrti kod dece, kao i procena efikasnosti modifikovanog McMaster protokola u otkrivanju NIVA.

Materijal i metode: Ispitivanu grupu sačinjava 401 dete sa PVM i hemodinamski beznačajnom mitralnom regurgitacijom. Numerički parametri testa opterećenja su obrađeni kod 258 asimptomatske dece sa PVM, koja su podvrgnuta standardnom (112 dece) i modifikovanom McMaster protokolu (146 dece).

Rezultati: Kod 4/401 deteta su registrovane NIVA. Kod dece testirane po standardnom protokolu nisu registrovane NIVA, dok su kod troje dece testirane po modifikovanom protokolu (3/146) nađene naporom indukovane ventrikularne ekstrasistole (EIVES), i kod jednog deteta (1/146) naporom indukovana ventrikularna tahikardija (NIVT). Rezultati su upoređeni sa rezultatima dve kontrolne grupe: deca sa displazijom mitralne valvule i deca sa strukturno neoštećenim srcem. Nema statistički značajne razlike u incidenci NIVA kod dece sa PVM u odnosu na kontrolne grupe.

Zaključak: Rezultati su pokazali da su NIVA retke kod dece sa PVM (incidenca 1%), da je kod svih pacijenata sa NIVA došlo do njihove regresije i da shodno tome PVM ne povećava rizik od pojave NIVA i iznenadne srčane smrti u naporu. Modifikovani protokoli su značajno efikasniji u otkrivanju NIVA kod dece sa PVM.

Ključne reči: PVM, NIVA, iznenadna srčana smrt

EXERCISE-INDUCED VENTRICULAR ARRHYTHMIAS IN CHILDREN WITH MITRAL VALVE PROLAPSE

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Introduction: Mitral valve prolaps (MVP) is a clinical syndrome caused by protrusion or partial inversion of one or both of the leaflet during systole into the atrium. It is often associated with heart rhythm disorders in children.

The Aim: The objectives of the study were: determining the incidence of exercise-induced ventricular arrhythmias (EIVA) in children with MVP, monitoring their outcomes, to determine: whether MVP increases the risk of EIVA and exercise induced sudden cardiac death in children, and also efficiency of the modified McMaster protocol in EIVA detection.

Materials and methods: Study population included 401 children with MVP and hemodynamic insignificant mitral regurgitation. Numerical parameters exercise test were analyzed in 258 asymptomatic children with MVP, which are subjected to the standard (112 children) and a modified McMaster protocol (146 children).

Results: EIVA were registered in 4/401 children. In the children tested by standard protocol are not registered EIVA, while in three children tested by a modified protocol (3/146) found exercise induced ventricular premature beats (EIVES), and in one case (1/146) exercise induced ventricular tachycardia (EIVT). The results are compared with the two control groups: children with mitral valve dysplasia and in children with structurally undamaged hearts. No statistically significant differences in the incidence of EIVA in children with MVP compared to control groups.

Conclusion: The results showed that the EIVA are rare in children with MVP (incidence 1%), that in all patients with EIVA come to their regression and consequently MVP does not increase the risk of EIVA and sudden cardiac death in the effort. The modified protocols are significantly more effective in detecting EIVA in children with MVP.

Keywords: MVP, EIVA, sudden cardiac death

MLPA ANALIZA SUBTELOMERNIH REGIONA KOD DECE SA SINDROMSKIM MENTALNIM RETARDACIJAMA

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Uvod: Hromozomski rearanžmani uključujući i rearanžmane subtelomernih regiona su značajan uzrok sindromskih mentalnih retardacija. Usled male veličine zahvaćenih segmenata, ove aberacije se ne mogu dijagnostikovati standardnim kariotipom. Stoga, za skrining subtelomernih regiona je potrebno koristiti metode poput fluorescentne in situ hibridizacije (FISH), višestruke amplifikacije proba koja je zavisna od ligacije (MLPA) ili komparativne genomske hibridizacije (CGH).

Cilj: Cilj je da utvrdimo da li je MLPA pouzdana tehnika za detekciju subtelomernih submikroskopskih rearanžmana kod pacijenata sa sindromskom mentalnom retardacijom.

Materijal i metode: Istraživanje je obuhvatilo 65 pacijenata za analizu subtelomernih regiona hromozoma. Pacijenti su odabrani na osnovu prisustva sindromske mentalne retardacije i normalnog nalaza kariotipa. Koristili smo MLPA metodu (kit SALSA P036-E1 i kit P070-B1).

Rezultati: MLPA skrining je pokazao subtelomerne abercije kod četiri bolesnika (6,15%). To su: 1p delecija, 1p delecija sa 12q duplikacijom, 4p delecija i 9p delecija sa 15q duplikacijom. Roditelji pacijenata sa ovim promenama su takođe testirani i u svim slučajevima je potvrđen njihov uredan nalaz, odnosno *de novo* nastanak aberacija kod dece.

Zaključci: Studija potvrđuje visoku učestalost subtelomernih rearanžmana kod pacijenata sa sindromskom mentalnom retardacijom. Ona ukazuje da je subtelomerni skrining indikovana kod svih bolesnika sa sindromskim mentalnim retardacijama, u cilju dobijanja tačne dijagnoze, analize genotipsko-fenotipske korelacije i obezbeđivanja adekvatnog genetičkog informisanja.

Ključne reči: MLPA skrining, subtelomerni regioni, sindromska mentalna retardacija

MLPA ANALYSIS OF SUBTELOMERIC REGIONS IN CHILDREN WITH SYNDROMIC MENTAL RETARDATION

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Introduction: Submicroscopic chromosomal rearrangements involving the subtelomeric regions are considered to be a significant cause of symptomatic mental retardation (MR). Because of small size of involved segments, these aberrations are undetectable by conventional banding techniques. Hence, for the screening of subtelomeric regions, more sensitive technique such as multiplex ligation-dependent probe amplification (MLPA), should be used.

The Aim: The aim was to find out is the MLPA trusty technique for detection of submicroscopic subtelomeric rearrangements in patients with symptomatic MR.

Materials and Methods: We have analyzed subtelomeric chromosome rearrangements in the group of 65 unrelated patients with MR, using MLPA method (SALSA P036-E1 and P070-B1 kits). They had normal finding on standard G-banded chromosome analysis.

Results: The MLPA screening revealed subtelomeric chromosome aberrations in four cases (6,15%). Detected aberrations were: 1p deletion, 1p deletion combined with 12q duplication, 4p deletion and 9p deletion combined with 15q duplication. The parents of patients with detected subtelomeric deletions/duplications were also tested in order to explore origin of aberration. In all cases *de novo* origin was confirmed.

Conclusion: This study confirms the high frequency subtelomeric rearrangements in patients with symptomatic mental retardation. It reinforces the idea of a routine subtelomeric screening in these patients in order to establish a correct diagnosis.

Keywords: MLPA method, subtelomeric chromosome rearrangements, symptomatic mental retardation.

UTICAJ PRAVOVREMENE DIJAGNOZE KAWASAKIJEVE BOLESTI NA KLINIČKE MANIFESTACIJE I SEKVELE

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Uvod: Kawasakijska bolest (KB) je vaskulitis malih i srednjih arterija kod dece sa posebnim afinitetom za koronarne arterije. Najozbiljnija komplikacija KB je arteritis koronarnih arterija sa nastankom koronarnih aneurizmi.

Cilj: Cilj ovog rada je da se proceni uticaj pravovremenog dijagnostikovanja Kawasakijske bolesti i primene adekvatne terapije na tok i ishod obolelih, pre svega na nastanak aneurizmi koronarnih arterija. Sekundarni cilj je ispitivanje primarno pozitivne reakcije ili rezistencije obolele dece na terapiju IVIG i acetilsalicilnom kiselinom

Materijal i metode: U našoj studiji analizirali smo 21 pacijenta sa Kawasakijskom bolešću. Bolesnici su podeljeni u dve grupe, u odnosu na vreme dijagnostikovanja KB i reagovanja na terapiju. Poređeni su ehokardiografski nalazi na koronarnim arterijama, primenom Studentovog t testa i hi-kvadrat testa.

Rezultati: Nije pronađena statistički značajna razlika u učestalosti normalnih koronarnih arterija i koronarnih arterija sa dilatacijom, između dve grupe dece koje su se razlikovale po vremenu postavljanja dijagnoze KB. Postoji statistički značajna razlika ($p=0,045$), u učestalosti džinovskih aneurizmi među ovim grupama. Rezistenciju na terapiju registrovali smo kod 6 (28%) dece i nema statistički značajne razlike u nalazima na koronarnim arterijama, između njih i dece koja su primarno reagovala na terapiju.

Zaključak: Kasno prepoznavanje KB i odložena primena specifične terapije povećava značajno rizik za pojavu ozbiljnih koronarnih promena pre svega džinovskih koronarnih aneurizmi. Drugi zaključak je da rezistencija na terapiju KB nije povezana sa intenzitetom patoloških promena na koronarnim arterijama.

Ključne reči: Kawasakijska bolest, aneurizme koronarnih arterija, odložena dijagnoza

INFLUENCE OF EARLY DIAGNOSIS OF KAWASAKI DISEASE ON CLINICAL MANIFESTATIONS AND SEQUELS

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Introduction: Kawasaki disease (KD) is vasculitis of small and medium-sized arteries in children with a special affinity for coronary arteries. The most serious complication of KD is the coronary aneurysms.

The aim: The aim was to evaluate the impact of early diagnosis of KD and the application of appropriate therapy on the course and outcome of patients, especially the formation of aneurysms of the coronary arteries. The secondary objective is to examine the primary positive response or resistance to treatment of infected children with IVIG and aspirin.

Materials and methods: We analyzed 21 patients with Kawasaki disease. Patients were divided into two groups with respect to time of diagnosis and KB response to therapy. Echocardiographic findings were compared to coronary arteries, using Student's t test and chi-square test.

Results: There was no statistically significant difference in the frequency of normal coronary arteries and coronary arteries with dilatation between the two groups which differed according to the time of diagnosis KB. There was a statistically significant difference ($p = 0.045$), the incidence of giant aneurysms among these groups. Resistance to therapy were noticed in 6 (28%) children and no statistically significant differences in the findings of the coronary arteries.

Conclusion: Late recognition and delayed application of KB-specific therapy significantly increases the risk of serious coronary changes primarily of giant coronary aneurysms. The second conclusion is that resistance to therapy KB is not connected with the intensity of pathological changes of the coronary arteries.

Keywords: Kawasaki disease, coronary artery aneurysms, delayed diagnosis

KLINIČKI TOK I ISHOD BOLESTI PACIJENATA SA RAZLIČITIM FORMAMA WESTOVOG SINDROMA

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Uvod: Westov sindrom (WS) je ozbiljna epileptična encefalopatija i kao takva spada u jedan od najtežih oblika epilepsije dečijeg doba.

Cilj: Analiza i komparacija efikasnosti terapije kod simptomatske i idiopatske forme WS.

Materijal i metode: U ovoj šestomesečnoj studiji, u kojoj je analizirano 122 pacijenta, praćeni su odgovor na terapiju i promene u EEG nalazima kod simptomatske i idiopatske forme WS.

Rezultati: Simptomatski oblik bolesti bio je prisutan kod 97 (79.5%), dok je idiopatski zabeležen kod 25 (20.5%) pacijenata. Pri svakom kontrolnom pregledu, pacijenti oboleli od idiopatske forme WS imali su uglavnom dobar odgovor na terapiju i poboljšanje EEG nalaza, dok su rezultati kod obolelih od simptomatske forme bili lošiji.

Zaključak: Pacijenti sa idiopatskom formom bolesti bolje reaguju na terapiju i u većem procentu imaju poboljšanje EEG nalaza u odnosu na pacijente sa simptomatskom formom WS.

Ključne reči: Westov sindrom, infantilni spazmi, etiologija, odgovor na terapiju

CLINICAL COURSE AND OUTCOME IN PATIENTS WITH DIFFERENT FORMS OF WEST SYNDROME

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Introduction: West syndrome (WS) is a serious epileptic encephalopathy, and as such, is one of the most severe forms of epilepsy in childhood.

The Aim: Analysis and comparison of therapy efficacy in symptomatic and idiopathic form of WS.

Materials and Methods: This is a 6 months study in which 122 patients were analyzed. We evaluated the therapy response and EEG changes in symptomatic and idiopathic form of WS.

Results: Symptomatic form of disease was present in 97 (79.5%), and idiopathic was diagnosed in 25 (20.5%) patients. Patients with idiopathic form of WS were good therapy responders, and improvement on their EEG findings was found at every follow up examination, unlike patients with symptomatic form of WS.

Conclusion: Patients with idiopathic form of disease have better therapy response and higher percentage of improvement of EEG findings than those with symptomatic form of WS.

Keywords: West syndrome, infantile spasms, etiology, therapy response

TEŠKE HIPOGLIKEMIJE KOD DECE OBOLELE OD DIJABETESA MELITUSA TIP 1

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Uvod: Hipoglikemija predstavlja jednu od akutnih komplikacija dijabetesa melitusa tip 1. Teška hipoglikemija predstavlja stanje kada dolazi do promene mentalnog statusa, dete može biti polusvesno, u nesvesti ili u komi, mogu se javiti konvulzije i dete nije sposobno da samo sebi ordinira pomoć.

Cilj rada: Ustanoviti učestalost i ukazati na značaj pojave teških hipoglikemija kod dece obolele od dijabetesa melitusa tip 1.

Materijal i metode: Nakon sprovedene ankete ispitanici su podeljeni u dve grupe. Grupa 1- oboleli od dijabetesa koji nisu imali tešku hipoglikemiju i grupa 2- oni koji su imali tešku hipoglikemiju. Grupe su poredene u odnosu na uzrast, dužinu trajanja dijabetesa, stadijum puberteta, HbA1c, vrstu insulinske terapije. Analizirani su uzroci hipoglikemije, način lečenja, brzina oporavka, posledice, kao i uticaj samog događaja na dalju kontrolu dijabetesa.

Rezultati: Pacijenti koji su imali tešku hipoglikemiju su duže bolovali od dijabetesa u odnosu na one u grupi 1 (7.5 vs 4.1 godine, $p < 0,01$). Pacijenti u grupi koja je imala hipoglikemiju su bili stariji u odnosu na one koji nisu imali hipoglikemiju (16.1vs 12.1 godine, $p < 0,01$). Ispitanici u grupi 2 imaju veće prosečne vrednosti HbA1c od onih u grupi 1 (8.3 vs 7.6 %), iako ta razlika nije statistički značajna ($p = 0,23$).

Zaključak: Dugoročni ciljevi terapije dijabetesa melitusa kod dece su postizanje optimalne glikemije i sprečavanje nastanka potencijalno životno ugrožavajućih hipoglikemija.

Ključne reči: dijabetes melitus, teška hipoglikemija, deca

SEVERE HYPOGLYCEMIA IN CHILDREN WITH DIABETES MELLITUS TYPE 1

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Introduction: Hypoglycemia is an acute complication of diabetes mellitus type 1. Severe hypoglycemia is a condition with change in mental status, a child can be semi-conscious, unconscious or in coma, convulsions may occur and the child is not capable to help himself.

The Aim: To establish the frequency and highlight the importance of severe hypoglycemia in children with type 1 diabetes mellitus.

Materials and Methods: We conducted a survey and divided patients into two groups. Group 1- diabetic patients who had severe hypoglycemia, and group 2 - those with severe hypoglycemia. Groups were compared with respect to the age, duration of diabetes, puberty stage, HbA1c and type of insulin therapy. We analyzed the causes of hypoglycemia, treatment, the consequences and impact of the event to the further control of diabetes.

Results: Patients who had severe hypoglycemia had longer diabetes duration compared to those in group 1 (7.5 vs 4.1 years, $p < 0,01$). Patients in the group who had hypoglycemia were older than those who did not have hypoglycemia (16.1vs 12.1 years, $p < 0,01$). Patients in group 2 have higher HbA1c values than those in group 1 (8.3 vs 7.6%), although this difference was not statistically significant.

Conclusion: The goals of treatment of diabetes mellitus in children are to achieve optimal glycemic control but to prevent potentially life-threatening hypoglycemia.

Key words: diabetes mellitus, severe hypoglycemia, children.

PROCENA USPEŠNOSTI GENETIČKOG INFORMISANJA U OKVIRU CENTRA ZA PERINATALNU I REPRODUKTIVNU GENETIKU I ENDOKRINOLOGIJU KLINIČKOG CENTRA SRBIJE

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Uvod: Genetičko informisanje je proces koji pomaže ljudima da razumeju i prilagode se mogućem medicinskom, psihološkom i porodičnom opterećenju usled genetičkog poremećaja.

Cilj rada: Cilj istraživanja je procena uspešnosti prenatalnog genetičkog informisanja u okviru Centra za perinatalnu i reproduktivnu genetiku i endokrinologiju Kliničkog Centra Srbije. Istraživanje vrši i procenu psihometrijskih karakteristika Perceived Personal Control (PPC) upitnika tj. njegove verzije na srpskom jeziku.

Materijal i metode: PPC upitnik sadrži devet stavki sa tri moguća odgovora na skali. Korisnice su ga popunjavale pre i nakon genetičkog informisanja. Ukupno su uključene 92 korisnice starosti od 17 do 43 godina.

Rezultati: Vršili smo prikaz korisnica po sociodemografskim i karakteristikama predhodnih trudnoća. Evaluacija PPC upitnika je pokazala njegovu odličnu prihvatljivost, prihvatljivu pouzdanost (unutrašnja konzistencija PPC-pre $\alpha = 0,799$), jednodimenzionalnost strukture (niska unutrašnja konzistencija među subskalama) i dobru senzitivnost na promene. Porast PPC skora nakon genetičkog informisanja je visoko statistički značajan (paired $t = -6,374$; $p < 0,01$). Prvi odabran glavni faktor objašnjava 52.735% i 49.703% varijanse za PPC-pre odnosno PPC-posle.

Zaključak: PPC upitnik na srpskom jeziku pokazuje dobre psihometrijske karakteristike kada se koristi kao jednodimenzionalni instrument. Neophodno je dalje praćenje uspešnosti genetičkog informisanja u okviru Centra, a PPC upitnik se zbog svojih navedenih karakteristika može koristiti u ovu svrhu.

Ključne reči: genetičko informisanje, perceived personal control, procena uspešnosti, merenje ishoda, sociodemografske karakteristike

ASSESSMENT OF SUCCESS OF GENETIC COUNSELING IN THE CENTER OF PERINATAL AND REPRODUCTIVE GENETICS AND ENDOCRINOLOGY CLINICAL CENTER OF SERBIA

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Introduction: Genetic counseling is the process of helping people understand and adapt to the medical, psychological and familial implications of genetic contributions to disease.

The Aim: The aim of the study is to evaluate the success of prenatal genetic counseling in the Center of Perinatal and Reproductive Genetics and Endocrinology, Clinical Center of Serbia. This research performs the assessment of psychometrics properties by the Serbian translation of the Perceived Personal Control (PPC) questionnaire.

Materials and Methods: The PPC questionnaire comprises nine items with a three-point response scale. Clients completed it before and after genetic counseling. A total of 92 clients, between the age of 17 and 43, were included in the study.

Results: We performed the assessment of clients' characteristics by analysis of their sociodemographic characteristics and characteristics of previous pregnancies. Evaluation of Serbian translation of PPC questionnaire has shown excellent acceptability, acceptable reliability (internal consistency after PPC $\alpha = 0,799$), one-dimensionality structure (low internal consistency of the subscales) and good sensitivity to changes. The increase in PPC scores after genetic counseling is highly statistically significant (paired $t = -6,374$; $p < 0,01$). One main factor solution could explain 52.735% and 49.703% of the variance of pre-visit and post-visit scores, respectively.

Conclusion: The Serbian translation of the PPC has good psychometric properties when used as a one-dimensional scale. It is necessary to continue evaluating the success of genetic counseling within the Center. The PPC can be used for this purpose, because of its characteristics.

Key words: genetic counseling, perceived personal control, assessment of success, outcome measurement, sociodemographic characteristics

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Uvod: Tipična apsansna epilepsija detinjstva je oblik generalizovane idiopatske epilepsije s početkom uglavnom pre puberteta, češće kod devojčica, sa tipičnim kliničkim i elektroencefalografskim karakteristikama, uz dobar odgovor na terapiju. Procenjuje se da incidenca iznosi oko 8% svih epilepsija školskog uzrasta.

Cilj rada: Ispitati razlike u javljanju tipične apsansne epilepsije prema polu i uzrastu, kliničke i elektroencefalografske karakteristike apsansnih napada, učestalost pojave generalizovanih tonično-kloničnih napada (GTK) uz apsanse, kao i farmakološku kontrolu bolesti.

Materijal i metode: Analizirano je 42 pacijenata, prosečne starosti 6,6 godina (najmlađi 13 meseci, najstariji 13 godina), koji zadovoljavaju kliničke i elektroencefalografske kriterijume apsansne epilepsije. Ispitivane su karakteristike napada, EEG, reagovanje na terapiju. Korišćen je metod deskriptivne statistike.

Rezultati: Od 42 pacijenata (25 ženskog i 17 muškog pola), njih 31 ili 73,8% ispoljilo je samo napade po tipu apsansa. Ostalih 11 ili 26,2% je uz apsanse imalo je i GTK napad. EEG nalaz kod svih pacijenata bio je izmenjen u smislu promena tipičnih za apsansnu epilepsiju. Kontrola napada uspostavljena je valproatom i kombinacijom valproata i etosuksimida u oko 80% pacijenata.

Zaključak: Ispitanici u ovom istraživanju imali su dobne, kliničke i elektografske karakteristike u ispoljavanju napada, kao i dobar odgovor na terapiju, koji odgovara karakteristikama tipičnih apsansnih epilepsija opisanih u literaturi. Dobijen podatak od 26,2% pacijenata koji su uz apsansne, ispoljili i GTK napade, govori u prilog tome da kod 11 pacijenata apsansna epilepsija nije prepoznata i lečena na vreme, te je došlo do progresije bolesti i pojave GTK napada

Ključne reči: deca; apsansni napadi; GTK napadi

CLINICAL FEATURES AND FLOW OF DISEASE IN CHILDREN WITH TYPICAL ABSENCE EPILEPSY

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Introduction: Typical absence epilepsy is a form of idiopathic generalised epilepsy, beginning mostly before puberty, more often in female population, with typical clinical and electroencephalographic characteristics and good reaction on applied therapy. It is estimated that incidence is about 8% from all epilepsies in school age children.

The Aim: To analyze differences in typical absence epilepsy, according sex and age, clinical and electroencephalographic characteristics of absence seizures, also frequency of appearance generalized tonic-clonic seizures (GTC) in association with absence seizures.

Material and methods: It was analyzed 42 patients, average age of 6,6 years (the youngest 13 months, the oldest 13 years), who satisfied clinical and electroencephalographic criterias of absence epilepsy. There were examined epileptic seizures characteristics, EEG, reaction on applied therapy. There were used methods of descriptive statistics.

Results: Of 42 patients (25 females and 17 males), 31 or 73,8% had only absence seizures. Another 11 ili 26,2% had GTC in association with absence seizure. EEG findings were typical for absence epilepsy. Control of seizures was achieved by using sodium-valproate and combination of valproate and ethosuximide in about 80% of patients.

Conclusion: Respondents in this examination had the same age, clinical and electroencephalographic characteristics, as well as children with absence epilepsy described in literature. The fact of 26,2% patients who had GTC in association with absences, tells that absence epilepsy was not recognized and treated on time, what caused appearance of GTC.

Keywords: children; absence seizures; GTC seizures

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Uvod: Zbog primene visokih doza citostatika i zračenja u pripremi za transplantaciju matičnih ćelija hematopoze (TMČH) dolazi do oštećenja epitelnih i endotelnih ćelija što se može ispoljiti u ranoj fazi posle TMČH (prvih 100 dana posle TMČH) ili kasnije.

Cilj rada je utvrditi učestalost ranih komplikacija transplantacije matičnih ćelija hematopoze kod dece.

Materijal i metode: Retrospektivnom analizom obuhvaćeno je 139 bolesnika uzrasta od jedne do 20 godina kojima je urađena autologna (87) ili alogena (52) TMČH. Studijom je obuhvaćen period od TMČH do 100-tog dana posle TMČH i komplikacije koje su se javljale u tom periodu.

Rezultati: Najčešće rane komplikacije u grupi bolesnika obuhvaćenih studijom kod kojih je urađena autologna TMČH bile su: febrilna neutropenija (85), mukozitis (82) i venookluzivna bolest jetre (VOD) (12), a u grupi bolesnika kod kojih je urađena alogena TMČH bile su febrilna neutropenija (50), mukozitis (44), bolest kalema protiv domaćina (GVHD) (38), multiorganska disfunkcija (MOF) (7), infekcija citomegalo virusom (7) i VOD (6).

Zaključak: Učestalost javljanja febrilne neutropenije i mukozitisa kod bolesnika obuhvaćenih studijom je identična podacima iz literature, nezavisno od oblika TMČH. U odnosu na podatke iz literature, učestalost VOD-a je manja. GVHD se javio sa većom učestalošću u odnosu na podatke iz literature. Smrtnost kod posledica komplikacija je u saglasnosti sa rezultatima iz literature. Poznavanjem patofizioloških mehanizama i kliničkih manifestacija ranih komplikacija TMČH, te njihovim ranim dijagnostikovanjem i primenom savremenih profilaktičkih i terapijskih principa smrtnost vezana za transplantaciju se može značajno smanjiti.

Ključne reči: Transplantacija matičnih ćelija, komplikacije

EARLY COMPLICATIONS AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN

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Introduction: Hematopoietic stem cell transplantation (HSCT) is an important method of treating numerous congenital and acquired diseases. Damages of the epithelial and endothelial cells occur due to administering of high doses of cytostatics and radiation which can be manifested at an early stage after HSCT (first 100 days after HSCT) or later.

The Aim: The aim of this study is to determine the incidence of early complications of haematopoietic stem cell transplantation in children.

Material and methods: This retrospective analysis included 139 patients aged from one to twenty years who underwent HSCT. The study covered the period from HSCT to the 100-days after HSCT and complications which arose during that period

Results: The most common early complications in patients in the study who underwent autologous HSCT were: febrile neutropenia (85), mucositis (82), VOD (12) and in the group of patients who underwent allogeneic HSCT were febrile neutropenia (50), mucositis (44), GVHD (38), MOF (7), CMV (7), VOD (6).

Conclusion: The incidence of febrile neutropenia and mucositis in patients in the study was identical to bibliography data, regardless of the forms of HSCT. Compared to bibliography data the incidence of VOD is lower. GVHD occurred with greater frequency as compared to bibliography data. Transplantation related mortality is in agreement with result from the bibliography. Knowledge of the pathophysiological mechanisms and clinical manifestations of early complications of HSCT and their early diagnosis and applications of modern prophylactic and therapeutic principles transplantation related mortality can be significantly reduced.

Key words: stem cell transplantation, complications.

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Uvod: Dijabetes melitus tip I je bolest dece autoimune prirode, gde T limfociti igraju glavnu ulogu u destrukciji β -ćelija. Adenozin dezaminaza, enzim u T limfocitima, igra ključnu ulogu u destrukciji β -ćelija.

Cilj rada: Praćenje ponašanja enzima adenozin dezaminaze unutar limfocita u različitim fazama bolesti, uticaj metaboličke kontrole bolesti na aktivnost enzima kao i utvrđivanje povezanosti stepena ekspresije enzima i veličine C-peptida.

Materijal i metode: Israživanjem je obuhvaćeno 40 dece, dijagnostikovanja dijabetes melitusa tip 1 na Klinici za dečje interne bolesti, tokom četiri godine. Deca su bila uzrasta između 4 i 16 godina, 55% dečaka i 45% devojčica. Kontrolnu grupu činilo je 38 zdrave dece. Ujutru iz periferne venske krvi dece izolovani su limociti, i merena aktivnost enzima adenozin dezaminaze u njima. Nivo glikozilisanog HbA1c određivan je kolorimetrijski, a vrednosti C-peptida RIA metodom.

Rezultati: Postoji statistički signifikantna razlika u enzimskoj aktivnosti među polovima ($p=0,45$). Pubertetska deca imaju značajno više bazalne nivoe C-peptida ($p=0,07$). Adenozin dezaminaza je na početku bolesti je signifikantno viša ($p<0,05$) i u odnosu na fazu remisije i na hronični tok bolesti. Aktivnost adenozin dezaminaze je u korelaciji sa nivoom glikozilisanog HbA1c ($r=0,891$), a adenozin dezaminaze i C-peptida u inverznoj korelaciji ($r=0,995$).

Zaključak: Povećanje aktivnosti adenozin dezaminaze u dijabetes melitusu tip 1 u odnosu na zdrave je znak povećane aktivnosti i autoagresivnosti limfocita. Metabolička kontrola ima značajan uticaj na moduliranje aktivnosti T limfocita. Kada je glikoregulacija slaba, adenozin dezaminaza je veća, a vrednosti C-peptida manje.

Ključne reči: adenozin dezaminaza, glikozilisani HbA1c, C-peptid, aktivnost limfocita

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Uvod: Klinički značaj različitih parametara varijabilnosti krvnog pritiska kao nezavisnih prediktivnih faktora za nastanak subkliničkih organskih oštećenja u dece sa ili bez arterijske hipertenzije još uvek nije u potpunosti jasan.

Cilj: Cilj je ispitati potencijalnu vezu između varijabilnosti krvnog pritiska i hipertrofije leve komore kod dece.

Materijal i metode: Ispitivanjem je obuhvaćeno šezdeset šestoro dece koja su upućena na Kliniku za dečje interne bolesti radi dodatne evaluacije i sumnje na sistemsku arterijsku hipertenziju. Svoj deci je rađen 24 - satni ambulatorni monitoring pritiska i ehokardiografski pregled. Varijabilnost krvnog pritiska je određivana kao standardna devijacija (SD) i kao prava 24 - satna prosečna varijabilnost pritiska (ARV)

Rezultati: 27 (41 %) deteta nije imalo povišen pritisak, 13 (19,7%) je imalo ambulatornu prehipertenziju, 6 (9%) ambulatornu hipertenziju, 18 (27,2%) ozbiljnu ambulatornu hipertenziju, dvoje (3%) hipertenziju belog mantila. U grupi dece sa sistemskom hipertenzijom nije nađena statistički značajna razlika između SD dece bez HLK i dece sa HLK ($12,3 \pm 3,1$ vs $13,1 \pm 3,4$), $p>0,05$ kao ni statistički značajna razlika u 24 časovnom ARV dece bez HLK i dece sa HLK. ($8,9$ vs 9) $p>0,05$.

Zaključak: Parametri varijabilnosti krvnog pritiska u dece nemaju veći prediktivni značaj u proceni stepena hipertrofije leve komore u dece.

Ključne reči: Arterijska hipertenzija, hipertrofija leve komore, parametar ARV

ADENOSIN DEAMINASE AS A MARKER OF LYMPHOCYTE ACTIVITY IN DIABETES MELLITUS TYPE 1

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Introduction: Diabetes mellitus type I is a children's autoimmune disease, where T lymphocytes play a major role in destruction of β -cells. Adenosine deaminase, an enzyme in T lymphocytes, plays a major role in the destruction of β -cells.

The Aim: Monitoring of the enzyme adenosine deaminase activity within lymphocytes in different stages of the disease, the impact of metabolic control on the activity of enzyme and determination the relation between the expression of enzyme and C-peptide level.

Material and methods: Our investigation included 40 children with the diagnosis of diabetes mellitus type 1, between 4 and 16 years old, 55% boys and 45% girls. Lymphocytes were isolated from peripheral venous blood, and the activity of the enzyme was measured in them. HbA1c was measured by colorimeter, and C-peptide by RIA.

Results: There is a statistically significant difference in enzyme activity between the genders ($p = 0.45$). Children in puberty have a significantly higher basal levels of C-peptide ($p = 0.07$). Adenosine deaminase was significantly higher ($p < 0.05$) at the beginning of disease. The activity of adenosine deaminase is in correlation with the level gHbA1c ($r = 0.891$), whereas the activity of adenosine deaminase and C-peptide are correlated inversely ($r = 0.995$).

Conclusion: Increased activity of adenosine deaminase is a sign of increased activity and auto-aggressive lymphocytes. Metabolic control has a significant effect on modulation of T lymphocytes' activity. When glycoregulation is not satisfactory adenosine deaminase is higher and C-peptide lower.

Key words: adenosine deaminase, glycolized HbA1c, C-peptide, lymphocyte activity

THE IMPORTANCE OF DETERMINING THE VARIABILITY OF BLOOD PRESSURE IN CHILDREN WITH SUSPECTED ARTERIAL HYPERTENSION

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Introduction: The clinical significance of various parameters of blood pressure variability as an independent predictive factors for the occurrence of subclinical organ damage in children with or without arterial hypertension is still not entirely clear.

The aim: The aim is to investigate the potential relationship between blood pressure variability and left ventricular hypertrophy in children.

Materials and methods: The study involved sixty-six children addressed to the Department of Internal childrens diseases for further evaluation and suspected systemic arterial hypertension.

All children was made 24 - hour ambulatory monitoring of pressure and echocardiography. The variability of blood pressure is measured as the standard deviation (SD) and as a true 24 - hour average pressure variability (ARV).

Results: 27 (41%) children had not hypertension, 13 (19.6%) had ambulatory prehypertension, 6 (9%) ambulatory hypertension, 18 (27.2%) severe ambulatory hypertension and two (3%) had hypertension of white coat.

In the group of children with systemic hypertension was not found statistically significant differences between the SD children without LVH and children with LVH (12.3 ± 3.1 vs 13.1 ± 3.4), $p > 0.05$ as not statistically significant difference in 24 ARV hour without children and children with left ventricular hypertrophy. (8.9 vs 9) $p > 0.05$.

Conclusion: The parameters of blood pressure variability in children have not greater predictive value in assessing the degree of left ventricular hypertrophy in children.

Key words: arterial hypertension, hypertrophy of left ventricle, parameter ARV

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Uvod: Hormon rasta je produkt adenohipofize. Odgovoran je za rast i razvoj individue. Njegov nedostatak dovodi do pojave niskog rasta.

Cilj: Praćenje i procena efikasnosti lečenja supstitucionom terapijom hormonom rasta kod dece sa niskim rastom različite etiologije, određivanje zavisnosti doze i efekta u određenom periodu praćenja i uticaja blagovremenog otkrivanja ovog poremećaja na ishod lečenja.

Materijal i metode: Praćen je rast 32 pacijenata uzrasta 8,7 do 10 godina, podeljena u tri grupe zavisno od uzroka niskog rasta: prva grupa (18 pacijenata) - sa izolovanim deficitom hormona rasta, druga grupa (8 pacijenata) - sa multipnim deficitom pituitarnih hormona, a treća (6 dece) - pacijenti sa Sy Turner. Praćeni su telesna visina, percentil TV, scor standardnih devijacija TV, visinska zrelost, uzrast, telesna masa, doza leka i brzina rasta. Prosečna dužina praćenja efekta lečenja bila je 3 godine

Rezultati: Prosečna brzina rasta najveća je u grupi sa MDH (8.8 cm/god) u odnosu na IDHR (7,5 cm/god). Statistički, Pearsonovi koeficijenti linearne korelacije nisu značajne, ali su one negativne, što znači da godišnja brzina rasta negativno koreliše sa uzrastom pacijenata, kao i sa primenivanom dozom. Kod dece sa sy Turner brzina rasta je manja, ali su oni ipak dostigli normalnu visinu.

Zaključak: Rano započeta terapija dovodi do povećanja brzine rasta i dostizanje željene visine (iznad 2SD) u kraćem vremenskom intervalu, pre nastupanja puberteta. Nakon toga, brzina rasta opada.

Kod Turnerovog sindroma brzina rasta je manja te je postizanje normalne konačne visine moguće uz dugogodišnju supstitucionu terapiju u suprafiziološkim dozama.

Ključne reči: hormon rasta, hipopituitarizam, Sy Turner

EVALUATION OF GROWTH HORMONE TREATMENT IN CHILDREN WITH PITUITARY NANOSOMIA AND TURNER SYNDROMA

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Introduction: Growth hormone is a product of the adenohypophysis. It regulates growth and development in humans. His deficiency leads to nanosomia.

The Aim: Follow and evaluate substitutional GH therapy in children with nanosomia of diverse etiology, estimate the connection between growth speed and GH dose and the significance of early diagnosis in final therapy outcome.

Material and Methods: We followed the growth of 32 patients aged 8,7 to 10 years. According to GH deficiency etiology, they were divided in three groups: I group (18 patients) - with isolated GH deficiency, II group (8 patients) - multiple hormone deficiency and III group (6 patients) - Sy Turner. The followed parameters were height, height percentile, standard deviation score, height maturity, age, weight, GH doses and growth speed. Average following period was 3 years.

Results: Our study has shown that average growth speed is higher in group with MHD (8,8cm/year) than in group with IDGH (7,5 cm/year). Statistically, Pearson's linear correlations aren't significant, but they are negative, which means that annual growth speed is in negative correlation with patients' age and used GH dose. Children with Turner syndrome grow slower but they reach normal height.

Conclusion: Early start of therapy increases growth speed and enables children to reach the desired height (above 2SD) in a brief period, before puberty begins. After that, growth speed decreases. In Turner syndrome, growth speed is smaller, hence accomplishing the desired height is possible with long-term supraphysiological GH doses.

Keywords: growth hormone, hypopituitarism, Sy Turner

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Uvod: Hipotalamo-hipofizno-adrenalna osovina je najvažnija u stresnim situacijama jer obezbeđuje energiju putem skoka kortizolemije i indukcijom glukoneogeneze. Incidenca adrenalnog krvarenja je 1,6 do 2,1 na hiljadu novorođenčadi. Poreklo adrenalne hemoragije može biti traumatsko i netraumatsko. Prilikom agresivnih akušerskih manevara, nadbubrežne žlezde ploda se povređuju i može doći do unilateralnog ili bilateralnog krvarenja u manjem ili većem obimu. Netraumatski razlozi krvarenja su ređi.

Cilj rada: je ultrasonografska analiza i endokrinološko praćenje toka adrenalne hemoragije (evolucija hemoragije i kortizolemija), te formiranje preporuka za terapiju i praćenje ove grupu novorođenčadi.

Materijal i metode: Praćeno je prospektivno 17 novorođenčadi (muškog i ženskog pola) sa adrenalnom hemoragijom na Institutu za zdravstvenu zaštitu dece i omladine Vojvodine u Novom Sadu u šestogodišnjem periodu (2006-2011). Svakom novorođenčetu su rađeni: periodični ultrasonografski pregledi, određivanja kortizolemija, kao i natrijemija i glikemija.

Rezultati: Adrenalna hemoragija u posmatranoj grupi javlja se u 76,47% kod novorođenčadi muškog i u 23,52% kod novorođenčadi ženskog pola. Prosečna porođajna dužina novorođenčadi iznosila je 50,58±1,55 cm, a težina 3740,59±269,13 g. Krvarenje je najčešće bilo desnostrano (47,05%). Inicijalna kortizolemija bila je prosečno 86,61±54,43 mmol/l. Glikemija kod ispitnika prosečno iznosi 3,88±0,72 mmol/l, a natrijemija 137,94±2,14 mmol/l. Terapija je ukinuta prosečno nakon 5 i po meseci. Postignuta vrednost kortizola prosečno je iznosila 591,12±219,22mmol/l

Zaključak: Adrenalna hemoragija javila se kod ročne dece, pretežno muškog pola, normalnog Apgar skora, prosečne porođajne težine i dužine. Češće se javlja desnostrano. Glikemija i natrijemija bile su u okviru referentnih vrednosti, a ukidanje terapije sprovedeno je prosečno 5,5 meseci po rođenju.

Ključne reči: adrenalna hemoragija; novorođenče; kortizol.

ADRENAL HEMORRHAGE IN NEWBORN

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Introduction: The hypothalamic-pituitary-adrenal axis is important in stressful situations because it provides energy through the higher levels of cortisol and gluconeogenesis induction. The incidence of adrenal hemorrhage is 1.6 to 2.1 per thousand newborns. The origin of adrenal haemorrhage may be traumatic and nontraumatic. When aggressive obstetric maneuvers are provided, fetal adrenal glands are easily hurting and may lead to uni or bilateral hemorrhages in greater or lesser extent. Non-traumatic causes of bleeding are rare.

The Aim: was the analysis and ultrasonographic monitoring of the endocrine adrenal hemorrhage (evolution of hemorrhage and cortisol levels), also the formation of recommendations for treatment and monitoring of this group of infants.

Material and methods: Prospectively 17 infants (male and female) with adrenal hemorrhage were evaluated at the Institute for Health Protection of Children and Youth in Novi Sad in the six year period (2006-2011). Every newborn baby were made: periodic ultrasound examinations, measured cortisol, sodium and glucose level in blood.

Results: Adrenal hemorrhage in the observed group occurs in 76.47% of male infants and 23.52% in female newborns. The average birth length of infants was 50.58 ± 1.55 cm, and weight was 3740.59 ± 269.13 g. Bleeding is usually rightsided (47.05%). Initial cortisol was an average of 86.61 ± 54.43 mmol/l. Glucose level in patients was on average 3.88 ± 0.72 mmol/l, and sodium level was 137.94 ± 2.14 mmol/l. Therapy was discontinued after an average of five and a half months. The achieved average cortisol value was 591.12 ± 219.22 mmol/l.

Conclusion: Adrenal hemorrhage occurred in the mature newborn, mostly males, with normal Apgar scores, and the average birth weight and length. It is more frequently right-sided. Glucose and sodium levels were within reference values, and the therapy was conducted on average 5.5 months after birth.

Key words: adrenal hemorrhage; newborn; cortisol.

NEUHRANJENO NOVOROĐENČE – ANALIZA UČESTALOSTI I ETIOLOŠKIH UZROČNIKA TOKOM DESETOGODIŠNJEG PERIODA

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Uvod: Jedan od globalnih i vodećih problema, kako u svetu tako i kod nas, i poremećaj sa kojim se svakodnevno susrećemo jeste loše uhranjeno novorođenče. Srećom, zahvaljujući poboljšanim uslovima života i nivou zdravstvene zaštite tokom poslednjih decenija, incidencija nutritivnih deficitnih stanja pokazuje stalno opadanje, ali i dalje predstavlja osnovni razlog javljanja roditelja primarnoj zdravstvenoj zaštiti.

Cilj: Cilj našeg istraživanja je bio da utvrdimo učestalost hospitalizacije terminskog novorođenčeta pod dijagnozom Hyponutritio neonati, ispitamo uzroke ove pojave, analiziramo laboratorijske nalaze, pridruženost drugih patoloških stanja, vrstu ishrane pre i tokom hospitalizacije, i ishod lečenja i napredovanja na telesnoj masi tokom boravka u bolnici.

Materijal i metode: Studija je obuhvatila 97 otpusnih pisama ročne novorođenčadi, hospitalizovane na Institutu za zdravstvenu zaštitu dece i omladine Vojvodine, pod dijagnozom Hyponutritio neonati. Studija je obuhvatila desetogodišnji period (2001. do 2011.)

Rezultati: Prosečna starost novorođenčadi na prijemu bila je 16 dana, a prosečna telesna masa 3061, umesto 3475 grama za dati uzrast. Na prijemu 56.1% novorođenčadi je imalo pridruženu infekciju, i to najviše urinarnih E. Coli u 22.4%. Pre prijema na bolničko lečenje, novorođenčad su u 77.6% bila na prirodnoj ishrani, dok je tokom bolničkog lečenja u 43.9% slučajeva morala biti uvedena dohrana.

Zaključak: Učestalost hospitalizacije novorođenčadi primljene zbog nenapredovanja na telesnoj masi iznosila je 27.7%. Najčešći pridruženi problem bila je neprepoznata infekcija, sa pratećom leukocitozom u krvnoj slici. Zastupljenost prirodne ishrane je korelatna sa opštom populacijom kod nas. Prosečno napredovanje tokom bolničkog lečenja iznosilo je 400 grama.

Ključne reči: Neuhranjeno novorođenče, telesna masa, ishrana.

MALNUTRITION IN NEONATAL PERIOD - CLINICAL STUDY DURING TEN YEARS PERIOD

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Introduction: One of the major global issues, and the disorder which we encounter on a daily basis is malnutrition newborn. Fortunately, thanks to improved living conditions and level of health care in recent decades, the incidence of deficient nutritional state shows a steady decline, but remains an important cause of reporting parents to basic primary health care.

The Aim: The aim of our study was to determine the incidence of hospitalization, analyzed laboratory findings, association with other pathological conditions, type of diet before and during hospitalization, and treatment outcome and progression of body weight during their hospital stay.

Material and methods: The study included 97 term newborns discharge letters, hospitalized at the Institute for health protection of children and young Vojvodine, with the diagnosis, Hyponutritio neonati. The study included a ten-year period (2001. to 2011.)

Results: The average age of infants at admission was 16 days, with average body weight of 3061 instead of 3475 grams for a given age. On admission 56.1% of infants had associated infections, mostly urinary E. Coli in 22.4%. Before admission, 77.6% infants was on a natural diet, while during hospitalization in 43.9% of cases had to be introduced supplementation.

Conclusion: The incidence of hospitalization for failure to gain weight was 27.7%. The most common problem was unrecognized infection, with leukocytosis in the blood picture. The representation of the natural diet is correlated with the general population in our country. Average progress during hospitalization was 400 grams.

Keywords: Malnutrition infant, weight, diet.

STRUKTURA MORBITETA PREMREMENO ROĐENE NOVOROĐENČADI ISTE GESTACIJSKE STAROSTI IZ JEDNOSTRUKIH I BLIZANAČKIH TRUDNOĆA

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Uvod: Premremeno rođena novorođenčad, rođena pre navršene 37 gestacijske nedelje pripadaju grupi ugrožene novorođenčadi. Imaju manju sposobnost preživljavanja usled kompleksa multifaktorskih bolesti kao što su respiratorni distres sindrom (RDS), nozokomijalna sepsa, nekrotizirajući enterokolitis (NEC), intrakranijalna hemoragija, ishemijska, bronhopulmonalna displazija (BPD), koje smanjuju preživljavanje, a kasnije i mogućnost za optimalan neurološki razvoj. Premremeno rađanje dece (prematurnitet) češće je u toku multiplih trudnoća (blizanačka, triplet trudnoća), čija je ekspanzija poslednjih godina širom sveta posledica primene brojnih asistiranijih reproduktivnih tehnika, koje su vodeći tretman u lečenju steriliteta. Premremeno rođena deca i deca manje porođajne telesne mase sklonija su različitim stanjima i promenama u odnosu na donešenu novorođenčad (infekcije, respiratorni distres sindrom, intrakranijalna hemoragija, retinopatija, hiperbilirubinemija).

Cilj: Ispitati strukturu morbiditeta prematurusa iz jednostrukih i blizanačkih trudnoća, iste gestacijske starosti.

Materijal i metode: Istraživanje je sprovedeno kao prespektivno-retrospektivno. Analizirano je 60 prematurusa (30 prematurusa, blizanača i 30 prematurusa iz jednostrukih trudnoća), kod kojih je dijagnostikovano jedno ili više oboljenja: respiratorni distres sindrom (RDS), intrakranijalna hemoragija (HIC), retinopatija prematurusa (ROP), ikterus, sepsa i dijagnostikovana druga infekcija osim generalizovane.

Rezultati: Kod prematurusa bez obzira da li su iz jednostrukih ili blizanačkih trudnoća, najčešće postavljena dijagnoza je hiperbilirubinemija (83,3%) i RDS (78,3%). Zatim slede infekcije u 26,6% za jednostruke i 23,3% za blizanačke trudnoće i intrakranijalna hemoragija u 20% odnosno 23,3% prematurusa.

Zaključak: Statističkom obradom nije utvrđena signifikantna razlika u incidenciji ispitivanog morbiditeta između prematurusa iz jednostrukih i prematurusa blizanačkih trudnoća.

Ključne reči: prematuritet, blizanci, morbiditet

MORBIDITY STRUCTURE AMONG PREMATURELY BORN CHILDREN OF TWINS COMPARED TO SINGLETONS OF THE SAME GESTATIONAL AGE

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Introduction: Prematurely born children, who are born before 37 weeks of gestation belong to the prematurity risk category. They have a lowered survival rate due to complex multifactorial diseases such as respiratory distress syndrome (RDS), nosocomial sepsis, necrotizing enterocolitis (NEC), intracranial pathologies (bleeding, ischemia, maldevelopment), retinopathy of prematurity (ROP), and bronchopulmonary dysplasia (BPD) threaten survival and optimal neurodevelopment. Multiple pregnancies are more often delivered preterm (twins, triplet births); the growing number of multiple pregnancies around the world is the result of the expansion in the use of assisted reproductive techniques as the central treatment for sterility. Premature babies and infants with very low birthweight have higher predisposition for different diseases than term birth infants (infection, respiratory distress syndrome, intraventricular hemorrhage, retinopathy, icterus, septicemia, hyperbilirubinaemia)

The Aim: Our objective was to determine the morbidity structure among prematurely born children of twins compared to singletons born at the same gestational age.

Material and methods: This research was prospective – retrospective. The analysis included 60 prematurely born children (30 preterm twins and 30 singletons) who have been diagnosed with one or more diseases: respiratory distress syndrome, intraventricular hemorrhage, retinopathy, icterus, septicemia, and other, with the exception of general infections.

Results: The most common diagnosis of preterm twins and singletons was hyperbilirubinaemia (83.3%) and RDS (78.3%). Infections follow with 26.6% in singletons and 23.3% in twins and intracranial hemorrhage in 20%, that is 23.3% prematurely born babies.

Conclusion: According to statistical analyses, there is no significant difference in incidence of morbidity among prematurely born children of singletons and preterm twins.

Key words: prematurely, twins, morbidity

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Uvod: Sideropenijska anemija je najčešće oboljenje krvi dece najmlađeg uzrasta. Postoje mnogobrojni faktori koji utiču na pojavu anemije u odojčadskom uzrastu: uticaj sredine, socio-ekonomski faktor, navike u porodici, anemija majke u trudnoći, određene individualne karakteristike odojčeta (pol, vreme i način porođaja, telesna masa pri rođenju, pridružena oboljenja), kao i način ishrane deteta.

Cilj rada: Otkrivanje nekih faktora koji utiču na pojavu anemije i utvrđivanje učestalosti odojčadi sa lakom, umerenom i teškom anemijom.

Materijal i metode: Studijom je obuhvaćeno 184 anemične dece odojčadskog uzrasta (1-12 meseci) koja su hospitalno lečena na Odeljenju za odojčće Službe za odojčće i malo dete Instituta za zdravstvenu zaštitu dece i omladine Vojvodine u Novom Sadu tokom 2010. i prva četiri meseca 2011. godine.

Rezultati: Od ukupnog broja dece hospitalizovane na Odeljenju u ispitivanom periodu 30,82% je bilo anemično. Najčešće su deca imala lak oblik anemije (71,74%), nešto ređe umeren oblik (23,91%) i najređe težak oblik anemije (4,35%). Kao faktori koji su udruženi sa pojavom anemije izdvojeni su: muški pol, gradska sredina, nizak stepen obrazovanja oca i majke, najmlađi uzrast (1-3 meseca), prevremeno rođenje, porođaj carskim rezom, niska ocena (Apgar skor) na rođenju i pet minuta nakon rođenja, mala telesna masa i telesna dužina pri rođenju, neuhranjenost, usporen motorni razvoj, neredovna imunizacija, prisustvo oboljenja respiratornog i gastrointestinalnog trakta, nedojenje dece, veštačka ishrana i dohrana neadekvatne za uzrast.

Zaključak: Neophodno je preduzeti sve potrebne socijalne, ekonomske i edukaciono-vaspitne mere kako bi se korigovala ishrana odojčadi i obezbedile optimalne nutritivne potrebe, čime bi se sprečio nastanak sideropenijske anemije.

KLjučne reči: sideropenijska anemija, odojčad, faktori rizika.

SEVERITY AND SOME CAUSES OF INFANT SIDEROPENIC ANEMIA

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Introduction: Sideropenic anemia is the most common blood disorder of the youngest age. There are many factors that influence the occurrence of anemia in infants: the impact of the environment, socio-economic factors, family habits, anemia during pregnancy, certain individual characteristics of infants (sex, time and method of delivery, birth weight, diseases) and child nutrition.

The aim: To discover some of the factors that influence the occurrence of anemia and to determine the frequency of infants with mild, moderate and severe anemia.

Materials and methods: The study included 184 anemic infants (1-12 months) who were hospitalized at the Department of the infant within the Institute for Health Protection of Children and Youth of Vojvodina in Novi Sad in 2010. and the first four months of 2011. year.

Results: Of the total number of children hospitalized at the department during the study period 30.82% were anemic. Most often the children had a mild anemia (71.74%), less often, a moderate form (23.91%) and severe form of anemia was the least frequent (4.35%). As factors that are associated with anemia have been distinguished: male sex, urban area, low level of education of the father and mother, the youngest age (1-3 months), premature birth, birth by Caesarean section, a low score (Apgar score) at birth and five minutes after birth, low birth weight and birth length, malnutrition, delayed motor development, irregular immunization, the presence of diseases of the respiratory and gastrointestinal tract, lack of breastfeeding, artificial nutrition and supplementation inadequate for age.

Conclusion: It is important to take all the necessary social, economic and educational corrective measures to improve the diet of infants and provide optimal nutrition, which would prevent the development of sideropenic anemia.

Key words: sideropenic anemia, infants, risk factors.

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Introduction: The world literature annually born about 3-4% of children at risk, according to criteria risk for children. They need extra medical care and may have serious difficulties in adjustment over the life hereafter.

Objectives: The aim of this paper is to show the incidence of children born at risk, the most common risks in the last three years obstetric department the Clinical Hospital Stip, and to show possible association with some demographic characteristics such as gender, order of birth, age of mother.

Material and methods: The survey was conducted in the Department of Preventive health care for children pre-school, which includes all children born in obstetric department Clinical Hospital Stip. Analyzed were total 3277 health cards of children born between 2009-2011. The risk was compared according to generally accepted criteria for risk factors at birth.

Results: From total of 2,200 newborns in the three-year period with risk factors were born 159 children or 7.3% with increasing in number from year to year. In terms of gender, no significant statistical significance, the ratio male: female is 41,5:58,5%. Common risk factors include asphyxia at birth (24,5%), SGA(23.4%) and premature, ie children born with gestational maturity of 33-36 GN Often children were firstborn in 17.1% cases, and mothers in 51% were aged 20-33 years.

Conclusion: The number of children born with a risk factor increases in each subsequent year. This is probably due to the more modern medical care and treatment of maternal and newborn. Yet the efforts of medical personnel should be greater focus on prenatal health education of future mothers, higher health care and that preventing the birth of children with the most common risk factors, particularly perinatal asphyxia, SGA and prematurity.

Key words: infants, risk factors, asphyxia, SGA, premature.





**PSIHIJARIJA
I KLINIČKA PSIHOLOGIJA**

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Uvod: Medicinski intervjui predstavljaju suštinu procesa dijagnoze. Osim prikupljanja preciznih medicinskih detalja, to je jedan od ključnih faktora za uspostavljanje dobrog odnosa između lekara i pacijenta.

Cilj: Cilj ove studije bio je da se analiziraju komunikacijske veštine studenata druge godine medicine i da se ukaže na prednosti i nedostatke kako bi se ove veštine unapredile na najadekvatniji način.

Metode i materijali: Studija je uključivala je 200 studenata druge godine medicine. Studenti su bili podeljeni u grupe (4 studenata po grupi) i bio im je dodeljen zadatak da pripreme i na času simuliraju medicinski intervjui prateći forme razgovora i ponašanja naučene tokom nastave engleskog jezika u medicini.

Rezultati: Posmatranjem se došlo do zaključaka da je neophodno dalje uvećavanje, ne samo obrazaca za obavljanje razgovora između lekara i pacijenta, već i obnavljanje određenih jezičkih elemenata, kako iz opšteg tako i iz stručnog medicinskog engleskog jezika.

Diskusija: Nema standardnih lekara i pacijenata, pa stoga ne postoji ni standardni način izvođenja medicinskog razgovora. Neki problemi, ipak, mogu da se naslute, i lekari treba da budu pripremljeni da se sa njima suoče na adekvatan način. Postoji skup komunikacijskih veština koje mogu da se nauče i uvećaju kako bi se odgovorilo na različite situacije.

Zaključak: Unapređenje komunikacijskih veština u okviru medicinskog intervjua je važna obaveza kojoj lekari treba da se posvete.

Ključne reči: medicinski intervjui, komunikacijske veštine, problemi u komunikaciji

COMMUNICATION SKILLS IN THE MEDICAL INTERVIEW

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Introduction: Medical interview represents the core of the diagnostic process. Apart from obtaining precise medical details, it is also one of the key factors in establishing a good doctor-patient rapport which, in turn, improves cooperation and patient satisfaction.

The aim: Was to analyse the communication skills of the second-year medical students and to point out the advantages, as well as the disadvantages in order to improve these skills.

Methods and materials: The study included 200 second-year medical students. The students worked in groups of 4 and were assigned to prepare and simulate a medical interview following the forms of communication and behavior learned during the English language course.

Results: The observation has shown that further practice is necessary, concerning not only the patterns for conducting the doctor-patient interview, but also the revision of specific linguistic elements both from the General English and from the expert medical English language.

Discussion: There are no standard doctors and patients and therefore, there is no standard way for conducting a medical interview. Certain problems may, however, be anticipated, and doctors need to be well prepared to deal with them in their practice. There is a set of communication skills that can be learnt and practiced in order to deal with different situations.

Conclusion: Improving of communication skills within the medical interview is an important obligation which should be devoted.

Key Words: medical interview, communication skills, communication problems

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Uvod: Poremećaj ponašanja je jedan od najzastupljenijih mentalnih poremećaja u adolescentnom uzrastu. Odnosi se na obrasce ponašanja kojim se krše osnovna prava drugih, društvena pravila ili uzrasno primerene norme ponašanja. Može da ima nepovoljan dugoročni efekat na edukativno postignuće, relacije sa vršnjacima, zloupotrebu droga i delikvenciju kod mladih i utiče na kriminalitet oštećenje zdravlja u odraslom dobu. Poremećaji ponašanja se sa većom učestalošću javljaju kod muškog pola, usled čega ima značajno manje istraživanja o poremećajima ponašanja kod devojaka. Razlike po polu u ispoljavanju poremećaja ponašanja postaju izraženije u adolescenciji, pri čemu adolescenti pokazuju otvoreno agresivno ponašanje i čine ozbiljnija delikventna dela, dok su adolescentkinje sklonije prikrivenoj agresivnosti i statusnim prekršajima.

Cilj: Cilj našeg istraživanja je utvrditi da li postoje razlike u obeležjima ličnosti i emocionalno-bihevioralnim problemima između adolescenata i adolescentkinja sa poremećajem ponašanja.

Materijal i metode: Na kliničkom uzorku od 40 pacijenata, 22 pacijenta muškog pola i 18 pacijenata ženskog pola, sa dijagnozom poremećaja ponašanja koristili smo mere samoprocene. Primenjene skale samoprocene su APSD-Antisocial Process Screening Device (Trick i Hare 2001) u sklopu koje smo utvrđivali postojanje crta narcizma, impulsivnosti i bezosečajnosti i YSR-Youth Self report (Achenbach 1991) skala u sklopu koje smo utvrđivali postojanje emocionalno-bihevioralnih problema anksioznosti, depresije, poremećaja pažnje, asocialnog ponašanja, agresivnosti i sklonosti ka samoubistvu. Primenom metoda deskriptivne statistike utvrđivali smo razlike između grupe adolescentkinja i adolescenata sa navedenim merama samoprocene tj. subskalama APSD i YSR.

Rezultati: Nakon adekvatne statističke obrade podataka utvrdili smo da ne postoji statistički značajna razlika između polova kod adolescenata sa poremećajem ponašanja u stepenu izraženosti antisocialnih obrazaca ponašanja i crta ličnosti. Kod devojaka je utvrđena značajno veća izraženost problema pažnje. Kod oba pola crte bezosečajnosti su izraženije u odnosu na impulsivnost i narcizam.

Zaključak: Postoji razlika u zastupljenosti opisanog psihopatološkog fenomena između muškaraca i devojaka sa prevalencijom 6-10% za muški pol i 2-9% za ženski pol. Međutim, u samim obrascima ponašanja kod već ispoljenog poremećaja ne postoji statistički značajna razlika.

Ključne reči: Poremećaj ponašanja, polne razlike, crte ličnosti, emocionalno-bihevioralni problemi.

GENDER DIFFERENCES IN ADOLESCENTS WITH CONDUCT DISORDER

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Introduction: Conduct disorder is the most common mental disorder in adolescence. It refers to patterns of behavior that violate the fundamental rights of others, social norms, or age appropriate norms of behaviour. It could have a long-term adverse effects on educational achievement, relationships between peers, drug abuse and delinquency among young people. It could also effect criminal behaviour and damage health in adulthood. The conduct disorder occurs more frequently in male populations, therefore, there has been significantly less research conducted on the female population. The gender differences in the expression of behavioral disorders become more prominent in adolescence. While male adolescents have openly aggressive behavior and do serious delinquent acts, female adolescents are more prone to aggression and covert status offenses.

The Aim: The aim of this study is to determine whether there are differences in personality traits and emotional-behavioral problems among male and female adolescents with conduct disorder.

Material and methods: In a clinical sample of 40 patients, 22 male patients and 18 female patients with diagnosed conduct disorder, we used measures of self-assessment. The applied scale of self-assessment used is APSD, the Antisocial Process Screening Device (Trick and Hare 2001), used to consider the existence of trait of narcissism, impulsivity and insensitivity, and the YSR-Youth Self Report (Achenbach 1991) scale was used to consider the existence of emotional and behavior problems anxiety, depression, attention deficit disorder, antisocial behavior, aggressiveness and suicidal tendencies. By applying the methods of descriptive statistics we determined differences between groups of male and female adolescents.

Results: After using appropriate statistical analysis we found that there are no statistically significant differences in the degree of severity of antisocial behavioral patterns and personality traits between the genders in adolescents with conduct disorder. A significantly higher expression of attention problems was found in the female population. The features of insensitivity were more prominent than impulsivity and narcissism in both genders.

Conclusion: There was difference in the prevalence of psychopathological phenomena described above between boys and girls with a prevalence 6-10% for males and 2-9% for females. However, there is no significant difference in behavioral patterns of those who have already manifested conduct disorder.

Key words: Conduct disorder, gender differences, personality traits, emotional and behavioral problems.

RECIDIVI KOD PACIJENATA NA SUPSTITUCIONOJ TERAPIJI METADONOM

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Uvod: Bolesti zavisnosti, među kojima je i narkomanija spadaju u grupu recidivantnih bolesti. U kliničkom smislu, recidiv znači ponovnu upotrebu supstance u toku ili posle određenog perioda lečenja. Učestalost recidiva kod pacijenata koji su na supstitucionoj terapiji metadonom kao i povratak heroinu, mogu se u značajnoj meri smanjiti poznavanjem faktora koji doprinose pojavi recidiva.

Cilj: Cilj istraživanja je procena učestalosti recidiva i faktora koji na njih utiču među heroinskim zavisnicima, koji su na supstitucionoj terapiji metadonom.

Materijal i metode: U istraživanje su uključeni zavisnici od heroina koji su lečeni u Centru za produženi tretman zavisnika Kliničkog centra Vojvodine. Istraživanje je obuhvatilo 65 ispitanika, a recidiv je praćen tokom prva tri meseca po uključenoj u program. Podaci su prikupljeni i statistički obrađeni u statističkom programu STATISTIKA 7.

Rezultati: Istraživanje je pokazalo da postoje statistički značajne razlike recidiva u odnosu na radni status zavisnika, psihičke poremećaje oca, dominantan etiološki faktor, bračni status njihovih roditelja i hepatitisa B.

Zaključak: U istraživanju predstavljenom u ovom radu, utvrđeno je da se recidiv češće javlja kod zavisnika koji su nezaposleni. Recidivi su češći kod pacijenata čiji su očevi bolovali od alkoholizma i drugih bolesti zavisnosti. Veća je učestalost recidiva među zavisnicima koji kao dominantan faktor za početak uzimanja droga navode patologiju porodice i primarne psihičke poremećaje. Češća je pojava recidiva među pacijentima koji imaju rastavljene roditelje.

Ključne reči: Recidiv, heroinska zavisnost, supstitucija metadonom.

RELAPSE IN PATIENTS ON METHADONE TREATMENT

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Introduction: All substance abuse, including drug addiction, belong to group of recurrent illness. From the clinical point of view, relapse presents repeated using of substance during or after the treatment. Frequency of relapse could be significantly decreased, as well as regression of heroin, if factors included in relapse are known.

The aim: The goal of this research was to investigate the relapse, and risk factors associated with unsuccessful methadone treatment

Material and methods: For research are used heroin addicts treated in Center for extended treatment of addicts Clinical center of Vojvodina. This examination involved 65 subjects where relapse are observed three months from the start of treatment. All data are retrieved and statistically processed using the program STATISTIKA 7.

Results: As the result of research, there are described significant differences between relapse in relation to working status of addicts, dominant etiological factor, psychologically diseases of father, marital status of parents and hepatitis B.

Conclusion: Based on research, which is presented in this paper, it is established to relapse is often in case of unemployed addicts. Relapse is more often in case of patients which have a feature that their fathers were alcoholics or some other mental problems. More frequently relapse is between addicts which state primary psychologically disturbances as the reason for start taking heroin. At the end, it is observed more frequently relapse, in case of heroin addicts with divorced parents.

Key words: relapse, heroin dependence, methadone treatment, addicts.

RAZLIKE U OSOBINAMA LIČNOSTI IZMEĐU STUDENATA TRI STUDIJSKA SMERA KATEDRE ZA SPECIJALNU REHABILITACIJU I EDUKACIJU

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Uvod: Osobine ličnosti mogu u značajnoj meri da utiču na profesionalno usmerenje. Pretpostavlja se, da se studenti različitih studijskih usmerenja kojima je zajednička usmerenost na pomoć drugim osobama, ne razlikuju značajno po osobinama ličnosti.

Cilj: Ispitivano je da li postoje razlike u osobinama ličnosti u zavisnosti od odabira studijskog modula/smera.

Materijal i metode: Ispitivane su razlike u osobinama ličnosti između tri različita studijska modula Katedre za specijalnu rehabilitaciju i edukaciju, Medicinskog fakulteta u Novom Sadu - Inkluzivno obrazovanje, Višestruka ometenost i Bolesti zavisnosti. U istraživanju je učestvovalo 153 studenata prve, druge i treće godine studija, sva tri studijska modula. Primenjen je test Velikih pet plus dva, koji procenjuje pet dimenzija ličnosti višeg reda – Ekstraverziju, Neuroticizam, Savesnost, Prijatnost, Otvorenost prema iskustvu, Pozitivnu i Negativnu valencu, kao i osamnaest dimenzija nižeg reda.

Rezultati: Dobijene su statistički značajne razlike između ispitanih grupa na tri dimezije višeg reda - Neuroticizam, Agresivnost i Negativna valenca, kao i na pet dimenzija nižeg reda Depresivnost, Negativni afekat, Bes, Manipulativnost i Negativna slika o sebi. Ustanovljeno je da se na navedenim dimenzijama višeg i nižeg reda modul Bolesti zavisnosti statistički značajno razlikuje od modula Inkluzivno obrazovanje i Višestruka ometenost, ostvarujući prosečno više skorove.

Zaključci: Dobijeni rezultati ukazuju da se studenti studijskog smera Bolesti zavisnosti značajno razlikuju na dimenzijama ličnosti od preostala dva smera, sugerirajući da osobine ličnosti igraju značajnu ulogu u odabiru profesionalnog usmerenja. Dobijeni rezultati su iznenađujući, usled polazne pretpostavke istraživača da se studenti pomagačkih profesija ne razlikuju međusobno u osobinama ličnosti.

Ključne reči: osobine ličnosti, studijski smer, velikih pet plus dva

PERSONALITY DIFFERENCES BETWEEN STUDENTS ON THREE UNDERGRADUATE DEGREE PROGRAMMES AT THE DEPARTMENT OF SPECIAL EDUCATION AND REHABILITATION

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Introduction: Personality traits may significantly influence one's choice of future occupation. It is often assumed that individuals choosing courses of study leading to helping professions share common characteristics and do not differ significantly in their personality traits.

The aim: Assessment of possible differences in personality traits between students attending three undergraduate degree programmes.

Materials and Methods: Possible differences in personality traits between students attending three undergraduate degree programmes were assessed: Inclusive Education, Multiple Disabilities, and Addiction Disorders. The study included a total of 153 first, second and third year students attending the three study programmes at the Department of Rehabilitation and Special Education, Faculty of Medicine in Novi Sad. Personality differences between the students were examined using the "Big Five Plus Two test", which assesses five higher-order personality dimensions (extraversion, neuroticism, conscientiousness, agreeableness, openness to new experience, positive and negative valence) and eighteen lower-order dimensions.

Results: One-way analysis of variance showed statistically significant differences between the three groups on the higher-order dimensions of neuroticism, aggression and negative valence, as well as on the five lower-order dimensions such as depression, negative affect, anger, manipulation and negative self-image. Post hoc analysis revealed that the Addiction Disorders students differed significantly from the students of the other two programmes, having achieved higher average scores on the specified dimensions.

Conclusion: The results show that Addiction Disorders students and the other two programmes differ significantly in personality dimensions, suggesting that personality traits play an important role in profession choice. The results are surprising and contradict the assumption that students of helping professions have similar personality traits.

Key words: personality traits, study programme, 'Big Five Plus Two'

SAGOREVANJE LEKARA U BOLNIČKOM RADU

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Uvod: Dosadašnja istraživanja stresa pokazuju da je lekarska profesija u visokom riziku od obolevanja od psihičkih i somatskih poromećaja povezanih sa profesionalnim stresom, što može voditi značajnom poremećaju ličnog, porodičnog i profesionalnog funkcionisanja.

Cilj rada: Cilj ovog istraživanja bio je da se utvrdi nivo izloženosti lekara profesionalnom stresu, da se uporedi nivo stresa u grupi lekara opšte prakse sa nivoom stresa u grupi psihijatarata i stepen rizika od nastanka burnout sindroma.
Materijal i metode: Za ovu studiju preseka ispitanici su isabrani metodom slučajnog uzorka. Trideset lekara opšte prakse i 30 psihijatarata popunili su tri testa – upitnika: Sociodemografski upitnik, Opšti zdravstveni upitnik (GHQ), Masleč inventar izgaranja (MBI). U interpretaciji rezultata korišćeni su Pearsonov χ^2 -test, t-test i analiza varijanse.

Rezultati: Ukupni nivo psihičkog distresa meren GHQ testom u obe grupe lekara bio je nizak, što pokazuje da je ukupni uzorak lekara u ovom radu bio dobrog mentalnog zdravlja. Dobijena razlika u riziku od burnout sindroma na osnovu MBI testa između grupa lekara bila je statistički značajna ($\chi^2 = 4,286; p < 0,05$) samo kod supskale lične ispunjenosti poslom (MBI-PA) kao posledica većeg broja lekara opšte prakse sa srednjim burnout rizikom (13,3% prema 0,0%). Međutim, pokazano je da je visokim rizikom od burnout sindroma bilo ugroženo 35 lekara iz ukunog uzorka, prema supskalama emocionalne iscrpljenosti (MBI-EE) i depersonalizacije (MBI-DP), što pokazuje da su lekari u obe grupe veoma ugoženi rizikom od nastanka burnout sindroma.

Zaključak: Postoji visok rizik od nastanka burnout sindroma i u obe grupe ispitanika. Utvrđen je visok stepen osećaja emocionalne iscrpljenosti i prenapregnutosti poslom, te smanjeno ukupno zadovoljstvo poslom. Nivo izloženosti profesionalnom stresu viši je u populaciji opšte prakse nego u populaciji psihijatarata ali dobijena razlika nije statistički značajna.

KLjučne reči: sagorevanje na radu, psihijatrija, stres.

DOCTORS BURNOUT SYNDROM IN HOSPITAL WORK

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Introduction: So far, studies of stress have shown that physicians are at a high risk of sickness from psychic and somatic disorders related to professional stress, that can lead to important disturbance of personal, familiar and professional functioning.

The Aim: Was to investigate the doctors exposition level to professional stress, to compare stress level in general practitioners (GP) group with that in the group of psychiatrists and risk level for the appearance of burnout syndrome.

Materials and Methods: This cross-section study included subjects recruited by a random sample method. Thirty General Practice doctors and psychiatrists filled the set of 3 questionnaires: Sociodemographics, General Health Questionnaire (GHQ), and Maslach Burnout Inventory (MBI). Appropriate statistical procedures (Pearson test, t-test, variance analysis) in interpretation of the results were used.

Results: A total level of psychic distress measured with the GHQ test in both groups was low implying their good mental health. A difference in Burnout risk based on MBI test between the groups was statistically significant ($\chi^2 = 4,286; p < 0,05$) only at subscale Personal Accomplishment (MBI-PA); it was a consequence of a higher number of GPs with medium burnout risk (13,3%, 0,0). However, 35 physicians from the sample were affected with a high burnout risk measured with subscales Emotional Exhaustion (MBI-EE) and MBI-DP, showing that both groups of physicians had risk for the appearance of burnout syndrome.

Conclusion: The obtained results showed a high burnout risk level in both groups. In both groups there was a high level of emotional exhaustion and overextension by job, and also a lower total personal accomplishment. Level of exposition to personal stress is higher in GPs than in psychiatrists, but the difference was not statistically significant.

Keywords: burnout, psychiatry, stress.

PSIHOSOCIJALNE DETERMINANTE REZILIJENCIJE KOD OSOBA IZLOŽENIH NEPOVOLJNIM ŽIVOTNIM OKOLNOSTIMA

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Uvod: Rezilijencija se odnosi na kapacitet osobe da se uspešno adaptira na životne teškoće. Rezilijentne individue ispoljavaju adaptivne psihološke i fiziološke odgovore na stres. Osim uloge genetskih faktora, istraživanja pokazuju i veliki značaj psihosocijalnih determinanti rezilijencije. Dugo izlaganje stresu iscrpljuje adaptivne mehanizme i povezano je sa razvojem psihopatologije.

Cilj rada je utvrđivanje nivoa rezilijencije kod osoba koje su nakon stresnih životnih događaja razvile simptomatologiju reaktivnog stanja.

Materijal i metode: 60 ispitanika je podeljeno u eksperimentalnu i kontrolnu grupu. U eksperimentalnoj grupi su se nalazili ispitanici koji su se nakon stresnih događaja obratili psihijatru i dobili dijagnozu: Reaktivno stanje, u kontrolnoj grupi su se nalazili ispitanici članovi porodica koji nisu razvili psihopatologiju. Za procenu je korišćen instrument za samoprocenu rezilijencije: Skala za samoprocenu rezilijencije i anksioznosti (Self-Assessment of Resilience and Anxiety Scale) SARA. Podaci su analizirani korišćenjem metoda deskriptivne statistike i t testa i Levenovog testa za homogenost varijanse.

Rezultati: Nije nađena statistički značajna razlika između: Moje telo je relaksirano i Ne izbegavam stvari zbog straha. Granična statistička razlika nađena je kod: Nemam briga. Značajna statistička razlika ($p < 0,05$) nađena je kod: Osećam mir, Moje misli su fokusirane, Osećam samopouzdanje i Brzo se povratim nakon stresa. Najznačajnija statistička razlika nađena je kod: Društen sam ($p < 0,001$).

Zaključak: Rezultati pokazuju da su smirenost, mentalna čistoća i samopouzdanje bitni faktori ljudske rezilijencije. Socijalnost i socijalna podrška pokazali su se kao najbitniji faktori koji se ogledaju u velikoj sposobnosti dubokog povezivanja i uspostavljanja bliskih interpersonalnih odnosa.

KLjučne reči: rezilijencija, reaktivno stanje, eksperimentalna grupa, kontrolna grupa, SARA

PSYCHOSOCIAL DETERMINANTS OF RESILIENCE IN SUBJECTS EXPOSED TO ADVERSITY

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Background. Resilience refers to a person's ability to adapt successfully to stress. A resilient individual demonstrate adaptive psychological and physiological stress responses. Research shown that resilience is mediated by adaptive changes in several neural circuits. These changes shape the functioning of the neural circuits that regulate reward, fear, emotion reactivity and social behavior.

The Aim of the paper is to focus on identifying the psychosocial determinants of stress resistance in subjects exposed to adversity.

Method. Experimental group consisted of 30 individuals who developed anxious-depressive disorder after adverse life events. Control group consisted of 30 individuals, members of the same families, who were exposed to the same adversities but did not developed psychopathology. Estimation was performed using the Self-Assessment of Resilience and Anxiety Scale. The statistical analysis was performed using t-test.

Results. No statistical difference was found on: My body is relaxed and I do not avoid things because of fear. Borderline statistical difference was found on: I am free of worries. Significant statistical difference ($p < 0,05$) was found on: I feel calm, My thoughts are focused, I feel confident and I can bounce back after a stress. The most significant statistical difference was found on I feel sociable ($p < 0,001$).

Conclusion. The results showed that calmness, mental clarity and confidence are important factors in human resilience. Social competence and social support proved to be the most important factor, reflecting at the deeper level good attachment ability and the capacity to create close interpersonal relationship.

Keywords. Resilience, anxious-depressive disorder, SARA

KVALITET ŽIVOTA I FUNKCIONALNOST KOD HRONIČNE UPOTREBE BENZODIAZEPINA I ZAVISNOSTI OD PARAMETARA BENZODIAZEPINSKE ZAVISNOSTI

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Uvod: Hronična upotreba benzodiazepina može usloviti razvoj benzodiazepinske zavisnosti. Benzodiazepinska zavisnost predstavlja bolest koja može, kao i druga oboljenja, dovesti do izmene kvaliteta života i funkcionalnosti.

Cilj: Cilj istraživanja bio je da se utvrdi da li je stepen izraženosti benzodiazepinske zavisnosti u relaciji sa padom kvaliteta života i funkcionalnosti kod psihijatrijskih pacijenata sa hroničnom upotrebom benzodiazepina.

Materijal i metode: U istraživanje su uključena 63 dispanzerska psihijatrijska pacijenta koji benzodiazepine uzimaju hronično (preko 3 meseca) i koji pri aktuelnom javljanju na tretman imaju kliničku sliku benzodiazepinske zavisnosti. U cilju dobijanja neophodnih podataka primenili smo sledeće upitnike: opšti sociodemografski upitnik, Benzodiazepine Dependence Self-Report Questionnaire, World Health Organization Quality of Life-Brief i Sheehan Disability Scale.

Rezultati: (a) Kvalitet života u domenu telesnog zdravlja je na statistički značajnom nivou bio niži kod svih ispitanika sa izraženim indikatorima benzodiazepinske zavisnosti (problematična upotreba, preokupiranost benzodiazepinima, nepridržavanje propisanih doza i apstinencijalni sindrom). Pored toga, pad kvaliteta života u domenu psihološkog zdravlja je bio povezan sa rastom indikatora loše komplijanse ($p=0,027$), a u oblasti okolinskih uslova sa rastom apstinencijalnog sindroma ($p=0,001$). (b) U odnosu na funkcionalnost, visoki scorevi preokupiranosti benzodiazepinima i apstinencijalnog sindroma su povezani sa padom funkcionalnosti u sve tri oblasti (profesionalna, socijalna i porodična funkcionalnost), dok su visoki scorevi loše komplijanse bili povezani sa padom u oblasti profesionalnog i socijalnog funkcionisanja, a problematične upotrebe sa padom profesionalnog funkcionisanja.

Zaključak: Psihijatrijski pacijenti sa hroničnom upotrebom benzodiazepina imaju značajan pad kvaliteta života i značajan pad funkcionalnosti u profesionalnom, socijalnom i porodičnom životu.

Ključne reči: kvalitet života, funkcionalnost, benzodiazepinska zavisnost

QUALITY OF LIFE AND FUNCTIONALITY IN CHRONIC USE OF BENZODIAZEPINES DEPENDING ON THE INDICATORS OF BENZODIAZEPINE DEPENDANCE

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Introduction: Chronic use of benzodiazepines can cause benzodiazepine dependence. Benzodiazepine dependence is a disease that may, like other diseases, change one's quality of life and functionality.

The Aim: The aim of our study was to determine whether the degree of benzodiazepine dependence correlates with the decline of the quality of life and functionality of a person.

Materials and methods: Our research included 63 psychiatric outpatients who used benzodiazepines for over 3 months and who had signs and symptoms of benzodiazepine dependence upon presentation. We used following questionnaires to obtain necessary data: the general sociodemographic questionnaire, Benzodiazepine Dependence Self-Report Questionnaire, World Health Organization Quality of Life-Brief and Sheehan Disability Scale.

Results: a) Quality of life, concerning physical well-being, was statistically significantly lower in subjects with marked indicators of benzodiazepine dependence: problematic use, preoccupation, prescribed dose non-compliance, withdrawal syndrome). Moreover, the decrease in the quality of life concerning psychological health correlated with the indicators of bad compliance ($p<0,027$), whereas in the case of environmental aspects it correlated with the degree of withdrawal syndrome ($p<0,0011$). b) Concerning functionality, high benzodiazepine preoccupation and withdrawal syndrome scores correlated to a decline in all three aspects of functionality (professional, social, family functionality), while high scores of bad compliance correlated to the decline in professional and social functionality, and scores of problematic use to the decline in professional functionality.

Conclusion: Psychiatric patients with chronic use of benzodiazepine have a significant decline of the quality of life and reduced functionality in professional, social and family life.

Keywords: quality of life, functionality, benzodiazepine dependence

KOMUNIKACIONE VEŠTINE MEDICINSKE SESTRE – VASPITAČA KAO PREDIKTOR USPEŠNOSTI PROCESA ADAPTACIJE DECE NA VRTIĆ

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Uvod: Polazak deteta u vrtić predstavlja njegovo odvajanje od primarnog objekta afektivne vezanosti. Kako bi se dete adaptiralo na novu situaciju i pronašlo novu sigurnu bazu u vrtiću, zadatak medicinske sestre-vaspitača je da mu u tome pomogne. Da bi u tome uspela neophodne su joj dobre komunikacione veštine koje smo ispitali u ovom istraživanju.

Cilj: Cilj ovog rada je ispitivanje povezanosti komunikacionih veština medicinskih sestara-vaspitača sa stepenom uspešnosti adaptacije dece na vrtić.

Materijal i metode: Istraživanje je sprovedeno u predškolskoj ustanovi u Novom Sadu u dve pedagoške jedinice. U jednoj pedagoškoj jedinici ispitano je sedam jaslenih grupa, četiri mlađe i tri starije, a u drugoj pedagoškoj jedinici jedna starija jaslena grupa. Istraživanjem je obuhvaćeno 78 dece uzrasta od 1 do 3 godine, njihovih 78 roditelja i 20 medicinskih sestara-vaspitača. Za ispitivanje su korišćeni: 1. upitnik samoprocene medicinskih sestara-vaspitača koncipiran u svrhu ovog rada koji sadrži 31 pitanje i ispituje njihove komunikacione veštine; 2. upitnik sociodemografskih karakteristika koji su popunjavali roditelji, a odnosi se na podatke o deci; 3. ček liste praćenja dece koje su popunjavale medicinske sestre-vaspitači u toku dečjih svakodnevnih aktivnosti.

Rezultati: Rezultati ovog istraživanja pokazuju da su komunikacione veštine medicinskih sestara-vaspitača u značajnoj i visokoj pozitivnoj korelaciji sa adaptiranošću dece, da ne postoji značajna povezanost socio-demografskih varijabli sa aspektima adaptacije i da su deca nakon pet nedelja zaista bila bolje adaptirana.

Zaključak: Dobijeni rezultati govore u prilog tome da su komunikacione veštine medicinskih sestara-vaspitača od velike važnosti za adaptiranje dece.

Ključne reči: adaptacija na vrtić, medicinska sestra-vaspitač, komunikacione veštine, afektivna vezanost

COMMUNICATION SKILLS OF NURSES-EDUCATORS AS THE PREDICTOR OF TODDLERS' SUCCESS IN ADAPTING TO NURSERY

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Introduction: For a child, starting kindergarten represents the separation from its primary entity of affective attachment. The task of nurses-educators is to help the child in the process of adapting to the new situation and in finding another safe base in the nursery. In order to succeed in this task, the nurses-educators ought to have good communication skills, which was the topic of this research.

The Aim: The aim of this research is to examine the correlation between the communication skills of nurses-educators and the success rate of on toddlers' adaptation to nursery

Materials and Methods: This research was carried out in two pedagogical units at a nursery in Novi Sad. In one of the units there were seven nursery groups involved (four younger and three older groups), and in the other unit one older nursery group. 78 children ages 1 to 3, their 78 parents and 20 nurses-educators were included in this research. The research process involved: 1. a self-assessment questionnaire for nurses-educators designed for this research containing 31 questions in regards to their communication skills; 2. socio-demographic questionnaire for parents in regards to their children; 3. check list designed for tracking children during their daily activities filled by nurses-educators.

Results: Results of this research show that communication skills of nurses-educators are in significant and high positive correlation with toddlers' success in adapting to nursery; that there is no significant correlation between socio-demographic variables of children and their rate of adaptation and that after five weeks spent in nursery children improved in settling in.

Conclusion: Results of this research highlight the importance of communication skills of nurses-educators in the settling in process of children in nurseries.

Key words: adaptation to nursery, nurse-educator, communication skills, affective attachment

ДА ЛИ ЕМОЦИОНАЛНА ИНТЕЛИГЕНЦИЈА (EIQ) УТИЧЕ НА ПРОСЕЧНУ ОЦЕНУ СТУДЕНАТА ФАРМАЦИЈЕ НА МЕДИЦИНСКОМ ФАКУЛТЕТУ УНИВЕРЗИТЕТА У КРАГУЈЕВЦУ?

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Увод: EIQ представља скуп способности које би требало допринети тачној процени и изражавању својих емоција, као и процени туђих емоција и њиховом доприносу на мотивацију, планирање и постизање циљева у животу. Ово даје базу за даље истраживање шта је то што људе чини прагматичнијим у одређеним животним ситуацијама.

Циљ: Циљ овог рада је да се одреди ниво EIQ као потенцијаног индикатора академске успешности, код студената фармације са различитом просечном оценом на студијама.

Материјал и методе: Студија је спроведена на 143 студента фармације од 3. до 5. године на Медицинском факултету Универзитета у Крагујевцу. Сви испитаници су добили анкету и тест емоционалне интелигенције. Уз помоћ теста линеарне корелације одређивана је статистичка значајност повезаности емоционалне интелигенције и просечне оцене на студијама.

Резултати: У овој студији одбачена је H_0 да не постоји линеарна веза између EIQ и просечне оцене на студијама. Утврђено је да је сигнификантност значајна тј. да је линеарна веза јака. Бројни фактори почевши од времена проведеног у учењу, преко емоционалног стауса до завршене средње школе и успеха постигнутог у истој показали су статистички значајну повезаност са просечном оценом.

Закључак: EIQ је способност која се стиче учењем и развија са годинама. Она не само да може олакшати процес учења и довести до повећања академске успешности, већ има важну улогу и у побољшању креативности и флексибилности у решавању проблема. Савремено друштво је прихватило концепт EIQ као главног индикатора успешности, што би се могло испитати и његовим имплементирањем у фармацеутску делатност.

Кључне речи: EIQ, академски успех, студенти фармације.

DOES EMOTIONAL INTELLIGENCE (EIQ) AFFECT THE AVERAGE EVALUATION OF PHARMACY STUDENTS ON UNIVERSITY FACULTY OF MEDICINE IN KRAGUJEVAC?

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Introduction: EIQ is a set of skills that should contribute to correct the assessment and expressing their emotions, and evaluate other people's emotions and their contribution to the motivation, planning and achieving goals in life. This provides the basis for further exploring what is it that makes people more pragmatic in different situations.

The Aim: To determine the level of EIQ as potential indicator of academic success, the pharmacy students with different average grades at University.

Materials and Methods: The study was conducted on 143 pharmacy students of 3rd to 5th year study. All subjects were given a general enquiry and a test of EIQ. With the help of linear correlation test determined statistical significance of the relationship of EIQ and average grades at University.

Results: In this study rejected H_0 because it was found that the linear relationship between EIQ and the average grades is strong. A number of factors ranging from time spent in learning, through emotional status and graduating from secondary school and success achieved in the same show a statistically significant relationship with average grades.

Conclusions: EIQ is an skill that is acquired by learning and developing with age. It can't only facilitate the learning process and lead to increased academic success, but has an important role in improving creativity and flexibility in solving problems. Modern society has accepted the concept of EIQ as the main performance indicators, which could be explored and their implementation in the pharmaceutical business.

Key words: EIQ, academic success, pharmacy students.

PSIHOTICIZAM KAO FAKTOR U RAZVOJU POLITOKSIKOMANSKE ZAVISNOSTI

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Uvod: Razmere politoksikomanije kod mladih u celom svetu su sve veće. Psihoticizam je psihološki entitet koji se odnosi na posebne dimenzije bazične ličnosti, odnosno dezintegraciju kognitivnih funkcija. On može biti osnova patološkog funkcionisanja mladih ljudi uopšte i uticati na obrasce mišljenja, osećanja i aktivnosti, te usloviti disfunkcionalnost.

Cilj rada: Cilj rada je bio da se utvrdi u kojoj meri bazična dimenzija psihotocizma utiče na opredeljenje mladih da zloupotrebom psihoaktivnih supstanci (PAS) smanje uznemirujuće unutarpsihičke doživljaje ili manifestne simptome psihoze.

Materijal i metode: Za potrebe istraživanja formirane su dve grupe ispitanika slične po uzrastu, po polu i strukturi porodice iz koje potiču (bar jedan roditelj je živ). Za procenu konativne dezintegracije u funkciji utvrđivanja i operacionalizacije psihotocizma primenjen je instrument DELTA-9. Dobijeni rezultati su obrađeni statističkim metodama. Od deskriptivnih statističkih parametara izračunavana je aritmetička sredina sa merama disperzije. Izvršena je unakrsna analiza po ispitivanim varijablama, a ispitana je i statistička značajnost primenom Pirsonovog χ^2 -testa i analiza varijanse.

Rezltati: Struktura ispitanika prema uzrastu i polu bila je vrlo slična u grupi politoksikomana i kontrolnoj grupi, tako da nije bilo statistički značajne razlike ($p>0,5$). Statističkom analizom je utvrđeno da se u većini varijabli psihotocizma bitno razlikuju politoksikomani i ispitanici kontrolne grupe. Ispitivanjem je potvrđena visoka statistički značajna razlika varijabli psihotocizma između dve posmatrane grupe ispitanika ($p<0,001$ do $p<0,01$).

Zaključak: Utvrđena je statistički značajna zastupljenost dimenzije psihotocizma u grupi politoksikomana. Naglašena je zastupljenost faktora opšte izvršne disfunkcije.

Ključne reči: psihotocizam, politoksikomanija, zavisnost od PAS, dezintegracija, ličnost.

PSZHOTICISM AS AN FACTOR OF DEVELOPMENT POLITOXICOMANS DEPPEPENDENCE

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Introduction: Polytoxicomanic proportions in subpopulations of youth have been growing steadily in recent decades, and this trend is pancontinental. Psychoticism is a psychological construct that assumes special basic dimensions of personality disintegration and cognitive functions. Psychoticism may, in general, be the basis of pathological functioning of youth and influence the patterns of thought, feelings and actions that cause dysfunction.

The Aim: The aim of this study was to determine the distribution of basic dimensions of psychoticism for commitment of youth to abuse psychoactive substances (PAS) in order to reduce disturbing intrapsychic experiences of manifestation of psychotic symptoms.

Materials and Methods: For the purpose of this study, two groups of respondents were formed, balanced by age, gender and family structure of origin (at least one parent alive). The study applied a DELTA-9 instrument for assessment of cognitive disintegration in function of establishing psychoticism and its operationalization. The obtained results were statistically analyzed. From the parameters of descriptive statistics, the arithmetic mean was calculated with measures of dispersion. A cross-tabular analysis of variables tested was performed, as well as statistical significance with Pearson's χ^2 -test, and analysis of variance.

Results: Age structure and gender are approximately represented in both groups. Testing did not confirm the statistically significant difference ($p>0,5$). Statistical methodology established that they significantly differed in most variables of psychoticism, polytoxicomaniacs compared with a control group of respondents. Testing confirmed a high statistical significance of differences of variables of psychoticism in the group of respondents for $p<0.001$ to $p<0.01$.

Conclusion: A statistically significant representation of the dimension of psychoticism in the polytoxicomaniac group was established. The presence of factors concerning common executive dysfunction was emphasized.

Keywords: psychoticism, polytoxicomania, dependence, disintegration, personality.

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Uvod. Agresivnost i violencija su ponašanja koja su fokus brojnih psihijatrijskih istraživanja na individualnom nivou i na nivou društva [1]. Osnovni tipovi agresivnog ponašanja obuhvataju fizičku agresivnost, verbalnu agresivnost, bes i hostilnost.

Cilj rada je upoređivanje dominantnog tipa agresivnog ponašanja kod osoba zavisnika od alkohola i zdravih ispitanika, kao i upoređivanje povezanosti različitih tipova agresivnost ponašanja u ukupnom uzorku, u grupi zavisnika od alkohola i u grupi zdravih ispitanika.

Materijal i metode: U istraživanje je uključeno 60 ispitanika. U eksperimentalnoj grupi se nalazilo 30 ispitanika, koji su dijagnostikovani kao zavisnici od alkohola i lečeni su u vanbolničkim uslovima. U kontrolnoj grupi se nalazilo 30 zdravih ispitanika. Procena dominantnog tipa agresivnog ponašanja izvršena je korišćenjem Upitnika za agresivnost (Aggression Questionnaire - AQ). Statistička analiza podataka je izvršena korišćenjem metoda deskriptivne statistike, Studentovog t-testa i Pearsonovog koeficijenta linearne korelacije.

Rezultati su pokazali da je na svim skorovima subskala, kao i na ukupnom skoru skale statistički značajno veća težina parametara ostvarena kod ispitanika eksperimentalne grupe ($p < 0,001$). Primena Pearsonovog koeficijenta linearne korelacije između podataka je pokazala da u celom uzorku i u eksperimentalnoj grupi ostvareni skorovi po svim subskalama statistički značajno pozitivno korelišu sa maksimalnim nivoima značajnosti ($p < 0,001$), ali ne i u kontrolnoj grupi.

Zaključak. Kod osoba zavisnika od alkohola postoji značajno teže ispoljavanje ukupne agresivnosti, kao i svih dimenzija konstrukta agresivnosti: fizičke i verbalne agresivnosti, besa i hostilnosti. Tipovi agresivnog ponašanja u međusobnoj su korelaciji i pojačavaju međusobno dejstvo. Najveća težina pokazana je za dimenziju hostilnost.

Ključne reči: agresivnost, hostilnost, AQ.

TYPOLOGY OF AGGRESSION IN PEOPLE ADDICTED OF ALCOHOL

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Background. Aggressiveness and violence are behaviors that are the focus of a number of psychiatric research. The main types of aggressive behaviors include physical aggression, anger and hostility.

The Aim is to compare the dominant type of aggressive behavior in people addicted to alcohol and healthy subjects, and comparing different type of relationship

Method The study included 60 patients. In the experimental group were found 30 patients who were diagnosed as alcohol addicts and were treated in outpatient conditions. The control group contained 30 healthy subjects. Estimation of the dominant type of aggressive behavior was carried out using the Questionnaire for aggressiveness (Aggression Questionnaire - AQ). Statistical analysis was performed using methods of descriptive statistics, Student's t-test and Pearson's linear correlation coefficient.

Results. Results showed that scores on all subscales and total score on the scale significantly greater weight parameters was the experimental group ($p < 0.001$). Application of Pearson's linear correlation coefficient between the data showed that in the whole sample and in the experimental group achieved scores on all subscales significantly positively correlated with the maximum levels of significance ($p < 0.001$) but not in the control group.

Conclusion. For people addicted to alcohol, there are considerably more difficult to express the overall aggressiveness, and all dimensions of the construct of aggression: physical and verbal aggression, anger and hostility. Types of aggressive behavior are correlated with each other and enhance each other effects. The maximum weight is shown by the dimension of hostility.

Key words. Aggression, alcohol, AQ.

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Uvod: Osobine ličnosti se mogu izdvojiti kao jedan od najznačajnijih činičaca koji utiču na izbor zanimanja.

Cilj: Ispitivano je da li se studenti humanističkog i tehničkog studijskog usmerenja razlikuju u osobinama ličnosti.

Materijal i metode: U istraživanju je učestvovalo 280 ispitanika, oba pola, podeljenih u dve grupe. Prva grupa je formirana od studenata tehničkih usmerenja – mašinstvo, elektrotehnika i arhitektura, dok su drugu grupu činili studenti humanističke orijentacije – pedagogija, medicina i specijalna rehabilitacija i edukacija. Grupe su formirane u zavisnosti od toga da li je buduće zanimanje usmereno na rad sa ljudima ili nije. Za procenu bazičnih dimenzija ličnosti korišćen je upitnik Velikih pet + dva, kojim se procenjuje sedam bazičnih dimenzija ličnosti i osamnaest poddimenzija.

Rezultati: Ustanovljeno je da se ispitivane grupe statistički značajno razlikuju na tri od sedam bazičnih dimenzija: Neuroticizmu, Ekstraverziji i Negativnoj valenci i sedam poddimenzija: Depresivnosti, Negativnom afektu, Srdačnosti, Pozitivnom afektu, Društenosti, Manipulativnosti i Negativnom self konceptu. Studenti humanističke orijentacije postižu niže prosečne vrednosti na dimenziji Neuroticizam i Negativna valenca, kao i na poddimenzijama Depresivnost, Negativni afekat, Manipulativnost i Negativna slika o sebi u odnosu na grupu studenata tehničkog usmerenja, dok na dimenziji Ekstraverzija i poddimenzijama Srdačnost, Pozitivni afekat i Društenost studenti humanističke orijentacije postižu više prosečne skorove u odnosu na grupu studenta tehničkog usmerenja. Grupe su se značajno razlikovale po polnoj zastupljenosti, što je uzeto u obzir prilikom interpretacije rezultata.

Zaključci: Dobijena razlika između grupa ukazuje da studenti humanističke orijentacije ispoljavaju izraženije osobine kao što su društenost, srdačnost, pričljivost, optimizam, dobrodušnost, vedrina.

Ključne reči: osobine ličnosti, izbor zanimanja, procena

THE EFFECT OF PERSONALITY TRAITS ON SELECTION OF A STUDY PROFILE

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Introduction: Personality traits can be distinguished as one of the most important factors influencing the choice of profession.

The Aim: It was examined whether students of different study orientations differ in their basic personality traits.

Materials and Methods: The study included 280 subjects of both sexes, divided into two groups. The first group consisted of students of technical direction - mechanical engineering, electrical engineering and architecture. The second group consisted of students of human orientation - pedagogy, medicine and special rehabilitation and education. The groups were formed depending on whether the future interest is directed to work with people or not. The „Big five + two“ instrument was used for assessment of basic personality dimensions. This instrument assesses seven basic personality dimensions and eighteen sub-dimensions.

Results: It was found that the examined groups statistically significantly differ in three out of seven basic dimensions: Neuroticism, Extraversion, and Negative valence and seven sub-dimensions: Depression, Negative affect, Hospitality, Positive affect, Sociability, Manipulativeness, and Negative self concept. In relation to a group of students of technical direction, students of human orientation achieved lower average values on the dimension of Neuroticism and Negative valence, as well as sub-dimension of Depression, Negative affects, Manipulativeness and Negative self-image. Students of human orientation achieved higher average scores on the dimension Extraversion and sub-dimension Warmth, Positive affect and Sociability, than students in the group of technical direction. The groups differed significantly in gender representation which was taken into account when results were interpreted.

Conclusion: The resulting difference between the groups suggests that students of human orientation exhibit more pronounced traits such as sociability, hospitality, talkativeness, optimism, compassion, serenity.

Key words: personality traits, profession choice, assessment

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Увод: "Facebook" као тренутно најпопуларнија друштвена мрежа привлачи јако пуно пажње. Чињеница је да преко милион људи само из Србије користи "Facebook", различите старосне структуре, а пре свега младих, који све више времена проводе на овој мрежи.

Циљ: Циљ ове студије је да се процени интензитет коришћења "Facebook"-а и квалитет сна међу студентима фармације Медицинског факултета у Крагујевцу, да се истражи да ли је претерана употреба само "Facebook"-а, као једне од најпосећенијих веб страница, фактор ризика за погоршање квалитета сна.

Материјал и методе: Истраживање је спроведено опсервационом методом и користила се студија пресека. Испитивање је спроведено путем упитника који садржи питсбуршки индекс квалитета сна (Pittsburg sleep quality index (PSQI)) и питања у вези са коришћењем "Facebook"-а. Уз помоћ PSQI је мерен квалитет и дужина сна, а валидност овог теста показују многе студије. Анкетирано је 190 студената, узраста 19-23 година, од којих је 172 (46 мушкараца и 126 жена) у потпуности одговорило на сва постављена питања.

Резултати: Статистичком обрадом података добијено је да постоји значајна корелација између дужине коришћења "Facebook"-а и квалитета сна са коефицијентом корелације $r = 0,83$ ($P < 0,001$) што показује јаку везу. Од укупног броја испитаника, 28,49% има добар квалитет сна (PSQI) скор мањи од 5), док 71,51% има лош квалитет сна (PSQI) скор већи од 5).

Закључци: Анализом резултата дошли смо до података да постоји значајна корелација између времена проведеног на "Facebook"-у и квалитета сна тј. да дужина коришћења ове друштвене мреже утиче на погоршање квалитета сна.

Кључне речи: квалитет сна, PSQI, интернет, коришћење компјутера, поремећај сна, адолесценција.

IS THERE A CORRELATION BETWEEN LENGTH OF USE OF FACEBOOK AND QUALITY OF SLEEP?

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Introduction: Facebook, currently as the most popular social network, attracts so much attention. The fact is that over one million people just from Serbia use Facebook, who are different age, especially young people. who spend more and more time on this network.

The aim: to estimate intensity of using the Facebook and sleep quality between farmacy students of Medical Faculty of Kragujevac; to investigate if excessive use of Facebook is risk factor for deterioration of quality of sleep.

Material and Methods: The study was conducted using observational and crossover study. The research was condused using the questionnaire which contains Pittsburg sleep quality index (PSQI) and some questions about using Facebook. PSQI is used to measure the quality and length of sleep, and many studies show the validity of this test (PSQI). There were 190 students, aged 19-23 years, of which 172 (46 men and 126 women) responded fully to all questions.

Results: Statistical data processing was a significant correlation between length of use "Facebook" and sleep quality with a correlation coefficient $r = 0.83$ ($P < 0.001$) indicating a strong relationship. Of all respondents, only 28.49% have good sleep quality (PSQI score less than 5), while 71.51% had poor sleep quality (PSQI score higher than 5).

Conclusion: The results showed a significant correlation between time spent on "Facebook" and quality of sleep. This means that the length of use of social networks affects the deterioration of the sleep quality.

Key words: quality of sleep, PSQI, internet, computing, sleep disorders, adolescence.

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Увод: Autizam predstavlja sveobuhvativni razvojni poremećaj, koji zahvata sve psihičke funkcije. Svrstan je u kategoriju pervazivnih razvojnih poremećaja. Javlja se do treće godine života. Težina kognitivnog i socijalnog oštećenja utiče na to da su roditelji dece s autizmom ranjivi na stres. Mnoge studije su opisale pojavu problema emocionalnog funkcionisanja i problema ponašanja kod roditelja dece s autizmom.

Циљ рада: Циљ рада је утврдити да ли постоје разлике у изражености емоционалних проблема и проблема понашања код родитеља dece са autizmom у односу на израженост ових проблема код родитеља dece без autizma. Хипотеза је да су ови проблеми израженији код родитеља dece са autizmom.

Материјал и методе: Истраживње је спроведено по типу опсервационе студије пресека. У истраживању је укључено 62 родитеља, старости од 23 до 59 година. Групу родитеља dece са autizmom чинило је 31 родитељ, а контролну групу родитеља, сличне старости и socioeconomic statusa, чинило је такође 31 родитељ dece без autizma. Instrument студије је био упитник ASR за самопроцену проблема emocionalnog funkcionisanja i problema pobašanja odraslih од 18 до 59 година.

Резултати: Rezultati pokazuju da, upoređivanjem dimenzija na skali problema ASR-a između grupe roditelja dece s autizmom i kontrolne grupe roditelja, ne postoji statistički značajna razlika.

Закључак: На основу резултата добијених овим истраживањем, не може се тврдити да су проблеми emocionalnog funkcionisanja i problemi ponašanja више изражени код родитеља dece са autizmom у односу на контролну групу родитеља.

Кључне речи: autizam, emocionalni problemi, problemi ponašanja, roditelji.

EMOTIONAL AND BEHAVIORAL PROBLEMS AMONG PARENTS OF CHILDREN WITH AUTISM

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Introduction: Autism is a developmental disorder, which covers all mental functions. It is in the category of pervasive developmental disorders. Displacement of cognitive and social damage affects parents of children with autism in order to be more vulnerable to stress. Many studies have described the occurrence of problems of emotional functioning and behavioral problems among parents of children with autism.

The Aim: The aim of this study was to determine whether there are differences in the expressiveness of emotional problems and problematic behavior among parents of children with autism compared to expression of these problems among parents of children without autism.

Material and methods: The study included a total of 62 parents, aged 23-59 years. A group of parents of children with autism consisted of 31 parent. A control group of parents, with similar age and socioeconomic status, consisted of also 31 parent of children without autism. The instrument was a questionnaire study ASR for self assessment of problems in emotional functioning and behavioral problems of adults aged 18 to 59 years.

Results: Results show that, comparing the dimensions of the problem scale ASR between groups of parents of children with autism and parents of the control group, there is no statistically significant difference.

Conclusion: Based on the results obtained in this study, we can not say that the problems of emotional functioning and behavioral problems are more prominent among parents of children with autism compared with the control group of parents.

Keywords: autism, emotional problems, behavioral problems, parents.

NEGATIVNE EMOCIJE ČLANOVA PORODICE NARKOMANA NA METADONSKOM PROGRAMU

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Uvod: Narkomanija pripada grupi bolesti zavisnosti i jedna je od najučestalijih psihijatrijskih oboljenja mladih. Sumnja ili saznanje da im dete koristi psihoaktivne supstance kod roditelja i drugih članova porodice pobudjuje brojne emocionalne i ponašajne reakcije.

Cilj: Cilj rada bio je da utvrdimo da li su sociodemografske karakteristike narkomana kao i posledice i tok narkomanije povezane sa negativnim emocijama njihovih saradnika u lečenju.

Materijal i metode: U studiju je uključeno 46 ispitanika oba pola (12 muškaraca ili 26,1% i 34 žena ili 73,9%) koji su bili saradnici u lečenju zavisnika na metadonskom programu. U cilju dobijanja neophodnih podataka, koristili smo opšti sociodemografski upitnik za podatke o saradniku u narkomanu, Beck Anxiety Inventory, The Patient Health Questionnaire 9 i Aggression Questionnaire.

Rezultati: Emocije saradnika u tretmanu narkomana na metadonskom programu su povezane sa tokom narkomanije, nekim karakteristikama narkomana, a nešto manje sa posledicama koje oboljenje sa sobom nosi. Sve negativne emocije su bile izraženije kod onih saradnika čiji je rođak ili partner imao najnižu stručnu spremu – osnovnu školu. Neuspeli pokušaji apstinencije su bili povezani sa fizičkom agresivnošću, besom, depresivnošću i anksioznošću.

Postoji povezanost između prethodnih overdoziranja narkomana i aktuelne anksioznosti i hostilnosti saradnika, kao i povezanost depresivnosti i hepatitisa C. Skoro svi korelati agresivnosti su se sa protokom vremena, tačnije dužinom narkomanije, tretmana i metadonskog programa redukovali

Zaključak: Negativne emocije saradnika u lečenju narkomana koji su na metadonskom tretmanu su dominantno povezane sa tokom bolesti i edukativnim nivoom narkomana.

Ključne reči: Negativne emocije, porodica, narkomanija, metadonska terapija

NEGATIVE EMOTIONS OF FAMILY MEMBERS OF DRUG ADDICTS ON METHADONE PROGRAM

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Introduction: Drug addiction belongs to a group of addiction diseases and it's one of the most common psychiatric disorders of young people. Suspicion or knowledge that their child is using substances among parents and other family members invokes a number of emotional and behavioral reactions.

Aim: The aim of this study was to determine whether sociodemographic characteristics and consequences of drug addicts and drug flow are associated with negative emotions at their associates in treatment.

Material and methods: The study included 46 subjects of both sexes (12 men or 26.1%, and 34 women or 73.9%) who were associates in treatment of drug addicts on methadone program. In order to obtain the necessary data, we used a general questionnaire for sociodemographic information about associates and drug addicts, Beck Anxiety Inventory, The Patient Health Questionnaire 9 and Aggression Questionnaire.

Results: Emotions of associates in drug addicts treatment on methadone program were associated with the flow of drug addiction, with some characteristics of drug addicts, and less with the consequences of disease. All negative emotions were more expressed in those associates whose cousins and partners had the lowest degree elementary school. Unsuccessful attempts at abstinence were associated with physical aggression, anger, depression and anxiety. There is a correlation between previous overdose and current anxiety and hostility within associates.

Conclusion: Negative emotions of associates in treatment of drug addicts who are on methadone treatment are predominantly associated with the disease flow and educational level of drug addicts.

Keywords: Negative emotions, family, drug addiction, methadone treatment

RIZIK OD SINDROMA PROFESIONALNOG IZGANANJA U RADU LEKARA

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Uvod: Dosadašnja istraživanja stresa pokazuju da je lekarska profesija u visokom riziku od obolevanja od psihičkih i somatskih poremećaja povezanih sa profesionalnim stresom, što može voditi značajnom poremećaju ličnog, porodičnog i profesionalnog funkcionisanja.

Cilj: cilj ovog istraživanja bio je da se utvrdi nivo izloženosti lekara profesionalnom stresu, i stepen rizika od nastanka sindroma profesionalnog izgaranja.

Metod: metod za ovu studiju preseka ispitanici su izabrani metodom slučajnog uzorka. Trideset lekara opšte prakse i 30 psihijatar (ukupno uzorak 60 lekara) popunili su tri upitnika: Sociodemografski upitnik, Opšti zdravstveni upitnik (*General Health Questionnaire* – GHQ, Goldberg D, 1991), Masleč inventar izgaranja (*Maslach Burnout Inventory* – MBI, Maslach C, 1996). U interpretaciji rezultata korišćeni su Pirsonov χ^2 -test, t-test i analiza varijanse.

Rezultati: Ukupni nivo psihičkog distresa meren GHQ testom u obe grupe lekara bio je jako nizak, što pokazuje da je ukupni uzorak lekara u ovom radu bio dobrog mentalnog zdravlja. Dobijena razlika u riziku od sindroma profesionalnog izgaranja na osnovu MBI testa između grupa lekara bila je statistički značajna ($\chi^2 = 4,286; p < 0,05$) samo kod supskale lične ispunjenosti poslom (MBI-PA), kao posledica većeg broja lekara opšte prakse sa srednjim rizikom od profesionalnog izgaranja (13,3% prema 0,0%). Međutim, pokazano je da je visokim rizikom od sindroma izgaranja bilo ugroženo čak 35 lekara iz ukupnog uzorka, prema supskalama emocionalne iscrpljenosti (MBI-EE) i depersonalizacije (MBI-DP), što pokazuje da su lekari u obe grupe veoma ugroženi rizikom od nastanka sindroma izgaranja.

Zaključak: Postoji visok rizik od nastanka sindroma profesionalnog izgaranja kod lekara.

Ključne reči: sagorevanje na radu, sindrom; lekari, porodični; psihijatrija; stres, psihički.

THE RISK OF PROFESSIONAL BURNOUT SYNDROME IN DOCTORS WORK

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Introduction: So far, studies of stress have shown that physicians are at a high risk of sickness from psychic and somatic disorders related to professional stress, that can lead to important disturbance of personal, familiar and professional functioning.

The aim of this study was to investigate the doctors exposition level to professional stress, to compare stress level in general practitioners (GP) group with that in the group of psychiatrists and risk level for the appearance of burnout syndrome.

Methods. This cross-section study included subjects recruited by a random sample method. Thirty General Practice doctors and 30 psychiatrists (totally 60 doctors) filled the set of 3 questionnaires: Sociodemographics features, General Health Questionnaire (GHQ; Goldberg D, 1991), and Maslach Burnout Inventory (MBI; Maslach C, 1996). Appropriate statistical procedures (Pearson test, t-test, variance analysis) in interpretation of the results were used.

Results. A total level of psychic distress measured with the GHQ test in both groups of physicians was very low implying their good mental health. A difference in Burnout risk based on MBI test between the groups was statistically significant ($\chi^2 = 4,286; p < 0.05$) only at subscale Personal Accomplishment (MBI-PA); it was a consequence of a higher number of GPs with medium burnout risk (13.3 : 0.0%). However, even 35 physicians from the sample were affected with a high burnout risk measured with subscales Emotional Exhaustion (MBI-EE) and MBI-DP, showing that both groups of physicians had risk for the appearance of burnout syndrome.

Conclusion. Obtained results showed a high burnout risk level among physicians.

Key words: burnout, professional; physicians, family; psychiatry; stress, psychological.

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Uvod: Psihijatrijski poremećaji predstavljaju poremećaje mišljenja, iskustava i emocija, dovoljno ozbiljne da onemogućavaju normalno funkcionisanje osobe, održavanje dobrih međuljudskih odnosa i obavljanje svakodnevnih poslova. Savremene trendove u domenu zaštite i unapređenja mentalnog zdravlja odlikuje to da se mentalni poremećaji ne proučavaju isključivo u svetlu individualne etiopatogeneze, simptomatologije i intrapsihološke dinamike, već u sferi nekoliko dimenzija, od kojih je svakako porodica značajan faktor.

Cilj: Cilj istraživanja je bio da se utvrdi da li se porodice dece sa psihijatrijskim poremećajima razlikuju po stepenu funkcionalnosti u odnosu na porodice dece bez psihijatrijskih poremećaja.

Materijal i metode: Uzorak u ovom istraživanju je činilo 60 porodica podeljenih u 2 grupe – kliničku i kontrolnu. Kliničku grupu je činilo 30 porodica dece koja imaju neki psihički poremećaj. Kontrolnu grupu je predstavljalo 30 porodica dece koja nemaju dijagnozu nekog psihičkog poremećaja. Kao instrumenti korišćeni su FACES IV i Opšti upitnik.

Rezultati: Primenom t-testa na skorove dobijene uz pomoć FACES IV utvrđene su statistički značajne razlike između kliničke i kontrolne grupe kada su u pitanju umreženost, nivo kohezivnosti i ukupan nivo balansiranoosti u porodici i porodično zadovoljstvo.

Zaključak: Porodice dece sa psihijatrijskim poremećajima se po stepenu funkcionalnosti razlikuju od porodica dece bez psihijatrijskih poremećaja.

Ključne reči: psihijatrijski poremećaji, porodična funkcionalnost, FACES IV

ANALYSING FUNCTIONALITY OF FAMILIES OF CHILDREN WITH PSYCHIATRIC DISORDERS

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Introduction: Psychiatric disorders are disorders of thoughts, perceptions and emotions, serious enough to obstruct ones normal functioning, good interpersonal relationships, and doing everyday jobs. Modern trends in protection and improvement of mental health do not study mental disorders only in the light of individual etiopathogenesis, symptomatology and intrapsychological dynamics, but they involve several dimensions, regarding family as a very significant factor.

The Aim: The aim of this study was to realize if families of children with psychiatric disorders differ by the level of functionality from families of children without psychiatric disorders.

Materials and methods: The research included 60 families divided into one clinical and one control group. In clinical group there were 30 families of children with some sort of psychiatric disorder, whereas in control group there were 30 families of children without any psychiatric disorder. FACES IV and General questionnaire were used as instruments.

Results: Differences in level of cohesion, enmeshed, total family balance ratio and family satisfaction between clinical and control group were found to be statistically significant by applying t-test on scores gained from FACES IV.

Conclusion: Families of children with psychiatric disorders differ from families of children without those disorders, regarding level of family functionality.

Key words: psychiatric disorders, family functionality, FACES IV

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Uvod: Zavisničko ponašanje je čvrsta homeostaza porodice.

Cilj rada: Cilj istraživanja bio je da se ustanove nepravilnosti tokom odrastanja zavisnika i specifičan tip odnosa među članova porodice zavisnika.

Metoda rada: Za potrebe istazivanja korišćeni su opšti upitnik o načinu odrastanja i upitnik gradir za ispitivanje porodičnih odnosa.

Rezultati: Delikventno ponašanje se često beleži kod zavisnika i pre nastanka zavisnosti. Ustanovljena je i značajna disfunkcionalnost porodice zavisnika. Porodice u kojima odrasta zavisnik nisu značajno oštećene ili izmenjene u pogledu emocionalne razmene, koliko u samoj strukturi, što pojačava disfunkcionalnost koja vodi ka zavisničkom ponašanju.

Zaključak: Emotivni podsticaji roditelja bez kontrole, zabrane i kazne doprinose izostanku u svesti koja bi omogućila bolju socijalizaciju zavisnika. Zbog prividne kontrole i podrške, zavisnici nemaju dobru raspodelu vremena i adekvatnu socijalizaciju. Emotivni podsticaj i bez obaveza da bolitoksikomani održavaju recipročan odnos sa svojim roditeljima utiču na to da roditelji podržavaju egoistični stil ponašanja.

Ključne reči: politoksikomanija, porodica, zavisnik.

DYSFUNCTIONALITY OF THE PRIMARY FAMILY AS A SUPPORTIVE FACTOR FOR THE DEVELOPMENT OF POLYTOXICOMANY IN YOUNG PEOPLE

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Introduction: Dependent behaviour represents a strong homeostasis of the family of an addict. Objective The aim of our research is to record and explore irregularities during the addicts' growth, as well as the specific type of family relations in the addicts family.

Methods For research: Purposes a general questionnaire was used on growth and development, and GRADIR questionnaire on the assessment of family relationships.

Results: Our results indicate that delinquent behaviour is often found with the addicts before the occurrence of abuse. A significant dysfunctional family of addicts was detected. Families with an addict were not substantially damaged or altered in terms of emotional exchange, but in their structure that enhanced dysfunction leading to addictive behaviour.

Conclusion: Emotional investments without control, prohibitions and penalties, contribute to a lack of consciousness that disturbs the process of socialization. Due to the apparent control and the apparent support, the addicts do not have structured organization and socialization. Emotional stimuli without obligation for polytoxicomani to maintain a reciprocal relationship with their parents influence the parental support of egoistic style of behaviour.

Keywords: polytoxicomany; family; drug addiction.

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Uvod: Dok je na počiniocima zločina skoncentrisana većina javne i profesionalne pažnje, žrtve zločina i viktimologija, kao nauka koja se njima bavi, se nalaze u nezaznaenom zapečku. Ovim radom pokušaćemo da zadržimo u viktimologiju afektivnih ubistava.

Cilj rada: Cilj istraživanja odnosi se na bolje razumevanje viktimološkog aspekta afektivnih ubistava kroz deskriptivnu specifičnu karakteristika žrtve i utvrđivanje njihovih međusobnih relacija, kao i realacija u odnosu na određene karakteristike počinioca i okolnosti krivičnog dela.

Materijal i metode: Uzorak obuhvata 117 ispitanika starosti od 18 do 65 godina, a koji su sudsko-psihijatrijski veštačeni u Centru za Sudsku psihijatriju, Instituta za psihijatriju Kliničkog Centra Vojvodine zbog počinjenog krivičnog dela ubistva. Od alata za izradu ovog rada korišćene su metode deskriptivne statistike i χ^2 test.

Rezultati: Prema ponašanju žrtve posmatrani uzorak možemo podeliti na četiri kategorije: neagresivno ponašanje, kojih je bilo 17 odnosno 14,5%, agresivno ponašanje na ravne delove kojih je bilo 50 odnosno 42,7% uzorka, primarno agresivno ponašanje kojih je bilo 49 slučajeva, odnosno 41,9% posmatranog uzorka i 1 slučaj sekundarnog agresivnog ponašanja, odnosno 0,9% uzorka. Pronašli smo da postoji statistički značajna razlika u distribuciji frekvencija između sa jedne strane ponašanja žrtve i dužine konflikta, pola žrtve i alkoholisanosti žrtve, ona postoji i kod odnosa alkoholisanosti žrtve i pola, i između poznatosti žrtve i pola i dužine konflikta.

Zaključak: Postoji statistički značajna razlika u distribucijama frekvencija među nekim viktimološkim parametrima afektivnog ubistva.

Knjučne reči: viktimologija, afektivno ubistvo

THE ANALYSIS OF THE VICTIMOLOGICAL ASPECT OF AFFECTIVE MURDERS

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Introduction: While public and professional attention is mostly concentrated on the perpetrator of the murder, the victim and victimology is often left on the sidelines. In this paper we will try to delve in to the victimology of affective murders.

The Aim: The aim of this paper corresponds to the better understanding of the victimological aspect of affective murders through the description of specific characteristics of victims, and determining the relations between them and their relations with certain characteristics of the perpetrator and the crime.

Material and methods: The sample contains 117 cases, where perpetrators are aged between 18 and 65, that were psychiatrically evaluated at the Centre for Court Psychiatry of the Institute of Psychiatry in the Clinical Center of Vojvodina because they committed a murder. Descriptive statistics and Pearson's χ^2 test were utilized.

Results: According to the victim behavior, the sample can be divided into four categories: nonaggressive behavior numbering 17 (14.5%), aggressive in equal parts numbering 50 (42.7%), primarily aggressive behavior numbering 49 (41.9%) and nonaggressive behavior numbering 1 (0.9%) of the sample. We found that there is a statistically significant difference in distribution of frequencies between victim behavior and the length of conflict, victim's sex and victim alcohol intoxication. It also exists between victim alcohol intoxication and victim sex, and the familiarity of the victim and victim sex and length of conflict.

Conclusion: There is a statistically significant difference between the distributions of frequencies among certain victimological parameters of affective murder victims.

Key words: victimology, affective murder

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Uvod: Učenje i nastava zasnovana na projektu je koncept koji se u engleskom jeziku za potrebe medicine zasniva na specifičnoj medicinskoj temi koju biraju studenti, a potom, u zavisnosti od sastava grupe i većina članova grupe, kroz saradnju dolazi do realizacije projekta.

Cilj istraživanja je da se na osnovu primene projekata u nastavi najpre istraže mogućnosti ove metode, a takođe i definišu oblasti jezika koje studentima predstavljaju problem i za koje je potrebno dodatno podučavanje.

Materijal i metode: Istraživanje je sprovedeno na Medicinskom fakultetu u Nišu. Učestvovalo je 200 studenata medicine druge godine. Studenti su bili podeljeni u grupe (5 studenata po grupi) i svaka grupa je odabrala temu svog projekta kao i način realizacije i prezentacije.

Rezultati: Na osnovu ličnih zapažanja i konsultacijama s nastavnikom, došlo se do zaključka da je primena projekata u nastavi izvor velike motivacije za studente medicine. Rezultati su takođe ukazali da studenti veoma često imaju jezičke probleme vezano za postavljanje pitanja, upotrebu relativnih zamenica, pasivnih konstrukcija, pravilnu upotrebu zamenica u engleskom jeziku, kao i upotrebu sadašnjeg perfekta.

Diskusija: Primena projekata je specifična za svaku grupu studenata i na najbolji način odslikava njihove sposobnosti i interesovanja. U nastavi engleskog jezika, rad na projektu omogućava ostvarivanje saradnje među studentima i timski rad i zajedničko učenje, a takođe i primenu stručnog medicinskog znanja na času engleskog jezika čime se simuliraju realne buduće profesionalne situacije u kojima će se naći studenti medicine, budući lekari.

Knjučne reči: nastava zasnovana na projektu, višestruke inteligencije, saradnja, engleski u medicini

PROJECT – BASED LEARNING

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Introduction: Project-based learning is a concept which in English for medical purposes is based on a specific topic chosen by the students, whereby depending on the group structure and skills of the members mutual cooperation leads to project realization.

The aim of the research was to explore the learning possibilities of the PBL method and to define the areas of the English language that present problems to students and need further instruction.

Material and Methods: The research was conducted at the Faculty of Medicine in Niš and it included 200 second-year medical students. The students were separated into groups of five and each group chose a topic for their project, as well as the manner of project realization and presentation.

Results: Based on personal observations and suggestions for the English language teacher, the results showed that the PBL method is a source of great motivation to the students. The results also showed that the students often encounter problems concerning asking questions, use of the relative pronouns, passive constructions, use of pronouns in English to refer to persons and objects and the use of the present perfect tense.

Discussion: PBL is specific for each group of students and it adequately reflects their skills and interests. In language teaching, PBL enables cooperation and team work between students, shared learning and the application of medical knowledge during the English course whereby the future real-life professional situations which await the students, are simulated.

Key Words: project-based learning, multiple intelligencies, cooperation, English in medicine

UTICAJ TERAPIJSKOG JAHANJA NA UNAPREĐENJE PSIHOLOŠKIH FUNKCIJA KOD OBOLELIH OD CEREBRALNE PARALIZE

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Uvod: Cerebralna paraliza (CP) je oboljenje koje nastaje kao posledica oštećenja mozga u njegovim ranim fazama razvoja- prenatalno, perinatalno i postnatalno do druge godine života deteta. Karakterističan klinički znak za CP je motorički deficit koji se manifestuje abnormalnim obrascima položaja i pokreta trupa i ekstremiteta, udruženo sa abnormalnim mišićnim tonusom i njegovom distribucijom. Terapijsko jahanje i hipoterapija su od ranije prepoznate metode rehabilitacije i habilitacije kojim se mogu popraviti neke fizičke, psihološke, socijalne funkcije i olakšati učenje kod osoba sa invaliditetom.

Cilj: Cilj istraživanja je bio procena stepena nekih psiholoških funkcija u grupi polaznika terapijskog jahanja koje je bilo usmereno na popravljjanje njihovih fizičkih funkcija.

Materijal i metode: Za dobijanje podataka od ispitanika korišćen je anonimni upitnik dizajniran za potrebe ovog istraživanja. Vrednovanje prisustva pojedinog obeležja je ostvareno pomoću petostepene skale od 1-5 pri čemu je manja numerička vrednost odražavala niži stepen prisustva određenog psihološkog obeležja i obrnuto.

Rezultati: Rezultati ispitivanja su pokazali da se poremećaji psiholoških funkcija mogu identifikovati kao pridruženi poremećaju u grupi obolelih od cerebralne paralize. Nađenje su statistički značajne razlike za svako obeležje u srednjim vrednostima skorova u I i II merenju kao i statistički značajne razlike u srednjim vrednostima ukupnih skorova u I i II merenju.

Zaključak: Može se zaključiti da terapijsko jahanje ima pozitivne efekte na ispitane psihološke funkcije kod osoba sa cerebralnom paralizom, i iz tih razloga može se preporučiti kao dodatna terapija u habilitacionom tretmanu ovih pacijenata.

Ključne reči: psihološke funkcije u cerebralnoj paralizi, cerebralna paraliza, terapijsko jahanje

THE INFLUENCE OF THERAPEUTICAL HORSE-RIDING ON IMPROVEMENT OF PSYCHOLOGICAL FUNCTIONS IN CEREBRAL PALSY PATIENTS

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Introduction: The Cerebral Palsy (CP) is an illness that appears as a consequence of a brain damage suffered during the early phases of development – before birth, during the birth or after the birth up to the second year of age of an infant. The characteristic clinical sign of CP is motorical insufficiency that manifests as abnormal patterns of position and movement of the body and limbs, combined with abnormal muscular tonus and its distribution. Therapeutical horse-riding and hipotherapy are recognized as rehabilitation methods which could improve some of the physical, psychological and social functions and to make learning easier for the disabled people.

The Aim: The goal of the research was evaluation of some psychological functions in a group of attendants of the therapeutical horse-riding conducted to improve their physical functions.

Materials and Methods: An anonymous questionnaire, designed for this research, was used to obtain the data. The evaluation of presence of particular features was achieved by 1-5 scaling, in which smaller numeric value represented lower level of presence of particular psychological feature and vice versa.

Results: The results of the research showed that disorders of psychological functions can be identified as concomitant disorders in the group of people who suffer from Cerebral Palsy. Statistically significant differences were found for every feature in the first and second measurement, as well as statistically significant differences of total scores in first and second measurement.

Conclusion: As a conclusion, therapeutical horse-riding has positive effects on studied psychological functions of people who suffer from Cerebral Palsy, and for this reason can be recommended as a complementary therapy in habilitation treatment of these patients.

Key words: psychological functions in cerebral palsy, cerebral palsy, therapeutical horse-riding

PROCENA PORODIČNOG FUKCIONISANJA U PORODICAMA DECE SA AUTIZMOM

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Uvod: Autizam je razvojni poremećaj koji se karakteriše poremećajima u recipročnim socijalnim interakcijama, verbalnoj i neverbalnoj komunikaciji, stereotipnim i repetitivnim obrascima ponašanja, interesovanja i aktivnosti. Javlja se po rođenju ili u uzrastu do treće godine. U ovom istraživanju je akcenat na porodici i proceni porodične funkcionalnosti u porodicama dece sa autizmom.

Cilj: Cilj istraživanja je bio da se utvrdi da li se porodice koje imaju dete sa autizmom razlikuju po stepenu funkcionalnosti u odnosu na porodice koje nemaju dete sa autizmom.

Materijal i metode: Studijom preseka obuhvaćeno je 62 roditelja koji su bili podeljeni u dve grupe: ispitivani u kontrolnu. U ispitivanoj grupi su bili roditelji koji imaju dete sa dijagnozom autizma, dok su kontrolnu grupu činili roditelji dece bez autizma. Roditelji su popunjavali upitnik FACES IV (Olson i saradnici, 2011) kojim se procenjuje porodična funkcionalnost.

Rezultati: Dobijene su razlike između ispitivane i kontrolne grupe na sledećim dimenzijama upitnika FACES IV: razdvojenost, nivo kohezivnosti, porodična komunikacija i porodično zadovoljstvo.

Zaključak: Porodice koje imaju dete sa autizmom se razlikuju po stepenu funkcionalnosti u odnosu na porodice koje nemaju decu sa autizmom.

Ključne reči: autizam, porodica, porodično funkcionisanje

ASSESSMENT OF THE FAMILY FUNCTIONING IN THE FAMILIES OF THE CHILDREN WITH AUTISM

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Introduction: Autism is a developmental disorder characterized by disturbances in reciprocal social interactions, verbal and nonverbal communication, stereotyped, sparse repertoire of interests and activities. It occurs at birth or in the age of three years. In this study, emphasis on family assessment and family functions in families of children with autism.

The Aim: The aim of this study was to determine whether the families who have children with autism vary in the degree of functionality compared to families without a child with autism.

Materials and Methods: This was a cross sectional study which included 62 families that were divided into an experimental group and a control group. In the study group were parents who had children diagnosed with autism, while the control group consisted of parents of children without autism. Parents filled out a questionnaire FACES IV (Olson and associates, 2011) which assess family functionality.

Results: Differences between the groups on the following dimensions of the questionnaire FACES IV: separation, the level of cohesion, family communication and family satisfaction.

Conclusion: Families of children with autism are different from family of children without those disorder, regarding level of family functioning.

Key words: autism, family, family functioning

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Uvod: Engleski je postao i intranacionalni i internacionalni jezik medicinske komunikacije, osnovno sredstvo za prenos podataka i ima ulogu savremenog univerzalnog jezika, *lingua franca*.

Cilj: Cilj ovog istraživanja je da se utvrdi poznavanje formi naučnog medicinskog jezika koje se očekuju od studenata medicine, budućih lekara, kao preduslova za napredovanje u profesionalnoj karijeri.

Metode i materijali: Studija je sprovedena na Medicinskom fakultetu u Nišu i učestvovalo je 86 studenata druge godine medicine. Od studenata se zahtevalo da napišu strukturirani apstrakt, a testovi su potom analizirani i ocenjivani prema upotrebi gramatike, formalnog akademskog rečnika, upotrebe izraza za povezivanje ideja i pasusa, prema primeni i praćenju IMRAD strukture i opštem utisku.

Rezultati: Rezultati studije pokazuju da je neophdno obnavljanje opšteg engleskog jezika, naročito upotrebe relativnih zamenica, potrebno je obogaćivanje formalnog akademskog rečnika kao i povezivanje teorijskog znanja sa praktičnom primenom.

Zaključak: Interkomunikacija, učestvovanje u istraživanjima, na kongresima, praćenje novih dostignuća imperativi su u nauci uopšte, i u medicini. U ostvarivanju tog cilja od presudnog značaja je dobro poznavanje medicinskog engleskog jezika.

Gljučne reči: medicinski engleski jezik, *lingua franca*, jezik nauke

THE SCIENTIFIC IMPORTANCE OF MEDICAL ENGLISH

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Introduction: English has emerged as an intranational and international language of medical communications; it is a prime vehicle for the transmission of information and it is a modern *lingua franca*.

The aim: Was to determine the level of the scientific medical language the students of medicine, future doctors, are expected to have, as a precondition of their further professional development.

Materials and Methods: The study was conducted at the Faculty of Medicine in Nis and included 86 students. The students were asked to write a structured abstract and the tests were analyzed and graded in terms of grammar use, use of formal academic vocabulary, use of linking words, following the IMRAD structure and an overall impression.

Results: The results of our study show that students need to revise their General English knowledge, particularly the use of relative pronouns, they need to enrich their scope of formal academic vocabulary and to practice more on the application of their knowledge of language in practice.

Conclusion: Intercommunication, the participation in researching, in congresses, following new achievements are imperative in science general, and in medicine too. In realization of that aim, good knowledge of medical English is of crucial significance.

Key Words: medical English, *lingua franca*, language of science

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Uvod: Verske terapijske zajednice se izdvajaju kao sve češći terapijski modalitet u tretmanu zavisnika od psihoaktivnih supstanci. One predstavljaju svojevrsan terapijski metod kojim se utiče na bihevioralnu, psihološku, kognitivnu i socijalnu promenu među njenim klijentima.

Cilj: Cilj istraživanja je bio da se ispita uticaj boravka u verskoj terapijskoj zajednici na redukciju određenih psihopatskih obeležja.

Materijal i metode: U istraživanju je učestvovalo 59 muških ispitanika, podeljenih u tri grupe: prvu grupu od 20 ispitanika su činili zavisnici od psihoaktivnih supstanci koji borave na tretmanu u terapijskim zajednicama, drugu grupu od 20 ispitanika su činili ispitanici koji su uspešno završili tretman zavisnosti od psihoaktivnih supstanci, dok su treću grupu od 19 ispitanika činili zdravi volonteri. Tokom istraživanja korišćen je instrument za procenu psihopatije.

Rezultati: Dobijene su statistički značajne razlike između grupa na dimenzijama Antisocijalno ponašanje i Životni stil, pri čemu grupa zdravih ispitanika ostvaruje najniže prosečne vrednosti na dimenziji Antisocijalno ponašanje, zatim sledi grupa ispitanika koja je uspešno prošla tretman u terapijskoj zajednici, a zatim grupa zavisnika na lečenju. Na dimenziji Životni stil beleži se prisustvo statistički značajne razlike između grupe zdravih ispitanika i grupe ispitanika na terapijskom tretmanu, pri čemu zdravi ispitanici ostvaruju prosečno niže skorove. Grupa na terapijskom tretmanu se ne razlikuje od druge dve grupe. Na dimenzijama Interpersonalni odnosi i Psihopatski afekat nisu registrovane razlike između ispitivanih grupa.

Zaključak: Verske terapijske zajednice svojim programom utiču na redukciju antisocijalnog ponašanja u grupi ispitanika koji su uspešno završili terapijski tretman.

Gljučne reči: verska terapijska zajednica, psihopatija.

THE INFLUENCE OF BEING INCLUDED IN A THERAPEUTIC RELIGIOUS COMMUNITY ON THE REDUCTION OF PSYCHOPATHIC MARKINGS OF ADDICTS

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Introduction: Religious therapeutic communities have started to stand out more often as a therapeutic model in the treatment of psycho active substance addicts. The communities present a therapeutic method which affects the behavioral, psychological, cognitive and social change among it's clients.

Aim: Aim of the research was to examine the influence of being included in a therapeutic community, on a reduction of certain psychopathic markings.

Material and methods: The total of 59 male subjects, divided into three groups: first group of 20 subjects consisted of psychoactive substance addicts being actively treated as a part of a therapeutic community; second group, of also 20 subjects, was made by individuals who have successfully finished addiction treatment on psychoactive substances, while in a therapeutic community. The third group, made of 19 subjects, was made of healthy volunteers who have never abused psychoactive substances. Psychopathic assessment instrument was used during research.

Results: Important statistical differences have appeared among tested groups in the dimensions of "Antisocial behavior" and "Lifestyle"; while the group of healthy subjects made the lowest average values of "Antisocial behavior", the group that had successfully finished therapy came second, and was followed by the group of addicts being currently treated. Statistics have also shown a great difference in the dimension of "Lifestyle" among the groups of healthy subjects and the ones currently in treatment, while the healthy subjects scored less in average.

Conclusion: Religious therapeutic communities, with their programs, affect the group of respondents that have successfully finished their therapy treatment by decreasing their antisocial behavior values.

Key words: Religious therapeutic community, psychopathy.

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Uvod: Zavisničko ponašanje je čvrsta homeostaza porodice narkomana.

Cilj rada: Cilj istraživanja bio je da se ustanove nepravilnosti tokom odrastanja zavisnika i specifičan tip odnosa među članovima porodice zavisnika.

Material i metode: Za potrebe istraživanja korišćeni su Opšti upitnik o načinu odrastanja i upitnik GRADIR za ispitivanje porodičnih odnosa.

Rezultati: Delinkventno ponašanje se često beleži kod zavisnika i pre nastanka zavisnosti. Ustanovljena je i značajna disfunkcionalnost porodice zavisnika. Porodice u kojima odrasta zavisnik nisu značajno oštećene ili izmenjene u pogledu emocionalne razmene, koliko u samoj strukturi, što pojačava disfunkcionalnost koja vodi ka zavisničkom ponašanju.

Zaključak: Emotivni podsticaji roditelja bez kontrole, zabrane i kazne doprinose izostanku svesti koja bi omogućila bolju socijalizaciju zavisnika. Zbog prividne kontrole i podrške, zavisnici nemaju dobru raspodelu vremena i adekvatnu socijalizaciju. Emotivni podsticaji bez obaveze da politoksikomani održavaju recipročan odnos sa svojim roditeljima utiču na to da roditelji podržavaju egoistični stil ponašanja takve dece.

Glavne reči: politoksikoman; porodica; zavisnost od droga.

THE INFLUENCE OF FAMILY DEVELOPMENT IN YOUNG POLITOXICOMANIA

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Introduction: The addictive behavior is a strong family homeostasis drug.

The Aim: The objective of this study was to determine irregularities in growing drug and a specific type of relationship among family members of addicts.

Material and Methods: We used the general question about how growing up and testing the questionnaire GRADIR family relationships..

Results: Delinquent behavior is often noted in drug addicts and before the creation of dependency. There was a significant family dysfunction drug. Families in which the addict growing up were not significantly damaged or altered in terms of emotional exchange, as in the structure, which enhances the dysfunction that leads to addictive behavior.

Conclusion: emotional stimuli without parental controls, prohibitions and penalties contribute to the lack of awareness that would allow for better socialization of addicts. Due to the apparent control and support, addicts do not have a good allocation of time and adequate socialization. Emotional stimuli without having to maintain politoxicomaniacs reciprocal relationship with his parents to influence the parents to support the selfish style of behavior of such children.

Keywords: politoxicomaniacs, families, drug addiction.

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Uvod: Povezanost shizofrenije, roditeljstva obolelih osoba i karakteristika njihove dece specifična je u mnogim aspektima. Brojne studije potvrđuju različitosti između obolelih osoba koje su roditelji i onih koji to nisu, specifičnosti relacije roditelj-dete i snažnu stigmu ovakvih porodica. Međutim, retke su studije koje su ispitivale kvalitet roditeljstva obolelih od shizofrenije.

Cilj rada: Cilj istraživanja je procena specifičnosti roditeljskih stilova osoba obolelih od shizofrenije, a koji bi mogli biti od značaja za konceptualizaciju programa podrške njihovim porodicama.

Material i metode: Studija preseka sprovedena je u Institutu za mentalno zdravlje u Beogradu. Istraživanjem je obuhvaćeno trideset pacijenata (n=30) kojima je postavljena dijagnoza shizofrenije u skladu sa kriterijumima MKB-10. Svi ispitanici su roditelji i u periodu ispitivanja bili su u stanju remisije. Procena funkcionalnosti roditeljskih stilova vršena je kroz semistrukturisani intervju u kojem je korišćen upitnik otvorenog tipa, posebno osmišljen u svrhu ovog istraživanja.

Rezultati: Ustanovljena je dominacija liberalnog stila vaspitanja (62,1% ispitanika), značajno odsustvo bilo kakvog kažnjavanja u procesu disciplinovanja dece (48,1%), ali i značajna zastupljenost fizičkog kažnjavanja (24,1%). Svi ispitanici izjavili su da u svom vaspitanju koriste nagradu, najčešće novac i poklon (66,7%). Slobodno vreme osmišljava i balansira 62,1%.

Zaključak: Smatramo da su dobijeni rezultati koji upućuju na specifične disfunkcionalnosti ali i pozitivne potencijale roditeljstva obolelih od značaja za osmišljavanje programa podrške savetodavnog i preventivnog tipa, koji bi bili usmereni na jačanje njihovih pozitivnih potencijala i korekciju prepoznatih disfunkcionalnosti.

Glavne reči: shizofrenija, roditeljski vaspitni stilovi, program podrške

PSYCHOTIC DISORDERS AND QUALITY OF PARENTING – PARENTING STYLES OF PATIENTS WITH SCHIZOPHRENIA

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Introduction: The relationship between schizophrenia, parenting by people who have the illness and the characteristics of their children is unique in many ways. Numerous studies confirm the differences between patients who are parents and those who aren't, the specific parent-child relation and a strong stigma of these families. However, the studies which explore the parenting quality of patients with schizophrenia are still rare.

The Aim: The goal of this research is the evaluation of specific aspects of the parenting styles of schizophrenia patients, which could be important for conceptualizing a support program.

Material and Methods: A cross-sectional study was carried out in the Institute of Mental Health in Belgrade. The research involved thirty patients (n=30) who had been diagnosed with schizophrenia in accordance with ICD-10 criteria. All the patients were parents, and during the study they were in a period of remission. The evaluation of the functionality of their parenting styles was carried out by a semi-structural interview that involved an open type questioner, specifically designed for this research.

Results: A domination of liberal parenting style was established (62,1%), as well as an important absence of utilizing any form of punishment during the disciplining of their children (48,3%). Physical punishment was, however, present (24,1%). All the interviewed patients acknowledged using rewards, with money and gifts as the reward in 66.7% of the cases. A total of 62.1% of the patients organize and balance their free time.

Conclusion: We believe that the given results are important for developing a support program including counseling and prevention for parents who have schizophrenia and their families. These support programs would be focused on strengthening their positive potentials and correcting recognized dysfunctions.

Keywords: schizophrenia, parenting styles, support program

FAKTORI RIZIKA ZA RAZVOJ PROBLEMA PONAŠANJA KOD ADOLESCENATA

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Uvod: Pod faktorima rizika za pojavu problema ponašanja podrazumevaju se oni faktori ili determinante za koje su naučnim istraživanjima dobijeni dokazi o uzročnoj povezanosti sa problemima u ponašanju.

Cilj rada: Analiza različitih faktora rizika: individualnih, porodičnih i vršnjačkih i proučavanje njihove povezanosti sa razvojem problema ponašanja.

Materijal i metode: Ispitanici su učenici prvog razreda dve srednje škole u Beogradu. Ukupan broj ispitanika koji je popunio upitnike iznosio je 177. Od toga je 51,4% ispitanika muškog pola, 46,9% ženskog, a 1,7% ispitanika nije odgovorilo na pitanje vezano za pol. Korišćeni su sledeći instrumenti procene: socio-demografsku anketa, Skala snaga i teškoća (The Strengths and Difficulties Questionnaire – SDQ) i Konersova skala (Conners rating scale).

Rezultati: Devojčice su pokazale više anksioznih i depresivnih simptoma, osećanja tuge, krivice, straha i brige ($Z=5,159$; $p<0,001$), ali i elemenata prosocijalnog ponašanja ($Z=2,124$; $p<0,05$). Značajne razlike su uočene između dečaka i devojčica kada je u pitanju broj članova porodice ($Z=-3,000$; $p<0,01$), kao i u školskom uspehu ($Z=-4,907$, $p<0,0001$). Bez obzira na pol, pokazana je visoko značajna pozitivna povezanost između problema ponašanja i simptoma hiperaktivnosti ($p=0,415$; $p<0,01$), a visoko značajna negativna povezanost između problema ponašanja i prosocijalnog ponašanja ($p=-0,319$; $p<0,01$).

Zaključak: Sagledavanje više aspekata faktora rizika, kao i njihove međusobne povezanosti, doprinose boljem razumevanju problema poremećaja ponašanja. Multidisciplinarni pristup, zasnovan na saradnji svih službi koje se bave decom i mladima bi mogao biti najefikasniji način za postizanje višestrukih pozitivnih ishoda.

Ključne reči: faktori rizika, problemi ponašanja, adolescenti, multidisciplinarni pristup

RISK FACTORS FOR THE DEVELOPMENT OF ADOLESCENT BEHAVIOR PROBLEMS

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Introduction: Risk factors include those factors that scientific research obtained evidence of a causal relationship with behaviour problems.

The Aim: To analyse: individual, family, peer risk factors and to study their connection with the development of problem behaviour.

Materials and Methods: The subjects were students from the first grade of two secondary schools in Belgrade. Total number of respondents was 177. 51.4% were male respondents, 46.9% female and 1.7% did not answer the question. The following instruments were used: socio-demographic survey, The Strengths and Difficulties Questionnaire-SDQ and Conners Rating Scale.

Results: Girls showed more depressive and anxious symptoms, feelings of sadness, guilt, fear and worry ($Z=5,159$, $p<0,0001$), elements of prosocial behaviour ($Z=2,124$, $p<0,05$). We can also see significant differences between boys and girls when it comes to the number of family members ($Z=-3,000$, $p<0,01$), which means that girls live in smaller families than boys, as well as school success ($Z=-4,907$, $p<0,0001$), which means that girls are more academically successful than boys. No matter of gender, it was observed highly significant positive correlation between behavioural problems and hyperactivity symptoms ($p=0,415$, $p<0,01$), and highly significant negative correlation between behaviour problems and prosocial behaviour ($p=-0,319$, $p<0,01$).

Conclusion: Consideration of several aspects of risk factors and their interdependence, will contribute to a better understanding of the problem. A multidisciplinary approach could be the most effective way to achieve multiple positive outcomes.

Keywords: risk factors, behaviour problems, adolescents, multidisciplinary approach

PROCENA SIMPTOMA HIPERKINETSKOG POREMEĆAJA SA POREMEĆAJEM PAŽNJE (ADHD) KORIŠĆENJEM SNAP-IV SKALE KOD DECE UZRASTA OD 7-11 GODINA

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Uvod: Etimološki gledano termin ADHD (Attention Deficit Hiperactivity Disorder) možemo podeliti na dve složenice, AD-Attention deficit što znači deficit pažnje i HD-Hyperactivity disorder što podrazumeva hiperaktivni poremećaj. ADHD je najčešći neurobihejvioralni poremećaj u detinjstvu.

Cilj rada: Utvrđivanje distribucije ADHD po polu i postojanja simptomatologije kod dece nižih razreda osnovne škole.

Materijal i metode: Uzorak je formiran od 320 učenika, 160 muških ispitanika i 160 ženskih ispitanika uzrasta od 7 do 11 godina metodom slučajnog izbora. Prilikom testiranja ispitanika korišćena je SNAP IV skala koja se sastoji od 90 pitanja od čega se 18 pitanja odnosi na DSM-IV simptome ADHD. Istraživanje je sprovedeno tokom školske 2011/12. godine u OŠ "Borivoje Stanković" u Beogradu.

Rezultati: Pokazali su da je 3,12% muških ispitanika i 1,88% ženskih ispitanika imalo ADHD što je 5% populacije učenika u nižim razredima osnovne škole. Međutim, neke od simptoma ADHD je imalo još 7,5% muških ispitanika i 2,81% ženskih ispitanika što je ukupno 10,31% ovih učenika koji se mogu registrovati kao borderline slučajevi.

Zaključak: Rezultati naše studije ukazuju na činjenicu da prevalencija ADHD kod dece od 7-11 godina iznosi 5%, sa akcentom na muški pol.

Ključne reči: ADHD, prevalencija, dijagnostički kriterijumi

ASSESSMENT OF SYMPTOMS ATTENTION DEFICIT HIPERACTIVITY DISORDER (ADHD) USE OF SNAP-IV SCALE IN CHILDREN AGED 7-11 YEARS

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Introduction: Etymologically, the term of ADHD (Attention Deficit Hiperactivity Disorder) can be divided into two compounds, AD-Attention deficit and HD-Hyperactivity. ADHD is the most common neurobehavioral disorder in childhood.

The Aim: Aim of this study was to identify ADHD by gender and the existence of symptoms in children in lower grades of primary school.

Materials and methods: Pattern is formed by 320 students, both sexes (160 or 50% males respondents and 160 or 50% females respondents) age of 7-11 years random. During the testing respondents I used SNAP IV scale consisting of 90 questions of which 18 items related to DSM-IV symptoms of ADHD. Research was conducted during school year 2011/2012. in Primary School "Borivoje Stanković" in Belgrade.

Results: Showed that the 3,12% males respondents and 1,88% females respondents had ADHD with making a total of 5% of students population in lower grades of primary school. However, some of the symptoms ADHD had 7,5% males respondents and 2,81% females respondents more which made a total of 10,31% of these students that we can register as borderline cases.

Conclusion: The results of our study indicate that the prevalence of ADHD in children aged 7-11 years is 5%, with an emphasis on the male gender.

Key words: ADHD, prevalence, diagnostic criteria

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Uvod: Povećanje dostupnosti testiranja i efikasne terapije dovelo je do povećanja broja ljudi za koje se zna da žive sa virusom humane imunodeficijencije. Mentalnim poremećajima, kao komorbidentnim stanjima u HIV infekciji se ne pridaje mnogo značenja, iako je njihova učestalost veća nego u opštoj populaciji. Depresija je drugi po redu najčešći mentalni poremećaj kod HIV pozitivnih osoba, koji ne utiče samo na kvalitet života, nego i na tok bolesti.

Cilj rada: Ispitivanje depresivnosti kod HIV pozitivnih pacijenata kao i da se analizira prisustvo iracionalnih uverenja i stavova koji mogu biti odgovorni za pojavu depresije.

Materijal i metode: 113 ambulantih pacijenata Instituta za infektivne i tropske bolesti u Beogradu je popunjavalo demografsku anketu, Bekov upitnik za depresiju (BDI) i upitnik Opšte skale uverenja i stavova (GABS), koje su obrađivane Studentovim-t testom, Pirsonovim testom i Spirmanovim testom.

Rezultati: Od 100 (88,5%) ispitanika koji su pristali da učestvuju u istraživanju, 74% su bili muškarci, a 26% žene. Njihova prosečna starost iznosila je 42,22 (SD=11,96) godine. Prosečan BDI skor bio je 15,71 (SD=13,46), a znakove depresije pokazalo je 60% ispitanika, bez statistički značajne razlike među polovima. Analizom podskala GABS-a utvrđena je statistički značajna povezanost vrednosti BDI i obezvređivanje drugih ($p<0,05$), kao i povezanost između iracionalne potrebe za ljubavlju i dužine trajanja bolesti ($p<0,05$).

Zaključak: Depresivnost HIV pozitivnih osoba je na visokom nivou, što ukazuje na potrebu za sistematskim sprovođenjem skrining testova, popularizacijom Liaison psihijatrije i edukativnih projektima koji bi za cilj imali smanjenje stigmatizacije HIV pozitivnih osoba.

Ključne reči: HIV, depresija, Srbija

DEPRESSION IN HIV POSITIVE PATIENTS

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Introduction: Better availability of testing and effectiveness of the treatment have increased the number of people who are known to live with HIV. Not much importance is given to mental disorders as co-morbidities in HIV infection, although their frequency is greater than in general population. Depression is the second most common mental disorder in HIV-positive people that affects both quality of life and course of the disease.

The Aim: The aim of this study was to examine depression in HIV positive patients and to analyze the presence of irrational beliefs that may be responsible for depression.

Materials and Methods: 113 patients of the Institute for Infectious and Tropical Diseases in Belgrade completed demographic, Beck's depression (BDI) and General beliefs and attitudes questionnaire (GABS), which were statistically analyzed with Student's t-test, Pearson test and Spearman test.

Results: There was 100 (88.5%) respondents who agreed to participate in the survey - 74% were male and 26% female. Their average age was 42.22 (SD=11.96) years. Average BDI score was 15.71 (SD=13.46), and 60% of respondents showed signs of depression with no statistically significant differences between genders. The analysis of GABS identified statistically significant correlation between BDI values and the devaluation of others ($p<0.05$), as well as the relationship with irrational need for love and duration of disease ($p<0.05$).

Conclusion: Depression among HIV positive people is high, indicating a need for systematic implementation of screening tests, popularization of Liaison Psychiatry and educational projects that would aim to reduce the stigmatization.

Key words: HIV, depression, Serbia

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Uvod: Kinofobija je vrsta specifične fobije koju karakteriše iracionalan i abnormalan strah od pasa. Najčešće je uzrokovana negativnim iskustvom sa psima, posebno tokom detinjstva.

Cilj: Cilj istraživanja je bio da utvrdimo zastupljenost i intezitet straha od pasa kod adolescenata, da analiziramo osnovne karakteristike straha od pasa u zavisnosti od pola, uzrasta, mesta stanovanja i prethodnih neprijatnih iskustava sa psima.

Uzorc i metode: Istraživanje je sprovedeno na uzorku od 600 adolescenata nekliničke populacije- srednja škola, muškog i ženskog pola u uzrastu srednje i pozne adolescencije. Ispitanici su bili sa teritorije gradova Beograda i Požarevca. Koristili smo upitnik za strah od pasa (DPQ- Dog Phobia Questionnaire, Hong and Zinbarg, 1999) koji sadrži 27 tvrdnji koje se mogu oceniti u formi sedmostepene Likertove skale.

Rezultati: Najveći broj ispitanika (56,7%) ima neki oblik straha od pasa, počev od malog do nepodnošljivog (2-8). Srednja vrednost za svih 600 ispitanika je 2,10±2,01. Ženski ispitanici pokazuju statistički značajnije veći stepen straha od pasa, kao i ispitanici iz seoske sredine. Utvrđena je visoko statistički značajna povezanost između ranijih neprijatnih iskustva sa psima i pojave straha.

Zaključak: Primenom upitnika za strah od pasa postiže se bolji uvid u učestalost specifičnih fobija (kinofobija) koje se u kliničkoj populaciji retko sreću jer se ne traži pomoć zbog poremećaja ovog tipa.

Ključne reči: kinofobija, adolescenti, upitnik

EXAMINATION OF CYNOPHOBIA IN ADOLESCENTS

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Introduction: Dog phobia is a specific type of phobia characterized by an abnormal and irrational fear of dogs. It is usually caused by a negative experience with dogs, especially during childhood.

The aim: The aim was to determine the prevalence and intensity of the fear of dogs in adolescents, to analyze the basic characteristics of fear of dogs, depending on gender, age, place of residence and previous unpleasant experiences.

Material and methods: The research was conducted on a sample of 600 non-clinical adolescent population- high school, men and women in middle age and late adolescence. The subjects are from Belgrade and Pozarevac. We used a questionnaire for fear of dogs (DPQ- Dog Phobia Questionnaire, Hong and Zinbarg, 1999), which contains 27 statements that can be evaluated in the form of seven-level Likert scale.

Results: Most of the respondents (56,7%) have some form of fear of dogs, from small to unbearable (2-8). The mean value of 600 respondents is 2,10±2,01. Female subjects showed statistically significant higher level of fear of dogs, and respondents from rural areas. There was a highly significant correlation between previous unpleasant experiences with dogs and the occurrence of fear.

Conclusion: Using a questionnaire for fear of dogs is achieved a better insight into the prevalence of specific phobias in a clinical population of rarely seen phobias because they don't ask for help for this disorder.

Key words: Cynophobia, adolescent, questionnaire

ISPITIVANJE EMOCIONALNE ISCRPLJENOSTI U SKLOPU SINDROMA IZGARANJA KOD STUDENATA MEDICINSKOG FAKULTETA U BEOGRADU

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Uvod: Burnout sindrom (sindrom izgaranja) je fenomen koji se vezuje kako za zdravstvene radnike, tako i za studente Medicinskog fakulteta. Njegove tri glavne komponente kod studenata su emotivna iscrpljenost, cinizam i smanjena akademska uspešnost.

Cilj: Cilj ovog rada je utvrditi nivo Burnout rizika za emocionalnu iscrpljenost kod studenata Medicinskog fakulteta i ispitati da li se on razlikuje između studenata prve i pete godine, studenata muškog i ženskog pola i onih sa nižom i višom prosečnom ocenom tokom studiranja.

Materijal i metode: U ovoj studiji korišćen je Maslač inventara izgaranja prilagođen za ispitivanje studenata (MBI-SS) koji ispituje sve tri komponente sindroma izgaranja.

Rezultati: Dobijeno je da visok Burnout rizik za emocionalnu iscrpljenost ima 94,3% studenata prve i 73,7% pete godine studija što je visoko statistički značajna razlika ($Z=-3,007$, $p<0,01$). Statistički značajne razlike nema kada se poredi skorovi emocionalne iscrpljenosti kod studenata muškog i ženskog pola ($Z=-1,666$, $p>0,05$), kao i kod studenata sa nižom i višom prosečnom ocenom studiranja ($Z=-1,010$, $p>0,05$).

Zaključak: Postoji visok Burnout rizik za emocionalnu iscrpljenost kod studenata prve i pete godine Medicinskog fakulteta i on je statistički značajno viši kod studenata prve godine. Ovi rezultati ukazuju na potrebu ozbiljnijeg sagledavanja problema Burnout-a kod studenata medicine, a sve u kontekstu očuvanja i zaštite zdravlja budućih lekara.

Ključne reči: sindrom izgaranja, emotivna iscrpljenost, student medicine, MBI.

RESEARCHING EMOTIONAL EXHAUSTION WITH REGARD TO THE BURNOUT SYNDROME AMONG THE STUDENTS OF THE SCHOOL OF MEDICINE IN BELGRADE

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Introduction: Burnout syndrome is a phenomenon related to both, medical workers and the students of the School of Medicine. As regards students, its three main components are emotional exhaustion, cynicism and decreased academic efficiency.

The Aim: To establish the level of the emotional exhaustion Burnout risk regarding the students of the School of Medicine and examine whether it shows any difference between the freshmen and the fifth year students, the male and female students and those with higher and lower average schooling grade.

Material and Methods: Maslach Burnout Inventory adapted for examining students (MBI-SS) was used in this study. It examines all three components of the Burnout syndrome.

Results: It was found that 94.3% of the freshmen and 73.7% of the fifth year students have a high level of the emotional exhaustion Burnout risk, which is an especially statistically significant difference ($Z=-3,007$, $p<0,01$). There isn't an important statistical difference when comparing the results of emotional exhaustion either between male and female students ($Z=-1,666$, $p>0,05$), or between those with higher and lower average grades ($Z=-1,010$, $p>0,05$).

Conclusion: There is a high Burnout risk of emotional exhaustion regarding the freshmen and the fifth year students of the School of Medicine and it is statistically considerably higher with the freshmen. These results indicate the need to review the Burnout problem concerning medical students much more seriously, with the aim of preserving and protecting the health of future physicians.

Key words : Burnout syndrome, emotional exhaustion, medical student, MBI.

VALIDNOST KLINIČKE PROCENE U DIJAGNOSTICI PERVAZIVNIH RAZVOJNIH POREMEĆAJA

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Uvod: Pervazivni razvojni poremećaji grupa su neurorazvojnih poremećaja sa teškoćama koje se manifestuju izmenjenim razvojem govora, neverbalne komunikacije, recipročnih socijalnih interakcija i ponašanja. Sličnost kliničke prezentacije sa kliničkim ispoljavanjem drugim medicinskih entiteta : mentalnom retardacijom, poremećajem razvoja govora, oštećenjima sluha i ranom dečijom psihozom nameće brojne diferencijalno – dijagnostičke nedoumice u prepoznavanju pojedinaca sa pervazivnim razvojnim poremećajima.

Cilj: Proveriti validnost kliničke procene u dijagnostikovanju pervazivnih razvojnih poremećaja.

Materijal i metode: Poređenje uputnih i završnih dijagnoza na osnovu istorija bolesti 38 pacijenata lečenih na Kliničkom odeljenju za decu i adolescente Instituta za mentalno zdravlje. Za ispitivanje značajnosti razlike korišćen Mek Nemarov metod. Poređenje rezultata CARS testiranja kod grupe pacijenata sa uputnom i završnom dijagnozom pervazivnog poremećaja i grupe pacijenata sa drugim uputnim dijagnozama i završnom dijagnozom iz kategorije pervazivnih poremećaja.

Rezultati: Postoji statistički visoko značajno $p<0,01$ veća osetljivost dopunskih metoda, uključujući standardizovane dijagnostičke upitnike, u prepoznavanju pervazivnih poremećaja od kliničke procene. Pacijenti inicijalno upućeni pod dijagnozom pervazivnog poremećaja imaju statistički visoko značajno $p<0,01$ viši CARS skor od onih sa drugim uputnim dijagnozama i završnom dijagnozom iz kategorije pervazivnih poremećaja.

Zaključak: Klinička procena nema dovoljnu osetljivost u dijagnostici pervazivnih razvojnih poremećaja i mora biti upotpunjena dodatnim dijagnostičkim procedurama.

Ključne reči: pervazivni razvojni poremećaj, diferencijalna dijagnoza, CARS, ADI-R.

VALIDITY OF CLINICAL ASSESSMENT IN THE DIAGNOSIS OF PERVASIVE DEVELOPMENT DISORDER

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Introduction: Pervasive developmental disorders are a group of neurodevelopmental disorders with disabilities who manifest altered language development, nonverbal communication, reciprocal social interaction and behavior. The similarity of clinical presentation with clinical symptoms of other medical entities: mental retardation, disorders of speech development, hearing impairment and early infantile psychosis imposes a number of differential - diagnostic confusion in identifying individuals with pervasive developmental disorders.

The Aim: Verify the validity of clinical assessment in the diagnosis of pervasive developmental disorders.

Materials and methods: A comparison of referral and final diagnoses based on case histories of 38 patients treated at the Clinical Department for Children and Adolescents Institute for Mental Health. To test the significance of differences was used Mac Nemar's method. Comparison of CARS test results in the patients with a referral and final diagnosis pervasive disorder and other groups of patients with other referral diagnosis and final diagnosis from the category of pervasive developmental disorders.

Results: There was a statistically highly significant $p < 0.01$ higher sensitivity of additional methods, including standardized diagnostic questionnaires, in recognition of pervasive developmental disorder by clinical assessment. Patients initially referred with the diagnosis of pervasive disorder showed a statistically significant $p < 0.01$ higher CARS scores than those with other referral diagnosis and final diagnosis from the category of pervasive developmental disorders.

Conclusion: Clinical evaluation does not have sufficient sensitivity in the diagnosis of pervasive developmental disorder and must be complemented by additional diagnostic procedures.

Keywords: Pervasive developmental disorder, differential diagnosis, CARS, ADI-R.

KO SI TI NA FEJSBUKU?

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Uvod: Upotreba novih tehnologija sve češće podrazumeva učešće u društvenim mrežama i virtualnoj realnosti koje za neke korisnike predstavljaju glavni izvor interpersonalne komunikacije. Ovaj vid komunikacije naročito je popularna među mladima, a ličnost umnogome predviđa upotrebu ovih sajtova.

Cilj: Cilj istraživanja bio je da se ispita povezanost socio-demografskih karakteristika i nivoa samopoštovanja i ponašanja korisnika na društvenoj mreži Fejsbuk (FB).

Materijal i metode: U istraživanju je učestvovalo 947 ispitanika, učenika prve i treće godine srednje škole i studenata prve, treće i pete godine studija na Medicinskom fakultetu u Beogradu. Ispitanici su popunjavali socio-demografski upitnik i strukturisani upitnik o učestalosti korišćenja i socijalnom ponašanju u okviru društvene mreže FB. Nivo samopoštovanja ispitanika procenjivan je primenom Rozenbergove skale samopoštovanja (RSS).

Rezultati: 80.1% ispitanika poseduje FB profil na kome provede 95.47±115.30 minuta u toku dana u komunikaciji sa 505.32±527.55 prijatelja. Srednjoskolci imaju značajno veći broj prijatelja ($U=21631.00$, $z=6.13$, $p=0.000$) i dnevno provode više vremena na FB-u ($U=44567.00$, $z=5.28$, $p=0.000$) u odnosu na studente medicine. Osobe sa nižim nivoom samopoštovanja ($p=-0.125$, $p=0.003$) više vremena provode u virtualnim socijalnim kontaktima i sklonije su prezentovanju sebe na način koji je u neskladu sa realnom ličnošću ($p=0.147$, $p=0.001$).

Zaključak: Upotreba socijalnih mreža široko je rasprostranjen fenomen u svetu, ali i kod nas, posebno izražen među mladim generacijama. Njegova globalna prisutnost i velika upotreba od strane osoba čije samopoštovanje je niže ostavlja prostora za primenu sadržaja koji ovo samopoštovanje mogu poboljšati, dovesti do unapređenja socijalnih veština uopšte, i ojačati ličnost za suočavanje sa problemima i van virtualne realnosti.

Ključne reči: samopoštovanje, društvene mreže, Fejsbuk, studenti medicine

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Introduction: The every-day use of new technologies often involves social networks and virtual reality, which, for some users are the only source of interpersonal communication. This type of communication is particularly popular among the young and personality can significantly predict it.

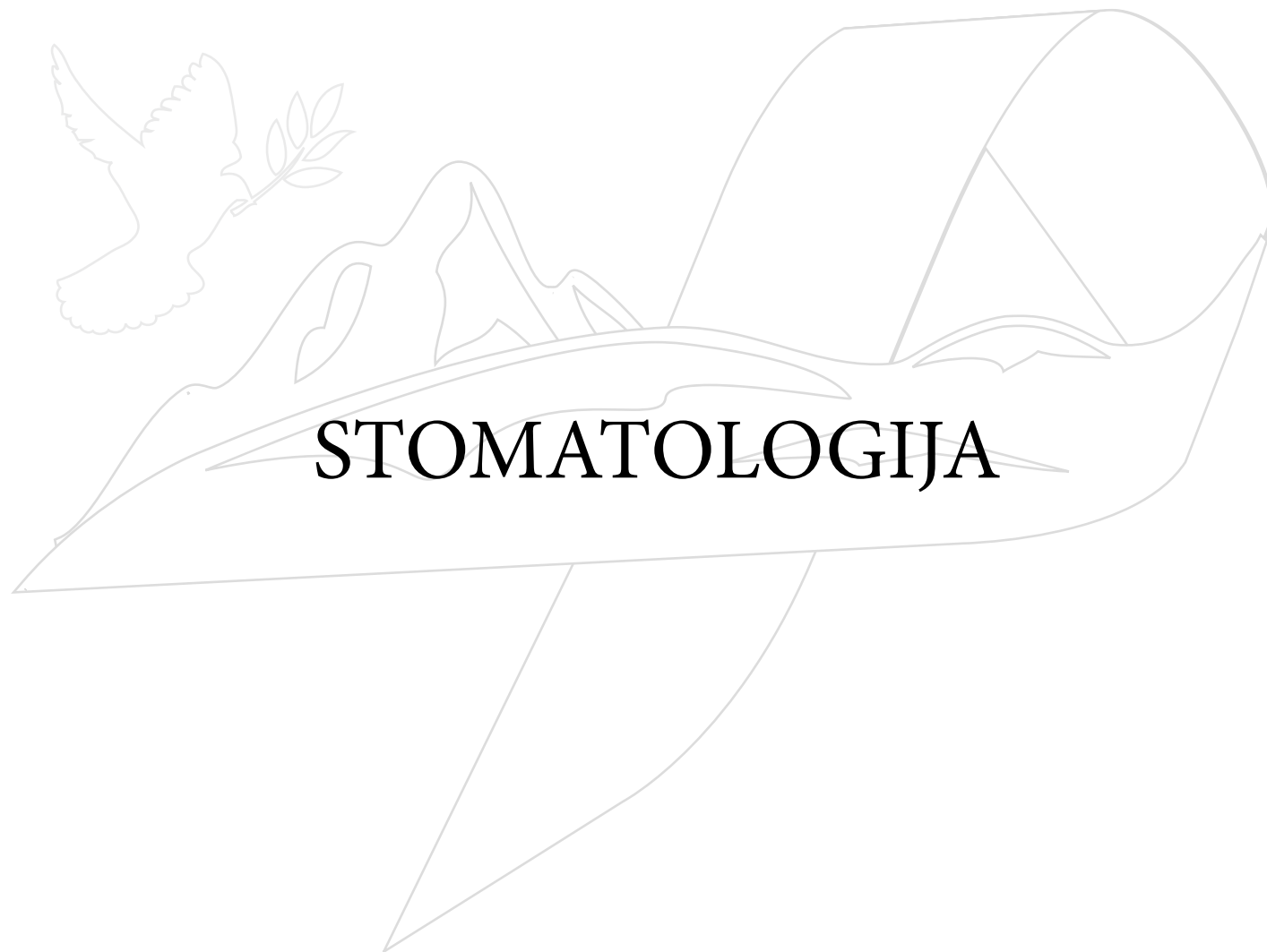
Aim: The aim of the study was to evaluate the association between socio-demographic parameters and self-esteem, and users' behavior on the social network Facebook (FB).

Material and methods: The study included 947 participants, first and third year high-school students and first, third, and fifth year students at the Medical Faculty in Belgrade. The participants filled in a socio-demographic questionnaire and a structured questionnaire on frequency of use and social behavior in social network FB. Respondents' self-esteem was assessed using the Rosenberg self-esteem Scale (RSS).

Results: 80.1% of respondents had a FB profile and spent, on average 95.47±115.30 minutes during the day in communication with 505.32±527.55 friends. High school students had more friends ($U=21631.00$, $z=6.13$, $p=0.000$) and spent more time in the FB ($U=44567.00$, $z=5.28$, $p=0.000$) compared to medical students. People with low self-esteem ($p=-0.125$, $p=0.003$) spent more time in social virtual contact and were more likely to present themselves differently ($p=0.147$, $p=0.001$).

Conclusion: The use of social networks is a global phenomenon, spread in our country particularly among young. The wide use of social networks, especially by persons with low self-esteem, creates a space for the application of contents designed to improve self-esteem, upgrade social skills, and strengthen the personality for the world outside the virtual reality.

Keywords: self-esteem, social networks, Facebook, medical students



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Uvod: Oštećenja mehaničkim agensima predstavljaju najčešća oštećenja oralnih tkiva. U terapiji ovih oštećenja primenjuju se različiti dezinficijensi, čajevi, vodice za ispiranje usta, a od skora se primenjuje i hijaluronska kiselina. Od skoro se primenjuje hijaluronska kiselina za prevenciju i terapiju zapaljenjskih promena u usnoj duplji.

Cilj rada: Ispitati efikasnost lokalne primene 0.2 % gela hijaluronske kiseline (Gengigel®) primenjenog u tretmanu oštećenja usne duplje izazvanih mehaničkim agensima.

Materijal i metod rada Istraživanje je sprovedeno na 12 pacijenata sa mehaničkim oštećenjem u usnoj duplji. Posle uzete anamneze i kliničkog ispitivanja, postavljena je dijagnoza mehaničko oštećenje, koje je bilo izazvano četkicom za zube ili uzimanjem hrane (kokice ili kikikriki). Ispitanici su podeljeni u dve grupe: prvu grupu činilo je 6 pacijenata, koji su primenjivali standardnu terapiju čajevima, vodicama za ispiranje usta i Sol.Gentiana violet 1%. Drugu grupu činilo je 6 pacijenata koji su primenjivali Sol. Gengigel[®] (hijaluronska kiselina). Terapija je trajala pet dana, i svakodnevno pri kontrolnom pregledu korišćena je Vizuelno-Analogna skala za bol (VAS).

Rezultati Od 12 ispitanika koji su učestvovali u ovom istraživanju bilo je 8 žena, prosečna starost bila je 39.8 ± 15.1 . Studentovim t-testom nezavisnih uzoraka utvrđeno je da su statistički značajno veće srednje vrednosti dobijene na VAS skali za grupu 2 u odnosu na grupu 1 nakon 1. ($p < 0,05$), kao i nakon 4. i 5. dana ($p < 0,01$).

Zaključak: Hijaluronska kiselina je pokazala dobru efikasnost u tretmanu pacijenata sa mehaničkim oštećenjem usne duplje, pa se može preporučiti u tretmanu istih.

Ključne reči: mehaničko oštećenje, hijaluronska kiselina

THE EFFICIENCY OF THE HYALURONIC ACID IN THE TREATMENT OF MECHANICAL INJURY OF ORAL TISSUE

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Introduction: The most common mechanical damage of oral tissues are caused by tooth brush or food. In the treatment of these defects it could be apply different disinfectants. Recent approaches in dentistry applied hyaluronic acid for the treatment of lesions and inflammatory changes in the oral cavity.

The aim: To examine the efficacy of topical application of 0.2% hyaluronic acid gel (Gengigel[®]) applied in the treatment of mechanical defects.

Materijal and methods: The study was conducted on 12 patients with mechanical injury in the oral cavity. After anamnesis and clinical examination, the diagnosis of mechanical injury that was caused by a toothbrush or eating (popcorn or peanuts) was established. Subjects were divided into two groups: first group consisted of 6 patients, who applied standard treatment (mouthwashes and Sol.Gentiana violet 1%). The second group consisted of 6 patients who had applied Sol. Gengigel R (hyaluronic acid). The therapy lasted for five days, and daily during the follow-used the Visual Analog Scale (VAS).

Results: Out of the 12 participants 8 were female, mean age was 39.8 ± 15.1 . Student's t-test for independent samples were found to be statistically significantly higher mean values obtained on the VAS scale for group 2 than in group 1 after 1 ($P < 0.05$), and after 4 and 5 days ($p < 0.01$).

Conclusion: Hyaluronic acid has shown good efficiency in the treatment of patients with mechanical damage on oral tissues, and can be recommended for its treatment.

Key words: hyaluronic acid, mechanical damage, oral tissue

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Uvod: Osobe sa invaliditetom su osobe sa mentalnim ili fizičkim oštećenjem koje im u velikoj meri ograničava jednu ili više životnih aktivnosti. Bolesnici sa posebnim potrebama pri stomatološkim intervencijama najčešće su indikovani za rad u opštoj anesteziji

Cilj rada: Utvrditi stanje oralnog zdravlja kod pacijenata koji su u periodu od 2011 do 2012 zbrinuti na klinici za Dečiju i preventivnu stomatologiju, a spadaju u grupu pacijenata koji su bili indikovani za rad u opštoj anesteziji.

Materijal i metode: Istraživanjem je obuhvaćeno 78 pacijenata. Za svakog pacijenta izrađen je naučno-istraživački karton u kome su beleženi podaci o polu i starosti pacijenta, vrsta anestezije koja se primenjivala, uputna dijagnoza, lična anamneza, porodična anamneza i sadašnja bolest. Kod svih pacijenata beležen je tok anestezije. Svim pacijentima ili starateljima dati su saveti o ishrani, održavanju oralne higijene i kupiranju bolova.

Rezultati: U istraživanje su bili uključeni pacijenti od 4. do 28. godine. 65% pacijenata je bilo muškog, 35% ženskog pola. Prosečan broj tretiranih zuba po pacijentu je 13. Ukupan broj izvršenih intervencija je 1018.

Zaključak: Na osnovu dobijenih rezultata i podataka prikupljenih od pacijenata možemo zaključiti da većina hendikepiranih pacijenata, ima zapušteno oralno zdravlje, oboljenja čvrstih i mekih tkiva usne duplje. Veliki broj zuba je bio indikovao za sanaciju i ekstrakcije.

Ključne reči: opšta anestezija, oralno zdravlje

STATE OF ORAL HELTH IN PATIENS INDICATED FOR TRETAMT UNDER GENERAL ANESTHESIA

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Introduction: Persons with disabilities are those with mental or physical damage that limits one or more of there normal life activities. Patients with special needs are mostly indicated for work under general anesthesia.

The Aim: Was to determine the state of patients oral health. All of these patients were indicated for work under general anesthesia and were taken care of in the period of 2011 till 2012 at the clinic for children's preventive dentistry.

Materials and methods: The research included 78 patients. We made a researching file in witch we noted data about gender and age, type of anesthesia, diagnosis, personal history, family history and present condition. All of the patients and there guardians were given advices about nutrition, keeping oral hygiene and taking care of the post operative pane.

Results: The research included patients between 4 and 28 years of age. 65 percent of the patients were male and 35 percent were female. Average number of treated teeth per patient was 13. The total number of interventions was 196.

Conclusion: Given the final results we concluded that the most disabled patients, have neglected there dental health, and have diseases of hard and soft oral tissues. A large number of teeth were indicated for sanation and extraction.

Key words: General anesthesia, oral health

UČESTALOST POJAVE KLINASTIH EROZIJA KOD STUDENATA BEOGRADSKOG UNIVERZITETA

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Uvod: Klinaste erozije su abakterijska oboljenja tvrdih zubnih tkiva, koje se javljaju u gingivalnoj trećini kliničke krune zuba. Etiologija oboljenja je multikauzalna. Klinička manifestacija je u vidu klina, čiji je vrh okrenut prema pulpi.

Cilj rada: Cilj ovog istraživanja bio je otkrivanje učestalosti klinastih erozija kod studenata Beogradskog univerziteta, distribucija te učestalosti kroz uzrast i pol, kao i njena povezanost sa lošim navikama.

Materijal i metode: Istrživanjem je obuhvaćeno 150 pacijenata oba pola, studenata Beogradskog univerziteta od 19. Do 33 godine. Za svakog pacijenta izrađena je anketa gde su beleženi podaci o polu i uzrastu pacijenata, prisustvu loših navika koje mogu imati uticaj na pojavu klinastih erozija, kao i stepenu održavanja oralne higijene. Kliničkim pregledom utvrđeno je prisustvo klinastih erozija. Pregledi su obavljani stomatološkim ogledalcetom i sondom, pod veštačkim osvetljenjem.

Rezultati: Prisustvo klinastih erozija zabeleženo je kod 8% pacijenata, od kojih se kod 73% nalaze na jednom zubu. Srednja starosna vrednost pacijenata obuhvaćenih istraživanjem je 26 godina. Najveća učestalost pojave klinastih erozija zabeležena je kod osoba 21 godine starosti, ženskog pola. Zubi najčešće zahvaćeni erozijama su premolari, sa 78%, i to češće u donjoj vilici.

Zaključak: Na osnovu dobijenih rezultata možemo zaključiti da se erozije češće javljaju kod osoba koje peru zube više puta na dan, konzumiraju alkoholna, gazirana i zaslađena pića.

Ključne reči: klinaste erozije

FREQUENCY OF WEDGE-SHAPED EROSION IN THE BELGRADE UNIVERSITY STUDENT POPULATION

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Introduction: Wedge-shaped erosions are non-bacterial hard dental tissues disease, that appear in gingival third of clinical crown. Etiology is multi-factorial. Clinical manifestation is like wedge, facing the pulp, by which they were named.

The Aim: The aim of this research was to measure frequency of wedge-shaped erosion in the population of Belgrade University students, distribution of that frequency through age and pole, and also relation between erosions and bad habits.

Material and method: Research involved 150 patients, both male and female, students of Belgrade University, age 19 to 33. A questionnaire was made for all of them, where were noted data about age and gender, patient's bad habits that may be important in the development of dental erosion, and the level of oral hygiene. Clinical examines were performed by using dental mirror and probe, under artificial light.

Results: Wedge-shaped erosions were found in 8 percent of patients, while in 73 percent of them, were on one tooth. Mean age value of patients that were involved in research is 26. The highest incidence is 21 years old female students.

Conclusion: Based on the results we made a conclusion that wedge shaped erosions were often found in people who wash their teeth several times a day, consume alcohol, fizzy and sweet drinks, and in smokers.

Key words: dental erosion

PROFILAKSA GINGIVITIS CATARRHALISA KOD STUDENATA PETE GODINE STOMATOLOGIJE MEDICINSKOG FAKULTETA U NIŠU

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Uvod: Gingivitis catarrhalis je zapaljenje gingive oko zuba. Može biti izazvan akumulacijom oralnog biofilma i zubnog kamenca, koji nastaju usled nepravilnog čišćenja zuba ili povreda desni od preteranog pranja. Kataralni gingivitis je uglavnom reverzibilan. Temeljno, ali blago pranje zuba i korišćenje pomoćnih sredstava za održavanje oralne higijene, su najefikasniji načini za sprečavanje pojave i lečenje Gingivitis catarrhalis-a.

Cilj rada: Cilj ovog rada je ispitati efikasnost jednokratne profilakse kataralnog gingivitisa kod studenata pete godine stomatologije Medicinskog fakulteta u Nišu.

Materijal i metode: Ispitivanje je izvršeno kod 50 studenata pete godine stomatologije. Prisustvo oralnog biofilma određivano je plak indeksom (PLI). Stanje gingive određivano je gingivalnim indeksom (Gi) i indeksom krvarenja (Ikrv) prilikom kliničkog pregleda. Studenti su, nakon popunjavanja upitnika, dobili uputstva o pravilnom načinu održavanja oralne higijene. Kontrolno određivanje indeksa krvarenja i stanja gingive vršeno je 15 dana nakon jednokratne profilaktičke procedure.

Rezultati: Analizom podataka dobilo se statistički značajno smanjenje vrednosti svih indeksa (plak indeks, gingivalni indeks i indeks krvarenja) nakon 15 dana od završene profilakse (p <0,05).

Zaključak: Dobijeni rezultati ukazuju da je jednokratna profilaksa, zajedno sa usmeno datim instrukcijama o održavanju oralne higijene efikasna u terapiji Gingivitis catarrhalis-a kod studenata pete godine stomatologije.

Ključne reči: Gingivitis catarrhalis, studenti, profilaksa, oralna higijena

PROPHYLAXIS OF GINGIVITIS CATARRHALIS WITHIN THE FIFTH YEAR DENTISTRY STUDENTS AT THE MEDICAL FACULTY OF UNIVERSITY OF NIŠ

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Introduction: Gingivitis catarrhalis is an inflammation of the gums around the teeth. It may be caused by a build up of plaque and tartar caused by improper cleaning of teeth or by injury to the gums from excessive brushing. Gingivitis catarrhalis is generally reversible. Brushing teeth thoroughly but gently and flossing are the most effective ways to prevent and treat Gingivitis catarrhalis.

The Aim: The aim of this study was to investigate the effectiveness of single prophylaxis of Gingivitis catarrhalis in the fifth year students of Medical Faculty in Niš.

Material and methods: investigation was performed in 50 dental students. The presence of oral biofilm formation was determined by plaque index (PLI). Gingival condition was determined by gingival index (Gi) and bleeding index of probing (BOP) during clinical examination. The students, after completing the questionnaire, got instructions on how to maintain proper oral hygiene. Control of bleeding and the index of gingival condition were examined 15 days after a single prophylactic procedure.

Results: Analysis of the data was obtained statistical decrease of all indices (plaque index, gingival index and bleeding of probing) 15 days after prophylaxis.

Conclusion: The results indicate that a single session of prophylaxis associated to oral hygiene instructions is efficient in the treatment of Gingivitis catarrhalis in students of fifth year of dentistry at Medical faculty in Niš.

Key words: gingivitis catarrhalis, students, prophylaxis, oral hygiene

LIMFANGIOGENEZA U HUMANOJ PULPI

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Uvod: Zubna pulpa predstavlja rastresito vezivno tkivo okruženo rigidnom strukturom mineralizovanih zubnih tkiva. Zbog ograničenosti njene ekspanzije pri zapaljenjskim procesima, zubna pulpa je osetljivija na promene tkivnog pritiska u odnosu na druga tkiva. Limfni sistem pulpe je značajan za eliminaciju viška tečnosti i makromolekularnih supstanci, što naročito dolazi do izražaja kod inflamatornih procesa u pulpi.

Cilj rada: Cilj rada bio je da se utvrdi broj limfatika u inflamiranoj pulpi, pulpi abradiranih i zdravih zuba.

Materijal i metode: Autori su analizirali biopsijske uzorke humane pulpe 21 bolesnika. Izdvojeno je 11 uzoraka zubne pulpe gde nije verifikovano zapaljenje (kontrolna grupa), 6 uzoraka pulpe sa umerenim do jakim zapaljenjskim infiltratom nastalim kao posledica karijesa i 4 uzorka sa promenama na pulpnom tkivu nastalim usled abrazije zuba. Standardni histološki preseki su korišćeni za utvrđivanje prisustva zapaljenja. Detekcija limfatika u pulpi vršena je imunohistohemijom metodom korišćenjem monoklonskog anti-CD31 antitela.

Rezultati: Analizirana je 21 zubna pulpa, pacijenata prosečnog starosnog doba 36 godina. Rezultati pokazuju da je prosečan broj limfnih sudova, pozitivnih na CD31, u grupi sa inflamacijom pulpe značajno veći ($p < 0.01$) u odnosu na prosečan broj limfatika u grupi bez inflamacije.

Zaključak: Rezultati ove studije ukazuju da povećanje CD31 u limfnim sudovima inflamirane pulpe može biti indikator limfangiogeneze.

Ključne reči: zubna pulpa, imunohistohemijske metode, limfangiogeneza, CD31

LYMPHANGIOGENESIS IN HUMAN DENTAL PULP

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Introduction: The dental pulp is a loose connective tissue enclosed within the rigid structure of the mineralized dental tissues. Due to its limited ability to expand during inflammatory state, it is more sensitive to changes in tissue pressure than other tissues. The dental lymphatic system represents an effective system for elimination of excess fluid and macromolecular substances, which plays especially great role in the inflammatory states.

Aim: To investigate the number of lymphatic vessels in inflamed dental pulp, as well as in the pulps of teeth associated with abrasion and caries.

Methodology: The authors analysed biopsy samples of human dental pulps taken from 21 patients. 11 samples of dental pulp without inflammation, 6 dental pulps with moderate to intense inflammatory infiltrate associated with dental caries, and 4 samples with changes in the pulp associated with dental abrasion were selected. Standard histological sections were used to detect the signs of inflammation. Detection of lymphatic vessels in dental pulp was performed immunohistochemically using the monoclonal anti-CD31 antibody.

Results: The 21 samples of dental pulp were analysed, taken from the patients of average age of 36. The results demonstrated that the mean number of lymphatic vessels positive for CD31 in the group with inflammation was statistically higher ($p < 0.01$) than the mean number in the group without inflammation.

Conclusion: Increased co-immunostaining of CD31 in vessels associated with dental pulp inflammation occurred, which suggests lymphangiogenesis.

Keywords: dental pulp, immunohistochemical methods, lymphangiogenesis, CD31

TELEMEDICINA DENTALNIH EKSTRAKCIJA

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Uvod: Dentalne ekstrakcije predstavljaju jednu od najčešće obavljenih intervencija u oralnoj hirurgiji. Oralni hirur je taj koji donosi konačnu odluku od ekstrakcije, a to čini na osnovu niza parametara koji su za ili protiv mogućnosti lečenja i očuvanja zuba u vilici. U doba kompjuterizacije i ekspanzije udaljenih metoda telemedicinske kod donošenja odluka, postavlja se pitanje da li oralni hirur na isti način donosi odluku prilikom direktnog vizuelno-taktilnog pregleda i telemedicinskim pregledom.

Cilj rada: Cilj ovog rada je komparirati oralno-hirurško postavljanje indikacije za ekstrakciju zuba direktnim vizuelno-taktilnim putem i preko *Store And Forward* telemedicinske metode.

Metode: Slučajno odabrani pacijenti sa Klinike za stomatologiju Medicinskog fakulteta u Prištini – Kosovska Mitrovica, prilikom javljanja na odeljenje oralne hirurgije, su po posebno pripremljenoj proceduri intervjuisani i fotografisani, pa su te informacije *upload*-ovane na telemedicinski sistem *XPA3 Online*. Oralni hirur je preko kompjutera i sistema *XPA3 Online*, pregledao dobijeni materijal i postavljao indikaciju za ekstrakciju zuba. Posle telemedicinskog pregleda, isti oralni hirur je direktno, vizuelno taktično pregledao pacijenta i postavljao indikaciju za ekstrakciju. Dobijeni rezultati su statistički obrađeni sa primenom *Spearman Rank* korelacionog testa.

Rezultati: Ukupno je obrađeno 55 pacijenta i postavljeno 48 indikacija ili kontra indikacija za ekstrakciju. Telemedicinskim putem postavljene su 42 indikacije za ekstrakciju i 6 kontraindikacije, dok su vizuelno-taktilnim putem postavljene 43 indikacije i 5 kontra indikacije. Za 95% nivo poverenja, i nivo značajnosti od $P < 0.0001$, *Spearman*-ov koeficijent je iznosio 0.902.

Zaključak: Udaljeno postavljanje indikacije za ekstrakciju zuba u oralnoj hirurgiji, se sa visokom sigurnošću može postaviti putem telemedicinskih metoda.

Ključne reči: telemedicina, ekstrakcija, komunikacija.

TELEMEDICINE DENTAL EXTRACTIONS

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Introduction: Dental extractions are among the most using interventions in oral surgery. Oral surgeon is the one who makes the final decision of the extraction, and it seems based on a number of parameters that are for or against the possibility of healing and preservation of the teeth in the jaw. In the era of computerization and the expansion of telemedicine for remote method of decision making, the question of whether an oral surgeon in the same way to make a decision in direct visual and tactile examination and review of telemedicine.

The Aim: The objective of this study was to compare the oral-setting indications for surgical extraction of teeth by direct visual and tactile means and via store and forward telemedicine methods.

Methods: Randomly selected patients from the Dental Clinic Medical School in Prishtina - Kosovska Mitrovica, when reporting to the department of oral surgery, specially prepared by the procedure interviewed and photographed, and the information is uploaded to the telemedicine system *XPA3 Online*. Oral surgeon is a computer and systems *XPA3 Online*, reviewed the material received and asked for an indication of tooth extraction. After review of telemedicine, the same oral surgeon directly, visually tactile examined the patient and asking indication for extraction. The results were statistically analyzed using the *Spearman Rank* correlation test.

Results: A total of 55 treated patients and 48 set of indications and contra indications for extraction. Telemedicine through the set of 42 indications for extraction and 6 side effects, while visual and tactile indication by the set 43 and 5 accounts indicated. For the 95% confidence level, and the significance level of $P < 0.0001$, *Spearman's* coefficient was 0.902.

Conclusion: Remote setting indications for tooth extraction in dental surgery, with high confidence can be placed via telemedicine methods.

Keywords: telemedicine, extraction, communications.

STANJE ORALNE SLUZOKOŽE KOD STUDENATA PETE GODINE STOMATOLOGIJE
MEDICINSKOG FAKULTETA U NIŠU

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Uvod: Usna duplja je pokazatelj zdravlja. Postojanje harmonije i sklada u ustima kao pokazatelja oralnog zdravlja uslovljeno je intaktnošću oralne sluzokože, uravnoteženošću oralne flore, urednom funkcijom pljuvačnih žlezda, ali i opštim zdravstvenim stanjem. Narušavanje ove ravnoteže, na bilo kojem od navedenih nivoa, ima za posledicu pojavu oralnih simptoma i oralnih bolesti koje zbog svoje specifičnosti mogu ugroziti svakodnevne životne funkcije i navike čoveka.

Cilj rada: Cilj rada bio je da se ispita stanje oralne sluzokože kod studenata pete godine stomatologije Medicinskog fakulteta u Nišu.

Materijal i metode: Anamnestički podaci dobijeni su anketiranjem 50 studenata pete godine stomatologije. Svim učesnicima odrađen je i klinički pregled usne duplje.

Rezultati rada: Od ukupnog broja svih studenata, njih 28 bilo je ženskog pola, a 22 muškog pola. Najveći broj ispitanih studenata bili su nepušači, njih 37. Od promena na oralnoj sluzokoži najviše je bila zastupljena linea alba, dok je najmanji procenat promena u prisustvu Fox-Fordyce žlezdi. Papilitis, Leukoplakia i Candidosa su promene koje nisu nađene ni kod jednog studenta.

Zaključak: Nakon izvršene analize podataka dobijenih iz anamneze i kliničkog pregleda, može se reći da je stanje oralne sluzokože, kod studenata pete godine stomatologije Medicinskog fakulteta u Nišu bilo zadovoljavajuće.

Ključne reči: studenti, oralna sluzokoža, oralna oboljenja

STAVOVI O KORIŠĆENJU PODLOGA ISPOD KOMPOZITNIH ISPUNA

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Uvod: Pregledom literature teško se može naići na jedinstven protokol u vezi postavljanja podloga ispod kompozitnih ispuna, kao ni preporuka za vrstu podloge u zavisnosti od dubine kaviteta.

Cilj rada: Utvrditi koji adhezivni sistemi i koje podloge se najčešće koriste ispod kompozitnih ispuna u zavisnosti od dubine kaviteta, kod studenata i doktora stomatologije.

Materijal i metode: U ispitivanje je uključeno 172 ispitanika (107 studenata 5. godine i 65 doktora stomatologije). Ispitivanje je realizovano u vidu ankete sa jasno definisanim pitanjima i ponuđenim odgovorima.

Rezultati: Na osnovu rezultata dobijenih anketom utvrđeno je da se najviše i skoro podjednako koriste trofazni i dvofazni total-etch adhezivi (70%). Najveći broj ispitanika ne koristi podlogu u gledi (96%) i površinskom dentinu (72%). U dentinu srednje dubine većina ispitanika koristi podlogu (74%), kao i u dubokom dentinu (98%). U dentinu srednje dubine najčešće se koriste podloge na bazi Ca(OH)₂ u kompozitnoj smoli (17%), konvencionalni glas jonomer cement (17%) i smolom ojačani glas jonomer cement (19%). U dubokom dentinu ne može se izdvojiti tip podloge koji preovlađuje.

Zaključak: Među našim stomatolozima i studentima završne godine Stomatološkog fakulteta ne postoje usaglašeni stavovi u vezi korišćenja podloge ispod kompozitnih ispuna. Neophodno je pomno praćenje istraživanja u ovoj oblasti kako bi se na osnovu naučnih dokaza formirali protokoli.

Ključne reči: podloga, adheziv, kompozitni ispun

THE CONDITION OF ORAL MUCOSA OF THE STUDENTS OF THE FIFTH YEAR ON THE FACULTY OF MEDICINE,
THE DEPARTMENT OF DENTISTRY, IN NISH

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Introduction: The oral cavity is an indicator of health. The existence of harmony in the mouth as an indicator of oral health is conditioned by intact oral mucosa, balance of oral flora, orderly function of the salivary glands, and general health. Disturbance of this balance in any of these levels, results in occurrence of oral symptoms and oral diseases because of their specificity that can affect daily life functions and habits of man.

Aim: The aim was to investigate the condition of oral mucosa in the fifth year dental students of the Medical Faculty in Nis.

Material and methods: Anamnestic data were obtained by interviewing 50 dental students. Clinical oral examination was done to all participants.

Results: Of the total number of students, 28 of them were females and 22 males. The largest number of students was non-smokers, they are 37th. The most frequent changes in the oral mucosa were linea alba, and the lowest percentage change was in the presence of Fox-Fordyce glands. Papillitis, Leukoplakia and Candidosa are the changes that are not found at any student.

Key words: students, oral mucosa, oral diseases

OPINIONS ABOUT USING BASES UNDER COMPOSITE RESTORATIONS

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Introduction: According to the available literature, it is difficult to find a unique protocol about the placement of bases under composite restorations, as well as a recommendation about the type of base to be used in cavities of different depth.

The Aim: To investigate which adhesive systems are most frequently used among students and doctors of dentistry, as well as which bases are commonly used under composite restorations depending on the depth of the cavity.

Materials and methods: 172 respondents were included in this study (107 5th year students and 65 dentists). All of them fulfilled questionnaire.

Results: The results showed that three-step and two-step total-etch adhesives are most frequently used (70%). The majority of respondents do not use bases in cavities in enamel (96%) and superficial dentine (72%). In medium dentine the majority of respondents use bases (74%), as well as in deep dentin (98%). In medium dentine most frequently used bases are: Ca(OH)₂ in composite resin (17%), conventional glass ionomer cement (17%) and resin modified glass ionomer cement (19%).

Conclusion: There are no compatible opinions about using bases under composite restorations among our dentists and final year students. It is necessary to closely follow research in this area in order to create protocols based on scientific evidence.

Key words: base, adhesive, composite restoration

PRIMENA INDUSTRIJSKE KOMPJUTERIZOVANE TOMOGRAFIJE ZA IZRADU VIRTUELNOG MODELA MOLARA

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Uvod: Razvoj računara i računarnom podržanih sistema pružio je mnogobrojne mogućnosti implementacije savremenih tehnologija u svakodnevnu stomatološku praksu sa ciljem smanjenja ljudskog uticaja na proizvodnju zubnih nadoknada i poboljšanja kvaliteta završnog proizvoda. Zubne nadoknade zbog njihovog složenog geometrijskog oblika, visokih estetskih i mehaničkih zahteva, iziskuju pažljivo i precizno planiranje, praćeno vremenski zahtevnom izradom. Koriscenjem savremenih metoda za akviziciju podataka, modeliranja i mašinske obrade, teži se skraćenju procesa proizvodnje uz standardizaciju i unapređenje kvaliteta zubnih nadoknada. Polazna faza pri izradi zubnih nadoknada je dobijanje radnog modela. Kompjuterizovana tomografija (CT) je beskontaktna, nedestruktivna metoda 3D digitalizacije. Merenje se vrši prodornim X zracima koji prolaze kroz ispitivani objekat, a dobijene informacije se daljom softverskom obradom rekonstruišu u virtuelni model.

Cilj istraživanja je prikaz metode dobijanja virtuelnog modela skeniranog akrilatnog molara.

Materijal i metode: Skeniranje akrilatnog molara obavljeno je industrijskom kompjuterizovanom tomografijom (Carl Zeiss- Metrotom). Daljom softverskom obradom napravljena je 3D rekonstrukcija akrilatnog molara i napravljen je virtuelni model.

Rezultati: Skeniranjem akrilatnog molara industrijskim CT-om dobijen je virtuelni model. Na virtuelnom modelu se zapaža strukturni defekt u vidu poroznosti. Tokom skeniranja javile su se greške koje su bile manje od 30 µm.

Zaključak: Upotreba industrijskog CT pokazala se kao adekvatan metod za dobijanje virtuelnih modela koji se mogu koristiti za dalja istraživanja.

Ključne reči: industrijski CT, poroznost, virtuelni model

APPLICATION OF INDUSTRIAL COMPUTED TOMOGRAPHY FOR MAKING VIRTUAL MOLAR MODEL

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Introduction: The development of computers and computer supported systems has provided many opportunities for implementation of modern technologies into everyday dental practice, with the purpose of reducing human impact on the production of dental restorations and improving the quality of the final product. Due to their complex geometric shape and high mechanical and aesthetic requirements, dental restorations require careful and precise planning, followed by a time-consuming preparation. The use of modern methods for data acquisition, modeling and machining, tends to shorten the production process as well as to standardize and improve the quality of dental restorations. The starting phase in the preparation of dental restorations is obtaining of a working model. Computed tomography (CT) is a contactless, nondestructive method of 3D digitization. The measurement is performed by X-rays which penetrate through the object of the analysis, and the information obtained is further software processed in order to reconstruct a virtual model.

Goal: This study aims to present a method of obtaining of a virtual model of a scanned acrylate molar.

Material and methods: Acrylate molar scan was performed by industrial computed tomography (Carl Zeiss-Metrotom). Further software processing enabled 3D reconstruction of acrylate molar and a virtual model design.

Results: The virtual model was obtained by industrial CT scan of acrylate molar. Structural defects in the form of pinholes were observed on the virtual model. Errors which occurred during the scan were less than 30 µm.

Conclusion: The use of industrial CT proved to be an adequate method of obtaining of a virtual model in dental profession.

Key words: industrial CT, porosity, virtual model

INCIDENCA KOMPLIKACIJA U TERAPIJI PRELOMA KOSTIJU LICA I VILICA

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Uvod: Pored napretka u operativnoj tehnici i prisutnog tehnološkog napretka u razvoju osteosintetskog materijala, tretman povreda kostiju lica i vilica, sa sobom nosi mogućnost pojave komplikacija, bilo ranih ili kasnih, kao neminovnog pratioca, bilo u većem ili manjem procentu, svih hirurških procedura.

Cilj rada: Cilj rada je odrediti učestalost pojedinih komplikacija u toku terapije preloma kostiju lica i vilica u trogodišnjem periodu.

Materijal i ispitanici: Retrospektivnim kliničkim istraživanjem ispitivana je incidenca pojave komplikacija u tretmanu preloma kostiju lica i vilica na Odeljenju za maksilofacijalnu hirurgiju Klinike za stomatologiju u periodu od 01.01.2009. do 31.12.2011. godine.

U navedenom periodu tretirano je 405 povredjenih sa prelomima kostiju lica i vilica.

Rezultati: Komplikacije su konstatovane kod 4,2% povredjenih. Komplikacije sa najvišom incidencom pojavljivanja su infekcije, bilo po tipu ranih postoperativnih komplikacija u smislu sinuzita ili kasnih postoperativnih komplikacija po tipu osteomijelita, poremećaj sprovodljivosti nerava, te gubitak čvrstine spoja osteosintetskog materijala i kosti. Dobijeni rezultati su, u smislu incidence, niži ili identični relativno retkim, rezultatima iz literature, gde se poremećaj sprovodljivosti smatra najučestalijom komplikacijom tretmana povreda kostiju lica i vilica.

Zaključak: Prisustvo komplikacija predstavlja neminovnost kod bilo kojih hirurških procedura, ipak relativno visok procenat komplikacija vezanih za osteosintetski materijal ukazuje na važnost pravilnog postupanja sa istim.

Ključne reči: kosti, lice, prelom, komplikacije.

INCIDENCE OF COMPLICATIONS IN TREATMENT OF FACIAL BONE FRACTURES AND JAWS

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Introduction: Despite the advances in operative technique and present technological progress in the development of osteosynthesis material, treatment of injuries of facial bones and jaw, carries with it the possibility of the occurrence of complications, whether early or late, as an inevitable companion, either a greater or lesser degree, all surgical procedures.

The aim of study: The aim is to determine the frequency of certain complications in the treatment of fracture of facial bones and jaw in three years.

Material and respondents: Retrospective clinical study investigated the incidence of complications in the treatment of fractures of facial bones and jaw in the Department of Maxillofacial Surgery, Dental Clinic in the period from 01.01.2009. to 31.12.2011 year. During this period, treated 405 injured, with fractures of facial bones and jaw.

Results: Complications were noted in 4.2% of injuries. Complications with the highest incidence of occurrence were infection, either by type of early postoperative complications in terms of sinusitis or late postoperative complications in type osteomyelitis, impaired nerve conduction, and loss of firmness osteosynthesis circuit materials and bone. The results were in terms of incidence, lower or identical relatively rare, the results from the literature, where the conduction disturbance is consider the most common complication of treatment of injuries of facial bones and jaw.

Conclusion: The presence of complications is unavoidable in any surgical procedure, however, relatively high complication rate related to osteosynthesis material points to the importance of proper handling of the same.

Keywords: face, bones, fracture, complication.

GREŠKE PRI IZRADI INDIREKTHNIH ISPUNA

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Uvod: izrada indirektnih ispuna predstavlja kompleksan zadatak koji sa sobom nosi dosta prostora za greške što je i opredelilo struku da ih potisne u drugi plan.

Cilj: Cilj ovog rada je da praktično predstavi greške koje su poznate teorijski, uz ideju da ukoliko su već poznate, onda se mogu i izbeći.

Materijal i metode: Rad je urađen na Klinici za bolesti zuba Stomatološkog fakulteta u Beogradu. Rađen je u in vitro uslovima. Za rad su korišćeni standardni modeli gornje i donje vilice sa plastičnim zubima.(26 preparacija). Na 15 humanih zuba(9 molara i 6 premolara) ekstrahovanih na Klinici za oralnu hirurgiju urađeno je 15 preparacija. Na njima su urađene modifikovane Blekove(10), kao i adhezivne preparacije(5). Preparacije su izvedene standardnim setom karbidnih i dijamantskih borera. Kao podloga korišćeni su GJ cementi Tip III: Fudži 8 (Fuji) i Alfagal(Galenika). Otiskivanje je rađeno plavim voskom(PlazDent) i elastomerima (Zerhmac). Fiksiranje ispuna je rađeno klasičnim i glas jonomernim cementima ojačanim smolama.

Rezultati: Greške koje su otkrivene i dokumentovane su: greške u toku planiranja, preparacije, uzimanja otiska ispreparisanog kaviteta, izrade ispuna i fiksiranja.

Zaključak: Pažljivim radom, uz dovoljno teorijskog predznanja i postignute manuelne spretnosti sve pobrojane greške se mogu prevenirati.

Ključne reči: indirektni ispun, greške, preparacija, otiskivanje, vosak, fiksiranje.

ERRORS IN THE PREPARATION OF INDIRECT RESTORATIONS

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Introduction: The development of indirect restorations is a complex task that carries a lot of room for error for which reason profession chose to suppress it in the background.

The Aim: The aim of this paper is to practically present errors, which are known theoretically, with the idea that if errors are already known, then they can be avoided.

Materials and methods: The paper was done at the Department of Restorative Dentistry, University of Belgrade. Standard models of the upper and lower jaw with plastic teeth were used for the examination (26 preparations). On 15 human teeth (9 molars and 6 premolars) extracted at the Clinic for Oral Surgery, 15 preparations were done. Modified Black (10) and adhesive(5) preparations were made on them. The preparations were performed by standard sets of carbide and diamond drills. Following Glass-ionomer cements were used as substrates: Fuji 8 (Fuji) and Alfagal (Galenika). For printing, blue wax (Plast-DENT) and elastomers(Zerhmac) were used. The fixation of the restorations was done with standard and modified cements.

Results: Detected errors are: errors in the planning, preparation, taking the impression of the drilled cavity, restoring and fixation.

Conclusion: Careful work, supported by sufficient level of theoretical knowledge and manual dexterity, could lead to prevention of mentioned errors.

Keywords: indirect restorations, errors, preparation, imprinting, wax, fixing.

STANJE ORALNOG ZDRAVLJA KOD DECE PREDŠKOLSKOG UZRASTA

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Uvod: Karijes ranog detinjstva (KRD) predstavlja hroničnu infektivnu bolest koja se karakteriše prisustvom jednog ili više karijesom zahvaćenih, ekstrahovanih usled karijesa ili saniranih zuba u mlečnoj denticiji, kod dece do 6. godine starosti.

Cilj: Cilj istraživanja bio je da se utvrdi rasprostranjenost karijesa kod dece predškolskog uzrasta, na području Šajkaša, kao i uticaj pojedinih faktora rizika na njegov nastanak.

Materijal i metode: Metodom slučajnog izbora obuhvaćeno je 80 dece, oba pola, starosti 3-6 godina, iz vrtića "Plavi čuperak", kao i njihovi roditelji. Istraživanje se sastojalo iz tri faze. Prva faza je predstavljala "pilot" studiju. U drugoj fazi ispitivanja roditeljima je plasiran anketni upitnik, u kojem su evidentirani podaci vezani za stanje oralnog zdravlja njihove dece. U trećoj fazi je izvršen stomatološki pregled dece. Nakon prikupljanja i evaluacije podataka, rezultati su prezentovani grafički i tabelarno.

Rezultati: Kod 67,5 % dece uočeno je prisustvo KRD, u vidu "belih mrlja", kavitacija ili gangrenoznih korenova na gornjim mlečnim incizivima. Na osnovu logističkih regresionih analiza, za nastanak karijesa ranog detinjstva izdvojilo se pet faktora rizika: upotreba flašice, dodatno slađenje hrane i napitaka, loše navike, upotreba medicinskih sirupa, kao i odsustvo primene fluor tableta.

Zaključak: Prevalencija KRD kod predškolske dece u Šajkašu je izuzetno visoka i direktno korelira sa utvrđenim faktorima rizika.

Ključne reči: karijes ranog detinjstva (KRD), "bela mrlja", faktori rizika

ORAL HEALTH IN PRESCHOOL CHILDREN

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Introduction: Early childhood caries (ECC) is a chronic infectious disease which happens among children under 6 years of age. It is characterized by the presence of one or more carious affected teeth, teeth extracted due to caries or teeth repaired in the milk dentition.

The Aim: The aim of this study was to determine diffusion of caries among pre-school children in the area of Sajkas. Also, the objective was to define what are the risk factors that influence its occurrence.

Materials and methods: By using the method of random selection, we included 80 children from kindergarten "Blue shag" and their parents. Research included children 3 to 6 years old of both sex. The study consisted of three phases. The first phase was a "pilot" study. In the second phase the parents filled out a questionnaire where data regarding the oral health of their children was recorded. The third phase consisted of dental examination of children. After collecting and evaluating data, results were presented in graphical and tabular form.

Results: Among 67.5% children the presence of ECC in the form of "white spots", cavitation or gangrenous root of the upper deciduous incisors was detected. After logistic regression analysis, five risk factors for early childhood caries set aside. These are: the use of bottles, additional sweetening of food and beverages, bad habits, the use of medical syrups and the lack of fluoride tablets usage.

Conclusion: The prevalence of ECC in preschool children in Sajkas is extremely high and directly correlates with established risk factors.

Key words: early childhood caries (ECC), "white spots", risk factors.

PROCENA RIZIKA ZA NASTANAK OBOLJENJA PARODONCIJUMA

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Uvod: Parodontalna oboljenja pokazuju sve veću učestalost među mlađom populacijom.

Cilj rada: Cilj rada je da se ispita rizik za nastanak oboljenja parodonticijuma.

Materijal i metod rada: Za procenu rizika je korišćena anonimna anketa. Ispitivanjem je obuhvaćeno 50 ispitanika starosti od 20 do 70 godina, koji su pacijenti Stomatološkog fakulteta Univerziteta u Beogradu. Anketa je sadržala 13 pitanja sa ponuđenim odgovorima, Da ili Ne koji su bodovani a dobijena vrednost je predstavljala odgovarajući rizik.

Rezultati: Rezultati su pokazali da je bez rizika 19(38%)ispitanika, sa niskim rizikom15(30%), srednjim 15(30%), visokim 1(2%) a izrazito visok rizik nije zabeležen. U odnosu na starost, najviše ispitanika bez rizika je u grupi od 20-30 god.(18%), sa niskim rizikom u grupi od 51-60god.(12%). Srednji rizik je najviše zastupljen u grupi od 51-60god.(12%) a visoki rizik u grupi od 61-70god. Na pitanje:“Da li imate dijabetes koji zahteva uzimanje insulina?” 4(8%) je odgovorilo DA . Na pitanje:“Da li imate dijabetes koji ne zahteva uzimanje insulina?” 3(6%) je dalo pozitivan odgovor,DA. Na pitanje:“Da li pušite vise od 10 cigareta dnevno?” 15(30%) je odgovorilo DA. Na pitanje:“Da li perete zube najmanje jednom dnevno?”46(92%) je odgovorilo DA, dok je samo 4(8%) odgovorilo NE.

Zaključak:Dobrom oralnom higijenom, korigovanjem loših navika i očuvanjem opšteg zdravlja moguće je smanjiti rizik za nastanak oboljenja parodonticijuma.

Gljučne reči: parodonticijum.

ASSESSMENT OF RISK FOR PERIODONTAL DISEASE

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Introduction: Periodontal disease have bigger rol today in younger population.

Purpose: Purpose of the paper is to assess the risk of periodontal disease occurrence.

Material and methods: An anonymous survey was used to assess the risk. Fifty persons aged from 20 to 70, who were patients at the Faculty of Stomatology of the Belgrade University, participated in the survey. The survey contained 13 questions with predefined answers, Yes or No, which were assigned points and the final sum represented the corresponding risk.

Results: The results have showed that 19 persons (38%) had no risk, 15 (30%) had low risk, 15 (30%) had moderate risk, 1 (2%) had high risk, and very high risk was not reported. With regard to age, the majority of people with no risk were in the age group from 20-30 (18%), with low risk in the group from 51-60 (12%). Moderate risk was most present in the group from 51-60 (12%), and high risk in the group from 61-70.

Conclusion:With good oral hygiene, correction of bad habits and maintenance of general health, it is possible to decrease the risk of periodontal disease occurrence.

Key words: parodontal.

ISPITIVANJE ANALGETIČKOG EFEKTA BUPIVAKAINA POSLE HIRURŠKOG VAĐENJA IMPAKTIRANIH DONJIH UMNJAKA

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Uvod: Hirurško vađenje impaktiranih donjih umnjaka veoma je česta intervencija u oralnoj hirurgiji. Za postoperativni period su bol i edem u toj meri karakteristični, da se ova intervencija često koristi kao model za ispitivanje analgetičkog efekta pojedinih lekova ili postupaka.

Cilj: Ispitati analgetički efekat primene 0,5% bupivakaina nakon hirurškog vađenja impaktiranih donjih umnjaka.

Materijal i metode: Ispitano je 40 nasumce odabranih pacijenata kod kojih je postojala indikacija za vađenje nekog od donjih impaktiranih umnjaka. Pacijenti su podeljeni u dve studijske grupe: prvoj grupi je, nakon intervencije, ponovo primenjena mandibularna anestezija 2% lidokainom sa vazokonstriktorom, dok je drugoj grupi, u te svrhe, ordiniran 0,5% bupivakain bez vazokonstriktora. Pacijenti su nakon intervencije popunjavali upitnik kojim su registrovani pojava i intenzitet postoperativnog bola.

Rezultati: Prosečno trajanje intervencija je bilo 26,12 minuta. Analgetički efekat je trajao prosečno 2,17 časova duže kod pacijenata druge grupe. Postoperativni bol je registrovan kod 52,5% pacijenata i to kod 70% pacijenata prve i 45% pacijenata druge grupe. Postoperativni bol je najčešće opisivao kao bol slabog intenziteta, dok je 20% pacijenata prve i 10% pacijenata druge grupe taj bol opisalo kao izuzetno jak bol.

Zaključak: Naknadna primena mandibularne anestezije 0,5% bupivakainom produžava postoperativni analgetički efekat, smanjuje učestalost bola i njegov intenzitet više nego kada se u te svrhe primeni 2% lidokain sa adrenalinom.

Gljučne reči: impaktirani umnjaci

ANALYSIS OF ANALGETIC EFFECT OF BUPIVACAINE AFTER SURGICAL EXTRACTION OF IMPACTED THIRD MOLARS

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Introduction: Surgical extraction of impacted third molars is a very common procedure in oral surgery. Characteristic postoperative complications, such as pain and edema, are so common that this procedure is often used as a model to investigate the analgesic effect of different medications.

The aim: To analyze the analgesic effect of 0.5% bupivacaine used immediately after surgical extraction of impacted lower third molars.

Materials and Methods: Forty patients undergoing impacted mandibular third molar surgery were randomly divided into two study groups: patients of the first group, immediately after surgery, received an additional 2% lidocaine/adrenaline injection, while the second group received an additional 0.5% bupivacaine injection. After surgery, patients were asked to complete a questionnaire to define the time of occurrence and intensity of postoperative pain.

Results: The average duration of surgery was 26.12 minutes. The analgesic effect lasted 2.17 hours longer in the second group, on average. Postoperative pain was registered in 52.5% of the patients (70% in the first and 45% in the second group).

Conclusion: The effect of bupivacaine, administered after completion of lower third molar surgery, extends the postoperative analgesic effect and reduces the incidence and intensity of postoperative pain more than lidocaine/adrenaline injection.

Key words: impacted wisdom teeth

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Uvod: Carabelli-evo obeležje se morfološki manifestuje na gornjem prvom stalnom molaru. Locirano je na meziolingvalnoj padini palatomezjalne kvrčice i može se pojaviti kao: brazda, jamica, manji ili veći tuberkulum ili da ima sve elemente kvrčice zuba. U našoj literaturi se često opisuje kao o Carabelli-eva kvrčica, iako se kao kvrčica ne pojavljuje u domaćoj populaciji. U nekim humanim populacijama (Melanezija) Carabelli-evo obeležje ima formu velike pete kvrčice (atribut rase), koja je u svemu slična glavnim kvrčicama zuba.

Cilj: Cilj ovog rada je da utvrdi učestalost pojave kao i ekspresiju Carabellijevog obeležja u domaćoj populaciji

Metod: Istraživanje je sprovedeno na 100 gipsanih modela intaktnih zubnih lukova gornje vilice. Za istraživanje je formiran poseban upitnik

Rezultati: Rezultati istraživanja pokazuju da se Carabellijevo obeležje pojavljuje na više od 80% gornjih prvih molara. Najčešći oblik je tuberkulum ili brazda. Dobijeni rezultati nemaju posebnu praktičnu primenu. Mogu biti preporuka zubnim tehničarima pri modelovanju kruna tokom rekonstrukcije zuba fiksnim zubnim nadoknadama ili dentalnoj industriji tokom izrade akrilatnih zuba.

Cljučne reči: Carabelli-eva kvrčica, Gornji prvi stalni molar

CARABELLI CUSPS EXPRESSION IN THE UPPER MOLARS

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Introduction Carabelli-feature is morphologically manifested in the upper first permanent molar. It is located on a palatomezial cusp and can appear as: furrow, pit, small or large tubercle or it can have all the elements of the tooth cusps. In the literature is often described as the Carabelli cusp, although it does not appear in the local population in the form of cusp. In some human populations (Melanesia) Carabelli feature takes the form of large fifth cusp (the attribute of a race), which is similar in all to the major cusps of the teeth.

The aim The aim of this study was to determine the incidence and the expression of Carabelli-feature in the local population.

Method The study was performed on 100 plaster models of intact dental arches of the upper jaw. Special questionnaire was created for this study.

Results The results show that Carabelli-feature appears on more than 80% of the upper first molars. The most common form is the tubercle or groove. Obtained results don't have special applications in praxis. It may be recommended to dental technicians when modeling tooth crown during the reconstruction with fixed dental restorations and to dental industry during the production of acrylic teeth.

Keywords: Carabelli cusp, Upper first permanent molar

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Uvod: U savremenoj stomatologiji, imperativ uspešne rekonstrukcije zuba fiksnim nadoknadama je definisanje optimalne boje kojom se nadoknade idealno uklapaju u oralnu kompoziciju. S obzirom na to da boja predstavlja specifični subjektivni kvalitet svetlosti interpretiran psiho-fizičkim fenomenima, odrediti boju zuba u kliničkim uslovima je veoma odgovoran zadatak.

Cilj: Cilj rada je da se proverí podudarnost boje fiksne nadoknade koja je zadata u stomatološkoj ordinaciji, i boje nadoknade realizovane u toku postupka izrade u zubotehničkoj laboratoriji.

Materijal i metod: Studija je sprovedena na Klinici za stomatološku protetiku, Stomatološkog fakulteta u Beogradu. Obuhvata 22 pacijenta sa 165 zuba indikovanih za prihvatanje fiksnih nadoknada (metalokeramičkih mostova i kruna). Određivanje boje zuba vršeno je spektrofotometrom, Vita Easyshade (Germany). Aparat funkcioniše obasjavanjem objekta monohromatskom svetlošću, i detektovanjem reflektovane svetlosti. Aparat dalje utvrđuje i softverski klasifikuje boju prema Vitapan klasičnom ključu. Na početku terapije, u ordinaciji je određena boja buduće nadoknade, a po njenoj izradi vršena je verifikacija aplikovanjem senzora aparata na površinu zuba.

Rezultati: Statističkom obradom (ANOVA test) utvrđena je značajna razlika u boji određenoj u ordinaciji i laboratoriji ($P < 0.05$). Uz to, vilice (gornja i donja) i segment (bočni i frontalni) ne utiču značajno na odstupanja ($P > 0.05$).

Zaključak: Navedena odstupanja mogu biti posledica neusklađenosti komercijalnog ključa boja i nedovoljno korektno složenih i sinterovanih keramičkih materijala.

Cljučne reči: boja zuba, spektrofotometar, ključ boja

AESTHETICALLY OPTIMAL TOOTH COLOR, GOOD OR BAD COMMUNICATION CLINICIAN/TECHNICIAN?

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Introduction: Nowadays, in order to have a successful reconstruction of teeth with fixed partial dentures, it is important to define the optimal color for the dentures to fit in the oral composition. Given that color is a specific subjective quality of light interpreted by psycho-physical phenomena, determining tooth color in clinical conditions is a difficult task.

Aim: The aim of this paper is to check if the two colors of fixed partial dentures, one determined in the dental office and the other during the creation process in the dental laboratory, are identical.

Materials and Methods: The study was conducted at the Department of Prosthodontics, Faculty of Dental Medicine. It includes 22 patients with fixed restorations, a total of 165 teeth (metal ceramic bridges and crowns). Determining tooth color was done using a spectrophotometer, Vita Easyshade (Germany).

Results: One-way analysis of variance (ANOVA) has revealed that the choice of shade guide (VITA classical shade guide and VITA easy shade compact) significantly influenced the determined tooth color ($P < 0.05$). Factors comprising upper or lower jaw and frontal or posterior segment of the jaw did not significantly influence detected differences of the determined tooth color (ANOVA $P > 0.05$).

Conclusion: These discrepancies may be due to incompatibility of commercial key color and unacceptable matching of tooth color, or insufficiently sintered ceramic material.

Keywords: tooth color, spectrophotometer, shade guide

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Uvod: Maksilarni sinus je najveća koštana pneumatizovana šupljina smeštena u telu gornje vilice.

Cilj rada: Utvrditi zastupljenost patoloških stanja maksilarnog sinusa.

Materijal i metode: U periodu između 2006-2011g. analizirana je medicinska dokumentacija (patohistološki izveštaji, stomatološki kartoni, foto zapis) na odeljenju oralne hirurgije, Klinike za Stomatologiju Medicinskog Fakulteta u Nišu. Beleženi su medicinski podaci koji su se odnosili na sva oboljenja maksilarnog sinusa (MS).

Rezultati: 96 pacijenta starosti od 16-78 godina je imalo patološke promene u MS. Muški pol je bio zastupljeniji (60 pacijenata-62,5%) sa statistički značajnom razlikom među polovima ($p < 0,05$). Utvrđena su sledeća patološka stanja MS: sinuziti kod 74 pacijenata (77,1%), i to akutni sinuziti 3 (3,13%), hronični nespecifični sinuziti 31 (32,29%), hronični polipozni sinuziti 18 (18,75%), hronični sinuzit u egzacerbaciji 17 (17,7%), hronični fibrozni sinuziti 4 (4,16%) i hronični sinuzit sa metaplazijom 1 (1,04%). Cistične lezije su zabeležene kod 10 pacijenata (10,42%), i to 4 (4,16%) radikularnih, 1 (1,04%) epidermalnih, 5 (5,21%) patološki neklasifikovanih cističnih lezija i mukokela kod 7 pacijenata (7,29%). Tumori su identifikovani kod 5 pacijenata (5,21%). Od ukupnog broja tumora maligni tumori su identifikovani kod 3 pacijenata (3,13%) i to Ca anaplasticum infiltrativum, Lymphoma Non-Hodgkin i Ca Microcellulare, dok su kod 2 pacijenta (2,18%) utvrđeni benigni tumori- fibromixoma i papiloma cilindrocellulare- Schneider.

Zaključak: Najčešća patološka stanja su hronični nespecifični maksilarni sinuziti i hronični polipozni sinuziti, ali su od izuzetnog značaja benigni i maligni tumori koji zahtevaju posebnu dijagnostiku i terapiju.

Ključne reči: maksilarni sinus, sinuziti, ciste, tumori.

ANALYSIS OF PATHOLOGICAL CHANGES IN MAXILLARY SINUS

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Introduction: Maxillary sinus is the largest pneumatic cavity of upper jaw.

The aim: To analyse pathological conditions of the maxillary sinus.

Materials and methods: The study was conducted at the Department of Oral Surgery, Dental Clinic of the Medical Faculty in Niš. Histopathological reports, dental records and photo documentation for the period of 6 years from 2006-2011 were used during the study.

Results: There were 96 patients aged 16-78, with a pathological change in the maxillary sinus and with predominance of male sex distribution of patients 60 (62,5%) were male ($p < 0,05$). The pathological conditions were determined: there were 74 cases (77,1%) of sinusitis in total; 3 (3,13%) of which presented with acute sinusitis, 31 (32,29%) with chronic non-specific sinusitis, 18 (18,75%) with chronic polypoid sinusitis, 17 (17,7%) with chronic sinusitis in exacerbation, 4 (4,14%) with chronic fibrous sinusitis and 1 (1,04%) with sinusitis. The recorded cysts was 10 (10,42%); 4 (4,16%) of which were radicular, 1 (1,04%) epidermal, and 5 (5,21%) non-aligned, and mucoceles were observed in 7 cases (7,29%). There were 5 cases (5,21%) of tumors, of which 3 (3,13%) were malignant (Ca anaplasticum infiltrativum, Lymphoma and Non-Hodgkin, Ca Microcellulare) and 2 (2,18%) were benign (fibromixoma and Papiloma cilindrocellulare-Schneider).

Conclusion: The most frequent pathological condition of maxillary sinus is chronic non-specific maxillary sinusitis. However, benign and malign tumors are of significant importance and therefore, mustn't be ignored in case of diagnoses and therapy.

Key words: maxillary sinus, sinusitis, cysts, tumors.

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Uvod: Cariogram® je kompjuterski program koji grafički ilustruje rizik za nastanak karijesa, istovremeno izražavajući u kojoj meri pojedini etiološki faktori utiču na rizik za nastanak karijesa.

Cilj: Cilj rada je bio da se proceni rizik za nastanak karijesa pomoću kompjuterskog programa i da se utvrdi međusobni odnos različitih etioloških faktora.

Materijal i metode: U istraživanje je bilo uključeno 30 pacijenata oba pola, uzrasta od 19 do 28 godina. Analizirani parametri bili su: zastupljenost karijesa, oralna higijena, način ishrane, upotreba fluorida, upitnik o opštem zdravlju i analize pljuvačke. Karijes rizik svakog pojedinca je grafički prikazan korišćenjem kompjuterskog programa Cariogram®.

Rezultati: Utvrđena je podjednaka zastupljenost ispitanika sa niskim (36%), srednjim (32%) i visokim (32%) rizikom za nastanak karijesa. Najznačajniji faktor za nastanak karijesa predstavlja dentalni plak, kao i ishrana.

Zaključci: Cariogram® je program koji ističe najznačajnije etiološke faktore za nastanak novog karijesa za svakog pacijenta ponaosob. Rezultati ukazuju na to gde treba sprovesti ciljne preventivne mere kako bi se smanjio rizik za nastanak karijesa.

Ključne reči: Cariogram®, procena rizika za nastanak karijesa.

EVALUATION OF CARIES-RISK USING A COMPUTER PROGRAM

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Introduction: Cariogram® is a computer program that graphically illustrates the risk for development of new caries.
The Aim: The aim was to assess the caries risk using a computer program and to determine the relationship between different etiological factors.

Materials and Methods: The study included 30 patients of both genders, aged 19 to 28 years. The analyzed parameters were: caries, oral hygiene, diet, use of fluoride, general health, and analyses of saliva. Caries risk for each individual was graphically displayed using a computer program Cariogram®.

Results: This study showed equal distribution of participants with low (36%), medium (32%) and high (32%) caries risk. The most important factors for caries were dental plaque and diet.

Conclusion: Cariogram® is a program that shows the most important etiological factors for the formation of new cavities for each patient. The results indicate where to implement preventive measures to reduce the risk of new cavities.

Key words: Cariogram®, estimate the risk of tooth decay.

PRIMENA KARIOGRAMA U PROCENI RIZIKA ZA NASTANAK KARIJESA U DECE

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Uvod: Karijes zuba je bolest sa multifaktorijskom etiologijom, jer nastaje kao posledica interakcije različitih faktora: ishrane, osetljivosti domaćina i prisustva mikroorganizama tokom određenog vremenskog perioda. Iako su razvijeni različiti modeli u oblasti dijagnostike rizika za nastanak karijesa, nijedan se do danas nije pokazao dovoljno efikasnim. U pokušaju da se riješi problem koji se javlja pri tumačenju različitih testova za predviđanje rizika, razvijeni su kompjuterski programi među koje spada Cariogram.

Cilj: istraživanja je bio da se proceni profil rizika za nastanak karijesa u dece pomoću Cariogram® Softver-a i ispita odnosi između različitih varijabla.

Metod: Podaci su prikupljeni na uzorku od 60 dece uzrasta od 12 godina. Podaci o ishrani i oralnoj higijeni dobijeni su pomoću odgovarajućeg anketnog upitnika. Nakon kliničkog pregleda, uzeti su uzorci pljuvačke. Karijes rizik svakog pojedinca je onda procenjen pomoću Cariogram® Softver-a.

Rezultati: Utvrđeno je da 48% dece ima visok, 33% srednji i 19% nizak rizik za karijes. Broj Streptococcus mutans, plak indeks, primena fluorida i puferski kapacitet pljuvačke su pokazali značajnu korelaciju sa KEP-om ispitivane dece ($p < 0,001$). Broj streptococcus mutans u pljuvački, zatim KEP i puferski kapacitet pljuvačke su bili u korelaciju sa visinom rizika ($p < 0,001$).

Zaključak: Korelacije između ispitivanih varijabla koje čine Kariogram pokazuju da ovaj model pruža mogućnost za jednostavnu i brzu procenu rizika za nastanak karijesa u dece.

Ključne reči: karijes, faktori rizika, Kariogram.

APLICACION KARIOGRAMA AT RISK FOR TOOTH DECAY IN CHILDREN

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Introduction: Dental caries is a multifactorial disease with etiology, it is the result of interaction of different factors: diet, host susceptibility and the presence of microorganisms over time. Although different models have been developed in the field of diagnostic risk of cavities, none to date has not been efficient enough. In an attempt to solve the problem that arises in the interpretation of various tests to predict risk, developed computer programs which include Cariogram. The aim was to assess the risk profile of cavities in children with Cariogram® software and examine the relationships between different variables.

Method: Data were collected on a sample of 60 children aged 12 Godunov. Data on diet and oral hygiene were obtained using the appropriate questionnaire. After clinical examination, samples of saliva. Caries risk of each individual was then estimated using Cariogram® software-a.

Results: It was found that 48% of children are high, 33% intermediate and 19% low risk for caries. Number of Streptococcus mutans, plaque index, fluoride application and the buffer capacity of saliva showed a significant correlation with EPC-tested with children ($p < 0.001$). Number of Streptococcus mutans in saliva, and then KEP buffer capacity of saliva were correlated with the amount of risk ($p < 0.001$).

Conclusion: The correlations between the examined variables that make Cariogram show that this model provides the ability to quickly and easily assess the risk of cavities in children.

Keywords: caries, risk factors, Cariogram.

RAZLIKA IZMEĐU RETRUDOVNOG KONTAKTNOG POLOŽAJA I INTERKUSPALNOG POLOŽAJA KOD ISPITANIKA BEZ I SA ZNACIMA KRANIOMANDIBULARNIH DISFUNKCIJA

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Uvod: Okluzalni činioci imaju važnu ulogu u etiologiji kranioandibularnih disfunkcija. Analiza pozicije kondila (kinematskog centra rotacije) pri referentnim kontaktnim položajima donje vilice pruža značajne informacije neophodne za pravilnu dijagnostiku i praćenje terapije pacijenata sa kranioandibularnim disfunkcijama.

Cilj: Cilj ovog rada je utvrđivanje razlike u poziciji kondila u interkuspalom položaju i retrudovanom kontaktnom položaju donje vilice kod ispitanika sa znacima i simptomima kranioandibularnih disfunkcija i ispitanika bez znakova i simptoma.

Materijal i metode: Ispitanici starosti od 18 do 26 godina, koji su dobrovoljno pristali na učešće u istraživanju, bili su podeljeni u dve grupe. Studijsku grupu je činilo 30 osoba sa znacima (simptomima) kranioandibularnih disfunkcija, a kontrolna grupa se sastojala od 10 osoba bez znakova (simptoma) disfunkcija. Prisustvo simptoma i znakova kranioandibularnih disfunkcija kod pacijenata je potvrđeno indeksima po Helkimu. Pozicije kinematskih centara rotacije u RKP i IKP, kao i put kinematskih centara iz RKP u IKP utvrđeni su pomoću kompjuterskog pantografa "Arcus Digma".

Rezultati: Analizom su utvrđene statistički značajne razlike između kontrolne i eksperimentlane grupe kako u dužini pomeranja iz RKP u IKP, tako i po broju ispitanika sa visokim vrednostima pomeranja.

Zaključci: Pantografsko merenje pozicija kinematskih centara rotacije u RKP i IKP može se koristiti kao značajna smernica u dijagnozi kranioandibularnih disfunkcija i praćenju rezultata terapije kod ovih pacijenata.

Ključne reči: kranioandibularne disfunkcije, kompjuterski pantograf, RKP, IKP.

THE DIFFERENCE BETWEEN RETRUEDED CONTACT POSITION AND INTERCUSPAL POSITION IN PATIENTS WITHOUT AND WITH SIGNS OF CRANIOMANDIBULAR DYSFUNCTION

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Introduction: Occlusal factors play important role in the etiology of craniomandibular dysfunction. Analysis of condylar position (position of kinematic center of rotation) in a reference contact positions of the lower jaw provides important information necessary for proper diagnosis and therapy monitoring of patients with craniomandibular disorders.

Materials and Methods: Respondents aged 18 to 26 years, who voluntarily agreed to participate in research were divided into two groups. The study group consisted of 30 persons with signs (symptoms) of CMD, and the control group consisted of 30 individuals without signs (symptoms) of CMD. The symptoms and signs of CMD in patients were determined according to Helkimo's indexes. The registration of the positions of kinematic center of rotation in the RCP and ICP, as well as the movement of kinematic center from RCP to ICP was performed by using the computer pantograph Arcus Digma.

Results: The analysis of this study revealed significant differences in the values of the condylar shift from RCP to ICP, as well in the number of respondents with high values of the condylar shift from RCP to ICP between the control and the experimental group.

Conclusion: The pantographic tracings of the condylar positions in RCP and ICP can be used as valuable guides in diagnosis of the craniomandibular dysfunction and evaluation of appropriate therapeutic procedures in these patients.

Keywords: craniomandibular dysfunction, computer pantograph, RCP, ICP.

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Uvod: Tumore pljuvačnih žlezda sačinjava grupa heterogenih lezija sa kompleksnim kliničkopatološkim karakteristikama. Ovi tumori sačinjavaju 3 do 10% svih neoplazija glave i vrata.

Cilj: Osnovni cilj ove studije bio je prikazati učestalost pojedinih vrsta tumora pljuvačnih žlezda, njihovu lokalizaciju, kao i demografske karakteristike 142 slučaja sa tumorima pljuvačnih žlezda u Niškom regionu u periodu od 5 godina i uporediti ih sa ostalim epidemiološkim studijama.

Materijal i metode: Retrospektivnom studijom su obuhvaćena 142 pacijenta sa patohistološki potvrđenim tumorima pljuvačnih žlezda na Klinici za Maksilofacijalnu hirurgiju u Nišu u petogodišnjem periodu (od 1.1.2006. do 31.12.2010). Prikupljeni podaci sadržali su pol, starost, histološki tip i vrstu tumora. Dobijeni rezultati statistički su analizirani.

Rezultati: Benigni tumori čine 81,2% slučajeva. Osobe ženskog pola bile su češće pogođene (57%), a odnos M:Ž bio je 1:1,3. Osobe muškog pola su bile signifikantno češće zashaćene malignim tumorima (61,9%, $P < 0,05$). Starosno razdoblje pacijenata bilo je od 13 do 86 godina (prosečna starost 52,8 god.). Parotidna pljuvačna žlezda bila je naj zastupljenija u 78,9% slučajeva. Od svih benignih tumora pljuvačnih žlezda naj češće se javljao Pleomorfni adenom (43,7%), a žene su signifikantno bile češće zastupljene ovim tumorom (69,3%, $P < 0,05$). Posle Pleomorfno adenoma najčešće su se javljao Vartinov tumor, a od malignih Adenoidni cistični karcinom (4,9%).

Zaključak: Predominacija žena, Pleomorfno adenoma kao histološkog tipa, i Parotidne pljuvačne žlezde kao lokalizacije bilo je u skladu sa dosadašnjim studijama.

Ključne reči: Pljuvačne žlezde, benigni tumori, maligni tumori, epidemiologija.

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Uvod: Deca sa teškom formom karijesa ranog detinjstva (KRD) mogu da imaju psihološke posledice koje se različito manifestuju. Kod uznapredovalog karijesa, zbog otežane ishrane i bola, kao i čestih komplikacija, destruirani zubi su uzrok patnje deteta, a poseta stomatologu traumatično iskustvo. Biohemijski odgovor na stres počinje aktiviranjem osovine hipotalamus-hipofiza-kora nadbubrežne žlezde. Taj sistem prvi aktivira otpuštanje steroidnih hormona, uključujući kortizol, primarni hormon stresa.

Cilj: je bio da se proceni nivo kortizola u pljuvački dece sa težom formom KRD ($kep > 6$) i uporedi sa nivoom kortizola u pljuvački dece sa zdravim zubima.

Metod: Ukupno 60 dece prosečne starosti $3.5 \pm 1,23$ godina je uključeno u istraživanje. Formirane su dve grupe: Grupa I ($n=30$), je formirana od dece sa KRD, i Grupa II ($n=30$), od dece sa zdravim zubima. Uzorci nestimulisane pljuvačke uzeti su pre i posle stomatološkog pregleda. Nivo kortizola pljuvačke je utvrđen pomoću enzima-linked immunosorbent testa (ELISA).

Rezultati: Srednja vrednost nivoa kortizola u pljuvački na početku ispitivanja iznosila je $3,75 \pm 1,53 \mu\text{g/L}$ u grupi dece sa KRD i $2,82 \pm 1,24 \mu\text{g/L}$ u grupi dece sa zdravim zubima, a nakon stomatološkog pregleda $2,48 \pm 0,86 \mu\text{g/L}$ u grupi dece sa KRD i $1,92 \pm 0,78 \mu\text{g/L}$ u grupi dece sa zdravim zubima.

Zaključak: Deca sa KRD su imala viši nivo kortizola u pljuvački u odnosu na decu sa zdravim zubima. Dalja istraživanja su potrebna da se razjasni da li je nivo kortizola u dece sa KRD povezan sa stresom ili sa nekim od etioloških faktora KRD.

Ključne reči: Karijesa ranog detinjstva, pljuvačka, kortizol.

SALIVARY GLAND TUMORS IN NISH REGION: A RETROSPECTIVE STUDY OF 142 CASES

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Introduction : Salivary gland tumors consist of a group of heterogeneous lesions with complex clinicopathological characteristics. These tumors are uncommon, comprising 3% to 10% of head and neck neoplasia.

The Aim: The main aim of this study was to describe the histologic type, tumor location, and demographic characteristics of 142 cases in a population from Nish region over a 5-year period and compare these with other epidemiological studies.

Materials and Methods: The medical records and case notes of all patients with histologically confirmed salivary gland tumors at the Clinic of Maxillofacial Surgery in Nish, were reviewed retrospectively from January 2006 to December 2010. The collection of data included gender, age, location, and histopathology of the tumor. The records were statistically analysed.

Results: The frequency of benign tumors was 81,2%. Women were the most affected (57%) and the male:female ratio was 1:1,3. Malignant tumors were significantly more frequent in male (61,9%, $P < 0,05$). Parotid gland tumors were the most frequent (78,9% of cases) and patient age ranged from 13 to 86 years-old (median of 52,8 years old). The most frequent tumors were pleomorphic adenomas (43,7%) followed by Warthin's tumor, and pleomorphic adenomas were significantly more frequent in women (69,3%, $P < 0,05$). Among malignant tumors, Adenoid cystic carcinoma was the most frequent (4,9%).

Conclusion: Women and the parotid gland were the most affected and pleomorphic adenoma was the most frequent lesion. This agrees with other studies.

Keywords: Salivary gland, Benign tumor, Malignant tumor, Epidemiology.

ANALYSIS OF CORTISOL LEVELS IN SALIVA OF CHILDREN WITH EARLY CHILDHOOD CARIES AND CHILDREN WITH HEALTHY TEETH

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Introduction: Children with severe early childhood caries (ECC) can have psychological consequences that are manifested differently. In advanced decay, due to difficulty in feeding and pain, and frequent komplikacija, destructed teeth are the cause of the suffering child, a visit to the dentist a traumatic experience. The biochemical response to stress begins activating shaft hypothalamic-pituitary-adrenal cortex. The system first activates the release of steroid hormones, including cortisol, the primary stress hormone.

Aim: of this study was to assess the level of cortisol in the saliva of children with severe form of KRD ($kep > 6$) and compared with the level of cortisol in saliva of children with healthy teeth.

Material: A total of 60 children mean age 3.5 ± 1.23 years was included in the study. Formed two groups: Group I ($n = 30$), was formed by children with ECC, and Group II ($n = 30$) than children with healthy teeth. Unstimulated saliva samples were taken before and after the dental examination. The level of salivary cortisol was determined using enzyme-linked immunosorbent assay (ELISA).

Results: The mean levels of cortisol in saliva at baseline was $3.75 \pm 1.53 \text{ mg/L}$ in the group of children with ECC and $2.82 \pm 1.24 \text{ mg/L}$ group of children with healthy teeth, a dental examination after $2.48 \pm 0.86 \text{ mg/L}$ in the group of children with ECC and $1.92 \pm 0.78 \text{ mg/L}$ in the group of children with healthy teeth.

Conclusion: Children with ECC had higher cortisol levels in saliva than children with healthy teeth. Further studies are needed to clarify whether the cortisol levels in children with ECC associated with stress or with some of the etiological factors of KRD.

Keywords: early childhood caries, saliva, cortisol

UTICAJ TORZIJONE KONTROLE NA POJAVU SEPARACIJE ENDODONTSKIH NITI INSTRUMENTATA PUNE ROTACIJE U KLINIČKI SIMULIRANIM USLOVIMA – PILOT STUDIJA

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Uvod: Pojava separacije niki-titanijumskih instrumenata je značajan klinički problem, jer do loma niki-titanijumskih instrumenata dolazi bez predhodne deformacije. Na osnovu mnogih studija, torzioni zamor je osnovni uzrok pojave defekata i lomova endodontskih NiTi instrumenata pune rotacije.

Cilj ove pilot studije je ispitivanje uticaja torzije kontrole na pojavu separacije endodontskih NiTi instrumenata pune rotacije u klinički simuliranim uslovima.

Materijal i metode: Ispitivanje je izvršeno na uzorku od dvadeset humanih zuba u laboratorijskim uslovima. Postupak eksperimentalnog rada podrazumevao je merenje zakrivljenosti kanala korena na digitalnim rendgenografijama svakog pojedinačnog korena zuba koji su činili uzorak, obradu kanala korenova zuba endodontskim NiTi instrumentima pune rotacije. Nakon izračunavanja prosečnih zakrivljenosti svakog od 20 zuba (60 kanala), napravljeno je 10 parova od po dva zuba sa najslabijim prosečnim zakrivljenostima. Na taj način su formirane 2 grupe zuba.

Rezultati: Wilkoxonovim testom parova (Wilcoxon matched pair test) je potvrđeno da ne postoji statistički značajna razlika u prosečnom broju upotreba instrumenata sa i bez torzije kontrole ($p > 0.05$).

Zaključak: Primerenom obukom studenata i stomatologa bez iskustva za rad sa mašinski pokretanim Ni-Ti instrumentima pune rotacije na modelima i ekstrahovanim zubima, maksimalnim pridržavanjem protokola rada, upotrebom endo-motora sa podesivom torzionom kontrolom i pažljivom evidencijom korišćenja svakog upotrebljenog instrumenta mogu se očekivati predvidljivi rezultati endodontske terapije lekara sa skromnim kliničkim iskustvom.

Ključne reči: Nikl-titanijumski instrumenti pune rotacije, torzija, separacija

THE INFLUENCE OF TORQUE ON THE SEPARATION OF ENDODONTIC NITI ROTARY INSTRUMENTS IN SIMULATED CLINICAL CONDITIONS- A PILOT STUDY

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Introduction: Appearance of separation of nickel-titanium rotary instruments is significant clinical problem, because the breakage of these instruments is not followed with previous deformation. Based on many studies, torque fatigue is primary cause of occurrence of defects and breakage of endodontic NiTi rotary instruments.

The aim of this pilot study is to examine influence of torque on separation of endodontic NiTi rotary instruments in simulated clinical conditions.

Materials and methods: Research is conducted on sample of 20 human teeth in laboratory conditions. Experimental procedure consists of measurement of canal curvatures of each canal on digital roentgenographs and root canal treatment using endodontic NiTi rotary instruments. After the calculation of average curvature for every single tooth of 20 sample teeth (60 canals), there have been made 10 pairs which consist of two teeth with most common curvature. So there were formed two groups of teeth.

Results: Wilcoxon matched pair test confirmed that there is no statistically significant difference in average number of usage of instruments with or without torque control ($p > 0.05$).

Conclusion: Appropriate training of students or dentists without clinical experience, for working with NiTi rotary instruments on models or extracted teeth, with maximum compliance protocol, usage of endo-motor with adjustable torque and careful record of use of each instrument, can be expected predictable results of endodontic therapy as dentist with short clinical experience.

Key words: Nickel-titanium rotary instruments, torque, separation

VREDNOSTI KEP INDEKSA I MEKIH NASLAGA KOD DECE OMETENE U RAZVOJU I MERE PREVENCIJE

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Uvod: Stomatološka zaštita dece sa posebnim potrebama, zbog specifičnog pristupa i ograničenih mogućnosti rada, je izuzetno teška s obzirom na smanjeno ili potpuno odbijanje saradnje od strane pacijenta, smanjene mišićne koordinacije pokreta, odnosno nemogućnosti razumevanja i praćenja upustava i saveta o merama prevencije.

Cilj: Cilj rada je bio da se utvrde vrednosti KEP indeksa i stanje mekih naslaga kod dece sa posebnim potrebama i predlože mere za preventivnu i terapijsku zaštitu zuba.

Materijal i metode: Eksperimentom je obuhvaćeno 83 štićenika, uzrasta 3 do 18 godina oba pola (49 muškog i 34 ženskog pola), doma za decu sa posebnim potrebama u Veterniku.

Rezultati: U mlečnoj denticiji vrednost opšteg karijesa frekvencije (kio) 84%, relativne karijes frekvencije (kiz) 44,7, a karijes indeks proseka (kip) 9. Kod dece sa stalnom denticijom može se zapaziti da su svi pregledani pacijenti imali neki od elemenata KEP indeksa, i opšta karijes frekvencija (Klo) iznosi 100%, relativna karijes frekvencija (Klz) iznosi 51,2, a karijes indeks proseka (Klp) 16.

Zaključak: Dobijeni rezultat i upućuju na neophodnost posebne i ciljane stomatološke zaštite dece sa posebnim potrebama.

Ključne reči: deca sa posebnim potrebama, KEP indeks, oralno zdravlje

VALUES OF DMFT INDEX AND SOFT PLAQUE IN CHILDREN WITH DISABILITIES AND PREVENTION MEASURES

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Introduction: Dental care of children with special needs, the specific approach and limited work opportunities is extremely difficult due to the reduced or completely non-cooperation by the patient, decreased muscle movement coordination, and inability to understand and follow instruction and advice on preventive measures.

The Aim: the aim of this study was to determine the values of the DMFT index and the state of soft plaque in children with special needs and propose measures for preventive and therapeutic dental care.

Materials and Methods: The experiment included 83 residents, ages 3 to 18 years of both sexes (49 males and 34 females), home for children with special needs in Veternik.

Results: The overall value of the milk dentition caries frequency (cid) 84%, the relative decay rate (pcc) 44,7 and decay index average is 9. In children with permanent dentition, it is evident that all patients have reviewed some of the elements of DMFT, general caries frequency (CID) is 100%, the relative frequency of caries (PCC) is 51,2 and the average decay index is 16.

Conclusion: These results indicate the necessity for special and targeted dental care for children with special needs.

Keywords: children with special needs, DMFT index, oral health

ISPITIVANJE UTICAJA RAZLIČITIH PROTOKOLA KONDICIONIRANJA NA GLATKIM POVRŠINAMA GLEDI, ZIDOVIMA JAMICA I FISURA

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Uvod: Zalivanje jamica i fisura predstavlja neinvazivnu, bezbolnu, metodološki jednostavnu i bezbednu profilaktičku meru u kojoj se adhezivna veza sa različitim materijalima ostvaruje sa intaktnom gleđi samo kondicioniranjem.

Cilj: Proceniti uticaj različitih sredstava za kondicioniranje gleđi- 10% poliakrilna kiselina, 20% poliakrilna kiselina, 37% ortofosforna kiselina i samonagrizajući adheziv, na glatkim površinama i u fisurnama i jamicama primenom skening elektronske mikroskopije (SEM).

Materijal i metode: U eksperimentalnoj studiji je korišćeno 10 sveže ekstrahovanih intaktnih premolara i molara. Eksperimentalne grupe su bile sledeće: I grupa je kondicionirana 10% poliakrilnom kiselinom, II grupa 20% poliakrilnom kiselinom, III grupa 37% ortofosfornom kiselinom, IV grupa je tretirana samonagrizajućim prajmerima dok V grupa nije bila tretirana.

Rezultati: Sve 4 vrste kondicionera dovode do mikromorfoloških promena na gleđi koje smo ocenjivali prema Silverstonu pomoću skening elektronske mikroskopije. I razlika između glatkih površina i jamica i fisura je statistički značajna kod svih vrsta kondicionera.

Zaključak: Najbolji efekat pokazuje 37% ortofosforna kiselina. Sličan efekat pokazuje samonagrizajući adheziv, dok 20% poliakrilna kiselina ne pokazuje toliku uspešnost, a 10% poliakrilna kiselina ima najslabije dejstvo. Svi kondicioneri pokazuju najbolju efikasnost na glatkim površinama gleđi, dok su najmanje efikasni kada je u pitanju dno fisure.

Glavne reči: zalivanje jamica i fisura, kondicioniranje gleđi, struktura gleđi.

EVALUATING THE DIFFERENT CONDITIONING PROTOCOLS ON SMOOTH ENAMEL SURFACES AND FISSURE WALLS ENAMEL

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Introduction: Pits and fissures sealing is noninvasive, painless, simple and safe prophylactic procedure. Sealing materials bond to the intact enamel after the conditioning exclusively.

The Aim: To assess the effect of different enamel conditioners: 10% polyacrylic acid, 20% polyacrylic acid, 37% phosphoric acid and self-etching primer; on smooth enamel surfaces, as well as on the fissure walls using scanning electron microscopy (SEM).

Materials and Methods: Ten extracted premolars and molar were used in these study. Teeth were divided into five experimental groups as follows. Group I: conditioned with 10% polyacrylic acid, group II: 20% polyacrylic acid, group III: 37% phosphoric acid, group IV: self-etch primer, group V: no conditioner, control group.

Results: All evaluated conditioners demonstrate their effects, causing the micromorphological changes at the enamel surfaces. The type of conditioning was evaluated using the Silverstone's criteria. All conditioners exerted stronger conditioning effect on smooth enamel surfaces when compared to the fissure walls and the bottoms of the fissure. And that difference was statistically significant ($p < 0,05$).

Conclusion: The best conditioning effect was achieved by using phosphoric acid. All evaluated conditioners exerted stronger conditioning effect on smooth enamel surfaces, compared to enamel of fissure walls and the bottom of the fissure.

Key words: Pits and fissures sealing, enamel conditioning, enamel morphology.

ANALIZA MODELA BEZUBIH VILICA SA PROTETSKOG ASPEKTA

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Uvod: Nakon gubitka svih zuba nastaje stanje bezubosti. Resorpcija i drugi procesi dovode do različitih promena na nivou rezidualnih alveolarnih grebenova bezubih vilica. Analiza bezube vilice sa protetskog aspekta podrazumeva posmatranje i uocavanje prisutnih morfoloških promena na alveolarnim grebenima i okolnim strukturama.

Cilj rada: Cilj ovog rada je bio da se analiziranjem zastupljenosti određenih morfoloških detalja na bezubim vilicama u domaćoj populaciji odredi sto efikasnija terapija i nacin lecenja kod ovih pacijenata.

Materijal i metode: U laboratorijskom ispitivanju bilo je ukljuceno 128 modela bezubih vilica. Modeli su dobijeni metodom izlivanja anatomskih ili funkcionalnih otisaka bezubih vilica, realizovanih na Klinici za stomatolosku protetiku Stomatoloskog fakulteta, Univerziteta u Beogradu u periodu od oktobra-novembra 2011 godine. Na modelima gornje bezube vilice analizirani su: oblik, veličina i širina RAG (retroalveolarni greben), stepen atrofije, izraženost tubera processusa alveolaris maxillae, izraženost torussa palatinusa, oblik svoda koštanog nepca, izraženost rugae palatinae, prisustvo egzostoza, izraženost papilae incisivae. Na modelima donje bezube vilice analizirani su: oblik, veličina i širina RAG, stepen atrofije, izraženost torusa mandibularis, izraženost i oblik crista-milohioideus, prisustvo egzostoza.

Rezultati: Dobijeni rezultati ukazuju na značajne morfološke varijacije bezubih vilica u domaćoj populaciji i predstavljaju doprinos standardizaciji terapijskog postupka bezubih pacijenata.

Zaključak: Razlicite morfološke varijacije koje su uocene kod bezubih pacijenata uslovljavaju razlicit izbor terapijskog postupka sa protetskog aspekta.

Glavne reci: bezube vilice, morfološke varijacije, analiziranje, standardizacija terapijskog postupka.

ANALYSIS MODEL EDENTULOUS JAWS WITH A PROSTHETIC ASPECT

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Introduction: After the loss of all teeth, an edentulous condition. Absorption and other processes lead to different changes in the level of residual alveolar ridges of edentulous jaws.

The Aim: The aim of this study was to analyzing the distribution of certain morphological details of edentulous jaws in the local population as determined by effective treatment and course of treatment in these patients.

Materials and Methods: In the laboratory study were included 128 edentulous jaw models. Models were obtained by casting method of anatomical or functional impressions of edentulous jaws, developed at the Department of Prosthodontics School of Dentistry, University of Belgrade in the period of October-November 2011. On the upper edentulous jaw models were analyzed: shape, size and width of RAG (retroalveolar ridge), the degree of atrophy, expression of uber processus alveolaris maxillae, expression torussa Palatinus, arched palate bone, palatinae mocking expression, the presence of exostosis, prominence of incisive papilla.

Results: The results shows significant morphological variation toothless jaw sin the local population and represent a contribution to the standardization of therapeutic treatment of edentulous patients.

Conclusion: Different morphological variations were observed in edentulous patients cause different selection of the therapeutic procedure with prosthetic aspects.

Keywords: toothless jaw, morphological variation, analysis, standardization of the therapeutic process.

NAJBOLJA ČETKICA ZA ZUBE

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Uvod: Četkica je najvažnije sredstvo u održavanju oralne higijene. Obični građani, pa i sami stomatolozi, često biraju model četkice u odnosu na oblik, boju, ime proizvođača, cenu, ranije iskustvo i sl. Vrlo je mali procenat onih koji razmišljaju o njihovoj efikasnosti, što je najbitnije.

Cilj: Cilj ovog rada je da se uporede različiti modeli četkica za zube u odnosu na njihovu efikasnost uklanjanja plaka i ustanovi koliki uticaj ima model četkice na efikasnost četkanja zuba.

Materijal i metode: U ispitivanje je uključeno 16 modela četkica za zube svih poznatijih proizvođača među kojima su Aquafresh, Colgate, Curaprox, Oral B, Parodontax, Reach, Sensodyne i Silver Care. Četkice su testirane na 80 ispitanika. Određivanje efikasnosti četkica vršeno je pomoću Quigley Hein Plak Indeksa (Modifikacija po Turesky-om).
Rezultati: Dobijeni rezultati su pokazali da je efikasnost četkice Aquafresh Clean&Flex 86,22%, Aquafresh Interdental 92,60%, Aquafresh Tooth&Tongue 82,43%, Colgate 360° DeepClean 88,31%, Curaprox CS5460 85,65%, Oral B Expert 91,25%, Parodontax 85,81%, Reach Access 81,73%, Reach DualEffect 83,82%, Reach StayWhite 85,88%, Reach Interdental 95,71%, Sensodyne Medium 87,04%, Sensodyne Sensitive 89,94%, Silver Care Plus 86,11%, Silver Care System 83,88%.

Zaključci: Iako postoje bolje i lošije četkice, efikasnost uklanjanja plaka četkicom za zube prvenstveno zavisi od tehnike četkanja, dužine četkanja i motivacije ispitanika. Sama četkica je tek na četvrtom mestu. Nijednom četkicom nismo u stanju da uklonimo plak sa svih površina zuba, zato je neophodna upotreba interdentalnog konca radi uklanjanja plaka koji se nalazi na aproksimalnim površinama zuba.

Ključne reči: četkica za zube, plak indeks

THE BEST TOOTHBRUSH

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Introduction: The toothbrush is the most important device for maintaining oral hygiene. People often choose the model of a toothbrush according to its shape, color, name of manufacturer, price, past experience. There is a very small percentage of those who are really familiar with the most important thing - their performance.

The Aim: The aim of this study is to compare the different models of toothbrushes in relation to their efficiency in removing plaque and to see what effect does the model of toothbrush have on the effectiveness of toothbrushing.

Materials and Methods: The study included 16 models of toothbrushes of well-known manufacturers. Toothbrushes were tested on 80 candidates. Determination of efficiency was performed by using a Quigley Hein Plaque Index (Modified by Turesky).

Results: The results showed that the efficiency of toothbrush Aquafresh Clean&Flex was 86,22%, Aquafresh Interdental 92,60%, Aquafresh Tooth&Tongue 82,43%, Colgate 360° DeepClean 88,31%, Curaprox CS5460 85,65%, Oral B Expert 91,25%, Parodontax 85,81%, Reach Access 81,73%, Reach DualEffect 83,82%, Reach StayWhite 85,88%, Reach Interdental 95,71%, Sensodyne Medium 87,04%, Sensodyne Sensitive 89,94%, Silver Care Plus 86,11%, Silver Care System 83,88%.

Conclusion: Although there are better and worse toothbrushes, efficiency in removing plaque with a toothbrush depends primarily on the brushing technique, brushing duration and motivation. None of the toothbrushes are able to remove plaque from all tooth surfaces, so it is necessary to use dental floss to remove the interdental plaque located on the proximal surfaces of teeth.

Keywords: toothbrush, plaque index

UTICAJ FUNKCIONALNOSTI OKLUZIJE NA NUTRITIVNI STATUS PACIJENATA STARIJE DOBI

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Uvod: Nutricija je snabdevanje ćelija i organa neophodnim materijama, dobijenih iz hrane, koje su potrebne za normalno funkcionisanje organizma. Nutritivni status starih osoba predstavlja poseban problem, što je posledica poremećaja funkcije žvakanja, gutanja i vodenog balansa.

Cilj: Ispitivanje uticaja funkcionalnosti okluzije na nutritivni status pacijenata starije dobi.

Materijal i metode: U istraživanju je učestvovalo 41 pacijent, starosti preko 65 godina, bez demencije ili blago kongitivnog oštećenja kojima oralni status nije značajno menjan poslednjih 5 godina. U cilju ispitivanja funkcionalnosti okluzije, ispitivan je broj okludirajućih parova zuba i prisustva zubnih nadoknada. U sklopu ispitivanja nutritivnog statusa meren je indeks telesne mase (BMI), mogućnost samostalne ishrane, mogućnost konzumiranja čvrste hrane kao i podaci o učestalosti unosa pojedinih vrsta namirnica.

Rezultati: Broj okludirajućih parova zuba je u najvećem broju slučajeva bio nedovoljan za normalno žvakanje, ali to nije uticalo na kvantitativni unos hrane, jer je BMI bio idealan kod većine ispitanika. Većina ispitanika može samostalno da se hrani, ali da je ta hrana u najvećem procentu usitnjena, kao i da ispitanici konzumiraju sve vrste namirnica više od četiri puta nedeljno.

Zaključak: Smanjenjem broja kontakata, smanjuje se mogućnost konzumiranja čvrste hrane, ali adekvatno izradjenom zubnom nadoknadom, funkcija okluzije se može nadoknaditi što nam potvrđuje kvalitativni i kvantitativni unos hrane kod ispitanika u ovom istraživanju.

Ključne reči: nutricija, okluzija.

THE INFLUENCE OF FUNCTIONAL OCCLUSION ON THE NUTRITIONAL STATUS IN OLDER POPULATION

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Introduction: Nutrition is the provision, to cells and organisms, of the materials necessary (in the form of food) to support life. Nutritional status in older population is usual problem, which is consequence of swallowing and chewing malfunction, and water balance.

The Aim: Investigation of functional occlusion on the nutritional status in older population.

Materials and Methods: The study included 41 patient, round 65, without dementia or cognitive damage, that oral status wasn't significantly altered in last 5 years. In order to test the functionality of occlusion, examined the number of pairs of teeth and the presence of dental restorations. Within the study of nutritional status was measured by BMI, the possibility of independent feeding, the possibility of eating solid food as well as data on the frequency of intake of certain types of foods.

Results: Number of occlusion pairs of teeth in most cases is insufficient for normal chewing, but it didn't affect the quantitative food intake, BMI, because it was ideal for most patients.

Conclusion: By reducing the number of contacts, reducing the possibility of eating solid food, but the design adequately dental restorations, occlusal function may be compensated as we confirm the qualitative and quantitative food intake of subjects in this study.

Key words: nutrition, occlusion.

VELIČINA I POLOŽAJ FRONTALNIH ZUBA KOD OSOBA SA MALOKLUZIJOM II KLASJE 2. ODELENJA

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Uvod: Malokluzija II klase 2. odeljenja predstavlja dento-alveolo-gnato-facijalnu nepravilnost.

Cilj rada: Bio je da se utvrdi razlika meziodistalnog promera gornjih i donjih sekutića kod osoba sa malokluzijom II₂ i osoba sa normalnom okluzijom i da se utvrde varijacije položaja gornjih sekutića kod malokluzije II²

Materijal i metode: Ispitivanjem je obuhvaćeno 110 ortodontskih pacijenata Klinike za Stomatologiju u Nišu. Od toga je bilo 60 (30 muških, 30 ženskih) osoba sa normalnom okluzijom i 50 (20 muških, 30 ženskih) osoba sa malokluzijom II₂. Uzeti su precizni otisci i urađeni studijski modeli, na kojima je meren meziodistalni promer gornjih i donjih sekutića, digitalnim nonijusom (Mitutoyo, Japan) sa tačnošću od 0.01mm. Određene su i varijacije položaja gornjih sekutića kod malokluzije II₂.

Rezultati: Ne postoji značajna polna razlika meziodistalnog promera gornjih i donjih sekutića kod osoba sa normalnom okluzijom. Kod osoba sa malokluzijom II₂ postoji značajna polna razlika meziodistalnog promera gornjih centralnih, donjih centralnih i lateralnih sekutića u korist osoba muškog pola, sa malokluzijom II₂.

Poređenje ispitivanih grupa je urađeno po polu zbog postojanja polnih razlika u meziodistalnom promeru zuba. Meziodistalni promer gornjih i donjih inciziva kod osoba sa malokluzijom II₂ je značajno manji od meziodistalnog promera ispitivanih zuba osoba sa normalnom okluzijom samo kod ženskog pola. Kod osoba muškog pola meziodistalni promer gornjih i donjih sekutića je manji kod malokluzije II₂ klase, ali bez statističke značajnosti. Varijacije položaja gornjih sekutića: retruzija centralnih sekutića (70%), retruzija centralnih i levog lateralnog (16%), retruzija centralnih i oba lateralna sekutića (8%), retruzija centralnih i desnog lateralnog sekutića (6%)

Zaključak: Poznavanje dentoalveolarnih karakteristika kod osoba sa malokluzijom II₂ je od kliničkog značaja.

Ključne reči: malokluzija II₂, frontalni zubi

THE SIZE AND THE POSITION OF FRONTAL TEETH IN PATIENTS WITH CLASS II DIVISION 2 MALOCCLUSION

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Introduction: Class II division 2 malocclusion represents dento-alveolar-gnato-facial irregularity.

The Aim: Aim of research was to determine the differences in mesiodistal diameter in upper and lower incisors between patients with class II₂ and patients with normal occlusion. And to determine variations in position of upper incisors in patients with class II₂.

Materials and methods: This research included 110 orthodontics patients of Dental Clinic in Niš. There were 60 (30 male, 30 female) patients with normal occlusion and 50 (20 male, 30 female) patients with class II₂. Mesiodistal diameter of central and lateral upper and lower incisors was measured with digital nonius (Mitutoyo, Japan) accuracy of 0.01mm. The variations in position of upper incisors at class II₂ are also determined.

Results: There is no significant gender differences in mesiodistal diameter of upper and lower incisors in persons with normal occlusion. In persons with class II₂ there is a significant gender difference in favor of males. Mesiodistal diameter of upper and lower incisors in persons with class II₂ is significantly lower than mesiodistal diameter in persons with normal occlusion only in females. In men mesiodistal diameter of upper and lower incisors is lower at the class II₂ but without significant difference. Variations in position of upper incisors: retrusion of central incisors (70%), retrusion of both central and left lateral incisor (16%), retrusion of both central and lateral incisors (8%) retrusion of both central and right lateral incisor (6%).

Conclusion: Knowledge of size of frontal teeth in persons with class II₂ is essential for clinical practice

Key words: class II₂ malocclusion, frontal teeth.

UTICAJ KALCIJUM-FOSFATA NA MIKROTVRDOĆU GLEDI

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Uvod: Demineralizacijom gleđi od strane bakterijskih produkata nastaje poremećaj u strukturi kristala hidroksiapatita. Aktivnim otpuštanjem jona kalcijuma, fosfata i fluora nastaje reparatura oštećenih i izgradnja novih kristala gleđi.

Cilj: Cilj rada je bio da se ispita uticaj materijala na bazi kalcijum-fosfata na mikrotvrdoću gleđi.

Materijal i metode: Iz 5 intaktnih ekstrahovanih molara napravljeno je 20 uzoraka gleđi. Nakon formiranja artificijelne karijesne lezije gleđi, uzorci su raspoređeni u 4 grupe: kazeinski fosfopetid-amorfni kalcijum fosfat, kazeinski fosfopetid-amorfni kalcijum fosfat sa dodatkom 900 ppm fluora, kalcijum-natrijum-fosfosilikat i kontrolna demineralizovana gleđ. Uzorci su u toku 5 dana naizmenično izlagani dejstvu demineralizacionog i remineralizacionog rastvora, a ispitivani materijali su aplikovani 2 puta dnevno prema uputstvu proizvođača. Mikrotvrdoća gleđi je merena na početku i na kraju eksperimenta Vickers-ovom metodom.

Rezultat: U poređenju sa demineralizovanom gleđi, materijali na bazi kalcijum-fosfata značajno su doprineli povećanju mikrotvrdoće gleđi.

Zaključak: Materijali na bazi kalcijum-fosfata povećavaju mikrotvrdoću gleđi i doprinose remineralizaciji.

Ključne reči: kalcijum fosfati, početna karijesna lezija gleđi, mikrotvrdoća.

INFLUENCE OF CALCIUM PHOSPHATES ON MICROHARDNESS OF THE TOOTH ENAMEL

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Introduction: Demineralisation of enamel as a bacterial product, brings to the malformation of hydroxyapatite crystal bar. The active releasing of calcium, phosphore and fluoride ions evolves in creation of new crystal bar in the form of fluorapatite, bringing remineralisation and increasing microhardness of the enamel.

The aim: The purpose of the study was to evaluate surface microhardness of demineralised enamel after treatment with casein phosphopeptide-amorphous calcium phosphate, casein phosphopeptide-amorphous calcium fluoride phosphate and calcium sodium phosphosilicate.

Materials and methods: Twenty enamel slabs obtained from sound extracted third molars were used. Following formation of the artificial carious lesion, four experimental groups were formed (CPP-ACP, CPP-ACFP, CSP, and control demineralised enamel), and enamel samples were submitted to a chemical caries model. For the surface microhardness test, three indentations were made in each specimen using a Vickers microindenter under a load of 100 g during 15 seconds.

Results: When compared with demineralised enamel, surface microhardness test revealed significant effects of calcium-phosphates. **Conclusion:** Materials based on calcium phosphate increase microhardness of the tooth enamel and show the potential to remineralise enamel surface lesions.

Key words: Calcium phosphate, microhardness, enamel surface lesion.

MOTIVACIJA STUDENATA I LEKARA ZA RESTAURACIJE ZUBA INDIREKTNIM ISPUNIMA

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Uvod: Indirektni ispuni su jedan od najkvalitetnijih načina restauracije defekata na zubima, koji su u današnje vreme zbog novih tehnologija, novih materijala i nedostatka vremena zapostavljeni.

Cilj: Cilj ovog rada je da se utvrdi motivacija studenata i lekara za izradu indirektnih ispuna.

Materijal i metode: Istraživanje je urađeno na osnovu upitnika posebno kreiranog za ovu vrstu istraživanja.

Upitnik je sadržao kombinaciju otvorenih i zatvorenih pitanja. Upitnikom su obuhvaćeni studenti stomatologije (120) i doktori stomatologije različitog stepena stručne spreme kao i dužine radnog staža (93). Dobijeni rezultati su obrađeni statističkom analizom.

Rezultati: Nakon statističke analize došli smo do sledećih podataka. Studenti nisu bili u prilici da izrade ispune u toku studija i zato 97,5% smatra da nisu obučeni da izrade ove vrste nadoknada. Uprkos tome 63,8% studenata je motivisano da ih uradi. Polovina lekara nije radila indirektnu ispunu (53,8%), ali kao i kod studenata motivacija je prisutna u 78,5%. Lekari koji su radili indirektnu ispunu uglavnom su ih radili u toku osnovnih studija na fakultetu, dok su indirektni ispuni bili obuhvaćeni programom.

Zaključak: Motivacija za izradu indirektnih ispuna zbog visokog kvaliteta koji poseduju je u većoj meri prisutna i kod studenata i kod lekara, ali postoje drugi faktori koji utiču na primenu indirektnih ispuna u svakodnevnoj praksi

Ključne reči: Indirektni ispuni, motivacija, upitnik, studenti, doktori stomatologije

MOTIVATION OF STUDENTS AND DOCTORS TO MAKE INDIRECT RESTAURATIONS

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Introduction: Indirect fillings are one of the best ways of restoration of defects on the teeth, which are today, because of new technologies, new materials and lack of time neglected

The Aim: The aim of this study was to determine the motivation of students and doctors in making indirect restorations

Materials and Methods: The research was done on the basis of a questionnaire specifically designed for this type of research. The questionnaire contained a combination of open and closed questions. The questionnaire included dental students (120) and dentists with different degrees of education and length of service (93). The obtained results were analyzed by statistical analysis

Results: After statistical analysis we came to the following data. Students were not able to make fillings during the studies and because 97.5% considered that they are not trained to develop these types of restorations. Despite 63.8% of students are motivated to do so. Half of the doctors did not done indirect fillings (53.8%), but as like as students motivation is present in 78.5%.

Conclusion: The motivation for the development of indirect fillings is present within the students and the doctors because of the high quality which they possess, but there are other factors that affect the application of indirect restorations in clinical practice

Keywords: Indirect filling (inlay, onlay), motivation, questionnaire, students.

POL, STAROST I INDEKS TJELESNE MASE KAO FAKTORI KOJI UTIČU NA POSTOPERATIVNI TOK NAKON HIRURŠKOG VAĐENJA DONJIH UMNJAKA

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Uvod: Bol, otok i trizmus predstavljaju najčešće komplikacije nakon hirurškog vađenja impaktiranih donjih umnjaka.

Cilj: Utvrditi da li postoji uticaj pola, starosti i indeksa tjelesne mase (BMI) pacijenata na pojavu ovih komplikacija.

Materijal i metod: U studiji je učestvovalo dvadeset pacijenata sa impaktiranim donjim umnjacima, koji su indikovani za hiruršku ekstrakciju, od kojih su preoperativno uzeti podaci o godinama starosti, tjelesnoj masi i visini. Intenzitet bola u postoperativnom periodu određivan je vizuelnoanalognom skalom (VAS), otoka mjerenjem rastojanja između tragusu i vrha brade, a trizmusa mjerenjem maksimalnog interincizalnog rastojanja, prije i nakon intervencije.

Rezultati: Analizom rezultata uočeno je da je postoperativni trizmus izraženiji kod pacijenata ženskog nego muškog pola, dok po ostalim kriterijumima nije bilo razlika između ove dvije grupe. Postoperativni otok bio je nešto izraženiji kod pacijenata starijih od 20 godina. Kod pacijenata sa pretjeranom tjelesnom masom (BMI 25-30) postoperativni bol je bio izraženiji nego u grupi pacijenata sa idealnom tjelesnom masom (BMI 18.5-25).

Zaključci: Dobijeni rezultati ukazuju da osim parametara koji se odnose na položaj i hirurški postupak vađenja impaktiranih umnjaka, pol, starost i indeks tjelesne mase pacijenata mogu imati uticaja na izraženost postoperativnih komplikacija.

Ključne riječi: pol, starost, BMI, otok, trizmus, bol, donji umnjak

GENDER, AGE AND BODY MASS INDEX AS FACTORS AFFECTING POSTOPERATIVE COURSE AFTER SURGICAL REMOVAL OF THIRD MOLARS

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Introduction: Pain, swelling and trismus are the most common complication after surgical extraction of impacted lower third molars.

The aim: To determine whether there is an influence of gender, age and body mass index (BMI) of patients on occurrence of these complications.

Materials and methods: Twenty patients with impacted lower third molars were included in this study. Preoperatively, data on patients age, body weight and height were recorded. The pain in the postoperative period was determined by visual analog scale (VAS). To assess intensity of postoperative swelling measurements of distance between the ear and midline of chin were made, and trismus was determined by measurement of maximal interincisal distance before and after the intervention.

Results: It was observed that postoperative trismus was more pronounced in female compared to male patients, while regarding other complications there were no differences between these two groups. Postoperative swelling was more pronounced in patients older than 20 years. In patients with excessive body mass (BMI 25-30) postoperative pain was more pronounced than in the group of patients with ideal body weight (BMI 18.5-25).

Conclusions: These results suggest that in addition to parameters related to the surgical procedure of removing impacted wisdom teeth, gender, age and body mass index of patients might influence occurrence of post-operative complications.

Keywords: Gender, age, BMI, swelling, trismus, pain, lower third molar

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Uvod: Savremeni trendovi u rekonstruktivnoj stomatologiji predlažu pojednostavljenje procedura i prelazak sa višeslojnih na jednoslojne kompozite.

Cilj rada: Određivanje odnosa jednoslojnih kompozitnih ispuna i čvrstih zubnih struktura.

Materijal i metoda: Pilot studija dva jednoslojna materijala je vršena u in vitro uslovima na šest humanih trećih molara izvađenih iz ortodontskih razloga. Ispreparisan je kavitet Klase II, po kliničkoj proceduri za kompozitni ispun. Po završenoj prepraciji izvršeno je nagrizanje ortofosfornom kiselinom (Eco-Etch[®], Ivoclar Vivadent) i aplikovan adhezivni sistem (OptiBond Solo[™] plus). Kompozitni materijali korišćeni u ovoj studiji: SonicFill[™] bulk fill (Kerr) i TetricEvo Ceram[™] bulk fill (Ivoclar Vivadent). Herculite[®] XRV Ultra[™] (Kerr) je korišćen u kontrolnoj grupi. Uzorci su sečeni u vestibulo-oralnom pravcu dijamantskom testerom (Buehler isomet), a zatim postavljeni u uređaj za naparavanje zlatom (BALTEC SCD005).

Zaključak: Na osnovu rezultata izvedene pilot studije može se zaključiti da kompozitni materijal TetricEvo Ceram[™] bulk fill (Ivoclar Vivadent) pokazuje intiman rubni kontakt sa čvrstim zubnim tkivima. I pored pojave sporadičnih mikropukotina kod kompozitnog materijala SonicFill[™] bulk fill, pomenuti defekti nemaju bitniji uticaj na vezu ovog materijala sa zubnim strukturama. Potrebna su detaljnija ispitivanja jednoslojnih kompozitnih materijala i njihovog odnosa sa čvrstim zubnim tkivima.

KLjučne reči: kompozit, jednoslojni

RELATIONSHIP BETWEEN BULK COMPOSITE MATERIALS AND TOOTH STRUCTURES

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Introduction: Current trends in reconstructive dentistry suggest simplification of procedures and the transition from multilayered to bulk composites.

The Aim: Determining the relationship between bulk composite materials and tooth structures.

Materials and methods: A pilot study of two bulk composite materials was performed in vitro on six human third molars extracted for orthodontic reasons. Upon the completion of Class II preps, orthophosphoric acid (Eco-Etch[®], Ivoclar Vivadent) was applied followed by the application of the adhesive system (OptiBond Solo[™] plus). Composites used: SonicFill[™] bulk fill (Kerr) and TetricEvo Ceram[®] bulk fill (Ivoclar Vivadent). Herculite[®] XRV Ultra[™] (Kerr) was used as a control group.

Results: Tested material TetricEvo Ceram[®] bulk fill (Ivoclar Vivadent) is characterized by intimate contact with the solid dental tissues. The second test material, SonicFill[™] bulk fill (Kerr), is characterized by the existence of microcracks with observed width of 15 μm between dentin and composite.

Conclusion: A conclusion can be made that composite material TetricEvo Ceram[®] bulk fill (Ivoclar Vivadent) shows an intimate contact with the solid tissue of the tooth. Despite the sporadic occurrence of microcracks in the composite material SonicFill[™] bulk fill these defects have little influence on the bond the composite forms with the tooth.

Key words: Composite, Bulk layering

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Uvod: U donjih pretkutnjaka, za razliku od gornjih, na kruni se sa okluzalnog aspekta mogu uočiti dve ili tri kvrčice. Pojava da se na okluzalnom aspektu pojavljuju tri kvrčice naziva se molarizacijom. Molarizacije se češće javlja kod donjeg drugog pretkutnjaka.

Cilj: Cilj ovog istraživanja je bio da se utvrdi učestalost pojave molarizacije u donjih pretkutnjaka kod domaće populacije.

Metod: Istraživanje je sprovedeno na 70 modela, dobijenih otiskivanjem zubnih lukova prirodnih intaktnih zubika. Registrovan je broj kvrčica kod donjeg prvog i drugog pretkutnjaka.

Rezultati: U rezultatima istraživanja je prikazana rasprostranjenost pojave molarizacije kod donjeg prvog i drugog pretkutnjaka.

KLjučne reči: pramolari, molarizacija, donji premolari.

MOLARIZATION OF THE LOWER PREMOLARS

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Introduction: Differences were found while examined occlusal views of upper and lower premolars. This paper presents a case of tooth variation, molarization, concerning occlusal aspect, when three cusps were found on the occlusal view of lower premolars.

The aim: The aim of this study was to investigate the frequency of this guise, regarding domestic population.

Method: Research was done on 70 casts, which were made out of impressions from intact human dental arches. Number of cusps were registered on first lower and second lower premolars.

Results: Results of survey shows prevailing status of molarization of upper and lower premolars.

Key words: premolars, molarization, lower premolars.

DA LI PROFILAKTIČKA PRIMENA ANTIBIOTIKA UTIČE NA UČESTALOST KOMPLIKACIJA NAKON HIRURŠKOG VAĐENJA IMPAKTIRANIH DONJIH UMNJAKA

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Uvod: Postoperativna infekcija jedna je od komplikacija hirurškog vađenja impaktiranih donjih umnjaka. Iako se antibiotici često primenjuju radi sprečavanja nastanka infekcije, nema dovoljno dokaza da je njihova primena efikasna u profilaksi postoperativne infekcije nakon hirurškog vađenja donjih umnjaka.

Cilj: Ova studija je istraživala da li je profilaktička primena antibiotika opravdana u slučaju ekstrakcije donjih impaktiranih umnjaka.

Materijal i metod: Studija je obuhvatila 32 ispitanika, podeljenih u dve grupe. Prvoj grupi (20 ispitanika), antibiotici nisu propisivani a druga grupa (12 ispitanika) je primala antibiotike u profilaktičke svrhe. Od kliničkih parametara, u postoperativnom periodu posmatrani su bol, trizmus i otok, kao i prisustvo infekcije operativne rane. Kontrolni pregledi su rađeni prvog, drugog i sedmog dana.

Rezultati: Nisu uočene značajnije razlike u intenzitetu bola, merenog vizuelno-analognom skalom između ispitanika obe grupe, osim što je kod pacijenata koji nisu primali antibiotike sedam dana nakon intervencije, srednje vrednosti VAS bile nešto veće nego u grupi sa antibioticima (7,75 mm VAS naspram 1,67 mm). Drugog postoperativnog dana pacijenti sa antibioticima imali su izraženiji trizmus (maksimalno interincizalno rastojanje smanjeno na 63,17%) u odnosu na pacijente bez primene antibiotika (75,25%). Što se tiče postoperativnog toka, nije bilo razlika između ispitivanih grupa. Takođe, u obe ispitivane grupe nije bilo slučajeva postoperativne infekcije.

Zaključci: Dobijeni rezultati ukazuju da primena antibiotika ne doprinosi smanjenju učestalosti postoperativne infekcije nakon vađenja donjih umnjaka, kao i da ne utiče na intenzitet postoperativnih komplikacija.

Ključne reči: antibiotici, bol, trizmus, otok

DOES PROPHYLACTIC USE OF ANTIBIOTICS AFFECTS INCIDENCE OF COMPLICATIONS AFTER SURGICAL EXTRACTION OF IMPACTED LOWER THIRD MOLARS

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Introduction: Postoperative infection is one of the complications of surgical extraction of impacted lower third molars. Although antibiotics are often applied in order to prevent infection, there is insufficient evidence that antibiotics are effective in the prophylaxis of infection after surgical removal of lower third molars.

The Aim: To assess if prophylactic use of antibiotics is justified after extraction of lower impacted third molars.

Materials and Methods: The study included 32 subjects with impacted third molars, divided into two groups. After surgical removal of these teeth, in the first group (20 patients) antibiotics were not prescribed and in the second group (12 patients) received antibiotics postoperatively. For seven days following the surgery, presence of postoperative pain, trismus, swelling and wound infection was recorded.

Results: No significant differences in pain intensity, measured by visual-analogue scale were noted between both groups. However, on the seventh postoperative day, mean VAS values were somewhat higher in the patients who have not received antibiotics compared to the other group (7.75mmVAS versus 1.67mm). On the second postoperative day, patients with antibiotics had more pronounced trismus (maximum interincisal distance was reduced to 63.17%) than patients without antibiotics (75.25%). As for the postoperative course, there were no differences between the groups. Also, in both groups there were no cases of postoperative infection.

Conclusions: These results indicate that prophylactic use of antibiotic does not contribute in reducing the incidence of postoperative infection after third molar extraction, and does not affect intensity of postoperative complications.

Keywords: antibiotics, pain, trismus, swelling

PRIMENA OHIP-14 I GOHAI UPITNIKA U CILJU PROCENE UTICAJA ORALNOG ZDRAVLJA NA KVALITET ŽIVOTA KOD STERIEJ POPULACIJE

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Uvod: Osnovni zadatak savremene stomatologije jeste ne samo poboljšanje oralnog zdravlja pacijenta već i sveukupnog kvalitet života.

Cilj rada: Cilja rada bio je procena uticaja oralnog zdravlja na kvalitet života kod ispitanika starije populacije primenom OHIP-14 i GOHAI upitnika.

Materijal i metode: U istraživanju su korišćeni OHIP-14 i GOHAI upitnik. Istraživanje je obuhvatilo ukupno 63 ispitanika ženskog pola i 30 ispitanika muškog pola.

Rezultati: Rezultati istraživanja pokazuju da postoji statistički značajna razlika u procentu ispitanika muškog i ženskog pola koji su pozitivno odgovorili na pitanja iz OHIP-14 upitnika. Rezultati takođe pokazuju da postoji statistički značajna razlika u procentu ispitanika koji su pozitivno odgovorili na pitanja iz GOHAI upitnika.

Zaključak: Utvrđena je statistički značajna razlika u procentu ispitanika muškog i ženskog pola koji su pozitivno odgovorili na pitanja iz OHIP-14 i GOHAI upitnika.

Ključne reči:

Oralno zdravlje, kvalitet života, OHIP-14 upitnik, GOHAI upitnik, starija populacija

APPLICATION THE OHIP -14 AND THE GOHAI QUESTIONNAIRES TO ASSESS THE IMPACT OF ORAL HEALTH ON QUALITY OF LIFE IN ELDERLY POPULATION

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Introduction: The main goal of the contemporary dentistry is not only to improve oral health but also to improve overall quality of patients life.

The aim: The aim of the present study was to assess OHRQoL using the OHIP-14 and the GOHAI questionnaire. The aim was also to assess differences in the OHRQoL between male and female gender in elderly population.

Material and methods: The research was conducted using the Serbian version of the OHIP-14 and the GOHAI questionnaire. The research included 93 participants.

Results: The research shows that in patients were differences in the oHIP-14 summary scores between genders. ($p < 0,05$) The research also shows that between genders were differences in the GOHAI summary scores. ($p < 0,05$)

Conclusion: There were statistically significant differences between genders in the OHIP-14 and in the GOHAI summary scores.

Key words: Oral health, Quality of life, OHIP-14, GOHAI, elderly.

KLINIČKO, RADIOGRAFSKO I HISTOPATOLOŠKO ISPITIVANJE HRONIČNIH PERIAPIKALNIH LEZIJA NA MLEČNIM ZUBIMA

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Uvod: Hronični periapikalni procesi na mlečnim zubima su česte promene koje nastaju najčešće kao posledica karijesa. Zbog mogućnosti njihove egzacerbacije i ozbiljnih komplikacija kod dece, veoma je važno ispitati kliničke, radiografske i histopatološke karakteristike ovih procesa.

Cilj: Cilj našeg istraživanja bio je da ispitamo karakteristike kliničkog i radiografskog dijagnostikovanja hroničnih periapikalnih lezija na mlečnim zubima i utvrdimo najčešći tip hroničnih periapikalnih procesa kod dece.

Materijal i metode: Ispitivanu grupu je činilo 28 pacijenta, uzrasta od 2-12 godina kojima je ekstrahovano 30 zuba. Nakon kliničke i radiografske dijagnostike hroničnih periapikalnih lezija indikovana je ekstrakcija zuba. Kiretaža apikalnog procesa nije rađena ni kod jednog pacijenta. Histopatološki su ispitane samo hronične periapikalne lezije koje su bile ekstrahovane sa zubom u istom aktu.

Rezultati: Analizirani su podaci dobijeni kliničkim i radiografskim pregledom i indikovana je ekstrakcija 30 zuba. Uzorci za histopatološku analizu dobijeni su sa 9 ekstrahovanih zuba. Na celokupnom uzorku je izvršena multipla logistička regresiona analiza kako bi se utvrdila povezanost kliničkih i radiografskih parametara. Rezultati analize pokazali su da ne postoji međusobna povezanost između ispitivanih varijabli. Kod 8 pacijenata, 9 zuba, kod kojih je pored kliničke i radiografske izvršena i histopatološka analiza hroničnih periapikalnih lezija, takođe su rezultati regresione analize potvrdili da ne postoji međusobna povezanost ispitivanih varijabli.

Zaključak: Istraživanje je pokazalo da bez obzira na relativno blagu kliničku sliku i radiografski nalaz, histopatološki nalaz govori u prilog invazivnih i destruktivnih periapikalnih procesa koji mogu oštetiti tkiva u razvoju. Stoga, mlečne zube sa hroničnim periapikalnim procesima treba što pre ekstrahovati.

Glavne reči: mlečni zubi, hronični periapikalni procesi, histopatološka analiza.

CLINICAL, RADIOLOGICAL AND HISTOPATHOLOGICAL EXAMINATION OF CHRONIC PERIAPICAL LESIONS IN THE PRIMARY TEETH

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Introduction: Chronic periapical lesions of deciduous teeth are very common changes that frequently occur as a result of caries. Because of the possibility of their exacerbations and serious complications in children, it is important to examine its clinical, radiographic and histopathological characteristics.

The aim: The aim of our study was to examine characteristics of the clinical and radiological diagnostics of chronic periapical lesions in primary teeth and to determine the most common type of chronic periapical processes in children.

Material and methods: The group consisted of 28 patients, aged 2-12 years, with 30 extracted teeth. After clinical and radiographic diagnosis of chronic apical periodontitis tooth extraction was recommended. Curettage of the apical process was not performed on any patient. The histopathological examination was performed only on chronic apical periodontitis, which were extracted with the tooth in the same procedure.

Results: The data obtained by clinical and radiographic examinations were analyzed and the extraction of 30 teeth was indicated. Samples for histological analysis were obtained only from 9 extracted teeth. Multiple logistic regression analysis was performed to determine the correlation of clinical and radiographic parameters of the entire sample. Results showed that there was no interconnection between the studied variables. Besides clinical and radiographic analysis, histopathological examination was performed on 8 patients (9 teeth), and the results of the regression analysis also confirmed that there is no interconnection between variables.

Conclusion: Despite relatively scarce clinical and radiographic findings, histopathologic results reveal invasive and destructive periapical processes that can damage tissues in the development. Therefore, milk teeth with chronic periapical processes should be extracted as soon as possible.

Key words: primary teeth, chronic periapical lesions, histopathological analysis.

KOMPARACIJA DUBINE UVOĐENJA IGLE PRI RAZLIČITIM TEHNIKAMA MANDIBULARNE ANESTEZIJE

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Uvod: Sprovodna anestezija oralnih grana donjoviličnog živca, poznata kao mandibularna anestezija, najčešće je primenjivana tehnika za postizanje anestezije u donjoj vilici. Postoji više opisanih tehnika mandibularne anestezije, ali ni jedna od opisanih tehnika nema 100% ucinak, a zapaženi su i određeni nedostaci. Među nedostacima koji se često ističu, ističe se i srazmerno velika dubina penetracije igle prilikom pristupa u predeo žleba viličnog vrata pri izvođenju standardnih tehnika mandibularne anestezije.

Cilj rada: Ustanoviti i uporediti dubinu uvođenja igle pri korišćenju direktnog i indirektnog pristupa standardnih tehnika mandibularne anestezije.

Materijal i metode: U radu je učestvovalo 24 pacijenata Klinike za oralnu hirurgiju Stomatološkog fakulteta Univerziteta u Beogradu, kojima je trebalo da se primeni mandibularna anestezija radi potrebne hirurške intervencije. Pacijenti su podeljeni u dve grupe po 12 pacijenata, zavisno od korišćenog pristupa. Anestezija je primenjena standardnom karpul-brizgalicom sa mogućnošću aspiracije, a na iglu je prethodno postavljen gumeni graničnik kojim je određivana dubina penetracije igle u tkivo. Za anesteziju je korišćen rastvor lidokaina sa adrenalinom (Lignospan®, Septodont, France).

Rezultati: Primenom mandibularne anestezije sa direktnim i indirektnim pristupom, ustanovljeno je da je prosečna dubina uvedene igle kod direktne tehnike iznosila 23,44 mm, a kod indirektno 25,22 mm.

Zaključak: Na osnovu prikazanih rezultata, zaključili smo da su postoje određene razlike u pogledu dubine uvedene igle kod standardnih tehnika mandibularne anestezije sa direktnim, odnosno indirektnim pristupom, ali da te razlike ne mogu ukazati na prednost bilo koje od njih.

Glavne reči: mandibularna anestezija, standardne tehnike, karpul brizgalica

COMPARISON OF NEEDLE INSERTION DEPTH WITH DIFFERENT APPROACHES OF STANDARD MANDIBULAR ANESTHESIA TECHNIQUES

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Introduction: Block anesthesia of oral branches of the mandibular nerve, known as mandibular anesthesia, is the most frequently applied technique of anesthesia in the mandible. There are several recommended techniques, neither of them being absolutely successful. Among shortcomings, a considerable needle penetration depth with standard techniques is frequently stressed.

The Aim: To determine and compare the depth of the needle insertion with direct and indirect approaches of the standard technique of mandibular anesthesia.

Material and methods: 24 patients requiring mandibular anesthesia at the Clinic of Oral surgery, School of Dental Medicine, University of Belgrade, participated in this study. Patients were divided into two groups of 12 patients each, depending on the standard technique approach (direct or indirect). Mandibular anesthesia was applied by standard breech-loading, cartridge-type aspirating syringes. A rubber stopper, determining the depth of needle penetration, was placed on the needle before the injection. Lidocaine with adrenalin (Lignospan®, Septodont, France) was used for all the injections.

Results: With standard techniques of mandibular anesthesia, the average depth of the needle penetration was 23.44 mm with use of direct approach, and 25.22 mm with use of indirect approach.

Conclusion: Based on the obtained results, we concluded that there are certain differences in the depth of needle insertion with various approaches (direct or indirect) of mandibular anesthesia standard techniques, but that these differences can not point to any advantage between them.

Keywords: mandibular anesthesia, standard techniques, cartridges

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Uvod: Strah je emocionalna reakcija na svesno prepoznate realne opasnosti koje ugrožavaju biološki, psihološki ili socijalni integritet čoveka. Izvor realne opasnosti, sa strahom kao pratećom emocijom najčešće potiče iz sopstvenog iskustva. Prisutan strah od stomatologa ili tačnije rečeno od stomatološkog zahvata priznaće mnogi ljudi, bez obzira na pol, socijalni status, godine života, zanimanje. Zbog toga strah od stomatologa predstavlja značajan zdravstveni problem, prvenstveno u dečjem uzrastu, jer ostavlja posledice i u kasnijem životnom dobu.

Cilj: Ovim ispitivanjem analizira se uticaj straha na oralno zdravlje adolescenata I njihovo ponašanje u toku različitih stomatoloških intervencija.

Ocenjivanje straha radi se preko dve komponente - kongnitivne I fiziološke.

Materijal I metode: Ispitivanjem je obuhvaćeno 60 adolescenata oba pola. Pacijenti su podeljeni u tri grupe: I grupa – stomatološki pregled, II grupa – ortodontska terapija, III grupa – stomatološki pregled I sanacija superficijalnog karijesa. III grupa ispitanika prolazila je kroz tri posete: u I-upoznavanje sa pacijentom, u II – uklanjanje mekih naslaga, III – sanacija karijesa. Stanje oralnog zdravlja analiziramo pomoću vrednosti KEP indeksa, prisustva gingivitisa I ortodontskih anomalija. Kongnitivna karakteristika straha analizirana je upotrebom upitnika koji adolescenti samostalno ispunjavaju pre prve intervencije (standardna skala opšte anksioznosti). Fiziološka komponenta (pogled I boja lica) procenjavani su metodom kliničkog praćenja.

Rezultati: Na osnovu analize I statističke obrade dobijenih podataka pokazalo se da je kod dece sa povišenim strahom KEP indeks uvećan, a celokupno oralno zdravlje ugroženo.

Zaključak: Stomatološki tretman ima veliki uticaj na oralno zdravlje dece a samim tim I na kvalitet života I njegove dimenzije (govor, ishrana, izgled, društveni odnosi).

Ključne reči: strah, stomatološka intervencija, oralno zdravlje.

THE IMPACT OF FEAR OF DENTAL PROCEDURES ON THE ORAL HEALTH OF CHILDREN

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Introduction: Fear is an emotional reaction to consciously recognize the real dangers that threaten the biological, psychological and social integrity of a man. Source of real danger, with fear as the accompanying emotion often comes from experience. Present fear of dental procedures, many people will recognize, regardless of gender, social status, age, occupation. Fear of the dentist became a major health problem, both in Serbia and in other countries, especially in children, because it has consequences later in life.

Objective: This investigation examines the impact of fear on oral health of adolescents and their behavior during various dental procedures. Assessment of fear in order to be more than two components - congenitive and physiological.

Material and methods: The study included 60 adolescents of both sexes. Patients were divided into three groups: group I - dental examination, group II - orthodontic therapy, III group - dental examination and repair superficial caries. Group III subjects went through three visits: the I-introduction to the patient, in the second - the removal of soft deposits, III - rehabilitation of caries. State of oral health values analyzed using DMFT index, presence of gingivitis and orthodontic anomalies. Cognitive characteristic of fear was analyzed using a questionnaire that adolescents meet independently before the first intervention. Physiological component (look and complexion) were evaluated using clinical monitoring.

Results: The analysis and statistical processing of the data showed that children with elevated fear had DMFT index increased and the entire oral health is threatened.

Conclusion: Dental treatment has a major impact on oral health of children and therefore the quality of life and its dimensions (speech, nutrition, appearance, social relations).

Key words: Fear, dental treatment, oral health.

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Uvod: Frakturu korena zuba karakteriše prelom cementa i dentina sa povredom pulpe. Frakturna linija može biti lokalizovana u cervikalnoj, srednjoj i apikalnoj trećini. U odnosu na sve dentoalveolarne traume, prelomi korena se dešavaju u opsegu 0,1- 0,7%.

Cilj: Cilj ovog rada je da se ispituju traume stalnih zuba sa frakturom korena, koji su lečeni na dečjem odeljenju Klinike za stomatologiju Vojvodine tokom perioda od 13 godina.

Materijal i metode: Analizirano je ukupno 29 pacijenata, koji su bili tretirani u periodu između 1999. i 2012. godine. Kod svakog pacijenta su analizirani pol, uzrast, mehanizam povređivanja, mesto frakture korena po trećinama, udružene povrede, broj povređenih zuba, vreme proteklo do pregleda, vreme do terapije, vrsta terapije, ishod tretmana, period preživljavanja zuba i prisutnost zuba.

Rezultati: Najčešće su povređivana deca uzrasta 11 godina. Uglavnom su povređeni zubi sa završenim razvojem korena (65%). Samo 9 (31%) pacijenata se na tretman javilo u roku prva 24 sata nakon traume dok je 20 (69%) pacijenata sanirano nakon tog perioda. Pokazano je da je vreme proteklo od nastanka traume do zbrinjavanja od izuzetne važnosti za dalji ishod lečenja. Pacijenti koji su se obratili stomatologu neposredno nakon povređivanja, imali su znatno bolje rezultate sanacije. 1 (3,4%) zub je ekstrahovan istog dana po prijemu, 6 (20,6%) zuba je ekstrahovano tokom opservacionog perioda, a preostala 22 (75,8%) zuba su uspešno sanirana.

Zaključak: Fraktura korena stalnog zuba je kompleksna povreda čiji ishod zavisi od pravovremeno i adekvatno sprovedenih svih neophodnih mera u toku lečenja.

Ključne reči: Povreda zuba, Dentoalveolarna trauma.

ROOT FRACTURE IN PERMANENT TEETH - A RETROSPECTIVE STUDY

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Introduction: Fracture of the root is characterized by cementum and dentin fracture with pulp injury. Fracture line can be localized in cervical, middle and apical third. In respect of all dentoalveolar trauma, root fractures occur in the range 0,1 to 0,7 %.

The Aim: The aim of this study was to investigate the trauma of permanent teeth with root fractures which were treated at the Department for Paediatric and Preventive Dentistry, Dentistry Clinic of Vojvodina during a period of 13 years.

Materials and methods: 29 patients were analyzed, and they were treated between 1999 and 2012. Data collected from the patients included: gender, age, etiology, the place of injury, combined injuries, the number of injured teeth, time until examination, time until therapy, type of therapy, type of splinting, duration of splinting, endodontic therapy, the survival rate of the teeth and presence of the teeth.

Results: Male children were more frequently injured, and the majority of patients injured were 11 years old (65%). During the first 24 hours the treatment was provided to only 9 (31%) patients, while 20 (69%) patients received treatment after that time. It was shown that the time elapsed from the occurrence of trauma is very important for the outcome of treatment. Patients who sought professional help immediately after the trauma had significantly better results in rehabilitation. One tooth (3,4%) was extracted immediately upon referral, and another 6 (20,6%) were extracted during the observation period. Another 22 (75,8%) teeth were successfully cured.

Conclusion: The root fracture in permanent teeth presents a challenge for treatment. Better prognosis can be achieved by proper and adequate treatment and regular check ups

Key words: Dental injuries. Dentoalveolar trauma.

MOGUĆNOSTI POSTOPERATIVNIH KONTROLNIH PREGLEDA PUTEM TELEMEDICINE U ORALNOJ HIRURGIJI

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Uvod: Postojanje modernih telekomunikacionih sistema značajno utiče na proširenje mogućnosti oralnohirurškog zbrinjavanja pacijenata. Sa druge strane potreba za rutinskim postoperativnim kontrolnim pregledima može često da bude opterećujući faktor za pacijente koji se nalazi na udaljenim lokacijama od terapeuta.

Cilj rada: Cilj je ispitati mogućnost udaljenog kontrolnog pregleda putem telemedicinske Store And Forward metode u oralnoj hirurgiji.

Metode: U eksperimentalnoj randomiziranoj studiji učestvovalo je 50 slučajno odabranih pacijenata koji su dolazili na postoperativne kontrolne preglede. Urađena su ekstra i intraoralna fotografisaa pacijenata, i zajedno sa anamnestičkim podacima uploadovani na telemedicinski server XPA3 Online. Terapeut je telemedicinskim putem pregledao dobijeni status kontrolnog pregleda, a potom i vizuelno taktilno pregledao pacijenta. Upoređeni su rezultati pregleda dobijeni udaljenim putem i direktnim pregledom. Određena je dijagnostička saglasnost Cohenovim kappa (k) koeficijentom, dijagnostička senzitivnost (SE), specifičnost (SP) i efikasnost (EFF). Statistička značajnost i poređenja vršena su Z-testom, a neparametarska obeležja Mc Nemmar χ^2 kvadrat testom za prag značajnosti $p=0.05$.

Rezultati: Urađeno je 57 telemedicinskih postoperativnih kontrola. U 55 (96.49%) slučajeva evidentirana je saglasnost između telemedicinske i vizuelno/taktilne metode, dok u 2 (3.51%) slučaja saglasnost nije postojala. Rezultati ($k=0.9298$, $SE=96.49\%$, $SP=96.49\%$, $EFF=96.49\%$) za $p=0.05$, ukazuju na postignutu SKORO POTPUNU dijagnostičku saglasnost.

Zaključak: Postoperativni oralnohirurški kontrolni pregledi urađeni Store And Forward telemedicinskom metodom mogu adekvatno zameniti vizuelno/taktilni kontrolni pregled, te osloboditi pacijenta i terapeuta obaveze direktnog pregleda.

Ključne reči: Telemedicina, teledentologija, oralna hirurgija, postoperativni pregled

OPPORTUNITIES OF POSTOPERATIVE CHECK-UPS VIA TELEMEDICINE IN ORAL SURGERY

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Introduction: Existence of modern telecommunication systems significantly affects the expansion of opportunities for surgical care of patients. On the other hand the need for routine post-operative check-ups can be a burden for patients located in remote areas from the therapist.

The Aim: Objective was to examine the possibility of remote control examination by store and forward telemedicine method in oral surgery.

Materials and Methods: The experimental group participated in a randomized study of 50 random patients who came to the post-operative check-ups. They made extra and intraoral photographs of patients, and with a history uploaded to telemedicine server XPA3 Online. The therapist reviewed the telemedicine obtained status of follow-up examination, then tactile and visually examined the patient. We compared the results obtained by remote viewing and via direct examination. Determined by the diagnostic agreement Cohen's kappa (k) coefficient, diagnostic sensitivity (SE), specificity (SP) and efficiency (EFF). Statistical significance of the comparisons were carried out via Z-test and parametric characteristics Mc Nemmar's χ^2 square test for significance level $p=0.05$.

Results: There were 57 telemedicine post-operative controls. In 55 (96.49%) cases registered the agreement between the telemedicine and visual/tactile methods, and in 2 (3.51%) cases there was no consent. Results ($k=0.9298$, $SE=96.49\%$, $SP=96.49\%$, $EFF=96.49\%$) for $p=0.05$, indicate a near-complete diagnostic agreement.

Conclusion: Postoperative periapical checkups done via Telemedicine Store and Forward method can adequately replace the visual / tactile check-up, and relieve the patient and the therapist's direct obligations of the examination.

Key words: Telemedicine, teledentistry, oral surgery, postoperative examination

EKSPRESIJA RECEPTORA VASKULARNOG ENDOTELNOG FAKTORA RASTA U ZUBNOJ PULPI

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Uvod: Receptori vaskularnog endotelno faktora rasta (VEGFR) se ekspimiraju na površini vaskularnih endotelnih ćelija. Oni su tipa tirozin-kinaze i javljaju se u tri oblika: VEGFR-1, VEGFR-2 i VEGFR-3.

Cilj rada: Cilj ovog rada je utvrđivanje ekspresije VEGFR-1 i VEGFR-2 u normalnoj i inflamiranoj pulpi.

Materijal i metode: Istraživanjem je obuhvaćena humana pulpa 21 zuba. Svi uzorci pulpe su analizirani mikroskopski na standardnom hematoksilin-eozin bojenju (HE). Za detekciju VEGFR-1 i VEGFR-2, korišćeno je anti goat-R1 i R2 antitelo (*RD sistem*) u razblaženju 1: 20 za VEGFR-1 i 1: 6 za VEGFR-2, uz korišćenje standardne *En Vision* metode. Analiza ekspresije receptora VEGFR-1 i VEGFR-2 u pulpi vršena je na velikom mikroskopskom povećanju ($\times 400$).

Rezultati: Mikroskopski je u pulpi 11 (52%) zuba verifikovan normalan histološki izgled. Kod 4 (19%) zuba je klinički verifikovana abrazija. Znaci zapaljenja pulpe utvrđeni su kod 6 (29%) zuba. Najčešće su bili prisutni znaci hroničnog pulpitisa sa mononuklearnim infiltratom. Rezultati analize ekspresije VEGFR-1 u ispitivanim grupama pokazali su vrlo diskretno citoplazmatsko prebojavanje sa VEGFR-1 u pulpi sa hroničnim zapaljenjem, samo u nekoliko slučajeva. Citoplazmatska i nuklearna ekspresija VEGFR-2 nije detektovana u ispitivanim grupama.

Zaključak: Na ispitivanom uzorku dokazana je vrlo slaba ekspresija VEGFR-1 u humanoj pulpi sa zapaljenjem, dok ekspresija VEGFR-2 nije detektovana.

Ključne reči: zubna pulpa, VEGFR-1, VEGFR-2.

VASCULAR ENDOTHELIAL GROWTH FACTOR RECEPTOR EXPRESSION IN THE DENTAL PULP

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Introduction: Receptors of vascular endothelial growth factor (VEGFR) are expressed on vascular endothelial cell surface. They are of the tyrosin-kinase (RTK) type and are present in 3 forms: VEGFR-1, VEGFR-2 i VEGFR-3.

The Aim: The aim of the present preliminary study was to detect vascular growth factor receptor expression in normal and inflamed dental pulp.

Materials and Methods: The study included 21 dental pulp. All pulp samples were analyzed microscopically using the standard hematoxylin-eosin staining (HE). For the detection of VEGFR-1 and VEGFR-2 we used goat anti-R1 i R2 antibody (RD system) diluted 1: 20 for VEGFR1 and 1: 6 for VEGFR-2, using the standard *En Vision* method. Analysis of expression of receptors VEGFR-1 and VEGFR-2 in the pulp was carried out at high microscopic magnification ($\times 400$).

Results: Microscopically, the pulp in 11 (52%) teeth verified histologically normal appearance. In 4 (19%) pulp samples were clinically verified dental attrition. Signs of pulp inflammation were observed in 6 (29%) teeth. The most common signs of inflammation were present with signs of chronic pulpitis mononuclear infiltrate. The results of analysis of expression of VEGFR-1 in experimental groups showed very discrete cytoplasmic staining with VEGFR-1 in the pulp with chronic inflammation, only a few cases. Cytoplasmic and nuclear expression of VEGFR-2 was not detected in our study.

Conclusion: On this sample demonstrated a very weak expression of VEGFR-1 in human dental pulp with inflammation, whereas VEGFR-2 expression was not detected.

Key words: dental pulp, VEGFR-1, VEGFR-2.

INDIVIDUALNI CIRKONIJA ABATMENTI IZRAĐENI CAD/CAM TEHNOLOGIJOM

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Uvod: Poslednjih godina individualni abatmenti izrađeni Computer-aided design/computer aided-manufacturing (CAD/CAM) tehnologijom su ušli u širu primenu. Njihove osnovne prednosti u odnosu na konvencionalne su: visoke estetske vrednosti, idealna potpora mekih tkiva, adekvatan izlazni profil i povoljna lokalizacija demarkacije. Dostupni su od cirkonija keramike i titana.

Cilj rada: Prikazati proceduru izrade CAD/CAM individualnog cirkonija abatmenta i predstaviti optimalno rešenje rekonstrukcije zubne nadoknade.

Materijal i metode: Nakon postupka otiskivanja, u laboratoriji se izliva radni model, ne kome se adaptira privremeni abatment kompozitnim materijalom, do pune anatomske forme i prema potrebama definitivne zubne nadoknade. Model budućeg abatmenta se fiksira za postolje - prenosnik koji se postavlja u predviđeno ležište na skeneru. 3D sken modela šalje se meglom u centralnu laboratoriju gde se obavlja izrada abatmenta CAD/CAM tehnologijom.

Rezultati: Izbor metode za rekonstrukciju ovako izrađenog abatmenta zavisi od angulacije i položaja implanta u kosti, koji definiše poziciju pristupnog otvora na abatmentu. Ako se pristupni otvor nalazi na palatinalnoj strani abatmenta, moguće je upotrebiti metodu direktnog nanošenja i pečenja keramike na abatment i retiniranje krune-abatmenta zavrtanjem.

Zaključak: Način izrade i fiksiranja definitivne zubne nadoknade na individualnom cirkonija abatmentu zavisi od angulacije i položaja implanta u kosti, koji definiše poziciju pristupnog otvora abatmenta.

Ključne reči: cirkonija, abatment, CAD/CAM, rekonstrukcija, nadoknada

CAD/CAM CUSTOM ABUTMENTS

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Introduction: Computer-aided design/computer aided-manufacturing (CAD/CAM) custom abutments have been gaining attention due to their advantages of esthetic emergence profile and ideal soft tissue contours, as well as availability in zirconia and titanium materials.

The Aim: This paper explored a method to produce a CAD/CAM custom abutments in zirconia material and presented optimal solution for the restoration.

Materials and Methods: After getting impression and pouring model, waxing procedure must be completed to build the abutment to full anatomic contour according to the needs of restoration. Thus the position of the wax-up abutment and implant can be determined by scanner. The scan is sent to the central laboratory for manufacturing to get custom abutment in zirconia material. The abutment is now suitable for cement- or screw-retained restorations. Moreover, this type of abutment reduces the chance of creating dark interproximal spaces or exposing margins on anterior restorations, relieving the dentist from abutment selection and preparation.

Results: At last, solution for restoration depends on implant position in bone, actually on screw access hole position. Crown can be produced on standard protocol (access hole placed on incisal or labial surface of the abutment) or ceramic layering directly on abutment (access hole on palatal surface of the abutment).

Conclusion: Optimal solution for CAD/CAM custom abutment depends on access hole position.

Key words: custom, abutment, restoration, access hole

DOPLER ULTRASONOGRAFIJA KAROTIDNIH ARTERIJA NAKON DETEKCIJE KALCIFIKACIJA NA ORTOPANTOMOGRFSKOM SNIMKU: PRIKAZ SLUČAJA

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Uvod: Moždani udar je treći među vodećim uzrocima smrti, odmah iza kardio-vaskularnih i malignih bolesti. 60% tromboembolijskih moždanih udara javlja se kao posledica postojanja aterosklerotskog plaka u račvi zajedničke karotidne arterije. Kalcifikacija do koje dolazi u evoluciji aterosklerotskog plaka može se detektovati na ortopantomografskom snimku koji se koristi u dijagnostici stomatoloških oboljenja. Dopler ultrazvučnom dijagnostikom se utvrđuje stepen suženja lumena krvnog suda i procenjuje rizik od nastanka moždanog udara.

Prikaz slučaja: Pacijenti su se javili na Kliniku za stomatologiju Vojvodine radi stomatološkog zbrinjavanja. U sklopu dijagnostičkog postupka načinjen je ortopantomografski snimak na kome su uočene kalcifikacije u regiji račve zajedničke karotidne arterije. Pacijentima je savetovano da se obrate svom lekaru, nakon čega je u sklopu cerebrovaskularne procene načinjena Dopler ultrazvučna dijagnostika. Kod sva 3 pacijenata, neurološki asimptomatska, dijagnostikovana je ateroskleroza karotidnih arterija: kod Pacijenta 1, starosti 64 godine, obostrano stenoza oko 30%; kod Pacijenta 2, starosti 59 godina, oko 25% sa desne strane; kod Pacijenta 3, starosti 45 godina, sa desne strane stenoza oko 55% a sa leve strane oko 50%, nakon čega im je propisana odgovarajuća terapija i redovne kontrole.

Zaključak: Dopler ultrazvučnom dijagnostikom je potvrđeno postojanje aterosklerotskog plaka u račvi zajedničke karotidne arterije kod pacijenata na čijim su ortopantomografskim snimcima uočene kalcifikacije.

Ključne reči: Dopler ultrazvučna dijagnostika, ortopantomografija, moždani udar, kalcifikacija, karotidna arterija.

CAROTID DOPPLER ULTRASONOGRAPHY AFTER DETECTING CALCIFICATIONS ON A PANORAMIC RADIOGRAPH: A CASE REPORT

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Introduction: Stroke is the third leading cause of death, after cardiovascular diseases and cancer. 60% of all strokes are the result of atheromatous plaque existing in carotid bifurcation. Calcification which occurs in the evolution of atheromatous plaque can be detected on panoramic radiographs which are used in diagnostic of dental diseases. Extent of luminal stenosis and the risk of stroke is determined best by carotid Doppler ultrasonography.

Case report: Patients came to Clinic of Dentistry of Vojvodina, for dental care. Panoramic radiographs obtained during dental examination revealed the presence of calcifications located in the region of carotid bifurcation. Patients were referred to their physicians. As the part of cerebrovascular assessment, carotid Doppler ultrasonography was performed. Carotid atherosclerosis was diagnosed in all 3, neurologically asymptomatic patients. In Patient 1, 64-year-old man, 30% stenosis was found bilaterally; in Patient 2, 59-year-old woman, 25% stenosis was found on the right side; in Patient 3, 45-year-old man, 55% stenosis was found on the right side, and 50% on the left side; after that, adequate therapy and regular check-ups were ordered.

Conclusion: Doppler ultrasonography confirmed the existence of atheromatous plaque in carotid bifurcation in patients with calcifications detected on their panoramic radiographs.

Key words: Doppler ultrasonography, panoramic radiography, stroke, calcification, carotid artery.

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Uvod: Jedan od najznačajnijih sistemskih faktora rizika u nastanku parodontopatije je Diabetes mellitus. Pored bazične terapije parodontopatije, poslednjih decenija značajnu ulogu u tretmanu oboljenja parodonticijuma imaju laseri male snage zbog svog analgetičkog, antiinflamatornog i antiedematoznog delovanja.

Cilj rada: Ispita efikasnost primene lasera male snage, kao pomoćnog sredstva, u terapiji parodontopatije kod pacijenata obolelih od dijabetesa.

Materijal i metod rada Ispitivanje je sprovedeno na 20 pacijenata sa dijagnozom šećerne bolesti i parodontopatija. Posle sprovedene standardne dijagnostičke i terapijske procedure, ispitanici su podeljeni u dve grupe: I grupu činilo je 10 pacijenata koji su tretirani bazičnom terapijom parodontopatije i laserom male snage i II grupu koju je činilo 10 pacijenata koji su lečeni samo bazičnom terapijom. Lasiranje je sprovedeno u 5 seansi u trajanju od 12 minuta. Primenjen je laser male snage marke Scorpion Dental Optima talasne dužine 635 nm, jačine 25mV.

Rezultati: U istraživanju je učestvovalo 20 pacijenata sa parodontopatijom i dijabetes mellitusom. Bilo je 12 ispitanika muškog pola, prosečne starosti 44,6 godina, a prosečna dužina trajanja DM bila je 8,75 godina. Uočena je statistički značajno manja vrednost Gi kod pacijenata kod kojih je primenjena dodatno i LLLT, posle prve terapije ($p < 0,001$), i posle pete terapije ($p < 0,02$).

Zaključak: Uočeno je značajnije smanjenje inflamacije gingive kod dijabetesnih bolesnika sa parodontopatijom primenom bazične terapije u kombinaciji sa laserima male snage. Laseri male snage pokazali su se efikasnim u eliminaciji inflamacije gingive i preporučuje se njihova primena kao dodatak bazičnoj terapiji parodontopatije dijabetesnih bolesnika.

ključne reči: parodontopatija, Diabetes mellitus, gingivalni indeks

STUDY OF LOW LEVEL LASER THERAPY EFFICIENCY IN TREATMENT OF DIABETIC PERIODONTAL DISEASE

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Introduction: Diabetes mellitus is one of the most important risk factors for periodontal disease. Basic therapy of periodontal disease is the common method, but low-power lasers are used in dentistry for its treatment. The biostimulative effects, especially anti-inflammatory and antiedematous effect are confirmed.

The Aim: To analyse the efficiency of low level laser treatment, as adjunctive treatment, in diabetics periodontal disease.

Materials and method: The study was conducted on 20 diabetics patients with Periodontal disease. Patients were divided into two groups: Group I consisted of 10 patients who were treated with basic therapy and low-power laser and the group II consisted of 10 patients who were treated only by basic therapy. LLLT was applied, with a Scorpion Dental Optima apparatus (wavelength 635 nm, strength 25mV), in 5 daily sessions. Gingival index (Loe Sillnes) was used for measuring gingival inflammation in diabetics.

Results: Twenty diabetic patients with periodontal disease were included in this investigation. Out of 20 patients 12 were male, averaged aged 44,6, with average duration of diabetes mellitus 8,75 year. After the first session the statistically significant difference between the average value of gingival index between the groups was established ($p < 0,001$). After fifth therapy session diabetic patients treated by LLLT +basic therapy had significantly lower mean value of gingival index than those treated by basic therapy only ($p < 0,02$).

Conclusion: LLLT is beneficial as an adjunctive treatment modality for treating gingival inflammation in diabetic periodontal disease.

Key words: Periodontal disease, Diabetes mellitus, gingival index

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Uvod: Specifičnost ekstrakcionih rana ogleda se u ispunjavanju nastalog defekta koštanim tkivom i prekrivanju rane epitelnim tkivom. Nekada se posle vađenja zuba može javiti otežano ili usporeno zarastanje rana. Ubrzanje ovog procesa, a naročito epitelizacije može biti pojedinim pacijentima od velike koristi.

Cilj rada: Cilj ovog rada je da se prikaže dejstvo soft lasera na proces sekundarnog zarastanja ekstrakcionih rana posle vađenja zuba.

Materijali i metode: Obrađeno je 60 ispitanika kod kojih je izvršena ekstrakcija prvog donjeg molara. Kod 30 ispitanika studijske grupe ekstrakcione rane, rane su zračene soft laserom u trajanju od sedam dana, dok su kod 30 ispitanika kontrolne grupe ekstrakcione rane ostavljene da spontano zarastu. Procena rezultata vršena je posle 14 dana na osnovu skale kliničkog istraživanja.

Rezultat: Rezultati pokazuju da je epitelizacija rana koje su tretirane laserom male snage bila uspešnija i brža u odnosu na rane koje su spontano zarastale.

Zaključak: Štetni efekti lasera nisu utvrđeni.

ključne reči: soft laser, ekstrakcija zuba, zarastanje rana

THE INFLUENCE OF LOW LEVEL LASERS ON HEALING EXTRACTION WOUND IN ORAL CAVITY

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Introduction: Specificity of extraction wounds is in filling a new defect with osseous tissue and recovering the wound with epithelium. Sometimes after tooth extraction difficult healing of wounds can be occurred. Acceleration of this process can be very important to some patients.

The Aim: The aim of this research is to show the influence of the low level lasers on the processes of secondary healing of the extraction wounds.

Materials and Methods: The process was done with 60 respondents, which had extracted mandibular first molar. In 30 respondents of studying group extraction wounds were treated with low level lasers during the period of 7 days, while in the control group of other 30 respondents extraction wounds were left on spontaneous healing. The evaluation of the result was done 14 days after, based on scale of clinical research.

Results: The result shows that epithelisation of the wounds, which were treated with low level lasers, was more successful and faster than epithelisation of the those wounds left on spontaneous healing.

Conclusion: Adverse effects of the low level lasers are not determined.

Key words: Low level laser, extraction of tooth, healing of wounds.

ESTETSKI DOŽIVLJAJ KORELACIJE OBLIKA LICA I OBLIKA GORNJEG CENTRALNOG SEKUTIĆA

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Uvod: Izgled frontalnih zuba veoma je bitan za harmoničan osmeh pacijenata. U svakodnevnoj stomatološkoj praksi oblik gornjih sekutića bira se prema obliku lica pacijenta. U istraživanju se pošlo od pretpostavke da oblik gornjeg centralnog sekutića ne mora da odgovara konturi lica, kao i da doživljaj lepog zavisi od nivoa obrazovanja.

Cilj: Cilj ovog istraživanja bio je da ispita estetski doživljaj različitih kombinacija oblika lica i gornjeg centralnog sekutića kod ljudi sa osnovnim, srednjim i visokim obrazovanjem, kao i nedavno svršenih studenata stomatologije.

Materijal i metode: Izvršena je modifikacija fotografija 6 osoba sa licem oblika kvadrata, trougla i ovoida sa tri različita oblika gornjeg centralnog sekutića (kvadrat, trougao i ovoid) (Ukupno 18 fotografija).

Svaka fotografija rangirana je vizuelno analognom skalom od strane 195 učesnika istraživanja. Komparacija između grupa prikazana je korišćenjem Hi-kvadrat testa. ($\alpha = 0,05$)

Rezultati: U estetskom doživljaju komparacije oblika lica i gornjeg sekutića nije nađena statistički značajna razlika ($p > 0,05$) kod pacijenata različitog stepena obrazovanja. Pored toga, oblik gornjeg centralnog sekutića u estetskom doživljaju ispitanika nije uvek odgovarao obliku lica.

Zaključak: Nivo obrazovanja nije uticao na estetski doživljaj zavisnosti oblika gornjeg sekutića i oblika lica. Nađeno je da stomatolozi uglavnom biraju ovalni oblik sekutića bez obzira na oblik lica pacijenta.

Ključne reči: estetska percepcija, oblik zuba, oblik lica.

AESTHETIC EXPERIENCE CORRELATION OF FORM OF THE FACE AND FORM OF CENTRAL INCISORS

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Introduction: The appearance of anterior teeth is very important for patients harmonious smile. In everyday dental practice, the shape of the upper incisors is chosen according to the shape of the face of the patient. In the study it was assumed that the shape of the upper central incisors does not have to match the contour of the face, and to experience the beautiful depends on the level of education.

Objective: The objective of this study was to investigate the aesthetic perception of different combinations of facial shape and the upper central incisors in people with primary, secondary and higher education, as well as recent graduates of dentistry.

Materials and Methods: A modification of images with 6 people face a square, triangular and ovoid with three different shapes of the upper central incisors (square, triangle, and ovoid) (total 18 photos). Each photograph was rated VAS by 195 participants. Comparison between groups was shown using the Chi-square test. ($\alpha = 0.05$)

Results: The comparison of the aesthetic experience shapes the face and upper incisors No statistically significant difference ($p > 0.05$) in patients with different degrees of education. In addition, the shape of the upper central incisors in the aesthetic experience of the respondents did not always match the shape of the face.

Conclusion: The level of education did not affect the aesthetic experience depending on shape of the upper incisors and face shape. It was found that most dentists choose the oval shape of the incisors, regardless of the patient's face shape.

Key words: aesthetic perception, the shape of the teeth, facial shape.

STEPEN HRAPAVOSTI GLEDNE POVRŠINE U ODNOSU NA VREME IZLAGANJA BEZALKOHOLNIM PIĆIMA, NJIHOVU pH I TITRABILNU KISELOST

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Uvod: Najčešći spoljašnji faktori dentalne erozije su kisela hrana i piće.

Cilj: Ustanoviti inicijalnu pH i titrabilnu kiselost (TA) bezalkoholnih pića i korelirati dobijene vrednosti sa parametrima hrapavosti gleđi (Ra, Ry-max, Rz) u odnosu na vreme izlaganja.

Materijal i metode: Inicijalna pH Coca-cola, soka od narandže, Cedevite, Guarane i jogurta sa jagodom je merena Metrohm 827-pH-lab pH-metrom. TA je procenjena titracijom sa standardnim rastvorom NaOH potenciometrijskom metodom. Za analizu hrapavosti gleđi korišćen je profilometar sa dijamantskom iglom. Erozivne promene su izazvane potapanjem polovina krunica ekstrahovanih zuba u napitke na 15, 30 i 60' 3x dnevno, u trajanju od 10 dana. Između ciklusa potapanja, uzorci su (kao i kontrole) držani u filtriranoj pljuvački. Za statistički su analizu korišćeni: ANOVA (pH i TA) i Mann-Whitney test (parametri hrapavosti).

Rezultati: Sva pića imaju pH ispod kritične. Guarana i Coca-cola pokazuju najnižu prosečnu pH, a jogurt i narandža najvišu. Coca-coli je potrebna najmanja, a narandži najveća količina baze da bi se povećala pH za jednu jedinicu. Profilometrijski parametri ukazuju da Coca-cola ima najjači erozivni potencijal u kratkim vremenskim izloženostima, Coca-cola i narandža sličan u srednjim i dužim izloženostima. Između Guarane i Cedevite nema značajne razlike u odnosu na vreme izlaganja. Iako ima početnu pH ispod kritične, TA nižu od narandže i znatno višu od Coca-cola, jogurt nije erodovao površinu gleđi.

Zaključak: Osim za jogurt, dobijene vrednosti pH i TA ukazuju na erozivni potencijal ispitivanih napitaka u korelaciji sa parametrima hrapavosti gleđi i vremenu izlaganja.

Ključne reči: bezalkoholna pića, pH, titrabilna kiselost, gleđ, hrapavost.

DEGREE OF ENAMEL SURFACE ROUGHNESS IN RELATION TO SOFT DRINKS EXPOSURE TIME, THEIR pH AND TITRABLE ACIDITY

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Introduction: The most common external factors of dental erosion are acid foods and drinks.

The aim: To establish initial pH and titratable acidity (TA) of the beverages and correlate with parameters of enamel surface roughness (Ra, Ry-max, Rz) and exposure time.

Materials and methods: The initial pH of Coca-Cola, orange juice, Cedevita, Guarana, and strawberry yogurt was measured by Metrohm 827-pH-lab pH-meter. TA was evaluated by titration with NaOH solution using potentiometric method. For analysis of enamel surface roughness was used a diamond stylus profilometer. Eroding changes are caused by immersion of extracted teeth crown samples in the beverages at 15, 30 and 60' 3-times daily, during 10 days. Between immersion, the samples were kept in filtered saliva. For statistical analysis ANOVA and Mann-Whitney test were used.

Results: Guarana and Coca-Cola showed the lowest pH, yogurt and orange-juice highest. To increase pH for one unit, the smallest amount of base needed to Coca-cola, the highest to orange-juice. Profilometric parameters indicate that Coca-Cola has the strongest potential for erosion in short time, Coca-cola and orange-juice similar in medium and long exposures. There is no significant differences between Guarana and Cedevita in relation to exposure time. Although has initial pH below the critical, TA lower than orange-juice and significantly higher than Coca-Cola, yogurt has not eroded the enamel surface.

Conclusion: Except yogurt, the values of pH and TA indicate that the erosive potential of tested beverages correlated with enamel roughness and exposure time.

Keywords: soft drinks, pH, titratable acidity, enamel, roughness.

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Uvod: Obrada kanala korena zuba laserom je vrlo specifična i često može da dovede do oštećenja dentina, cementa i ostalih periapikalnih struktura.

Cilj rada: Cilj rada je bio da se ultrastrukturno analizira cementno tkivo apeksa korena zuba posle obrade kanala Er:YAG laserom.

Materijal i metode: Kao materijal u istraživanju korišćeno je 20 maksilarnih i mandibularnih jednokorenih i dvokorenih zuba ekstrahovanih iz različitih razloga i podeljenih u dve grupe. Kod svih zuba je formiran pristupni kavitet. Za obradu kanala korišćen je Er:YAG laser. Prva, A grupa uzoraka (n=10) tretirana je Er:YAG laserom bez irigacije. Druga, B grupa uzoraka (n=10) tretirana je Er:YAG laserom uz stalnu irigaciju fiziološkim rastvorom.

Posle obrade kanala Er:YAG laserom, vrhovi korenova zuba su poprečno odsećeni na dužini od 4 mm, napareni zlatom u vakuum evaporatoru, a ultrastrukturna analiza cementnog tkiva na apeksnom delu korena zuba, rađena je na skenirajućem elektronskom mikroskopu JEOL-JSM-5300.

Rezultati: Ultrastrukturna analiza cementne strukture na apeksu korena zuba posle obrade kanala Er:YAG laserom bez vodenog hlađenja ukazuje na promenu morfologije celularnog cementa sa karakterističnim izgledom u vidu ploča i pukotina. Intrakanalna obrada Er:YAG laserom uz kontinuirano vođeno hlađenje ne menja strukturu cementnog tkiva. Uočavaju se lakune u celularnom cementu sa dobro očuvanim cementocitima.

Zaključak: Obrada kanala korena Er:YAG laserom uz kontinuirano hlađenje ne menja strukturu cementnog tkiva na apeksu korena zuba, dok primena Er:YAG lasera bez hlađenja termički modifikuje cement apeksa korena zuba.

Ključne reči: laser, cement, apeks, ultrastruktura

EFFECTS OF LASER THERAPY ON CEMENT TISSUE ON APICAL PART OF DENTAL ROOT

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Introduction: Laser treatment of root canal is very specific and often cause damage to the dentine, cement and other periapical structures.

The Aim: The Aim of this study was to analyze ultrastructurally cement tissue of the root apex, after Er:YAG laser treatment of root canal.

Materials and Methods: Twenty maxillary and mandibular teeth were used in this study extracted for various reasons, and were divided into two groups. Cavity is formed in each tooth. Er:YAG laser is used for canal treatment. First group of samples (n=10) was treated with Er:YAG laser without irrigation. Second group of samples (n=10) was treated with Er:YAG laser with continuous irrigation with saline. After Er:YAG laser treatment of root canals, each root apex was cut transversely in about 4 mm length. Ultrastructural analysis of cement tissue of apical portion of the root, were done on Scanning Electron Microscope JEOL-JSM-5300.

Results: Ultrastructural analysis of the cement structure on the apex of the root after canal treatment with Er:YAG laser without water cooling indicates the modification of cellular cement with characteristic appearance in the form of slabs and cracks. Intracanal Er:YAG laser treatment with continuous water cooling doesn't change the structure of the cement tissue. Lacunae are observed in the cellular cement with several well-preserved cementocytes.

Conclusion: The intracanal Er:YAG laser treatment with continuous cooling does not change the structure of the tissue at the apex of the root. Er:YAG laser treatment without cooling modifies cement of the root apex.

Key words: laser, cement, apex, ultrastructure

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Uvod: Paste za zube su najvažnije pomoćno sredstvo za održavanje oralne higijene. Dodavanje fluorida i drugih aktivnih sastojaka u velikoj meri povećava njihov značaj u očuvanju oralnog zdravlja.

Cilj rada: Ispitivanje uticaja paste za izbeljivanje zuba i paste sa biljnim sastojcima na stvaranje dentalnog plaka i stanja zdravlja gingive.

Materijal i metode: Istraživanje je obuhvatilo 90 studenata pete godine Stomatološkog fakulteta kojima su uklonjene naslage sa zuba i uzeti anamnestički podaci. Ispitanici su podeljeni u tri grupe (n=30): 1) korisnici paste sa biljnim sastojcima 2) korisnici paste za izbeljivanje zuba i 3) kontrolna grupa. Vrednosti SILNESS-LÖE, LÖE-SILNESS i MÜHLEMANN-PBI indeksa oralne higijene su praćene nakon 7,14 i 21 dana. Ispitanici su na kraju istraživanja ocenili karakteristike pasti po traženim kriterijumima.

Rezultati: Statistički značajno smanjenje svih tri praćena indeksa oralne higijene (p<0,05), je zabeleženo kod grupe ispitanika koji su koristili pastu sa biljnim sastojcima nakon 21. dana. Ispitanici su pasti za izbeljivanje zuba dali prednost sa aspekta svih traženih kriterijuma.

Zaključak: Upotreba paste sa biljnim sastojcima je nakon 21 dana dala najbolje rezultate što je potvrđeno statistički značajnim smanjenjem vrednosti praćenih indeksa oralne higijene. Da bi se dobili verodostojniji rezultati, neophodno je izvršiti istraživanje na većem broju ispitanika i u dužem vremenskom intervalu.

Ključne reči: pasta, SILNESS-LÖE, LÖE-SILNESS, MÜHLEMANN-PBI

EFFECT OF DIFFERENT TOOTHPASTES ON DENTAL PLAQUE FORMATION AND GINGIVAL HEALTH STATUS

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Introduction: Toothpastes are the most important assistance tool for oral hygiene. Adding fluoride and other active ingredients greatly increases their importance in maintaining oral health.

The Aim: Examination of the effects of teeth whitening paste and paste with herbal ingredients on dental plaque formation and gingival health status.

Materials and Methods: The study involved 90 students of the fifth year of School of Dental Medicine, where plaque and calculus was removed from the teeth and anamnesis was taken. Subjects were divided into three groups (n = 30): 1) users of paste with herbal ingredients 2) users of teeth whitening paste and 3) a control group. Values of SILNESS-LÖE, LÖE-SILNESS and MÜHLEMANN-PBI oral hygiene indexes were observed after 7,14 and 21 days.

Results: Statistically significant reduction in all three followed indexes (p <0.05) was observed in groups of patients who used toothpaste with herbal ingredients, after 21 days.

Conclusion: Use of toothpaste with herbal ingredients after 21 days gave the best results as confirmed by statistically significant reduction in the value of followed oral hygiene indexes. In order to obtain plausible results, it is necessary to do research on a larger sample size and longer time interval.

Key words: toothpaste, SILNESS-LÖE, LÖE-SILNESS, MÜHLEMANN-PBI.

UTICAJ POSTPOLIMERIZACIONIH METODA NA MEHANIČKA SVOJSTVA AKRILATNIH MATERIJALA

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Uvod: Materijal poli (metil metakrilat) često se koristi u stomatologiji. Bez obzira na različite načine iniciranja polimerizacije akrilatnih materijala, konverzija monomera u polimer nikada nije potpuna, pa jedna količina nepolimerizovanog metil metakrilata, nazvana rezidualni monomer, zaostaje u strukturi zubne proteze. Rezidualni monomer u stomatološkim akrilatnim materijalima negativno utiče na njihova mehanička svojstva.

Cilj rada: Cilj istraživanja bio je ispitivanje uticaja postpolimerizacionih tretmana na napon gnječenja akrilatnih materijala.

Materijal i metode: Ispitivani materijal obuhvatio je 2 toplo i 2 hladno polimerizovana akrilatna materijala. Hladna polimerizacija odvijala se na sobnoj temperaturi, bez pritiska, u toku 15 minuta. Topla polimerizacija obavljena je u vodenom kupatilu, u ključaloj vodi, u trajanju od 60 minuta. Ispitivanje mehaničkih svojstava akrilatnih materijala obavljeno je pritiskivanjem u hidrauličnoj presi.

Rezultati: Postpolimerizacioni tretmani i potapanje uzoraka u vodeno kupatilo indukovali su poboljšanje mehaničkih svojstava hladno polimerizovanih akrilata. Step polimerizacije takođe zavisi i od dužine trajanja polimerizacije. Sa porastom dužine polimerizacionog ciklusa smanjuje se i količina rezidualnog monomera.

Zaključak: Postpolimerizacioni tretmani u cilju poboljšanja kvaliteta toplo polimerizovanih akrilata nisu bili potrebni.

Ključne reči: Akrilati, postpolimerizacija, napon gnječenja.

IMPACT POST POLYMERIZATION METHOD OF MECHANICAL PROPERTIES OF MATERIALS ACRYLIC

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Introduction: The material poly (methyl methacrylate) is often used in dentistry. Regardless of the different ways of initiating polymerization of acrylic material, the conversion of monomers in the polymer is never complete, and a quantity of methyl methacrylate nepolimerizovanog, called the residual monomer, the structure behind the dentures. Residual monomer in dental acrylic material adverse effect on their mechanical properties.

The Aim: The objective of this study was to investigate the impact of treatment on the voltage postpolymerization squeezing acrylic material.

Material and Methods: The examined material included two warm and two cold-cured acrylic materials. Cold polymerization was carried out at room temperature without pressure for 15 minutes. Hot polymerization was carried out in a water bath in boiling water for 60 minutes. Testing of mechanical properties of acrylic material is performed by pressing in a hydraulic press.

Results: Postpolymerization treatment and soaking the samples in water bath induced improvement of mechanical properties of cold-acrylate polymer. The degree of polymerization also depends on the length of the polymerization. With increasing length of curing cycle and reduces the amount of residual monomer.

Conclusion: Postpolymerization treatments to improve the quality of hot polymer resin were needed.

Keywords: Acrylics, postpolymerization, voltage collapse.

DENTALNA ANKSIOZOST I STRAH DECE PRE I POSLE STOMATOLOŠKE INTERVENCIJE

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Uvod: Dentalna anksioznost je često prisutna prilikom posete stomatologu i ima veliki uticaj na oralno zdravlje dece. Anksioznost predstavlja reakciju na situaciju koja dete zabrinjava ili koju dete doživljava kao pretnju i često je udružena sa nerealnim strahom od stomatološke intervencije. Zato je veoma korisno upotrebiti neki od testova za određivanje nivoa anksioznosti i staha u ordinaciji, primeren decjem uzrastu.

Cilj: Cilj rada je da se proceni nivo anksioznosti i staha od stomatološke intervencije u dece predškolskog uzrasta.

Materijal i metode: Ukupno 58 dece prosečne starosti 4.9±1.0 godina je uključeno u istraživanje. Anksioznost u dece procenjena je pre i posle stomatološke intervencije. Za procenu nivoa anksioznosti i straha korišćen je Venhamov slikovni test ili skala izraza lica (Venham Picture Test - VPT) i Dečjeg dentalnog straha slikovni test (Children's Dental Fear Picture Test - CDFPT).

Rezultati: Najveći procenat (67%) dece je pokazalo veći nivo anksioznosti pre stomatološke intervencije, dok je nakon intervencije taj procenat niži (16%). U 76% slučajeva nivo straha je bio značajno povezan sa vrstom stomatološke procedure.

Zaključak: Iščekivanje stomatološkog tretmana je stresna situacija i nivo anksioznosti u stresogenim situacijama raste. Nakon završene stomatološke intervencije deca pokazuju značajno manji nivo anksioznosti i straha nego pre intervencije, što ukazuje da dobro planiran i sproveden stomatološki tretman doprinosi budućem odnosu deteta prema stomatološkim intervencijama, a time i očuvanju oralnog zdravlja.

Ključne reči: dentalna anksioznost, strah, deca.

DENTAL ANXIETY AND FEAR IN CHILDREN BEFORE AND AFTER DENTAL INTERVENTION

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Introduction: Dental anxiety is often present during the visit to the dentist and have a major impact on oral health of children. Anxiety is a reaction to a situation that worries the child or that child is perceived as a threat and is often associated with unrealistic fear of dental procedures. It is therefore useful to use some of the tests for determining the level of anxiety and fear of surgery, adequate child growth.

Objective: The objective was to assess the level of anxiety and fear of dental procedures in children of preschool age.

Material and methods: 58 children mean age 4.59 ±1.0 years is included in the study. Anxiety in children was assessed before and after dental intervencije. Za assess levels of anxiety and fear is used the image Venham test or scale of facial expression (Venham Picture Test - VPT) and the Children's dental fear is the test image (Children's Dental Fear Picture Test - CDFPT).

Results: The highest percentage (67%) children showed higher levels of anxiety prior to dental procedures, while the intervention of the lower percentage (16%). In 76% of the level of fear was significantly associated with the type of dental procedure.

Conclusion: The anticipation of dental treatment is a stressful situation and the anxiety level in stressful situations is growing. After completing dental intervention showed children significantly lower levels of anxiety and fear is than before the intervention, suggesting that well-planned and executed dental treatment contributes to the future of the child to dental treatment, and thus the preservation of health.

Keywords: dental anxiety, fear is, children.

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Uvod: Telestomatologija je grana telemedicine i predstavlja način da se uz korišćenje telekomunikacionih i informacionih tehnologija pruže medicinske usluge bez obzira na to gde se geografski nalaze davalac usluge, pacijent, medicinska informacija ili oprema.

Cilj: Cilj ovog rada je upoznavanje sa mogućnostima telestomatologije danas.

Materijal i metode: Rad je urađen na osnovu dostupne literature i radova na temu telestomatologije.

Rezultati: Poslednjih godina pojavljuje se sve veći broj literature na temu telestomatologije, što je pokazatelj ozbiljnog razvojnog trenda ove oblasti stomatologije. Telestomatologija danas nalazi praktičnu primenu u kontinuiranoj edukaciji, brzom i olakšanoj komunikaciji stomatologa i zubotehničke laboratorije, telemonitoringu (daljinsko praćenje fizioloških parametara pacijenta), telekonzilijumima (daljinski pristup kliničkim konzilijumima).

Zaključak: Imajući u vidu širok spektar mogućnosti, za koji se kaže da je ograničen maštom, telestomatologija predstavlja novu kliničku dimenziju odnosa doktor – doctor, doctor – pomoćno osoblje i doktor - pacijent, i ubrzo bi trebalo da postane kamen temeljac nove stomatološke prakse, koji će povećati efikasnost i efektivnost oralnog zdravlja.

Ključne reči: Telestomatologija, budućnost stomatologije.

NEW CHALLENGES OF THE PROFESSION - TELEDENTISTRY

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Introduction: Teledentistry is a branch of telemedicine, representing a way of using telecommunications and information technologies to provide medical services regardless of where the service provider, patient, medical information or equipment are located geographically.

Objective: The objective of this paper is to introduce the capabilities of contemporary teledentistry.

Material and methods: The study was made on the basis of available literature and essays on teledentistry.

Results: In recent years there is more and more literature on the subject of teledentistry, which is an indication of a serious development trend in this field of dentistry. Today, Teledentistry is in practical use in continuing education, rapid communication and facilitation of dentists and dental laboratories, telemonitoring (remote monitoring of physiological parameters of patients), teleconsultations (remote access to the clinical consulting team).

Conclusion: Given the wide range of options, which is said to be limited only by the imagination, teledentistry represents a new clinical dimension of doctor-doctor, doctor-support staff and doctor-patient relationships, and should soon become the cornerstone of a new dental practice, which will increase efficiency and effectiveness of oral health.

Keywords: Teledentistry, the future of dentistry.

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Uvod: Karijes predstavlja značajan zdravstveni problem u dečjoj populaciji čija se težina kao i neophodnost mera prevencije mogu sagledati najispravnije kroz školsku stomatološku negu.

Cilj: istraživanja je bio da se utvrdi prevalencija karijesa stalnih zuba kod dece mlađeg školskog uzrasta jedne niške osnovne škole.

Materijal i metode: Stomatološki sistematski pregled je obavljen kod 288 dece u stomatološkoj ambulanti jedne niške osnovne škole. Korišćenjem Klein-Palmerovog sistema i standardnih formula za izračunavanje indeksa za procenu stanja zuba izračunat je:

Rezultati: Vrednosti Klo su se kretale, od 23,86% kod učenika prvog razreda, 43,48% u drugom razredu, 51,95% u trećem razredu, do 57,14% kod učenika četvrtog razreda. Vrednosti Klz su bile kod učenika prvog razreda 4,43%, drugog 8,12%, trećeg 8,84% i četvrtog razreda 9,77%. Vrednosti Klp-a kod učenika prvog razreda su bile 0,38% , drugog 0,96%, trećeg 1,39% i četvrtog 1,52%. Najmanji procenat karijesnih zuba u strukturi KEP-a je bio kod učenika drugog razreda 29.55% , najveći kod prvog 78.79%, kod trećeg 58.87% i četvrtog 46.15%. Najmanji procenat plombiranih zuba je bio u prvom razredu 18.18%, najveći u drugom 70.45%, u trećem 39.26% , u četvrtom 53.85%. Ekstrahovanih zuba je bilo kod učenika prvog razreda 3.03%, trećeg 1.87%, drugog i četvrtog 0%.

Zaključak: Kod dece mlađeg školskog uzrasta postoji relativno visoka prevalencija karijesa stalnih zuba, sa tendencijom porasta. Ulaganje u preventivni program i promotivne strategije u cilju očuvanja zdravlja usta i zuba školske dece je ulaganje u unapređenje oralnog zdravlja cele populacije.

Ključne reči: prevalencija, Klp, Klo, Klz, KEP.

CARIES PREVALENCE OF PERMANENT TEETH IN YOUNG SCHOOL CHILDREN IN THE ONE ELEMENTARY SCHOOL IN NIŠ

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Introduction: Dental caries is a major health problem in the pediatric population, whose weight and the need for preventive measures may be considered most proper dental care through the school.

Objective: The study was to determine the prevalence of dental caries of permanent teeth in young school children one primary school.

Methods: dental physical examination was performed in 288 children in the dental clinic one primary school. using the Klein-palmer system and the standard formula for calculating the index for evaluation the condition of teeth was calculated: KIO, PCC, Kip, KEP.

Results: Values of PCI ranged from 23.86% for first graders, 43.48% in the second grades, 51.95% in the third grades and 57.14% for fourth grades. PCC values were in first grades 4.43%, other 8.12, 8.84%, and 9.77% in fourth grades. The values of Kip in first grade were 0.38%, 0.96% of the second, third and fourth 1.39% and 1.52%. The lowest percentage of carious teeth in the structure of EPC was in second grade 29.55%, highest in the first 78.79%, 58.87% in the third and fourth 46.15%. Lowest percentage of filled teeth was in first grade, 18.18%, the second largest in 70.45%, third in 39.26%, 53.85% in the fourth. Extracted teeth were first grade students of 3.03%, 1.87% of the third, second and fourth 0%.

Conclusion: In children younger school age children there is a relatively high prevalence of dental caries of permanent teeth, with the growth. Investing in preventive programs and promotional strategies in order to maintain oral health and the teeth of school children is an investment in improving oral health of the entire population

Keywords: prevalence, Kip, KIO, KIZ, KEP

UTICAJ FIKSNOG APARATA NA STANJE PARODONCIJUMA

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Uvod: Parodoncijum i zubi su neprekidno izloženi delovanju različitih sila. Ove sile dok su fiziološke, ne izazivaju smetnje već deluju stimulatino na stanje parodoncijuma. Pod uticajem fiksnog aparata može doći do poremećaja ravnoteže usled pomeranja zuba i otežanog održavanja oralne higijene.

Cilj: Cilj istraživanja bio je ispitivanje uticaja fiksnog aparata na parodoncijum.

Materijal i metode: U istraživanju je učestvovalo 12 ispitanika, starosne dobi između 19 i 25 godina. Minimalni period nošenja fiksnog aparata bio je 6 meseci. Stanje parodoncijuma evaluirano je uz pomoć građuisane parodontalne sonde. Podaci o stanju parodoncijuma analizirani su uz pomoć parodontalnog indeksa po Ramfjordu i indeksa dentalnog plaka (po Silness-Loe). Ispitivanja su vršena bodovanjem na 6 reprezentativnih zuba. Stanje gingive za jednu osobu računato je sabiranjem dobijenih vrednosti za sve pregledane zube pa zatim deljenjem sa njihovim brojem.

Rezultati: Tokom procene stanja čitavog parodoncijuma obradom podataka dobijena je srednja vrednost od 1.07, što ukazuje na umerenu inflamaciju gingive. Prisustvo parodontalnih džepova uočeno je kod 24% ispitanika. Pri proceni nivoa održavanja oralne higijene dobijena je srednja vrednost od 1.29, što ukazuje na umerenu količinu dentalnog plaka, koja se i vizuelno može uočiti. Kod ispitanika koji su adekvatno održavali oralnu higijenu nije bilo uočeno prisustvo dentalnog plaka, niti inflamacije gingive.

Zaključak: Fiksni aparat nema direktnog uticaja na stanje parodoncijum, ali dovodi do inflamatornih promena u slučaju neadekvatnog održavanja oralne higijene.

Ključne reči: Parodoncijum, fiksni aparat, dentalni plak, inflamacija.

THE INFLUENCE OF ORTHODONTIC MOVEMENT ON PERIODONTIUM

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Introduction: Periodontium and teeth are constantly subjected to all kind forces. These forces are stimulating periodontium. In some cases they could become harmful because of bad influence of dental braces. Under the influence of the braces, it may disturb the balance of action force and difficulty in oral hygiene. Braces are also places of major accumulation of dental plaque.

The Aim: Examine the influence of dental braces on periodontium

Materials and Methods: The study included 12 patients, age between 19 and 25. minimum period of having braces was 6 months. Periodontal status was assessed using a periodontal index by Ramphord and dental plaque index by Silness-Loe. The research was doing on 6 representative teeth. Gingival condition every patient is calculated by adding the values obtained for all examined teeth and than dividing by their number.

Results: The assessment of the entire state of periodontal treatment of the data obtained the meanvalue of 1.07, indicating moderate gingival inflammation. In assessing the level of oral hygiene obtained the mean value of 1.29, indicating amoderate amount of plaque, which can be observed. In patients who maintained adequate oral hygiene was not observed the presence ofdental plaque or gingival inflammation.

Conclusion: Braces have no direct impact on the state of periodontium, but leads toinflamatory changes in the case of inadequate oral hygiene.

Key words: Periodontium, fixed apparatus, dental plaque, inflammation.

UTICAJ KONTINUIRANE EDUKACIJE NA PREVENCIJU KARIJESA I PARODONTALNIH OBOLJENJA

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Uvod: Karijes i parodontalna oboljenja su veliki problem, za stomatologiju i za celokupnu medicinu jer krajnji rezultat ovih oboljenja je gubitak zuba. Mogućnost praćenja rasprostranjenosti i rane dijagnostike svrstavaju ova oboljenja u grupu bolesti koje je moguće prevenirati.

Cilj: Ispitati, da li kontinuirana edukacija o oralnoj higijeni i adekvatnoj ishrani ima direktnog uticaja na promenu vrednosti oralnog statusa.

Materijal i metod rada: Istraživanje je sprovedeno 2010/11 godine i uključivalo je 94 učenika, starosti 12 godina, oba pola na području Severnog dela Kosovske Mitrovice. Parametri korišćeni za procenu stanja oralnog zdravlja bili su indeksi karijesnih, izvađenih i zuba plombiranih zbog karijesa (DMFT). Za procenu nivoa oralne higijene, stanja gingive i stepena inflamacije korišćeni su: plak indeks (PI) i gingivalni indeks po Löe-Silness-u i indeks krvarenja (IK) po Mühlemann-u. Ispitanici su podeljeni u dve grupe. U prvoj grupi edukacija o održavanju oralne higijene i adekvatnoj ishrani je sprovedena na početku istraživanja a u drugoj grupi izvodila se kontinuirana edukacija u roku od šest meseci.

Rezultati: Karijes indeks prosek kod ispitanika kod kojih je primenjena edukacija kretao se od 4.89-2.88, dok se kod ispitanika bez edukacije kretao od 4.62-5.77. Kod dece gde je vršena kontinuirana edukacija o važnosti oralne higijene prosečna vrednosti PI indeksa, GI indeksa i vrednosti indeksa krvarenja (IK) su se značajno promenile.

Zaključak: Stanje oralnog zdravlja kod ispitanika u ovom istraživanju nije zadovoljavajuće. Ali je dokazano da kontinuirana edukacija o važnosti oralnog zdravlja daje dobre rezultate u smislu sprečavanja nastanka oralnih oboljenja.

Ključne reči: oralno zdravlje, deca, higijena, karijes.

EFFECT OF CONTINUING EDUCATION IN CARIES PREVENTION AND PERIODONTAL DISEASE

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Introduction: Caries and periodontal diseases are a major problem for dentistry and medicine because of the overall end result of these diseases is the loss of teeth. The ability to track the prevalence of early diagnosis and classify the disease in a group of diseases that can be prevented.

The Aim: To investigate whether continuous education about oral hygiene and adequate nutrition has a direct impact on the change in the value of oral status.

Materials and methods: Survey was conducted year 2010/11 and included 94 students, aged 12 years, both sexes in the northern part of Kosovska Mitrovica. The parameters used to assess oral health indices were carious, extracted and filled teeth due to caries (DMFT). To assess the level of oral hygiene, gingival condition and degree of inflammation were used: plaque index (PI) and gingival index by Löe-Silness-in and bleeding index (IK) by Mühlemann-in. Subjects were divided into two groups. In the first group education on oral hygiene and adequate nutrition was conducted at baseline and in the second group performed the continuing education within six months.

Results: Average caries index in patients who underwent the training ranged from 4.89-2.88, whereas in patients without the training ranged from 4.62-5.77. In children, where he conducted continuing education on the importance of oral hygiene index average value of PI, GI index and bleeding index values (IK) were significantly changed.

Conclusion: Oral health status of respondents in this survey is not satisfactory. But it is proven that continuous education about the importance of oral health gives good results in terms of preventing oral diseases.

Keywords: oral health, children, hygiene, dental caries.

NIVO ZNANJA I NAVIKE U ODRŽAVANJU ORALNE HIJIGIJENE KOD DECE ŠKOLSKOG UZRASTA

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Uvod: Deca školskog uzrasta postaju motivisana za čuvanje oralnog zdravlja, jer više pažnje posvećuju estetskom izgledu.

Cilj rada: Cilj ovog rada je da se ustanovi nivo znanja i navike u očuvanju oralnog zdravlja kod dece školskog uzrasta (higijena, korišćenje fluorida i ishrana).

Materijal i metode: Istraživanje je sprovedeno u vidu ankete i obuhvatilo je pet stotina dece četvrtog i osmog razreda osnovnih škola, u kojima ne postoje stomatološke ambulante. Anketa je sadržala 28 pitanja koja su se odnosila na učestalost pranja zuba, korišćenje osnovnih i pomoćnih sredstava u održavanju oralne higijene, korišćenje fluorida, znanje o značaju šećera na pojavu zubnog karijesa, učestalost i razlog posete stomatologu.

Rezultati: Rezultati dobijeni anketom ukazuju na to da deca poseduju osnovno znanje u održavanju oralne higijene, ali to znanje nije na zadovoljavajućem nivou. Zanimljiv podatak da veliki broj ispitanice dece četvrtog razreda (70%) i osmog razreda (58%) ne zna šta su fluoridi. Anketom je ustanovljeno da deci četvrtog razreda u nešto većem procentu (36%) krvavi gingiva prilikom pranja zuba, nego deci osmog razreda (25%). Skoro 30% dece oba ispitana razreda se ne seća kada je poslednju put bila kod stomatologa.

Zaključak: Ovo istraživanje nam ukazuje da je znanje dece o značaju održavanja oralne higijene i o navikama na zadovoljavajućem nivou, ali da postoji potreba za dodatno poboljšanje i edukaciju. To se može sprovesti edukacijom dece i roditelja zajedno, ali i unapređivanjem saradnje između primarnih centara stomatološke zdravstvene zaštite i osnovnih škola.

Ključne reči: oralna higijena, navike

THE LEVEL OF ORAL HEALTH KNOWLEDGE AND HABITS IN ELEMENTARY SCHOOL CHILDREN

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Introduction: Elementary school children become more motivated to keep oral health, because they pay more attention to their aesthetics.

The Aim: The aim of this study was to assess the oral health knowledge and habits in elementary school children (hygiene, use of fluorides and nutrition).

Materials and Methods: Research was carried out with the questionnaire and it involved five hundred children of fourth and eighth grade, where schools have no dental ambulance. The questionnaire consisted of 28 questions regarding frequency of tooth brushing, use of basic and auxiliary materials for oral hygiene, use of fluoride, knowledge about importance of sugar in occurrence of tooth decay, frequency and reasons of visits to the dentists.

Results: Results obtained with questionnaire indicate that children have the basic oral health knowledge, but that knowledge is not satisfactory. Interesting fact is that great number of fourth grade children (70%) and eighth grade children (58%) don't know what fluorides are. Fourth grade children have higher percent (36%) of gingival bleeding than eighth grade children (25%). Nearly 30% of both fourth and eighth grade children can't remember when they were last time at the dentist.

Conclusion: This research indicates us that children knowledge regarding oral health and hygiene is satisfactory, but there is need for improvement and further education. This can be carried through an education of both children and parents, but also through improvement of cooperation between primary dental care centers and elementary schools.

Key words: oral hygiene, habits

ISPITIVANJE ORALNE MOTORNE FUNKCIJE I STANJA ORALNOG ZDRAVLJA KOD MENTALNO NEDOVOLJNO RAZVIJENIH LICA

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Uvod: Kod osoba sa invaliditetom se uočavaju nepovoljni epidemiološki profili, postojanje većeg broja oboljenja usta i zuba u poređenju sa opštom populacijom.

Cilj. Poređenje oralne motorne funkcije i stanja oralnog zdravlja kod mentalno nedovoljno razvijenih i zdravih osoba.
Materijal i metode. Analizirano je 40 pacijenata koji su bili ispitivani na dečjem odeljenju Klinike za stomatologiju Vojvodine u periodu 2011. - 2012. godine. Kod svakog pacijenta su analizirani KEP, plak indeks, gingivalni indeks, CPITN indeks i urađen je NOT-S test.

Rezultati. Uočena je veća zastupljenost karijesa i ekstrahovanih zuba, lošiji nivo oralne higijene, veća prevalencija gingivitisa i potrebe za ekstenzivnijim stomatološkim tretmanom kod mentalno nedovoljno razvijenih ispitanika u odnosu na kontrolnu grupu ($p < 0.05$). Problemi sa obavljanjem oralnih motornih funkcija kod mentalno nedovoljno razvijenih lica evidentirani su tokom anketiranja, što je potvrđeno i kliničkim pregledom. Znatno viši rezultati ankete i kliničkog pregleda zabeleženi su kod mentalno nedovoljno razvijenih osoba u poređenju sa kontrolnom grupom. Ova razlika je bila statistički značajna ($p < 0.05$, one-way ANOVA).

Zaključak. Postoji statistički značajna razlika u stanju oralne motorne funkcije i oralne higijene kod zdravih pacijenata i nedovoljno mentalno razvijenih pacijenata.

Ključne reči : oralna motorna funkcija, mentalno nedovoljno razvijena lica, NOT-S test

EXAMINATION OF ORAL MOTOR FUNCTION AND ORAL HEALTH IN MENTALLY CHALLENGED PERSONS

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Introduction: In people with disabilities are perceived unfavorable epidemiological profiles, the existence of large number of oral diseases in comparison with the general population.

The Aim. Comparison of oral motor function and oral health in mentally challenged and healthy individuals.

Materials and methods. We analyzed 40 patients who were examined at the Department for Pediatric and Preventive Dentistry, Dentistry Clinic of Vojvodina over the period 2011th-2012. year . Each of the patients were analyzed by DMFT, plaque index, gingival index, CPITN index, as well as NOT-S test.

Results. There was a higher prevalence of caries and extracted teeth, poorer oral hygiene, higher prevalence of gingivitis and the need for more extensive dental treatment of mentally challenged patients compared to control group ($p < 0.05$). Problems with the performance of oral motor function in mentally challenged persons were recorded during the survey, which was confirmed by clinical examination. Significantly higher results of the survey and clinical examination were recorded for mentally challenged persons in comparison with controls. This difference was statistically significant ($p < 0.05$, one-way ANOVA).

Conclusion. There was a statistically significant difference in the state of oral motor function and oral hygiene in healthy patients and insufficiently developed mental patients.

Key words : oral motor function, mentally underdeveloped person, NOT-S test

MOGUĆNOST EKSTRAKCIJE DONJIH MOLARA PRIMENOM TERMINALNE ANESTEZIJE

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Uvod: Lokalna anestezija je postupak kojim se postiže reverzibilni osećaj gubitka bola u anatomski ograničenom predelu organizma. Terminalna anestezija se postiže ubrizgavanjem lokalnog anestetičkog rastvora u predeo terminalnih grana pojedinih nerava i njena primena najčešće je indikovana u gornjoj i u frontalnom segmentu donje vilice.

Cilj rada: Ispitati subjektivni bol pacijenta pri odvajanju epitelne insercije i pri ekstrakciji donjih molara nakon date terminalne anestezije, obzirom na hemijska svojstva primenjenih anestetika.

Materijal i metode: Ispitivanjem je planirano je da bude obuhvaćeno 20 pacijenata sa indikacijom ekstrakcije donjeg prvog ili drugog molara. Pacijentima je aplikovan anestetik metodom terminalne anestezije. Korišćene su dve vrste anestetika, Lidocaine hydrochloride 2% sa adrenalinom i Articaine hydrochloride 4% sa epinefrinom. Nakon aplikovanja anestetika karpul brizgalicama, ispitivan je subjektivni intenzitet bola pri odvajanju epitelne insercije i ekstrakcija zuba. Od instrumenata su korišćene donje Bajnove i Krijerove poluge, donja molarna i donja korenska klešta.

Rezultati: Tokom odvajanja epitelne insercije, kod svih dosadasnjih 8 pacijenata, koristeći unakrsno oba anestetika, bol se nije pojavio. Prilikom ekstrakcije zuba, kod pacijenata kod kojih je aplikovan lidoćain, u 3 slućaja se pojavio bol, a samo u jednom ne. Pacijentima kojima je aplikovan articain, bol se javio samo jednom, dok se u ostala tri slućaja postigla bezbolnost.

Zaključak: S obzirom na mali broj ispitanika u ovom trenutku, ne možemo izvesti definitivan zaključak o primeni ove metode, ali možemo tvrditi da je u većini slućajeva kada je aplikovan articain metodom terminalne anestezije pri ekstrakciji donjih molara postignuta apsolutna bezbolnost.

Ključne reći: donji molari, terminalna anestezija, ekstrakcija.

POSSIBILITY OF LOWER MOLARS EXTRACTION USING TERMINAL ANESTHESIA

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Introduction: Local anesthesia is a procedure that achieves a reversible loss of sense in a limited anatomically area of the organism. The terminal anesthesia is achieved by injecting anesthetic solution in the area of terminal branches of individual nerves and its implementation is usually indicated in the upper, and in the frontal segment of the mandible.

The aim: To examine the patient's subjective pain during the separation of the epithelial insertion and during and the extraction of mandibular molars after anesthetic was administered by terminal method.

Material and methods: This testing has planned to include 20 patients with indication of extraction of extraction of mandibular first or second molars. Method of terminal anesthesia was used, two types of anesthetic: 2% Lidocaine hydrochloride with adrenaline 1:80 000 and 4% Articaine hydrochloride with 1:100 000 epinephrine. Subjective pain intensity was tested during separation of epithelial insertion and teeth extraction. Mandibular extraction forceps and dental elevators were used for separation of epithelial insertion and tooth extraction.

Results: During the separation of epithelial insertion, neither of eight patients felt pain. During teeth extraction 3 patients felt pain where Lidocain was administered. The patients who were administered articain, the pain occurred only once, while the other three cases were painless.

Conclusion: Considering the small number patients at the moment, we cannot perform a definitive conclusion, but in most cases when the articain is applied using the terminal anesthesia method during the extraction of mandibular molars an absolute painlessness is achieved.

Keywords: lower molars, terminal anesthesia, extraction.

PROFILAKTIĆKA PRIMENA NIMESULIDA ZA KONTROLU POSTOPERATIVNOG BOLA NAKON HIRURŠKOG VAĐENJA UMNJAKA

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Uvod: Profilaktička primena analgetika podrazumeva uzimanje analgetika jedan sat pre hirurške intervencije da bi se ovim načinom sprećilo nastajanje većeg broja lokalnih faktora, medijatora, odgovornih za postoperativno nastajanje bola.

Cilj rada: Cilj ovog rada je bio da se ispita da li profilaktička primena nimesulida, nesteroidnog antiinflamatornog leka, može da redukuje pojavu postoperativnog bola.

Materijal i metode: U kliničkom ispitivanju bilo je uključeno 30 zdravih ispitanika sa hirurškim vađenjem donjih impaktiranih umnjaka u lokalnoj anesteziji postignutoj 4% artikainom sa adrenalinom. Ispitanici su bili podeljeni u 2 grupe; I) nimesulid dat jedan sat pre hirurške intervencije, i II) nimesulid dat jedan sat posle završene intervencije (100 mg per oralno).

Rezultati: Dobijeni rezultati nisu pokazali znaćajnu razliku u vremenu nastanka prvog bola, kao i u vremenu kada je uzet prvi dodatni analgetik, bez obzira da li je nimesulid ordiniran jedan sat pre intervencije ili u istom vremenskom intervalu posle intervencije. Znaćajno manji broj pacijenata je uzimao analgetike u obe ispitivane grupe u odnosu na ukupan broj pacijenata. Ukupan broj dodatnih analgetika se nije znaćajno razlikovao između ispitivanih grupa.

Zaključak: Nimesulid dat jedan sat pre i jedan sat posle hirurškog vađenja donjih impaktiranih umnjaka može da postigne očekivani, uspešni, profilaktički analgetički efekat pošto se ordinira pre uobićajene pojave postoperativnih bolova.

Ključne reći: profilaktička primena analgetika, nimesulid, umnjaci

PROPHYLACTIC USE OF NIMESULIDE FOR CONTROL OF POSTOPERATIVE PAIN AFTER SURGICAL EXTRACTION OF THIRD MOLARS

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Introduction: Prophylactic use of analgesic means taking analgesic one hour before surgical intervention to prevent formation of large number of local factors, mediators, responsible for postoperative pain.

The Aim: The aim of this work was to examine whether prophylactic use of nimesulide, nonsteroidal anti-inflammatory drug, could reduce appearance of postoperative pain.

Materials and Methods: In clinical trials 30 healthy subjects were included, who had surgical extraction of lower impacted third molar in local anesthesia with 4% articaine with adrenaline. Subjects were divided into 2 groups I) nimesulide given one hour before surgery, and II) nimesulide given one hour after completed intervention (100mg oral).

Results: The results showed no significant difference in the time of the first occurrence of pain, as well as the time when the first additional analgetic was taken, whether nimesulide was prescribed one hour before the intervention or at the same time interval after the intervention. Significantly fewer number of patients were taking analgesics in both group, compared to the total number of patients.

Conclusion: Nimesulide given one hour before and one hour later after surgical extraction of lower impacted molars can achieve expected, successful prophylactic analgesic effect when is given before usual postoperative pain.

Keywords: prophylactic use of analgesics, nimesulide, third molars

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Uvod: Jedan od terapijskih modaliteta u sanaciji krezubosti je i parcijalna proteza. U okviru faktora koji utiču na indikaciju i plan terapije parcijalnom protezom izdvaja se biološka vrijednost retencionih zuba, koja je određena njihovom morfologijom i položajem. Retencioni zubi moraju biti pripremljeni za nošenje elemenata parcijalne proteze.

Cilj rada: Cilj rada je bio ispitati promjene položaja retencionih zuba, dubinu podminiranosti na kojoj se nalazi retencioni element, kao i postojanje adekvatne protetske pripreme retencionog zuba.

Materijal i metod: Analizirano je 50 modela krezubih vilica različitih klasa krezubosti, odn. 149 retencionih zuba. U paralelometru su mjerene dubina podminiranosti, rotacija, inklinacija i migracija. U artikulatu je analiziran položaj retencionih zuba u odnosu na okluzalnu ravan. Takođe, evidentirano je prisustvo protetske pripreme retencionih zuba, tip indikovane nadoknade, i vrsta retencionog elementa.

Rezultati: Rotiralo je 26% ispitivanih retencionih zuba, inkliniralo 22,6%, a migriralo 9,1%. Elongirano je 43,6%. Samo 23,9% retencionih zuba je protetski pripremljeno, dok se samo 12,6% retencionih elemenata se nalazi na adekvatnoj dubini podminiranosti.

Zaključak: Statistički je značajan procenat zuba koji rotiraju, inkliniraju, i elongiraju, dok je za migraciju taj procenat manji. Kod malog procenta retencionih zuba postoji protetska priprema. Značajan broj retencionih elemenata je smješten u neodgovarajućim dubinama podminiranosti.

Ključne riječi: parcijalne proteze, retencioni zubi, položaj

THE ANALYSIS OF RETENTION TEETH POSITION IN PARTIALLY DENTAL PATIENTS

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Introduction: Partial denture is a therapy modality in treating partially edentulous conditions. One of the factors that influence the indication and the therapy plan for a partial denture is the biological value of retention teeth.

The Aim: The aim of the study was to determine changes in retention teeth position, also the size of an undercut where the retention element is placed, as well as the existence of an adequate prosthetic preparation of a retention tooth.

Materials and Methods: 50 models of partially edentulous jaws, or 149 retention teeth, were analysed. Size of an undercut, rotation, inclination and migration were measured in parallelometer. The retention teeth position was compared to the level of occlusal plane in articulator. Furthermore, the existence of an adequate prosthetic preparation of a retention tooth.

Results: 26% of analysed retention teeth had rotated, 22,6% had inclined, 9,1 % had migrated, and 43,6% had elongated. Just 23,9% of retention teeth had prosthetic preparation.

Conclusion: There is a statistic significance of rotated, inclined and elongated retention teeth, whereas that percent is smaller for migration. A small number of retention teeth is prosthetically prepared. A significant number of retention elements is located in an inadequate undercut size.

Key words: partial denture, retention teeth, position

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Uvod: Periodontalna ligamentarna (PLA) ili intraligamentarna anestezija je koristan dodatak za suprapariostalnu anesteziju ili blok anesteziju. Indikacije za korišćenje ove tehnike su potreba za anesteziju pojedinačnog zuba, potreba za anesteziju mekih tkiva u neposrednoj blizini jednog zuba. PLA anestezija je efikasna i lako se izvodi.

Cilj rada: Cilj ove studije je bio da se proceni uspešnost primene periodontalne ligamentarne anestezije u regiji premolara u gornjoj vilici sa obe strane.

Materijal i metode: Studija je izvedena na 32 ispitanika. Posebno pripremljen upitnik je postavljen svakom ispitaniku. Za izvođenje PLA igla izbora je bila kratka igla, 27 G (gejdza), a koristila se karpul brizgalica. Širina anestetičkog polja, merena u milimetrima, merena je 5 i 10 min nakon primene anestezije uz pomoć fleksibilnog lenjira i "pin-prick" testa. Vitalitet zuba se merio uz pomoc testa vitaliteta.

Rezultati: Test vitaliteta je bio negativan posle 10 min kod 90.8 % ispitanika. Srednja vrednost za nivo bola kod svih ispitanika je bila 13.2%. Srednja vrednost širine anestetičkog polja nakon 5 min iznosila je 10 mm, a nakon 10 min iznosila je 20 mm.

Zaključak: Primenom periodontalne ligamentarne anestezije postiže se bezbolnost prilikom ekstrakcije premolara u gornjoj vilici i nema neželjenih anestetičkih dejstava.

Ključne reci: Periodontalna ligamentarna anestezija, ekstrakcija zuba, anesteticki parametri.

APPLICATION PERIODONTAL LIGAMENTAR ANESTHESIA FOR THE UPPER PREMOLARS

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Introduction: Periodontal ligamentar (PLA) or intraligamentar anesthesia is a useful addition to suprapariosteal anesthesia or block anesthesia. Indications for use of this technique are the need for anesthesia individual teeth, the need for anesthesia of the soft tissue near a tooth. PLA anesthesia is effective and easy to perform.

The Aim: The objective of this study was to evaluate the efficacy of periodontal ligamentar anesthesia in premolar region of the upper jaw on both sides.

Materials and Methods: The study was performed on 32 subjects. Specially designed questionnaire was posted to each respondent. For conducting PLA needle of choice was a short needle, 27 G (Gage) and karpul syringe was used. Width anesthetic field, measured in millimeters, was measured 5 and 10 min after administration of anesthesia using a flexible ruler and "pin-prick" test. Vitality of the tooth was measured by tests of vitality.

Results: The vitality test was negative after 10 min in 90.8% of respondents. The level of pain for all patients was 13.2%. The mean width of the field after 5 min was mm, and after 10 min was mm.

Conclusion: Using periodontal ligamentar anesthesia painless is achieved for the extraction of premolars in the upper jaw and there are no side effects of anesthetic.

Keywords: Periodontal ligamentar anesthesia, extractions, anesthetic parameters.

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Uvod: Svedoci smo enormne ekspanzije Interneta u svim porama života. Osim za komunikaciju i zabavu, Internet među studentima stomatologije sve više postaje popularan i kao edukacioni resurs. Brojni specijalizovani sajtovi sa aktivnim pretragama čine dostupnom široku oblast stomatologije i oralne hirurgije. Najnovija saznanja i naučna dostignuća iz ovih oblasti, danas se prvo predstavljaju na Internetu, a brojni relevantni naučni časopisi svoja izdanja baziraju samo na elektronskoj formi dostupnoj jedino preko Interneta.

Cilj rada: Cilj ovog rada je bio da ispita stav studenata stomatologije Medicinskog fakulteta u Prištini o Internetu, kao edukacionom resursu u savladavanju gradiva oralne hirurgije.

Metode: Upitnici su distribuirani studentima četvrte i pete godine stomatologije na Medicinskom fakultetu Priština – Kosovska Mitrovica.

Rezultati: Ukupno je ispitano 52 studenta. Svi studenti (100%) su se izjasnili da koriste Internet i da imaju pristup sa mesta odakle uče. Svi studenti (100%) su do sada koristili Internet za dobijanje edukacionih informacija i razjašnjenje nejasnoća iz oralne hirurgije i stomatologije. Da je potpuno jednostavno doći do tražene informacije stav je 34 (65.4%) studenta, 18 (34.6%) studenata misle da je to umereno teško. Petnaest (28.9%) studenata je stava da se ekspresno mogu naći potrebni edukacioni resursi, dok je 37 (71.1%) stava da je ipak potrebno odvojiti izvesno vreme za pretragu. U proceni pouzdanosti dobijenih informacija, 14 (26.9%) studenata procenjuje ove informacije potpuno pouzdanim, dok 38 (73.1%) procenjuje ih kao delimično pouzdane. Da su dobijene informacije potpuno kompletne stav je 6 (11.5%) studenata, da su dovoljne za razjašnjenje, ali ne kompletne stav je 26 (50%) studenata, da su informacije samo delimično dovoljne stav je 16 (30.7%) studenata i da su nedovoljne za učenje stav je 4 (7.8%) studenta. Svi studenti (100%) su stava da im je posebno značajno što mogu vizuelno da razjasne gradivo koje nije šematizovano u udžbeniku. Kao sajtove od posebne pomoći u savladavanju gradiva naveli su youtube.com 40 (76.9%), belimantil.com 7 (13.5%) i wikipedia.com 5 (9.6%).

Zaključak: Na osnovu dobijenih rezultata možemo zaključiti da studenti stomatologije Medicinskog fakulteta u Prištini veoma aktivno koriste Internet u savladavanju gradiva oralne hirurgije i da im to predstavlja važan edukacioni resurs u procesu učenja.

Ključne reči: internet, edukacija, oralna hirurgija.

INTERNET IN THE EDUCATION OF STUDENTS IN ORAL SURGERY

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Introduction: We are witnessing an enormous expansion of the Internet in all parts of life. Young people quickly accept it and enjoy the numerous benefits that stem from there. Except for the communications and entertainment, the Internet among dental students is becoming increasingly popular as an educational resource. A number of specialized sites with active texts are available to a wide field of dentistry and oral surgery. The latest scientific discoveries and achievements in these areas today are the first on the Internet, a number of relevant scientific journals based their publications only available in electronic form only over the Internet.

The Aim: The aim of this study was to examine the attitude of dental students of the Medical Faculty in Pristina on the Internet as an educational resource in mastering oral surgery.

Methods: Questionnaires were distributed to students of the fourth and fifth year of dentistry at the Medical Faculty of Pristina - Kosovska Mitrovica.

Results: The total of 52 students. All students (100%) declared to use the Internet and have access to places where they learn. All students (100%) have so far used the Internet to obtain educational information and clarification of ambiguities in oral surgery and dentistry. That is very easy to get to the information requested position is 34 (65.4%) students, 18 (34.6%) of students think that it is moderately difficult. Fifteen (28.9%) of students believes that the Express can find the necessary educational resources, while 37 (71.1%) position that is still necessary to take some time to search. In assessing the reliability of the information obtained, 14 (26.9%) students assess these information completely reliable, whereas 38 (73.1%) as estimated by partially trusted. That the information received is completely full paragraph 6 (11.5%) students, that are sufficient to clarify, but not a complete view of 26 (50%) students, the information is only partially sufficient attitude is 16 (30.7%) and students to be inadequate learning attitude is four (7.8%) students. All students (100%) have the attitude that they are particularly important to be able to visually clarify the material that is schematized in the textbook. As sites of special help in mastering led youtube.com 40 (76.9%), belimantil.com 7 (13.5%) and wikipedia.com 5 (9.6%).

Conclusion: We conclude that dental students of the Medical Faculty in Pristina actively use the Internet in mastering oral surgery and give them to an important educational resource in the learning process.

Keywords: internet, education, students, oral surgery.

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Uvod: Mini dentalni implantati se uglavnom koriste za stabilizaciju donjih totalnih proteza, što se postiže postavljanjem 4 implantata u interforamini region mandibule. Specifična struktura kosti u ovom regionu povećava rizik od nastanka pregrevanja tkiva za vreme ugradnje implantata. Temperatura od 47^o u toku 1 minuta može dovesti do osteonekroze, i prouzrokovati neuspeh oseointegracije.

Cilj: Cilj ovog "in vitro" istraživanja je ispitivanje promene temperature kosti u toku ugradnje mini dentalnih implantata.

Materijal i metode: Svih 56 merenja temperaturnih promena je vršeno u vodenom kupatilu da bi se simulirali "in vivo" uslovi. Mini dentalni implantati dijametara 1.8mm, 2.1mm, 2.4mm i dužina 10mm, 13mm, 15mm i 18mm ugrađivani su u goveđa rebra koja su simulirala kost mandibule. Kost je preparisana uz pomoć fiziodispenzera, a isti pilot borer upotrebljen je za sve implantate, nezavisno od dijametra i dužine. Identična pozicija preparacije za implant, kao i za termoparove postignuta je korišćenjem metalnog šablona. Temperatura kosti je merena pomoću 3 termopara vertikalno postavljena oko svakog implantnog ležišta na udaljenosti 0,5mm od preferije implantata na 3 dubine.

Rezultati: Sve izmerene temperature su bile u okviru dozvoljenih vrednosti. Duži implantati su stvarali veće temperature nezavisno od njihovog dijametra.

Zaključak: Dužina mini dental implantata je faktor koji ima veći uticaj na zagrevanje kosti u poređenju sa dijametrom implantata.

Ključne reči: mini dental implant, zagrevanje kosti

THE INFLUENCE OF MINI DENTAL IMPLANTS MACRODESINE ON THE BONE TEMPERATURE CHANGES DURING MINI DENTAL IMPLANT PLACEMENT

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Introduction: Mini dental implants are commonly used to stabilize lower complete denture and it requires placement of 4 implants in the interforaminal region of the mandible, composed of dense bone. Such structure of the bone increases the possibility of tissue overheating during mini dental implants placement. Temperature of 47°C for 1min induces bone tissue necrosis and leads to osseointegration failure

The Aim: The aim of this "in vitro" study was to investigate bone thermal changes during mini dental implant placement.

Materials and Methods: All 56 temperature measurements were done in water bath to simulate in vivo conditions. Mini dental implants with diameters of 1.8mm, 2.1mm and 2.4mm and lengths of 10mm, 13mm, 15mm and 18mm were placed in bovine ribs that simulated human mandibular bone. Temperature of bone was measured by 3 thermocouples vertically inserted around each implant site, at distance of 0.5mm from implant's periphery and at 3 depths: coronal, middle and apical third of the osteotomy.

Results: All temperatures were in safe range. Longer implants produced a higher temperature regardless of the implant diameter.

Conclusion: Length of mini dental implant is a factor that has a higher impact on bone temperature compared with implant diameter.

Key words: mini dental implants, bone temperature changes.

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Uvod: Početna karijesna lezija ili "bela mrlja" (WSL) predstavlja prvi vizuelni klinički prikaz karijesa i karakteriše se demineralizacijom potpovršinske gledi. Kada se koriste u kombinaciji sa drugim preventivnim merama, fluoridni preparati su u stanju da remineralizuju početne karijesne lezije, spreče stvaranje kaviteta i na taj način neoperativno zaustave karijes.

Cilj rada: Utvrditi terapijski efekat 2 visoko koncentrovana preparata fluorida (gel i lak) na aktivne WSL, razliku u efikasnosti i da li postoji različita procentualna zastupljenost WSL po grupama zuba kod ortodontski tretiranih i netretiranih pacijenata.

Materijal i metode: Od 65 pregledane dece, uzrasta $14,78 \pm 1,74$ godina, kod 15 su detektovane početne karijesne lezije. Lezije su dijagnostikovane ako su se nalazile pored gingive ili nedavno uklonjenih breketa i ocenjene na osnovu WSL-Indeksa. Ispitanici su metodom slučajnog izbora podeljeni u 2 test grupe. Aplikacije su vršene jednom nedeljno u periodu od mesec dana Fluor Protector lakom i Fluorogal Forte gelom. Za statističku analizu korišćen je χ^2 test.

Rezultati: Procentualna zastupljenost početnih karijesnih lezija prema grupama zuba kod ortodontski tretiranih i netretiranih pacijenata u našem uzorku nije statistički značajna. Oba preparata su pokazala efikasnost sa statistički značajnom razlikom između prvog i pregleda nakon mesec dana, ali nije postojala značajna razlika između preparata.

Zaključak: Na osnovu dobijenih rezultata može se zaključiti da ne postoji značajna razlika između ortodontski tretiranih i netretiranih pacijenata. Preparati fluora su pozitivno delovali na aktivne WSL bez razlike u efikasnosti između korišćenih preparata.

Ključne reči: početne karijesne lezije; WSL; fluoridni preparati;

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Uvod: Gingivalne recesije (GR) su patološke tvorevine nastale pomeranjem gingivalne ivice apikalno od cementnogledne granice. Javljaju se u osoba sa dobrom, ali i u osoba sa lošom oralnom higijenom. Ipak, smatra se da je neadekvatna tehnika pranja zuba osnovni uzrok GR zbog konstantne traume, koja vodi oštećenju epitela. Međutim, faktori koji dovode do razvitka malih bezopasnih lezija gingive u GR još uvek ostaju nerazjašnjeni, a nalazi kontraverzni.

Cilj: Utvrditi učestalost i veličinu GR u studenata stomatologije i proceniti potencijalnu ulogu tehnike pranja zuba u nastanku neinflamatornih, lokalizovanih recesija gingive.

Materijal i metode: U istraživanju su učestvovali studenti Univerziteta u Nišu, Medicinskog fakulteta, odsek stomatologija. Nakon popunjavanja ankete urađen je klinički pregled pri kome je određen nivo oralne higijene, status zuba i zabeleženo prisustvo i veličina GR.

Rezultati: GR su uočene u 59 (64.83%) studenata, odnosno u 184 (6.74%) prisutnih zuba. 9 (9.78%) studenata je koristilo tvrdu četkicu za zube i svi su imali GR. Jači pritisak pri pranju zuba primenjivala su 23 (25%) studenata, a statistička analiza je pokazala zavisnost prisustva GR od jačine pritiska pri pranju zuba GR.

Zaključak: Gingivalne recesije su veoma česte u studenata stomatologije. Neadekvatno pranje zuba upotrebom čvrste četkice za zube uz pojačan pritisak za vreme pranja zuba dovodi do češće pojave gingivalnih recesija. Neophodna je konstantna edukacija i motivacija studenata sa ciljem odabira pravilne tehnike pranja, postizanja dobrog nivoa oralne higijene, ali i sprečavanja oštećenja parodonta.

Ključne reči: gingivalne recesije, studenti, pranje zuba

THERAPEUTIC EFFECT OF FLUORIDE PREPARATIONS ON ACTIVE INCIPENT CARIES LESIONS

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Introduction: White spot lesions (WSL) represent the first clinical observation of caries and it is characterized by enamel demineralization of the subsurface. Fluoride preparations can reverse the demineralization process of WSL, when are combined with other preventive measures and so non-operatively stop the caries.

The Aim: The aim of this study was to evaluate the therapeutic effect of two high concentration fluoride preparations (gel and varnish) on active WSL, the difference in efficiency and if there was different percentage representation of WSL by groups of teeth in orthodontically treated and untreated patients.

Material and methods: From 65 examined children, aged 14.78 ± 1.74 years, at 15 of them WSL were detected. The diagnosed lesions were located next to the gingiva or recently removed brackets and evaluated on the basis of WSL-Index. Subjects were randomly divided into two test groups. Applications were made once a week for one month with Fluor Protector varnish and Fluorogal Forte gel. For statistical analysis, χ^2 test was used.

Results: Percentage of WSL according to the groups of teeth in orthodontically treated and untreated patients in our sample was not statistically significant. Both preparations showed the efficiency with statistically significant difference between the first and examination after one month, but there was not significant difference between preparations.

Conclusion: Based on these results it can be concluded that there was not significant difference between orthodontically treated and untreated patients. Fluoride preparations had positive influence on active WSL without difference in efficiency between used preparations.

Key words: incipient caries lesion; WSL; fluoride preparations;

THE FREQUENCY OF GINGIVAL RESESIONS IN DENTAL STUDENTS

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Introduction: Gingival recession (GR) is defined as the displacement of the gingival margin apical to the cemento-enamel junction. Inadequate washing technique is the main cause of GR due to the constant trauma, which leads to damage of the epithelium. The factors that lead to the development of small benign lesions of the gingiva in GR still remains unresolved and controversial.

The Aim: The aim of the study was to determine the frequency and size of the GR in dental students and assess the potential role of tooth brushing techniques in the development of noninflammatory, localized gingival recession.

Materials and Methods: The study involved students of the University of Nis, Faculty of Medicine, Department of Dentistry. After completing the survey, a clinical examination was done which consisted of determining the level of oral hygiene, dental status and the presence and size of the GR.

Results: GR were observed in 59 (64.83%) students, and in 184 (6.74%) present teeth. 9 (9.78%) students were using a hard toothbrush and all of them had GR. 23 (25%) students applied increased pressure while brushing teeth, and a statistical analysis showed the presence of GR depending on the strength of the pressure while brushing teeth GR.

Conclusion: GR are very common in dental students. Inadequate brushing technique using too hard toothbrush with increased pressure leads to more frequent occurrence of GR. A constant education and motivation of students are necessary in order to prevent periodontal defects.

Key words: gingival recessions, students, toothbrushing

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Uvod: Sluzokoža usne duplje, jezika i usana u dece je izložena dejstvu brojnih negativnih uticaja koji mogu prouzrokovati razne patološke promene na njoj.

Cilj rada: Cilj istraživanja bio je da se utvrdi prevalenca oboljenja mekih tkiva usne duplje, jezika i usana kod dece nižih razreda osnovnih škola u Nišu.

Materijal i metode: Stomatološkim pregledom obuhvaćeno je 317 dečaka i 287 devojčica uzrasta od 6-11 god. Ovaj uzorak čini 10% školske dece ovog uzrasta, na teritoriji grada Niša. Metodologija korišćena za istraživanje je obuhvatala popunjavanje ankete za utvrđivanje stanja oralnog zdravlja prema preparuci SZO.

Rezultati: Najviši procenat dece sa razvojnim anomalijama jezika pripada oboljenu Lingua plicata 5.63%. Ovo oboljenje je najzastupljenije u IV razredu (8.55%), dok su u III razredu najzastupljenija oboljenja Lingua Geographica i Ankyloglosia u istom procentu, 4.49%. Ispitivanja stanja zdravlja usana su pokazala da je procenat obolelih od Cheilitis exfoliativa viši (39.24%), u odnosu na broj obolelih od Cheilitis angularis-a (4,14%). Najveća procentualna zastupljenost je registrovana u IV razredu za oboljenje Cheilitis exfoliativa (47.36%), a u I razredu za oboljenje Cheilitis angularis (7.14%).

Zaključak: Rezultati ove studije pokazali su da su promene na jeziku i usnama relativno česte kod dece nižih razreda osnovnih škola u Nišu, Srbija. Iz tih razloga zdravstvena edukacija i dobra oralna higijena će sigurno pomoći da se poboljša stanje zdravlja usne duplje kod dece mlađeg školskog uzrasta.

Glavne reči: deca, oboljenja jezika, oboljenja usana

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Uvod: Alveolit je najčešća postoperativna komplikacija koja se javlja 2-4 dana nakon ekstrakcije. U terapiji se primenjuju različiti medikamenti koji deluju analgetično.

Cilj: Ispitati efekte lokalne primene deksametazona u terapiji alveolita.

Materijal i metode: Ispitivanjem je obuhvaćeno 18 pacijenata koji su bili podeljeni u dve grupe. Kontrolnu grupu je činilo 13 pacijenata kod kojih je nakon kiretiranja alveole i ispiranja fiziološkim rastvorom aplikovan Alvogyl. Eksperimentalnu grupu je činilo 5 pacijenata kod kojih je nakon kiretiranja alveole i ispiranja fiziološkim rastvorom aplikovana jodoform traka koja je bila natopljena deksametazonom. Tokom trajanja terapije svakodnevno su vršene serije aplikovanja ovih lekova sve do potpunog odsustva bola. Tokom ispitivanja određivana je verbalno-analogni i vizuelno-analogni skala intenziteta bola kao i prisustvo komplikacija u toku lečenja.

Rezultati: Prvog dana nakon otpočinjanja terapije intenzitet bola u kontrolnoj grupi opao je za 30 mm VAS, a u eksperimentalnoj grupi za 52 mm VAS. Petog dana od otpočinjanja terapije svi pacijenti iz eksperimentalne grupe bili su bez bola, dok je u kontrolnoj grupi intenzitet bola iznosio 14,75 mm VAS. Srednje vreme trajanja terapije kod pacijenata iz kontrolne grupe iznosilo je 9,2 dana, a kod pacijenata eksperimentalne grupe 4 dana.

Zaključci: Dobijeni rezultati sugerišu da bi lokalna primena deksametazona mogla da bude korisna u lečenju alveolita.

Glavne reči: alveola, ekstrakcija zuba, komplikacije, deksametazon.

THE PREVALENCE OF SOFT ORAL TISSUE DISEASES IN YOUNGER SCHOOLCHILDREN IN NIŠ

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Introduction: The oral mucosa, tongue and lips in children are exposed to many negative influences which can cause various pathological changes in it.

The Aim: The aim of the study was to determine the prevalence of the tongue and lips oral soft-tissue diseases: in lower grades children, of primary schools in Niš.

Materials and methods: Oral examination included 317 boys and 287 girls, 6-11 years old. This sample represented 10% of school children at this age, in the city of Niš. The methodology used for the study included filling out the questionnaire to determine the state of oral health as recommended by WHO.

Results: The highest percentage of children with development anomalies of tongue belong with the Lingua plicata 5,63%. This disease is most prevalent in the fourth grade (8,55%), while in the third grade, the most common diseases are Lingua geographica and Ankyloglosia in the percentage of (4,49%). Examinations of the lips showed that the percentage of patients with Cheilitis exfoliativa is higher (39,24%) compared to the number of patients with Cheilitis angularis (4,14%). The highest percentage was registered in the fourth grade for Cheilitis exfoliativa (47,36%), and in the first grade for Cheilitis angularis (7,14%).

Conclusion: The results of this study showed that changes on the tongue and the lips are relatively frequent in the children in lower grades of primary schools in Niš, *Srbija*. For these reasons, health education and good personal hygiene will definitely help to improve the health status of school children.

Key words: children, tongue diseases, lip diseases.

EFFECT OF THE LOCAL ADMINISTRATION OF THE DEXAMETHASONE IN THE TREATMENT OF THE DRY SOCKET

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Introduction: Dry socket is the most common postoperative complication that occurs 2-4 days after tooth extraction. Different medications with analgetic effect are used for treatment.

The aim: To examine effects of local administration of dexamethasone in the treatment of dry socket.

Materials and Methods: This study involved 18 patients who were divided into 2 groups. The control group consisted of 13 patients. After curettage of the alveolus and rinsing with saline solution Alvogyl dressing was applied. The experimental group consisted of 5 patients. After curettage of the alveolus and rinsing with saline solution, they were treated with iodine strip soaked with dexamethasone. During the therapy, daily administration of these medications were made in order to achieve complete absence of the pain. Verbal analogue and visual analog scale were used to assess intensity of pain and occurrence of postoperative complications was registered.

Results: On the first day of treatment intensity of pain in the control group decreased by 30 mm of VAS compared to 52 mm of VAS in the experimental group for. On the third day of treatment all patients in the experimental group were free of pain, while in the control group, intensity of pain was 14,75 mm of VAS. Mean duration of treatment for patients in the control group was 9,2 days, and in the experimental group 4 days.

Conclusion: The results suggest that local application of dexamethasone may be useful in the treatment of dry socket.

Key words: socket, tooth extraction, complications, dexamethasone.

Mogućnosti stomatološkog zbrinjavanja osoba sa autizmom

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Uvod: Autizam je razvojni poremećaj definisan kao značajno oštećenje u socijalnoj interakciji i komunikaciji, neobičnom obrascu ponašanja i interesovanja. Autizam ne uzrokuje specifične promene u usnoj duplji. Usled neredovnog i nepravilnog održavanja oralne higijene dolazi do nakupljana zubnog plaka, zubnog kamenca i nastanka karijesa.

Cilj: Ispitati mogućnosti stomatološkog zbrinjavanja pacijenata sa autizmom.

Materijal i metode: Izvršena je retrospektivna analiza podataka na Klinici za stomatologiju Vojvodine, kojom je obuhvaćeno 48 pacijenata sa dijagnostikovanim autizmom, od januara 2007. do januara 2012. godine. U zavisnosti od mogućnosti uspostavljanja saradnje sa pacijentima, stomatološki tretman se sprovodio ambulantno, u opštoj anesteziji ili kombinovanjem ove dve metode.

Rezultati: Ispitivanje obuhvata 40 (83,33%) pacijenata muškog i 8 (16,67%) pacijenata ženskog pola. Pored dijagnostikovano autizma kod pacijenta se uočava najveća zastupljenost psihomotorne retardacije. Ukupni KEP iznosi 322. Kod 16 (33,33%) pacijenata vid lečenja bio je samo ambulantno, dok je kod 15 (31,25%) pacijenata bio pod opštom anestezijom, a kod 17 (35,42%) kombinovanjem ove dve metode. Najčešći vid stomatoloških intervencija je ekstrakcija zuba sa 51,14%. Prosečni broj poseta pacijenata lečenih samo ambulantno je 8,38, dok je prosečan broj pacijenata pre uvođenja u opštu anesteziju i pokušaja sanacije ambulantno 3, 24.

Zaključak: Autistične osobe je moguće lečiti ambulantno. Operativno lečenje uz uvođenje u opštu anesteziju treba razmatrati na individualnom nivou.

ključne reči: autizam, stomatološki tretman

DENTAL SOLUTIONS FOR AUTISTIC PEOPLE

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Introduction: Autism is a disorder of neural development characterized by impaired social interaction and communication, and by restricted and repetitive behavior. Autism does not cause specific changes within the oral cavity. Dental plaque and caries is formed due to irregular oral hygiene.

The Aim: to investigate the possibilities of dental solutions for autistic patients.

Material and methods: A retrospective data analysis has been done at the Dental Clinic Center of Vojvodina which included 48 patients with a diagnosis of autism, from January 2007 to January 2012. Depending on the cooperation with patients, the dental treatment was conducted in the infirmary, with general anesthesia, or in combination of the two.

Results: The study was conducted on 40 male patients (83, 33%) and 8 female patients (16, 67%). Apart from the diagnosed autism, patients show psychomotor retardation. The total DMFT is 322. Infirmary treatment was done on 16 patients (33, 33%), 15 patients (31, 25%) were treated under general anesthesia, while the remaining 17 patients (35, 42 %) were treated using the combination of these two methods. The most common dental intervention is tooth extraction (51, 14%). The average number of dental visits treated only in the infirmary is 8, 38 while 3, 24 patients have been treated in the infirmary before being put under general anesthesia and sanation.

Conclusion: It is possible to treat autistic people in the infirmary. Operations under general anesthesia must be taken into consideration on an individual level.

Keywords: autism, dental treatment

Povrede nervus alveolaris inferiora u toku vađenja visoko-rizično impaktiranih donjih umnjaka

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Uvod: Nervus alveolaris inferior (NAI) je senzitivna i motorna grana nervusa mandibularisa. Najčešće povrede NAI se dešavaju u toku ekstrakcija donjih impaktiranih umnjaka koji su u visoko-rizičnom položaju.

Cilj: Utvrditi postojanje i stepen učestalosti povreda NAI kod pacijenata kod kojih je ekstrahirani donji umnjak u visoko rizičnom položaju (duboko postavljeni, blizak odnos sa mandibularnim kanalom).

Materijal i metode: Analizom je obuhvaćena grupa pacijenata, od 2009. do 2011. godine, koji su imali operaciju visoko-rizično impaktiranih donjih umnjaka na odeljenju oralne hirurgije Klinike za Stomatologiju u Nišu. Analizirana je učestalost povrede (neurapraxia, axonotmesis, neurotmesis) NAI u odnosu na pol, starosnu dob pacijenta i u odnosu na radiološku klasifikaciju visoko-rizičnog položaja impaktiranog zuba.

Rezultati: Od ukupno 983 pacijenata pacijenata koji su operisani zbog impakcije donjeg umnjaka, bilo je ukupno 67 pacijenata sa visoko-rizičnim položajem umnjaka (duboko postavljeni, blizak odnos sa mandibularnim kanalom). Od ovog broja 42 pacijenta je ženskog pola, a 25 muškog pola, sa statistički značajno više ispitanika ženskog pola u grupi sa komplikacijama ($p < 0,01$). U odnosu na ukupan broj pacijenata, procentualni odnos pacijenata sa komplikacijama je bio 0,31% što nije statistički značajno ($p < 0,01$). Kod 2 pacijenta su povrede bile u formi neurapraxia sa kliničkom ispoljenošću hipoestezije u trajanju od 8-14 nedelja. Kod 1 pacijenta je povreda bila u formi axonotmesis-a sa trajnom dizestezijom. Ukupan broj pacijenata sa komplikacijama je statistički značajno manji od broja onih koji ih nisu imali ($p < 0,01$).

Zaključak: Rezultati ovog istraživanja pokazuju da nema statistički značajnih oštećenja nervus alveolaris inferiora posle hirurške ekstrakcije donjih umnjaka u visoko-rizičnom položaju.

ključne reči: nervus alveolaris inferior, povrede, teške impakcije.

INJURES TO NERVUS ALVEOLARIS INFERIOR DURING EXTRACTION OF HIGH-RISK IMPACTED LOWER MOLARS

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Introduction: Nervus alveolaris inferior (NAI) is sensitive and motor branch of nervus mandibularis. The most common injuries of NAI happens during extraction of high-risk impacted molars.

The Aim: The aim of this study is to establish the frequency of injuries of NAI in patients with extracted mandibular molar in malposition (deeply positioned, very near to mandibular canal).

Materials and Methods: The analysis covers group of patients from 2009 to 2011, which had operated high-risk impacted mandibular molar on the Department of Oral Surgery, on Faculty of Medicine University of Niš. The analysis includes frequency of injuries (neurapraxia, axonotmesis, neurotmesis) of NAI, in regard to sex, age, and radiological classification of 3th high-risk impacted molar.

Results: By analysis of 983 operated patients, there were 67 patients with high-risk impacted molars (deeply positioned, very near to mandibular canal). Of that number, 42 were female and 25 male, with significantly more female respondents in group with complications ($p < 0,01$). In regard to all patients percentage, the patients with complications was 0,31% which is not significant ($p < 0,01$). In 2 patients injuries were in form-neurapraxia with clinical manifestation hipoesthesia in a period of time 8-14 weeks. In 1 patient the injury was in form-axonotmesis with permanent disesthesia. The whole number of patients with complications is significantly lower than the other group without complications ($p < 0,01$).

Conclusion: The results of this research indicated there were no significant damage of nervus alveolaris inferior after surgical extraction of high-risk impacted mandibular molars.

Key words: nervus alveolaris inferior (NAI), injuries, difficult impactions.

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Uvod: Beljenje zuba je konzervativni tretman prebojenih zuba (vitalnih i avitalnih). Uz pravilnu kliničku proceduru beljenje ne oštećuje zube i desni. U slučajevima kada beljenje zuba nije indikovano ili ne daje adekvatan estetski efekat, moguća je izrada estetskih zubnih nadoknada, kao što su fasete.

Cilj: Cilj ovog rada je prikaz ordinacijskog beljenja vitalnih zuba i izrade direktnih nanohibridnih kompozitnih faseta.

Prikaz slučaja: Pacijentkinja, stara 26 godina, javila se na Kliniku za stomatologiju Vojvodine na odeljenje za Bolesti zuba i endodontiju da joj se iz estetskih razloga izvrši beljenje zuba i zamena starih kompozitnih nadoknada na gornjim centralnim sekucicima. Kliničkim pregledom je ustanovljena dobra oralna higijena, prisustvo kompozitnih ispuna na zubima 11 i 21, kao i atricija donjih frontalnih zuba (32, 31, 41, 42). Diskoloracija zuba je bila nižeg stepena, a nastala je kao posledica konzumiranja kafe, čaja i drugih obojenih pića i hrane. Nakon kliničkog pregleda odlučeno je da se sprovede tretman beljenja vitalnih zuba preparatom na bazi vodonik peroksida i izrada direktnih nanohibridnih kompozitnih faseta na zubima 11 i 21.

Diskusija: Opisana tehnika beljenja zuba preparatom na bazi vodonik peroksida urađena je bez ikakve stimulacije hemijskog procesa. Uočena su značajna poboljšanja nakon samo jedne kliničke seanse, a po završetku celokupnog tretmana zadovoljeni su očekivani estetski zahtevi. Kompozitne fasete se smatraju konzervativnom alternativom protetskim restaurativnim procedurama koje zahtevaju obimno uklanjanje zubnog tkiva. Nanokompozit koji je korišćen za izradu faseta poseduje izuzetnu stabilnost boje i dobru otpornost na dejstvo mastikatornih sila.

Zaključak: U svetu stomatologije estetika zauzima posebno mesto, te su savršeno beli zubi postali estetski imperativ. Nakon funkcionalno uspešne terapije, svaki pacijent očekuje da mu stomatolog obezbedi lep osmeh. To se u najvećem broju slučajeva može postići beljenjem zuba i izradom estetskih zubnih nadoknada. Uz pravilno pridržavanje indikacija, kontraindikacija i protokola estetskih procedura, mogu se očekivati dobri estetski rezultati, što je prezentovano i u ovom prikazu slučaja.

Ključne reči: estetika, beljenje zuba, kompozitne fasete

ESTETIC DENTAL TREATMENT – CASE REPORT

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Introduction: Bleaching of teeth is a conservative treatment of dark, coloured teeth (vital and non-vital). Bleaching does no damage to teeth and gums when clinical treatment is properly performed. In cases where the bleaching of teeth is not recommended, or not given adequate esthetic effect, it is possible to make esthetic restorations such as veneers.

Objective: The objective of this study is to represent a case of in-office bleaching of vital teeth and the making of nanohybrid direct composite veneers.

Case report: A female, aged 26 years, came to the Department of Restorative Dentistry and Endodontics of Dental Clinic of Vojvodina to execute teeth whitening and replacement of old composite restorations on the maxillary central incisors for esthetic reasons. Clinical examination demonstrated good oral hygiene, the presence of composite restorations on teeth 11 and 21, and attrition of lower anterior teeth (32, 31, 41, 42). A lower degree teeth discoloration was a consequence of consumption of coffee, tea and other colored drinks and food. After clinical examination, it was decided to carry out the treatment of vital teeth bleaching with a products based on hydrogen peroxide and to manufacture nanohybrid direct composite veneers for teeth 11 and 21.

Discussion: The described technique of teeth whitening with products based on hydrogen peroxide was performed without any stimulation of chemical processes. Significant improvements after just one clinical session, and upon completion of the entire treatment met the expected esthetic requirements. Composite veneers are considered to be a conservative alternative for many restorative procedures that require extensive removal of tooth structure. Nanocomposite that was used for making veneers has excellent color stability and good resistance to the effects of masticatory forces.

Conclusion: In the world of dentistry esthetic has a special place, and the perfect white teeth have become an esthetic imperative. After a functionally successful treatment, each patient expects from the dentist to provide him a beautiful smile. In most cases it is achieved by bleaching of teeth and making esthetic restorations. With proper adherence to the indications, contraindications and esthetic procedures and protocols, good esthetic results can be expected as presented in this case report.

Keywords: esthetic, teeth whitening, composite veneers

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Uvod: Afte (Rekurentni aftozni stomatitis, RAS) su jedno od najčešćih oboljenja u svetu. Prevalenca je u rasponu od 2% do 66%, pri čemu je veća prevalenca uočena u višim socioekonomskim grupama i u osoba pod stresom kao što su studenti u vreme ispinog roka. RAS je oboljenje za koje je karakteristična pojava rekurentnih ulceracija na oralnoj mukozu bez znakova nekog drugog oboljenja. Uprkos intenzivnim istraživanjima, još uvek nije rasvetljena njihova tačna etiologija i patofiziologija.

Cilj rada: Cilj istraživanja je ispitati učestalost afti u pušača studenata stomatologije prikupljanjem anamnestičkih podataka i kliničkim ispitivanjem.

Materijal i metode: U istraživanju su učestvovali studenti IV i V godine Univerziteta u Nišu, Medicinskog fakulteta, odsek stomatologija. Nakon popunjavanja ankete urađen je klinički pregled pri kom je određen status zuba i nivo oralne higijene.

Rezultati: U istraživanju je učestvovao 91 student (28 muškog i 63 ženskog pola). 34 (37,36%) studenata je imalo RAS. 22 (24,18%) studenata su bili aktivni pušači, a 6 bivši pušači (6,59%). Afte je imalo 4 pušača (18,8%), 27 nepušača (42,36%) i 3 (50%) bivših pušača. Uočeno je da u slučaju pozitivne porodične anamneze postoji značajan rizik za razvitak RAS.

Zaključak: Afte učestalije u nepušača studenata stomatologije u odnosu na pušače. Pozitivna porodična anameza za razliku od pušenja predstavlja faktor rizika za oboljevanje od RAS. Činjenica da se afte rede pojavljuju u pušača treba biti stimulans za dalja istraživanja u cilju rasvetljenju patogeneze oboljenja i pronalaženju novih terapijskih i preventivnih mera.

Ključne reči: afte, pušenje, studenti

THE FREQUENCY OF RECURRENT APHTHOUS STOMATITIS IN SMOKERS – DENTAL STUDENTS

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Introduction: Aphthous ulcers (Recurrent aphthous stomatitis RAS) is one of the most frequent diseases. The prevalence is in range of 2% to 66%, with a higher prevalence observed in higher socioeconomic groups and people under stress, such as students during the examination period. RAS is characterized by recurring ulcers in the oral mucosa without any sign of other diseases.

The Aim: The aim of the study was to investigate the frequency of RAS in smokers dental students using anamnesis and clinical examination.

Materials and Methods: The study involved students of IV and V years of the University of Nis, Faculty of Medicine, Department of Dentistry. After completing the survey, during clinical examination status of the teeth and oral hygiene level were estimated.

Results: The study involved 91 students (28 male, 63 female). 34 (37.36%) students had RAS. 22 (24.18%) students were active smokers, former smokers and 6 (6.59%). RAS were present in four smokers (18.8%), 27 non-smokers (42.36%) and 3 (50%) former smokers. It was observed that in case of positive family history there is a significant risk for the development of RAS.

Conclusion: It can be noticed aphthous ulcers are more common in nonsmokers dental students than in smokers. The presence of aphthous ulcers in family contrary to smoking is a risk factor for development of RAS. The fact that aphthous ulcers occur less frequently in smokers should be a stimulus for further research in order to discover new therapeutic and preventive measures.

Key words: aphthous ulcers, smoking, students

PROTETSKI STATUS PACIJENATA SA DEMENCIJOM

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Uvod: Alchajmerova bolest je najčešći uzrok demencije i predstavlja neurodegenerativnu bolest koja ugrožava svakodnevne aktivnosti i zbog toga predstavlja veliki problem današnjice. Napredovanjem bolesti, naročito u kasnijim stadijumima, dolazi do pogoršanja oralne higijene sa porastom parodontalnih bolesti, višim procentom karijesa i većom učestalošću drugih problema sa oralnim funkcionisanjem, kao npr. teškoće u nošenju proteza, nemogućnost izvođenja procedura prilikom održavanja oralne higijene.

Cilj rada: Cilj ovog istraživačkog rada jeste ispitati dentalni i protetski status pacijenata sa Alchajmerovom bolešću.

Materijal i metode: Uzorak je činilo 40 pacijenata obolih od Alchajmerove bolesti, starijih od 65 godina koji u zadnjih 5 godina nisu značajnije menjali svoj dentalni status. U posebno pripremljeni upitnik upisivano je da li je pacijent krezub ili bezub, broj prirodnih zuba pacijenata kao i prisustvo mobilnih i/ili fiksnih zubnih nadoknada.

Rezultati: Među ispitanicima je bila učestalija krezubost nego bezubost. Veći broj ispitanika imao je zubne nadoknade, i to totalne proteze najčešće a zatim fiksne nadoknade. Prisustvo protetskih radova češće je kod žena nego muškaraca.

Zaključak: Oralno zdravlje pacijenata sa Alchajmerovom bolešću je loše zbog učestale krezubosti i bezubosti koja nije protetski rehabilitovana. Kako se pacijenti sa ovom dijagnozom ne mogu uspešno protetski zbrinjavati u odmaklim fazama bolesti, najbolje je da se sveobuhvatan stomatološki tretman obavi kod svih starih ljudi a naročito u početnim fazama demencije.

Ključne reči: demencija, oralni status, protetske nadoknade.

PROSTHETIC STATUS OF PATIENTS WITH DEMENTIA

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Introduction: Alzheimer's disease is the most common cause of dementia and a progressive, neurodegenerative disease that threatens the performance of everyday activities and therefore represents a major problem nowadays

The Aim: The objective of this research is to examine the dental and prosthetic status of patients with Alzheimer's disease.

Materials and Methods: The sample consisted of 40 patients with Alzheimer's disease, aged 65 years who in the last 5 years have not significantly changed their dental status. Specially designed questionnaire was filled in with info such as: whether the patient is edentate or toothless, the number of natural teeth of patients and the presence of mobile and / or fixed dentures.

Results: Among the respondents, edentate ones were more common than toothless ones. A number of respondents had a denture, and often to full dentures and fixed compensation. The presence of prosthetic devices is more common with women rather than with men.

Conclusion: Oral health with patients with Alzheimer's disease is poor because of the frequentness of edentate and toothless, that is prosthetically not rehabilitated. As the patients with this diagnosis cannot be successfully treated in advanced prosthetic stages of the disease, the best is to perform a comprehensive dental treatment for all elderly people especially in the early stages of dementia.

Key words: dementia, oral status, prosthetic replacements.

UTICAJ MOTIVACIJE NA ORALNO ZDRAVLJE KOD STUDENATA NOVOSADSKOG UNIVERZITETA

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Uvod: Stomatolog kao dijagnostičar i terapeut, ima važnu ulogu u edukaciji i motivaciji pacijenata u pogledu održavanja oralne higijene. Motivacijom utičemo na stavove pacijenta prema sopstvenom zdravlju, uklanjanju štetnih navika i usvajanju određenog modela ponašanja koji će doprineti poboljšanju oralnog zdravlja. Uspeh motivacije u velikom stepenu zavisi od spremnosti pacijenta da prihvati i usvoji dobijene informacije.

Cilj rada: Utvrditi razlike u stanju oralnog zdravlja između studenata stomatologije i studenata ostalih fakulteta Novosadskog Univerziteta i ispitati uticaj motivacije od strane stomatologa (ispitivača) na stanje oralnog zdravlja u ispitivanim grupama pacijenata.

Materijal i metode: Istraživanjem je obuhvaćeno 28 studenata podeljenih u dve grupe. Prvu grupu čini 14 studenata stomatologije, drugu grupu čini 14 studenata ostalih fakulteta Univerziteta. Ispitanici su popunjavali Upitnik o oralnoj higijeni, a urađen je i stomatološki pregled koji je obuhvatio: CPITN indeks, gingivalni i plak indeks i dentalni status zuba.

Rezultati: Prisustvo statistički značajne razlike gingivalnog indeksa je ustanovljeno kod studenata stomatologije poređenjem ovog indeksa u prvom i drugom pregledu, kao i poređenjem gingivalnog indeksa u drugom pregledu između studenata stomatologije i studenata drugih fakulteta. Motivacija od strane ispitivača nije dovela do statistički značajnih promena parametara oralnog zdravlja u ispitivanom vremenskom periodu.

Zaključak: Motivacija u trajanju od mesec dana ne utiče značajno na oralno zdravlje, ali u pojedinim parametrima su vidljive pozitivne promene kod obe grupe studenata.

Ključne reči: motivacija, oralno zdravlje, oralna higijena, CPITN

INFLUENCE OF MOTIVATION ON ORAL HEALTH AMONG STUDENTS OF UNIVERSITY OF NOVI SAD

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Introduction: As diagnosticians and therapists, dentists' important role relates to patients' education and motivation in terms of maintaining good oral hygiene. Motivation is significant factor in creating each patient's own health manner, eliminating bad habits and adopting certain modes of behavior that will contribute to improving oral health. Success of motivation greatly depends on patient's willingness to accept and approve information obtained.

The Aim: To determine whether there are differences in oral health conditions between dental students and students of other faculties of the University of Novi Sad and to examine the influence of dentist's motivation on oral health conditions in the study groups of patients.

Materials and Methods: The study included a total of 28 students divided into two groups. The first group consisted of 14 dental students while another group consisted of 14 students of other faculties of the University. In the study subjects completed a questionnaire on oral hygiene and in addition they underwent a dental examination that included CPITN index, plaque, gingival index and recording dental status.

Results: Statistically significant difference in gingival index was determined with the dental students by comparing this index in the first and the second survey. The difference was also noticed when comparing the gingival index in the second survey between the dental students and students from other faculties.

Conclusion: Motivation for a period of one month does not significantly affect oral health but in some aspects, however, certain positive changes are visible for all both group of students.

Key words: motivation, oral health, oral hygiene, CPITN

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Uvod: Osnovne metode za određivanje radne dužine zuba su: rendgenografska i elektrometrijska metoda. Rendgen (Rtg) je nezaobilazno dijagnostičko sredstvo koje se na konvencionalan (standardni) način upotrebljava u medicini oko sto godina. Upotreba digitalnog rendgena koji omogućava da se Rtg slika kompjuterski analizira, predstavlja tehnološki napredak i menja dosadašnju primenu radiologije u stomatologiji.

Cilj: Cilj istraživanja bio je da se utvrdi da li postoji značajna razlika između realne radne dužine kanala korena zuba (RD1) i radne dužine izmerene Rtg metodom (RD2), i time da se utvrdi da li digitalno Rtg snimanje predstavlja pouzdanu metodu za određivanje radne dužine zuba.

Materijal i metode: Istraživanje je sprovedeno na Klinici za stomatologiju Vojvodine. Ispitivanje je vršeno na 48 ekstrahovanih zuba. Radna dužina (RD1, realna radna dužina) određena je za svaki zub pomoću ručne K turpije #15 i milimetarske skale endometra. Pomoću milimetarskog lenjira izmerena je dužina zuba (DZ1, realna dužina zuba). Svaki zub zajedno sa K turpijom #15 snimljen je digitalnim rendgen aparatom. Na ovaj način dobijeno je 48 digitalnih rendgenografskih snimaka. Snimci su obrađeni u Kodak dental imaging softwer-u. U ovom programu izmerena je Rtg radna dužina (RD2), kao i Rtg dužina zuba (DZ2). Za sve četiri merene vrednosti (RD1, RD2, DZ1 i DZ2) izračunata je srednja vrednost i standardna devijacija. Rezultati merenja statistički su obrađeni t- testom.

Rezultati: Studentovim t-testom utvrđeno je da ne postoji statistički značajna razlika ($p > 0,05$) između realne radne dužine kanala korena zuba (RD1) i radne dužine dobijene digitalnom Rtg metodom (RD2). Takođe je utvrđeno da ne postoji statistički značajna razlika između realne radne dužine kanala korena zuba (RD1) i realne dužine zuba (DZ1).

Zaključak: Digitalno Rtg snimanje predstavlja pouzdanu metodu za određivanje radne dužine kanala korena zuba.

Ključne reči: Radna dužina, digitalna rendgenografija, dužina zuba.

WORKING LENGTH DETERMINATION BY DIGITAL RADIOGRAPHY

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Introduction: The main methods for root canal working length determination are radiographic and electrometric. The digital radiography obtained through intrabuccal sensors represents technological progress that allows quantitative analysis and measurement of working length.

The Aim: The aim of this study was to investigate the difference in values of the accurate root canal working length and the working length determined by digital radiography and to test if digital radiography is a reliable method for working length determination.

Materials and methods: The investigation was conducted on 48 extracted human teeth without endodontic treatment and with well preserved coronal and radicular structures. Tooth length (TL1) was measured by millimeter ruler. Coronal access to the teeth was obtained with a round bur and high speed hand-piece. The actual working length (WL1) was obtained by introducing a #15 K file in the canal until it appeared at the apical foramen. The length was verified on endometer. The digital images were obtained for every tooth sample. The canal working length (WL2) and the length of the tooth (TL2) were measured in the Kodak dental imaging software. Mean value and standard deviation were calculated and statistical analysis performed by student t-test.

Results: Statistical analysis has shown no statistical difference between the accurate root canal working length and the working length obtained by digital radiography. It was also found that there was no statistical difference between the tooth length and working length measured by digital radiography ($p > 0,05$).

Conclusion: There is no significant difference between the accurate root canal working length and the working length measured by digital radiography. Digital radiography is reliable method for working length determination.

Key words: Working length, digital radiography, tooth length.

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Uvod: Hronična urtikarija je oboljenje koje traje nekoliko meseci a specifični uzrok se teško otkriva.

Patofiziološki radi se o oboljenju koje je posredovano hemijskim medijatorima, a među kojima je najznačajniji histamin. Karakteriše se ekzudativnom papulom ili plakom kao osnovnom promenom koja se javlja duže od šest nedelja a može trajati mesecima i godinama.

Cilj: Određivanje učestalosti oralnih promena kod osoba sa hroničnom urtikarijom.

Materijal i metode: Ispitivanjem je obuhvaćeno 22 pacijenta sa hroničnom urtikarijom, od kojih je 12 bilo muškog pola a 10 ženskog pola. Svim ispitanicima je uzeta anamneza i urađen je klinički pregled. Ispitivanje je rađeno u Kliničkom centru Srbije, na Klinici za alergologiju i imunologiju.

Rezultat: Dobijeni rezultati pokazali su da je 21 ispitanika osoba imala bar jednu promenu u usnoj duplji za vreme epizode koprivnjače, a samo jedna ispitanika osoba nije imala promene u usnoj duplji.

Zaključak: Hronične urtikarije su često oboljenje, ali je put do etiološke dijagnoze dug i komplikovan. Prisustvo oralnih promena kod ovih pacijenata ukazuje na vezu usne duplje sa imunim sistemom.

Ključne reči: hronična urtikarija, oralne manifestacije.

PREVALECE OF ORAL CHANGES IN PATIENTS WITH CHRONIC URTICARIA

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Introduction: Chronic urticaria is a disease that takes several months, a specific cause is difficult to detect. Pathophysiology for the disease that is mediated by chemical mediators, among which the most histamine. It is characterized by exudative papules or plaques as a primary change that occurs more than six weeks and can last for months or years.

The Aim: Determining the incidence of oral changes in patients with chronic urticaria.

Material and methods: The study included 22 patients with chronic urticaria, of which 12 were male and 10 female. All subjects were medical history taken and underwent a clinical examination. Testing was performed at the Clinical Center of Serbia, Clinic of Allergology and Immunology.

Results: The results showed that 21 people tested had at least one change in the oral cavity during episodes of hives, and only one person didn't have changes in the oral cavity.

Conclusion: Chronic urticaria is often a disease, but the way to the etiological diagnosis is long and complicated. The presence of oral manifestations in these patients suggests a link with oral immune system.

Key words: chronic urticaria, oral manifestations.

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Uvod: Dentogene infekcije, usled svoje učestalosti, te mogućih komplikacija sa letalnim ishodom predstavljaju jedan od značajnih zdravstvenih problema.

Cilj rada: Utvrditi incidencu ekstrakcija nakon hospitalizacije kod pacijenata sa infekcijama dentogenog porekla, radi utvrđivanja blagovremenog sprovođenja jedne od mera terapije dentogenih infekcija.

Ispitanici i metode: Retrospektivnim kliničkim istraživanjem analizirana je incidenca ekstrakcija na odeljenju za Maksilofacijalnu hirurgiju Klinike za Stomatologiju u Nišu u periodu od 2009. do 2011. god. kod hospitalizovanih pacijenata sa infekcijama dentogenog porekla i manifestnim laboratorijskim nalazima u smislu leukocitoze i povišenog CRP-a. Podaci su dobijeni uvidom u medicinsku dokumentaciju.

Rezultati: Kod 150 hospitalizovanih pacijenata, sa infekcijama dentogenog porekla izvršeno je ukupno 140 ekstrakcija. Najčešće je zahvaćen submandibularni prostor, a najčešće je izvršena ekstrakcija zuba 46. Prosečan broj dana koji su pacijenti proveli u bolnici iznosi 5,25. Prosečne vrednosti leukocita iznose $14,82 \times 10^9/l$, dok je prosečna vrednost CRP-a kod pacijenata sa dentogenom infekcijom $85,15 \text{ mg/l}$ na početku lečenja.

Zaključak: Izuzetno visoka incidenca ekstrakcija izvršenih u hospitalnim uslovima, kod bolesnika sa infekcijama dentogenog porekla, sa prisutnim izraženim laboratorijskim nalazima koji ukazuju na zapaljenje, govori da su navedene ekstrakcije, kod ovih bolesnika kasno izvedene i da ih je trebalo izvršiti u mnogo ranijim stadijumima infekcije. Stoga treba insistirati na što ranijem sprovođenju kauzalne terapije u smislu endodontske sanacije ili ekstrakcije zuba uzročnika dentogenih infekcija.

Ključne reči: zubi, infekcija, ekstrakcija, CRP, leukocitoza

INFECTION OF ODONTOGENIC ORIGIN – THE IMPORTANCE OF TIMELY EXTRACTION

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Introduction: Odontogenic infections, by frequency, and possible complications with lethal outcome represents a significant health problem.

The Aim: Evaluate the incidence of extractions after hospitalization in patients with infections, to determine the timely implementation of a measure of causal therapy.

Patients and methods: Retrospective clinical study analyzed the incidence of extractions performed at the Clinic of Dentistry in Nish since 2009. by 2011. years. in hospitalized patients with infections of odontogenic origin and manifest in terms of laboratory findings of leucocytosis and elevated CRP. The data were obtained by examining the medical records.

Results: In 150 hospitalized patients, there were 140 extractions. Most often the affected submandibular space, usually a tooth extraction was performed 46. The average number of days that patients spent in hospital was 5.25. The average values of leukocytes amounted $14.82 \times 10^9 / l$, while the average value of CRP in patients with odontogenic infection, 85.15 mg / l at baseline.

Conclusion: High incidence of extractions performed in hospital, in patients with infections, marked with the present laboratory findings that indicate inflammation, suggests that the above extraction, was to be performed in much earlier stages of infection. We should insist on an early implementation of causal therapy, in terms of endodontic restoration or tooth extraction.

Key words: teeth, infection, extraction, CRP, leukocytosis

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Uvod: Delovanjem na početnu karijesnu leziju gleđi nanokompleksom kazeinski fosfopeptid-amorfni kalcijum fosfat, kazeinski fosfopeptid-amorfni kalcijum fluorofosfat i 0,05% rastvorom NaF možemo pospešiti remineralizaciju.

Cilj rada: Cilj istraživanja bio je ispitivanje i upoređivanje dejstva kazeinskog fosfopeptid-amorfno kalcijum fosfata, kazeinskog fosfopeptid-amorfno kalcijum fluorofosfata i 0,05% rastvora NaF na remineralizaciju arteficialne karijesne lezije gledji pomoću svetlosnog mikroskopa.

Metode: U istraživanju je korišćeno dvanaest uzoraka gleđi na kojima je formirana arteficialna karijesna lezija. Uzorci su raspoređeni u 4 grupe: kazeinski fosfopeptid-amorfni kalcijum fosfat, kazeinski fosfopeptid-amorfni kalcijum fluoro-fosfat, 0,05% NaF i kontrolna demineralizovana gleđ. Uzorci su u toku 7 dana naizmenično izlagani dejstvu demineralizacionog i remineralizacionog rastvora. Ispitivani preparati su primenjivani dva puta dnevno tokom sedam dana, u skladu sa uputstvima proizvođača. Rezultati su procenjeni svetlosnom mikroskopijom.

Rezultati: U grupi 0,05% NaF remineralizacija je postignuta u površinskim slojevima arteficialne karijesne lezije gleđi, dok je dejstvom preparata sa nanokompleksom kazeinski fosfopeptid-amorfni kalcijum fosfat remineralizacija postignuta kako na površini, tako i u dubljim slojevima lezije.

Zaključci: Sva tri ispitivana materijala pokazala su remineralizacionu sposobnost.

Ključne reči: Demineralizacija, karijes, hemijski model karijesa, kazeinski fosfopeptid-amorfni kalcijum fosfat, remineralizacija.

INFLUENCE OF FLUORIDE AND CASEIN PHOSPHOPEPTIDE-AMORPHOUS CALCIUM PHOSPHATE ON ARTIFICIAL CARIES-LIKE LESIONS

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Introduction: By treating the initial caries lesions with casein phosphopeptide-amorphous calcium phosphate, casein phosphopeptide-amorphous calcium fluoride phosphate and 0.05% sodium-fluoride it is possible to increase remineralization.

The Aim: The aim of this study was to asses the effects of casein phosphopeptide-amorphous calcium phosphate, casein phosphopeptide-amorphous calcium fluoride phosphate and 0.05% sodium-fluoride on remineralization of artificial caries-like enamel lesions with polarized light microscopy.

Materials and Methods: Twelve samples of demineralized enamel were divided into four groups: casein phosphopeptide-amorphous calcium phosphate, casein phosphopeptide-amorphous calcium fluoride phosphate, 0.05% sodium-fluoride solution and control demineralized enamel. During 7 days samples were exposed to the chemical caries model. Evaluated products were applied twice a day according to the manufacturers' recommendations. The enamel samples were evaluated with polarized light microscope.

Results: In the 0.05% NaF group, remineralisation was achieved in the superficial layer of enamel lesion, while casein phosphopeptide-amorphous calcium phosphate containing pastes remineralised also deeper layers of the lesion.

Conclusions: All three evaluated materials have shown remineralization capability.

Key words: Demineralization, caries, pH-cycling method, casein phosphopeptide-amorphous calcium phosphate, remineralization.

TRODIMENZIONALNA REKONSTRUKCIJA RADIKULARNIH CISTI I NJIHOV ODNOS PREMA ZUBIMA I KOSTI

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Uvod: Radikularne ciste predstavljaju najčešći tip odontogenih cista sa prevalencom kod muškaraca u dobi 30-50 godina. Ekspanzivan rast i liza kosti u prisustvu ove ciste čine ih značajnim u diferencijalnog dijagnostici prema cističnim tumorima vilica.

Cilj: Cilj rada je da prikaže histološki prostorni model za rekonstrukciju radikularnih cista i da izvrši komparaciju takvog modela sa modelom nastalim konstrukcijom cista u trodimenzionalnom obliku.

Materijal i metode: Metod je razvijen na uzorcima patohistoloških preparata 20 radikularnih cista različite veličine i topografije jednostavnim isecanjem i povezivanjem njihovih projekcija na papiru, koji je dopunjen konstrukcijom cista u tri dimenzije uz upotrebu kompjuterskih tehnika. Generisani modeli su komparirani međusobno i sa digitalnim zapisima radiografija cista.

Rezultati rada: Rezultati našeg rada su konstrukcija dva metoda za prostorni prikaz radikularnih cista i predlog selekcije oblika i numeričkih vrednosti u dvodimenzionalnom sistemu koji bi mogao biti upotrebljen za automatizovanu analizu metodom *data mining*.

Zaključak: Budući da se radikularne ciste otkrivaju uglavnom slučajno pri radiografijama iz drugih razloga, trodimenzionalna rekonstrukcija, određivanje odnosa prema zubima i kosti je od značaja pri planiranju terapijskog pristupa.

Glavne reči: radikularna cista, histološki model, rekonstrukcija, zub, alveolarna kost

THREE-DIMENSIONAL RECONSTRUCTION OF RADICULAR CYSTS AND THEIR RELATION TO THE TEETH AND BONE

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Introduction: Radicular cysts are the most common type of odontogenic cyst with the prevalence in men aged 30-50 years. The expansive growth and bone lysis in the presence of cysts makes them important in the differential diagnosis of cystic tumors of the jaw.

The Aim: The aim is to show the histological reconstruction of the spatial model of radicular cyst and to make comparisons of this model with a model created in the construction of pure three-dimensional form.

Materials and Methods: The method was developed on samples of 20 histopathological specimens of radicular cyst different size and topography by simply cutting and linking their projections on paper, which was supplemented by the construction of a cyst in three dimensions using computer techniques. Generated models were compared with each other and with digital radiography records clean.

Results: Our results are the construction of two methods for the spatial representation of radicular cyst and proposal selection of shapes and numerical values in two-dimensional system that could be used for automated analysis using *data mining*.

Conclusion: Since radicular cysts discovered incidentally when radiographs mainly for other reasons, three-dimensional reconstruction, determination of the relationship to the teeth and bone is important in planning the therapeutic approach.

Keywords: radicular cyst, histological model, reconstruction, tooth, alveolar bone

PREVALENCIJA RAZLIČITIH KLINIČKIH FORMI INFEKCIJA CANDIDOM ALBICANS

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Uvod: Candida albicans je ubikvitarni organizam koji pripada gljivicama. Ona je komensal koji normalno naseljava usnu duplju. Kada se poveća broj gljivica u određenom području, dejstvom nekih faktora, nastaje oralna kandidioza.

Cilj rada: Cilj ovog rada je da se odredi prevalencija različitih kliničkih formi infekcija izazvanih Candidom albicans.

Materijal i metode: Ispitivanjem je obuhvaćen 31 pacijent uzrasta od 24 do 82 godine. Od toga je 24 pacijenta bilo ženskog pola, a 7 pacijenata muškog pola. Infekcija je verifikovana pomoću mikrobiološkog nalaza koji je potvrdio prisustvo Candidae albicans.

Rezultati: Uočena je veća prevalencija svih kliničkih formi ($p < 0.05$) kod osoba ženskog (64%) u odnosu na muški pol (36%). Podjednaka je prevalencija akutne pseudomembranozne i eritematozne kandidioze (45.2%), dok su se ostale forme javljale u 9.6% slučajeva. Posmatrano u odnosu na godine starosti, češća je bila kod osoba starijih od 50 godina ($p < 0.05$). Akutna pseudomembranozna kandidioza je bila češća kod starijih od 65 godina, a akutna eritematozna kod osoba između 50 i 65 godina. Uzimajući u obzir mesto na kom se javila promena, 51% se odnosi na dorzum jezika, 32% na tvrdo nepce. Najveći broj pacijenata (53%) se lečio od hipertenzije, srčana oboljenja su bila prisutna kod 21% pacijenata, a astma i endokrine bolesti kod 26%.

Zaključak: Uočava se veća prevalencija oralne kandidioze kod osoba ženskog pola i kod starijih osoba. Nije primećen značajniji uticaj ustanovljenih opštih oboljenja na prevalenciju određene kliničke forme infekcije.

Glavne reči: kandidioza, Candida albicans, prevalencija

PREVALENCE OF DIFFERENT CLINICAL FORMS OF CANDIDA ALBICANS INFECTION

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Introduction: Candida albicans is ubiquitous yeast. It is commensal which is a member of normal flora in oral cavity. When the number of yeasts increases in certain area, due to predisposing factors, oral candidiasis occurs.

The aim: to determine the prevalence of different clinical forms of Candida albicans infections.

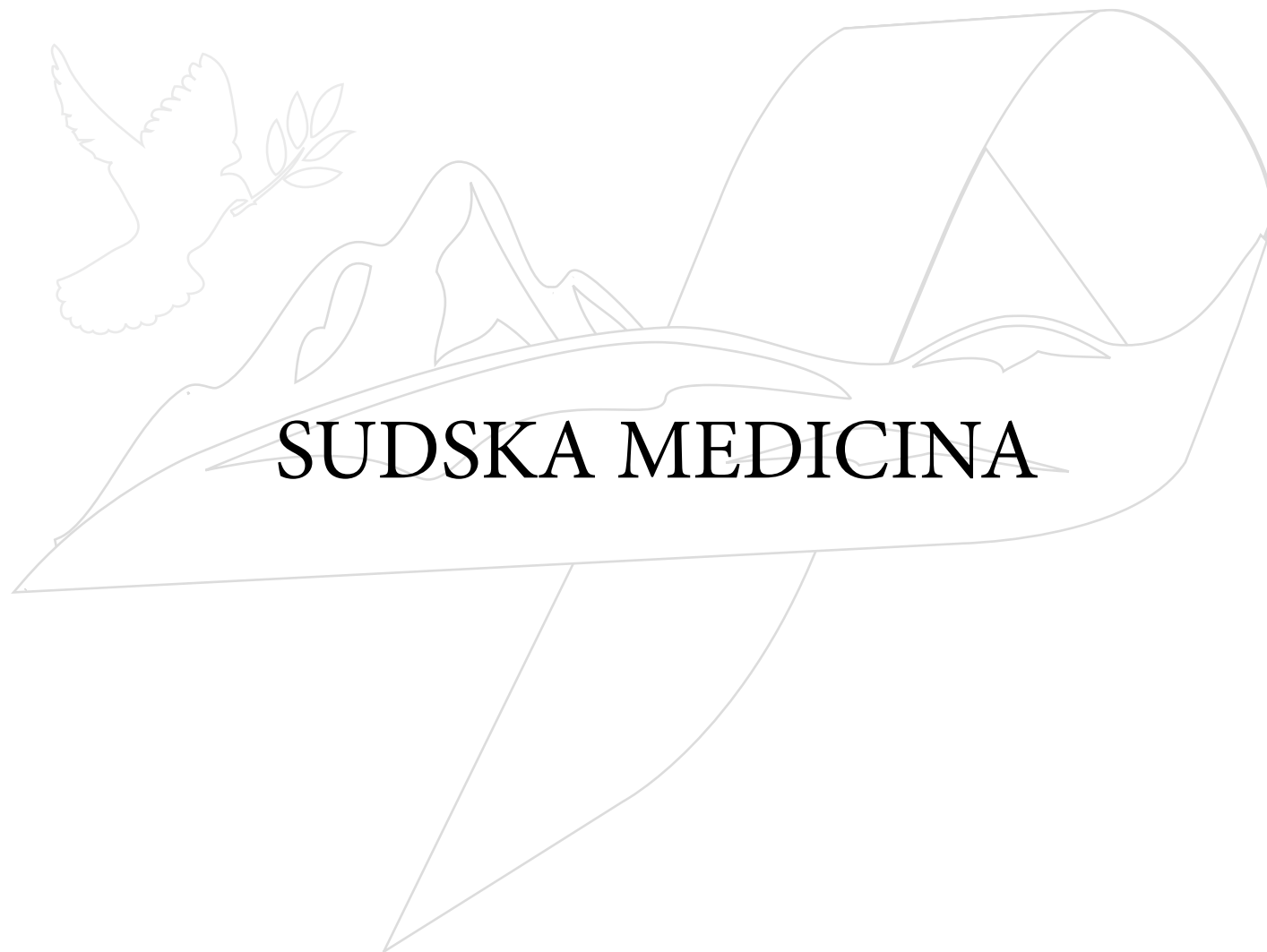
Materials and methods: The study included 31 patient aged 24-82 years, in which 24 patients were women and 7 were men. The presence of yeast was verified by microbiological findings.

Results: All clinical forms were more prevalent ($p < 0.05$) in female patients (64%) than in male ones (36%). The prevalence of acute pseudomembranous and acute erithematosus candidiasis was equal (45.2%), while other forms are represented in 9.6% of cases. Regarding the age of patients, candidiasis was more prevalent in patients older than 65. Acute pseudomembranous candidiasis was more often in older than 65, and acute erithematosus between 50 and 65 years. Considering the place where the change occurred, 51% referred to dorsum of tongue and 32% to hard palate. Most of the patients was taking therapy for hypertension, 21% had heart diseases, 26% asthma and endocrine diseases.

Conclusion: It is noticed that all clinical forms of infection are more prevalent in female and in older patients. A significant impact of determined systemic diseases on the prevalence of clinical forms of oral candidiasis is not noticed.

Key words: candidiasis, Candida albicans, prevalence





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Uvod: Nezrelo novorođenče (prematuro) je dete rođeno pre navršene 37 nedelje gestacije. Zbog opšte nezrelosti organa veoma često dolazi do smrtnog ishoda. Ukoliko smrt nastupi u prvih 28 dana života radi se o neonatalnoj smrti.

Cilj rada: Cilj našeg rada je bio utvrđivanje osnovnih antropometrijskih parametara umrle novorođenčadi, kao i učestalost neposrednog uzroka smrti na osnovu kliničkih i sudskomedicinskih pregleda.

Materijal i metode: istraživanje je sprovedeno kao deskriptivna retrospektivna studija kojom je obuhvaćeno 35 pretermo rođenih, potom umrlih i obdukovanih beba. U toku istraživanja analizirani su obdukcioni zapisnici sa Instituta za sudsku medicinu u Beogradu kao i prethodne istorije bolesti.

Rezultati: Od ukupno 35 obdukovanih beba, 12 (34%) je bilo ženskog, a 23 (66%) muškog pola. Prosečna gestaciona starost iznosila je 25,91 (+/- 2,35) nedelja, prosečna dužina života je bila 140,14 (+/- 185,04) sati, prosečan APGAR score u prvoj minuti je 2,47 (+/- 1,50), dok je u petoj minuti 2,96 (+/- 1,94), obim glave na rođenju je u proseku 24,21 (+/- 3,23) cm, prosek telesne dužine na rođenju bio je 35,94 (+/- 5,40) cm, prosečna telesna masa na rođenju je bila 904.71 (+/- 350.71) grama. Najčešća klinička dijagnoza bila je sindroma angoris (distress) neonati respiratoria u 33 slučaja (94,28%), dok je prema obdukcionim zapisnicima najčešće utvrđeno intrakranijalno krvarenje, čak u 32 slučaja (91,42%)

Zaključak: Na osnovu dobijenih podataka možemo zaključiti da najveći broj novorođenčadi umire zbog opšte nezrelosti organizma, a kao neposredni uzrok smrti najčešće je zastupljen respiratorni distress sindrom i intraventrikularno krvarenje.

Ključne reči: prematurosi, karakteristike, tanatologija.

CLINICAL AND FORENSIC ASPECTS OF NATURAL DEATH NEONATAL IMMATURE

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Introduction: Immature infants (premature infants) the child is born before 37 weeks gestation. Due to the general immaturity of organs often leads to death. If death occurs in the first 28 days of life it is a neonatal death.

The Aim: The objective of this study was to determine basic anthropometric parameters of newborns died, and the frequency of the immediate causes of death based on clinical and forensic examination.

Material and methods: The study was conducted as a descriptive retrospective study that included 35 preterm births, deaths, and then autopsied babies. During the study analyzed autopsy records from the Institute of Forensic Medicine in Belgrade as well as previous history of disease.

Results: Of the 35 autopsied babies, 12 (34%) were female and 23 (66%) males. Mean gestational age was 25.91 (+/- 2.35) weeks, the average length of life was 140.14 (+/- 185.04) hours, average APGAR score in the first minute was 2.47 (+/- 1.50), while in the fifth minute, 2.96 (+/- 1.94), head circumference at birth was on average 24.21 (+/- 3.23) cm, average body length was 35, 94 (+/- 5.40) cm, mean body weight at birth was 904.71 (+/- 350.71) grams. The most common clinical diagnosis was angoris syndrome (distress) neonati respiratoria in 33 cases (94.28%), while the autopsy records commonly found intracranial hemorrhage, even in 32 cases (91.42%)

Conclusion: Based on the obtained data we can conclude that most infants die due to the general immaturity of the organism, and as the immediate cause of death was most frequent respiratory distress syndrome and intraventricular hemorrhage.

Keywords: premature infants, characteristics, thanatology.

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Uvod: U ovom revijalnom radu smo ukazali na nemogućnost preciznog određivanja vremena nastupanja smrti. Pojedinačne metode koje se koriste u post mortalnom periodu su same za sebe nepouzdana i daju neprecizne rezultate, sa relativno velikim odstupanjima.

Cilj: Cilj rada je da ukaže na nemogućnost potpuno preciznog utvrđivanja vremena nastupanja smrti i da analizom postojećih metoda pokuša da utvrdi koje to metode i u kojoj kombinaciji mogu dati najpreciznije odgovore na ovo važno medicinsko, sudsko - medicinsko i pravno pitanje.

Materijal i metode: Koristili smo metode detaljne analize i komparacije rezultata različitih publikacija.

Rezultati: Kao obavezni parametri koji se moraju ispitati preporučuju se: unutrašnja temperatura leša, mrtvačke mrlje, mrtvačka ukočenost i ispitivanje supravitalnih reakcija. Upoređivanjem različitih publikacija, došli smo do zaključka da se najprecizniji rezultati dobijaju korišćenjem temperaturnog metoda, kojim se utvrđuje maksimalna preciznost u dozvoljenim granicama od 95%, plus-minus 2,8 sati, od pravog vremena smrti. Ostale preporučene metode predstavljaju prilično pouzdani znak smrti, ali nemaju apsolutnu snagu njenog dokaza.

Zaključak: Prilikom korišćenja grupe navedenih metoda, i njihovom komparacijom i ukrštanjem dobija se približno tačan, mada još uvek aproksimativan, vremenski interval od nastupanja smrti. Nemogućnost preciznog određivanja nastupanja smrti je posledica nepostojanja uniformne, separate, dovoljno objektivne metode za tačno utvrđivanje trenutka prestanka vitalnih funkcija ljudskog tela.

Ključne reči: Vreme smrti, metode, post - mortalni period

DETERMINATION OF THE TIME OF DEATH

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Introduction: In this review we pointed out the impossibility of accurately determining the precise time of death. All methods now in use to determine the time of death are to a degree unreliable and inaccurate. They usually give vague or dubious answers.

The Aim: The first aim of this review is to point out the impossibility of accurately determining the true time of death. The second aim is to analyze existing methods and determine which methods can be combined to give accurately answers to this important issue.

Materials and Methods: We used the method of detailed analysis and comparison of the results of various publications.

Results: As required parameters that must be tested are recommended: internal temperature of the corpse, livor mortis, rigor mortis and testing outliving reaction. Comparison of different publications, we have come to the conclusion that the most accurate results are obtained using the temperature method, which determines the maximum allowable limits of accuracy of 95%, up or down 2.8 hours, from the true time of death. Other methods are reliable signs of death, but don't have absolute strength of evidence.

Conclusion: When using the methods of the group, and comparing and crossing is obtained an approximate exact, but still approximately result. The inability to determine precisely the time of death was caused by the absence of uniform, separate, objective method for determining the time of death.

Keywords: Time of death, methods, post - mortem period

GENETIČKI POLIMORFIZAM AUTOZOMALNIH STR LOKUSA U POPULACIJI VOJVODINE

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Uvod: Analiza mikrosatelitskih lokusa (Short tandem repeats – STR), lokalizovanih u nekodirajućim regijama deoksiribonukleinske kiseline, predstavlja metod izbora u analizama iz oblasti medicinske kriminalistike, vestačenja spornih srodnčkih odnosa i humane identifikacije. Potreba za standardizovanjem i mogućnošću komparacije rezultata dovela je do formiranja CODIS – Combined DNA Index System - baze podataka, koja obuhvata podatke o genetičkom polimorfizmu 13 STR lokusa, koji predstavljaju osnov većine komercijalnih kitova.

Cilj: Cilj istraživanja je analiza genetičkog polimorfizma autozomalnih STR lokusa u populaciji Vojvodine i utvrđivanje mogućnosti njihove primene u forenzičkim analizama.

Materijal i metode: Istraživanje je sprovedeno na rezultatima analiza DNK 597 nesrodnih, odraslih osoba, sa prebivalištem na području Vojvodine. Baza podataka je sačinjena standardnim analizama izolacije jedarne DNK primenom Chelex-100 reagensa i Proteinase K, a amplifikacija metodom lančane reakcije polimeraze uz primenu AmpFISTR Identifiler identifikacionog kita. Detekcija nastalih produkata je rađena metodom kapilarne elektroforeze. Statistički parametri su dobijeni računskim putem, a forenzički primenom PowerStats 1.2 softvera, Promega Madison, WI. Statistička analiza je sprovedena primenom Studentovog t – testa.

Rezultati: Najviši stepen polimorfizma pokazuju lokusi D2S1338 (PIC = 0.86) i D18S51 (PIC = 0.86), a najniži TPOX (PIC = 0.55). Svi posmatrani lokusi ispoljavaju PD>0.85 i procenat heterozigotnosti >70%, izuzev lokusa TPOX. Ne postoji statistički značajna razlika između vrednosti dobijene i očekivane heterozigotnosti.

Zaključak: Rezultati istraživanja u skladu su sa Hardy – Weinberg-ovim zakonom, a aleli pokazuju visok stepen polimorfizma, što ispitivane lokuse čini pogodnim za primenu u oblastima medicinske kriminalistike, vestačenja spornih srodnčkih odnosa i humane identifikacije na teritoriji Vojvodine.

ključne reči: STR markeri, polimorfizam, AmpFISTR Identifiler, populacija Vojvodine

GENETIC POLYMORPHISM OF AUTOSOMAL STR LOCI IN THE POPULATION OF VOJVODINA

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Introduction: The analysis of microsatellite loci (Short tandem repeats – STR), located in the non-coding regions of the deoxyribonucleic acid, is a method of choice in analysis in the field of medical criminalistics, disputed kinship testing and human identification. The necessity of standardization and comparison of the results of analysis resulted in forming of CODIS – Combined DNA Index System - database, that includes data about genetic polymorphism of 13 STR loci, which represent the base of most of the commercial kits.

The Aim: The goal is to analyze genetic polymorphism of the autosomal STR loci in the population of Vojvodina and to evaluate the possibility of their use in forensic analysis.

Material and methods: The research was conducted on the results of DNA analysis of 597 non-related adults living on the territory of Vojvodina. The database was made using the standard analysis for the isolation of nuclear DNA with Chelex-100 reagents and Proteinase K, and amplification with the polymerase chain reaction in combination with AmpFISTR Identifiler identification kit. The detection of amplification products was performed with capillary electrophoresis. The statistical parameters were calculated, and the forensic were obtained using the PowerStats 1.2 software package, Promega Madison, WI. The Student's t – test was used for the statistical analysis.

Results: The highest polymorphism rate was shown on loci D2S1338 (PIC = 0.86) and D18S51 (PIC = 0.86), and the lowest on TPOX (PIC = 0.55). All of the observed loci showed PD>0.85 and percentage of heterozygosity >70%, except for the locus TPOX. There is no statistically significant difference between the observed and expected heterozygosity values.

Conclusion: The research results are in concordance with the Hardy – Weinberg's law, while alleles show high polymorphism rate, which makes them suitable for the use in the fields of medical criminalistics, disputed kinship testing and human identification on the territory of Vojvodina.

Key words: STR markers, polymorphism, AmpFISTR Identifiler, the population of Vojvodina

MORFOLOŠKE KERAKTERISTIKE JETRE KOD HEROINOMANA

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Uvod: Heroin se u organizam unosi ušmrkavanjem, pušenjem ili injekcijom. Svi načini izazivaju zavisnost. Posledice zavisnosti su emotivno, fizičko, psihičko i socijalno propadanje ličnosti. Jetra je najveći organ u ljudskom telu. Uloga jetre u organizmu je: metabolička i hemodinamska.

Cilj: studije je bio da se ustanove značajna morfološka oštećenja jetrinog tkiva kod hroničnih heroinomana, kao i to da li je izraženost ovih oštećenja zavisna od dužine vremenskog perioda u kojem je korišćen heroin.

Materijal i metod: studija je obuhvatala analizu 50 autopsija-40 iz grupe heroinomana (34 leševa muškog, 6 leševa ženskog pola, starosne dobi od 15 do 40 godina), 10 iz kontrolne grupe (8 leševa muškog, 2 leša ženskog pola, starosne dobi od 15 do 35 godina). Grupisanj su po dužini staža unošenja heroina u 4 grupe: do 2 godine, između 2 i 5, između 5 i 10 i dužim od 10 godina.

Rezultati: Analiza dobijenih podataka je pokazala da su vezikularne promene predominantno prisutne u zoni 2 acinusa (71,5%), sa povećanjem staža dominantne panacinusno (75%);masne promene na hepatocitima u najvećem procentu je nađeno u grupi sa stažom između 5 i 10 godina (61,5%); hronični aktivni hepatitis sa stažom dužim od 10 godina prisutan u svim slučajevima (100%); ciroza najzastupljenija sa stažom dužim od 10godina (75%) udružena je sa hroničnim aktivnim hepatitisom (50%);

Zaključak: Rezultati studija su pokazali sledeće-vaskularne promene su najzastupljenija vrsta promena na hepatocitima heroinomana. Sa porastom dužine heroinomanskog staža raste njihova učestalost, kao i učestalost hroničnog aktivnog hepatitisa i zastupljenost ciroze.

ključne reči: hepatitis, ciroza, jetra, heroin.

MORPHOLOGICAL CHARACTERISTICS OF LIVER IN HEROIN ADDICTS

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Introduction: Heroin can be sniffed, smoked or injected. General consequences of addiction are emotional, physical, psychological and social deterioration of person. Liver is the largest organ in the body. The role liver plays in the organism can be: metabolic and hemodynamic.

The aim: Our study was to determine significant morphological changes of liver tissue in chronic heroin abusers as well as the connection of these changes with duration of the abuse of heroin.

Material and Methods: Study consisted of 50 autopsy-40 from heroin addict group (34 were male, 6 were female, age 15-40 years),10 from control group (8 were male, 2 were females, age 15-35 years). They were grouped by the amount of time they were using heroin into 4 groups: up to 2 years, between 2-5, between 5-10, and more than 10 years.

Results: Analysis of recieved data shown that vesicular changes were mostly present in zone 2 of the acinus (71.5%), with longer abuse they become panacinus (75%);greasy changes in hepatocytes were most found where abuse lasted 5 and 10 years (61.5%); where abuse lasted longer than 10 years chronic active hepatitis was present in all cases (100%); cirrhosis was most prevalent with abuse longer than 10 years (75%).

Conclusion: Results of the study shown the following-vascular changes were the most prevalent type of change in hapatocytes in heroin addicts. Longer heroin abuse greater was the incidence of these changes as well as the incidence of chronic active hepatitis and cirrhosis.

Key words: hepatitis, cirrhosis, liver, heroin

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Uvod: S obzirom da broj narkomana na našem području iz godine u godinu sve više raste i imajući u vidu da je narkomanija jedan od vodećih rizikofaktora za samoubistvo, naše istraživanje pokazuje problem narkomanije na našem području kao i njihovu povezanost sa vrstama samoubistva.

Cilj: Cilj ovog istraživanja je da se ukaže na učestalost samoubistva među narkomanima u Beogradu, specifičnost načina izvršenja i druge sudskomedicinske karakteristike ovih smrti.

Materijal i metode: Izvršena je retrospektivna analiza smrtnih slučajeva narkomana obdukovanih u Institutu za sudsku medicinu "Milovan Milovanović" Medicinskog fakulteta Univerziteta u Beogradu, u periodu od 3 godine (od početka 2009. do kraja 2011.g.). Ukupno su obrađena 164 smrtna slučaja uživaoca droga. Pri analizi svakog pojedinačnog slučaja korišćeni su kompletni obdukcioni zapisnici, nalaz hemijskotoksikološke analize, ali i heteroanamnestički podaci dobijeni od rodbine, kao i drugi dostupni podaci.

Rezultati: Od ukupno obrađena 164 slučaja, samoubistvo je izvršilo 38 osoba, što je od ukupnog broja 23,17%, a od nasilnih smrti čak 54,28%. Najveći broj samoubistava među narkomanima je bio tokom 2009. godine, a narkomani koji su izvršili samoubistvo pretežno su bili muškog pola, uzrasta između 30 i 39 godina, sa srednjom stručnom spremom, koji su živeli u porodičnom okruženju, korisnici heroina i marihuane uz alkohol. Najčešće su se odlučivali za „sigurna“ samoubistva – vešanje, upotrebu vatrenog oružja i skok sa visine.

Zaključak: Naše istraživanje je potvrdilo veliku učestalost samoubistva među narkomanima kao i značajni udeo korišćenja „sigurnih“ metoda.

Ključne reči: suicid, narkoman, heroin, marihuana

FORENSIC CHARACTERISTICS OF SUICIDE AMONG DRUGS USERS

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Introduction: The number of drug addicts in this area is constantly growing. Our research shows the problem of drug abuse and their relation to the types of suicide in Belgrade.

Aim: The aim of this study is to show the frequency of suicide among drug users in Belgrade, the specific methods of execution and other forensic features of these deaths.

Material and methods: A retrospective analysis of deaths in drug addicts, autopsied at the Institute of Forensic Medicine "Milovan Milovanovic", School of Medicine, University of Belgrade, was performed for the period from the beginning of 2009. till the end of 2011. The total of 164 deaths of drug users were treated. The complete autopsy reports, findings from toxicological analysis, and also heteroanamnesis data obtained from relatives and other available information were used in analysis of each case.

Results: Of the total 164 cases processed, 38 people has committed suicide (23.17%), which is 54.28% of the number of total violent deaths. The highest suicide rate among drug users was in 2009. Drug addicts who committed suicide were predominantly male, between 30 and 39 years old, with secondary education, who lived in a family environment, users of heroin and marijuana along with alcohol. The most often option for committing the suicide was "safe" method - hanging, firearms use and jumping from heights.

Conclusion: Our research confirmed the high incidence of suicide among drug users and a significant proportion of use of "safe" method for suicide.

Key words: suicide, drug addict, heroin, marijuana.

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Uvod: Fizičke povrede predstavljaju nasilna oštećenja zdravlja nastala dejstvom fizičkih agenasa, pa se kao takve mogu podeliti na: termičke, radijacione, povrede prouzrokovane elektricitetom i povrede prouzrokovane visokim ili niskim atmosferskim pritiskom.

Cilj: Utvrđivanje porekla smrti i drugih sudskomedicinskih karakteristika žrtava stradalih usled fizičkih povreda.

Materijal i metode: Retrospektivnom studijom analiziran je obdukcioni materijal Instituta za sudsku medicinu Medicinskog fakulteta Univerziteta u Beogradu iz trogodišnjeg perioda. Uzorak je definisan tako što su za analizu korišćeni svi slučajevi kod kojih je nalazom obdukcije ustanovljena fizička povreda kao uzrok smrti. Podaci su dobijeni evaluacijom obdukcionih protokola, izvestaja istražnih organa i standardizovanih upitnika za uzimanje podataka od članova porodice pokojnika.

Rezultati: Uzorak ovog istraživanja obuhvatio je ukupno 96 slučajeva, što predstavlja 2,63% od ukupno 3652 obdukcije izvršene u navedenom periodu. Među njima je bilo 72 muškarca i 24 žene. Uzrok smrti kod 83 (86%) žrtve bila je termička povreda, a kod 13 (14%) povreda prouzrokovana elektricitetom. Ni u jednom slučaju uzrok smrti nije bila radijaciona povreda ili barotrauma.

Poreklo smrti utvrđeno je kod 90 (94%) žrtava, a ostalo je nepoznato u 6 (6%) slučajeva. Smrt je u 82 (85%) slučaja bila zadesnog porekla, u 6 (6%) samoubilačka, a u 2 (2%) slučaja se radilo o ubistvu.

Zaključak: U ispitivanom uzorku umrlih zbog fizičkih povreda, smrt zadesnog porekla bila je najčešće dijagnostifikovana, samoubistvo je bilo znatno ređe, dok je ubistvo bilo najmanje zastupljeno.

Ključne reči: fizičke povrede, diferencijalna dijagnoza, poreklo smrti.

DIFFERENTIAL DIAGNOSIS OF THE ORIGIN OF DEATH IN PHYSICAL INJURY

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Introduction: Physical injuries are violent damages of health caused by physical agents.

Aim: Determining the manner of death and other forensic characteristics of victims who died as a result of physical injury.

Materials and methods: Autopsy material of the Institute of Forensic Medicine, School of Medicine, University of Belgrade collected over the three year period was analyzed in a retrospective study. The sample was defined collecting all cases in which a physical injury was determined as a cause of death. Data were obtained by evaluation of autopsy protocols, the official investigating records and standardized questionnaires for collecting the heteroanamnesic information.

Results: The sample of this study included 96 cases, representing 2.63% of all 3652 autopsies performed in that period. Among them 72 were men and 24 women. The cause of death for 83 (86%) victims was thermal injury, and 13 (14%) were victims of injuries caused by electricity. In no cases cause of death was radiation injury or the effect of atmospheric pressure.

The manner of death was determined for 90 (94%) victims, while it remained unknown in 6 (6%) cases. In the studied sample, the manner of death was accidental in 82 cases, in 6 cases suicidal and homicidal in 2 cases.

Conclusion: In this sample, accidental death was most common, suicide was significantly lower and murder was the least represented.

Key words: physical injury, differential diagnosis, manner of death.

SUDSKOMEDICINSKE KARAKTERISTIKE SAMOUBISTAVA U USTANOVAMA ZA IZVRŠENJE KRIVIČNIH SANKCIJA

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Uvod: Samoubistvo predstavlja svesno i namerno uništenje sopstvenog života. Samoubistvo je četiri puta češće u zatvorskim uslovima u odnosu na opštu populaciju.

Cilj: Analiziranje pojedine sudskomedicinske karakteristike slučajeva suicida izvršenih u ustanovama za izvršenje krivičnih sankcija: karakteristike žrtve, uzrok smrti, podaci o prethodnim pokušajima samoubistva kao i eventualnim psihijatrijskim poremećajima i/ili bolestima zavisnosti.

Materijal i metode: Retrospektivnom analizom obdukcionog materijala na Institutu za sudsku medicinu „Milovan Milovanović“ Univerziteta u Beogradu za petogodišnji period (2005-2009.) izdvojeno je, radi dalje analize, 58 slučajeva smrti u zatvorskim uslovima. Učestalost je izražavana brojevima i procentima. Za obradu podataka korišćene su standardne metode deskriptivne statistike.

Rezultati: U analiziranom uzorku, koji su činile osobe umrle u ustanovama za izvršenje krivičnih sankcija na teritoriji grada Beograda, utvrđeno je samoubilačko poreklo smrti u 13, 8%, odnosno, u 8 slučajeva. Istovremeno u 68, 9% utvrđeno je prirodno poreklo smrti. Svi slučajevi samoubistva uključeni u ovo istraživanje izvršeni su vešanjem. Učestalost prethodnih pokušaja suicida u analiziranom uzorku je čak 50%. Samo jedna žrtva (12,5%) nije imala postavljenu dijagnozu psihotičnog poremećaja, dok su kod ostalih žrtava prethodno utvrđena duševna oboljenja: shizofrenija (37,5%) i drugi psihotični poremećaji (50%).

Zaključak: Naša studija pokazala je, na osnovu velikog broja ranijih pokušaja samoubistava (50%) i visoke učestalosti psihijatrijskih poremećaja (87,5%) kod izvršiocia suicida, da i kod nas postoje problemi vezani za uslove izdržavanja kazne u ustanovama predviđenim za to, kao i neadekvatna prevencija suicida i nejednakost u pristupačnosti zdravstvenih usluga zatvorenicima u odnosu na opštu populaciju.

Ključne reči: samoubistvo, zatvorske ustanove, psihički poremećaji

FORENSIC CHARACTERISTICS OF SUICIDE IN PENAL INSTITUTIONS

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Introduction: Suicide is intentionally and consciously destruction of one's life. It is four times often in conditions of detention in relation to the general population.

Aim: Purpose of our work was to analyse characteristics of suicide cases in Penal Institutions: characteristics of victims, cause of death, information about previous attempts and possible psychiatric diseases and/or addiction disease.

Material and Methods: A retrospective analysis has been done on 58 death cases in prison conditions in a five year period from 2005-2009, which autopsies were done on the Institute of Forensic medicine, University of Belgrade. The frequency was expressed in figures and percentages. For data processing we used standard descriptive methods.

Results: In the analyzed sample, which presents people died in Penal Institutions in Belgrade suicidal nature of death was in 68.5%, what presents 8 cases. At the same time 68.9% were determined as nature deaths. In all cases suicide was committed by hanging. The frequency of previous attempts is 50%. Only one victim (12.5%) was without a diagnosis of a psychiatric disease, while the other victims previously diagnosed mental illness: schizophrenia (37.5%) and other psychiatric disorders (50%).

Conclusion: Our study showed, based on a large number of previous suicide attempts and the high percent of psychiatric diseases (87.5%) at suicide committers, in our country there are problems in Penal Institutions that are connected with conditions in them, as also bad prevency of suicide and not proper medical care comper to the rest of population.

Key words: suicides, penal institutions, psychiatric diseases

SUDSKO-MEDICINSKI ASPEKTI SAOBRAĆAJNIH NESREĆA NA PODRUČJU GRADA KRAGUJEVCA U PERIODU OD 2006. DO 2011. GODINE

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Увод: Велики број људи је свакодневно укључен у саобраћај у различитом својству. Основне карактеристике саобраћајног трауматизма су: политрауматизам, полиморфизам, полифазичност и диспропорција између спољашњих и унутрашњих повреда.

Циљ: Циљ нашег истраживања је утврђивање фактора који утичу на акцидентогеност у саобраћајним несрећама, као и учесталост и тип саобраћајних несрећа на територији града Крагујевца.

Материјал и методе: У студији смо користили материјал архиве Службе за судску медицину и токсикологију Клиничког центра Крагујевца. Обрађено је 632 обдукциона записника који обухватају период 2006-2011-те године.

Резултати: Од свих прегледаних записника, у 2/3 случајева су задесне смрти. Саобраћајне несреће су најчешћи вид задеса, а најугроженији учесници су пешаци 43,75%. На лицу места је преминуло чак 71,73%, а најчешћи узрок смрти су биле краниоцеребралне повреде. Најучесталије су политрауме са (61,76% обдукованих). Код возача најчешће повреде су локализоване у пределу грудног коша, затим трбуха и главе. Код пешака су најчешће повреде главе, па трбуха, а код путника у пределу главе и грудног коша. Од обдукованих задесно страдалих којима је рађена анализа крви на алкохол, код 32,15% резултат је био позитиван, а највише је било оних са нивоом алкохола у крви до1% (45,27%). Преминули су већином припадници мушког пола и старосне доби преко 50 година.

Закључак: Саобраћајне несреће су најучесталији вид задеса. Врсте повреда, њихов број и тежина у непосредној су вези са својством учешћа у саобраћају повређених, видом незгоде, а и са неким особинама повређених особа, где је алкохолисаност најважнији чинилац.

Кључне речи: саобраћајна несрећа, обдукција, узрок смрти.

FORENSIC-MEDICAL ASPECTS OFF TRAFFIC ACCIDENTS IN THE CITY Kragujevac DURING SINCE 2006. TO 2011. YEAR

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Introduction: A large number of people are involved in the daily traffic for different reasons. The Basic characteristics of traffic injuries are: polytrauma, polymorphism, poliphasic and disproportions between external and internal injuries.

The Aim: The objective of this study was to determine the factors that influence akcidentogen in road accidents, as well as frequency and type of traffic accidents in the city Kragujevac

Material and methods: In this study we used the archive material of the Service of Forensic Medicine and Toxicology, Clinical Center Kragujevac. Total of 632 autopsy report covering the period 2006-2011-the year.

Results: Of the records reviewed, the 2/3 of the accidental death. Traffic accidents are the most common form happens and the most vulnerable participants pedestrians 43.75%. On the site is dead even 71.73%, and the most common cause of death were craniocerebral injuries. Most common are the multiple trauma (61.76% autopsied). Drivers from most injuries are localized in the chest, then abdomen and head. From accidental deaths autopsied, who underwent blood tests for alcohol, with 32.15% the result was positive, and most were those with a blood alcohol level 1% (45.27%). Deceased members are mostly male and aged over 50 years.

Conclusion: Road traffic accidents are the most common kind of happens. The types of injuries, their number and weight are related with the capacity to participate in traffic injuries, seeing the accident, and with some characteristics of injured persons, where alcohol is the most important factor.

Key words: car accident, autopsy, cause of death



A line art illustration in the background. On the left, a dove is shown in flight, carrying an olive branch. In the center, there are stylized mountains. On the right, a large, rounded tent or shelter is depicted. The entire scene is rendered in a simple, clean line-art style.

VETERINARSKA MEDICINA

ZASTUPLJENOST I SKLONOSTI KA POSEDOVANJU KUĆNIH LJUBIMACA U POPULACIJI STANOVNIKA GRADA BEOGRADA

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Uvod: U zavisnosti od različitih materijalnih momenata i mentalnih afiniteta, različite osobe imaju različite sklonosti prema kućnim ljubimcima. Na to utiču stepen fizičke zrelosti, obrazovanja, kulturnog razvoja, ekonomski činioci, socijalni status, veličina životnog prostora ali i stepen svesti o sopstvenim vrednostima unutar jedne društvene zajednice, odnosno u zavisnosti od moralnih i etičkih karakteristika ličnosti, zdravstvenog statusa i raspoloživog vremena.

Cilj rada: U ovom radu je ispitivana zastupljenost vlasnika kućnih ljubimaca na teritoriji grada Beograda kao i sklonost stanovnika Beograda da postanu potencijalni vlasnici kućnih ljubimaca.

Materijal i metode: Uzorkom je obuhvaćeno 450 ispitanika različite starosne dobi, a za ispitivanje je korišćen anketni metod. Ispitanici su pitani da li poseduju kućnog ljubimca i koje vrste a ako je odgovor bio negativan pitani su da se izjasne koju vrstu kućnih ljubimaca bi voleli da poseduju.

Rezultati: Najveći broj ispitanika (57,78%) poseduje kućnog ljubimca, i to 37% ispitanika ima psa, 25% mačku, 13% ribice, 9% ptice, 5% glodare, 3% gmizavce a 8% ima dve i više od dve vrste kućnih ljubimaca. Od 190 ispitanika bez kućnog ljubimca 49% bi posedovalo psa, 18% mačku, glodara 9%, pticu 8%, gmizavca 6%, ribice 4%, a 6% ispitanika ne bi posedovalo ni jednog kućnog ljubimca. Samo su se tri ispitanika, od 450 koji su učestvovali u ispitivanju i koji već poseduju kućnog ljubimca, izjasnila da bi volela da imaju još jednu vrstu kućnog ljubimca. Ni jedan ispitanik ne poseduje, niti bi voleo da poseduje insekta.

Zaključak: Na osnovu ovakvih podataka prati se zainteresovanost stanovnika jedne države za posedovanje kućnih ljubimaca, a samim tim se prate i pokazatelji kvaliteta života stanovnika kako sa psihofizičkog tako i sa ekonomskog aspekta. U našoj zemlji ne postoje precizni podaci o broju domaćinstava koja poseduju kućnog ljubimca a posebno ne podaci po vrstama kućnih ljubimaca. Takođe ni rad veterinaru male prakse uglavnom nije specijalizovan u odnosu na vrstu kućnog ljubimca, a što bi u skorijoj budućnosti trebalo promeniti.

Ključne reči: kućni ljubimac, vlasništvo, društveni trendovi.

PRESENCE AND TENDENCY TOWARDS PET ANIMAL KEEPING IN BELGRADE

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Introduction: Depending on the different moments of the economic and mental affinity, different people have different preferences for pets. This is based on degree of physical maturity, education, cultural development, economic factors, social status, size of living space and the level of awareness of their own values within a community, or depending on moral and ethical personal characteristics, health status and time available.

The Aim: The article deals with presence of pet owners in Belgrade and tendency of citizens to become the potential pet owners.

Materials and Methods: The sample included 450 persons of different age who answered whether they have a pet animal and if the answer was positive what species and if the answer was negative what animal species they would like to keep.

Results: The majority of participants (57.78%) own one pet, and 37% of them own a dog, 25% cat, 13% aquarium fishes, 9% bird, 5% rodent, 3% reptile while 8% of all pet owners had two or more than two different species of pet. The majority of a total of 190 participants who did not have a pet would like to have a dog (49%), 18% of them would like to have a cat, 9% rodent, 8% bird, 6% reptile, 4% aquarium fish and only 6% wouldn't like to own any kind of pet. Only 3 participants who have already had one of animal species would also like to have some other. None of the participants did have, or did like to have an insect.

Conclusion: These data are used for national monitoring of the interest of residents for pet animal ownership and also as indicators for state monitoring of quality of life base upon psychophysical and economic aspects. In our country there are no precise data on the number of households with pets and especially the data on type of pets is lacking. Also, the work of small animal veterinary practices is not specialized in relation to the type of pet, which should change in the near future.

Keywords: pet animals, ownership, community trend.

MORFOLOGIJA, GRADACIJA I UČESTALOST MASTOCITOMA KOD PASA

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Uvod: Mastocitomi su tumoru građeni od velikog broja različito diferentovanih mastocita. Kod pasa, čine 15-20% svih tumora kože i ujedno predstavljaju potencijalno maligne tumore kože. Prosečna starost obolelih pasa je oko 9 godina. Pojavljuju se na koži trupa (50-60%), nešto manje na ekstremitetima (25-40%) i najmanje na koži glave i vrata (10%). Makroskopski izgled mastocitoma široko varira u zavisnosti od stepena histološke diferencijacije.

Cilj: Cilj istraživanja je da pruži više informacija o patologiji i učestalosti mastocitoma kod pasa

Materijal i metode: Rad je retrospektiva analiza dijagnostikovanih mastocitoma u periodu od 2004. do 2012. godine na Katedri za patologiju, Fakulteta veterinarske medicine u Beogradu. Biopsijski material je podvrgnut histopatološkoj analizi. Tkivni iseći debljine 3-5 µm bojani H&E metodom i TB metodom. Anketirani su veterinari iz 40 veterinarskih ordinacija u Beogradu.

Rezultati: U navedenom periodu dijagnostikovano je 65 mastocitoma. Zastupljenost je bila 9,46% od svih tumora kože. Lokalizacija je bila na glavi, trupu i ekstremitetima. Utvrđen je kod različitih rasa pasa. Mastocitomi su dijagnostikovani u 25 ordinacija grada Beograda. Tumor je bio nodoznog, nepravilnog, verukoznog i polipoznog oblika sa mnogim sekundarnim alteracijama.

Zaključci: Mastocitom su predstavljali najčešće hematopoezne i „round cell“ dijagnostikovane tumore. Najčešća lokalizacija sui ekstremiteti. Predisponirane rase su zlatni retriver i mešanac. Preovladavao je nodozni oblik tumora sa ekspanzivnim rastom i sekundarnim alteracijama u vidu inflamacije.

Ključne reči: pas, mastocitom, morfologija, učestalost.

MORPHOLOGY, GRADATION AND FREQUENCY OF MASTOCYTOMAS IN DOGS

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Introduction: The mastocytomas are formed of many various mast cells. Almost 15-20% of all dog skin tumors are mastocytomas, and they are potentially malignant. The average age of affected dogs is 9 years. Most common changes are present on the skin of the trunk (50-60%), slightly less affected are extremities (25-40%) and rarely the head and neck are affected (10%). Macroscopic appearance of mastocytomas varies in accordance to the degree of histological differentiation.

Objective: The objective of this study was to provide information about the pathology and frequency of mastocytomas in dogs.

Material and methods: The retrospective study analyse of mastocytomas diagnosed in the period between 2004. and 2012 at the Department of Pathology, Faculty of Veterinary Medicine in Belgrade was performed. Biopsy material was subjected to histopathological analysis. The 3-5µm thick tissue clips were stained with H&E and TB method. The additional data were obtained from 40 veterinary stations in Belgrade.

Results: There were 65 mastocytomas diagnosed. Prevalence was 9.46% of all skin tumors. Localization was the head, trunk and extremities. It was found in different breeds of dogs. Mastocytomas were diagnosed in 25 ordinations in the City. The tumor was nodal, irregular, verucose and polypose shaped with many secondary alterations.

Conclusions: Mastocytomas were the most common haematopoietic and round cell tumors diagnosed. The most common locations are limbs. Predisposed breeds are golden retriever and mongrels. Nodal shape is the dominant form of this tumor with expansive growth and secondary alterations in form of inflammation.

Keywords: dog, mastocytoma, morphology, frequency.

LIMFOMI KOD PASA

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Uvod: Limfom je jedan od najčešćih tumora kod pasa. Za razliku od pola utvrđeno je da rasa ima uticaj na povećanje rizika za dobijanje limfoma. Etiologija limfoma kod pasa i dalje je nerazvijena. Kod pasa se najčešće nalaze četiri forme limfoma: multicentrični, medijastinalni, gastrointestinalni i kožni limfomi.

Cilj: Cilj ovog rada je bio da se ustanovi učestalost limfoma kod različitih rasa pasa, njihovo godište, kao i pol.

Materijal i metode: Uzorci za patohistološka i imunohistohemijska ispitivanja su fiksirani u 10% neutralnom puferizovanom formalinu ne duže od 48 sati, posle čega su procesovani u automatskom tkivnom procesoru. Tkiva su uklapana u parafinske kalupe, a tkivni isečci debljine 3-5 µm bojeni uobičajenom hematoksilin-eozin (HE) metodom i po potrebi LSAB2 imunohistohemijskom procedurom.

Rezultati: U istraživanju koje je sprovedeno u preiodu od 2008 do 2012. godine dobijeni su sledeći rezultati: ukupn broj tumora bio je 872, a od toga 45 bili su limfomi. Najviše je bilo mešanaca i zlatnih retrivera. Obolelih ženki bilo je 21, mužjaka 15, dok u 9 slučajeva pol nije bio poznat. Najmlađi pas sa dijagnostikovanim limfomom imao je jednu godinu, a najstariji pas je imao četrnaest godina.

Zaključci: Iz dobijenih rezultata može se konstatovati da je u našem materijalu povećana učestalost limfoma kod mešanaca. Takođe povećana je učestalost kod zlatnih retrivera i bul mastifa. U ispitanoj materijalu, nije bilo moguće odrediti učestalost pojedinih formi limfoma, ali je uočeno da su kutani limfomi pasa u porastu

Ključne reči: pas, limfomi, učestalost, morfologija.

LYMPHOMA IN DOGS

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Introduction: Lymphoma is one of the most common tumors in dogs. In contrast of sex, breed has influence on increase of the risk of lymphoma. Etiology lymphoma in dogs is still unknown. In dogs the most frequent forms of lymphoma are: multicentric, mediastinal, gastrointestinal and cutaneous.

The Aim: Goal of this paper was to study the frequency of lymphoma in different breeds of dogs, their age, and sex.

Materials and Methods: Tissue samples for histopathology and immunohistochemistry were fixed in 10% neutral formalin no longer than 48 hours, and embedded in paraffin. The tissue sections, approximately 3 to 5 µm thick, were stained by using standard method (HE) and by immunohistochemical LSAB2 method in some cases.

Results: The total number of tumors diagnosed from 2008 to 2012 was 872 and 45 of them were lymphomas. Most of the dogs with diagnosed lymphomas were Golden Retrievers and mongrels. Lymphoma was established in 21 female, 15 males and in 9 samples coming from animals of unknown sex. The youngest dog with diagnosed lymphoma was one year old, while the oldest one was fourteen years old.

Conclusion: Upon the results of the research on our material, it can be concluded that lymphoma was more frequent in mongrels. Also lymphoma was more frequent in Golden Retriever and Bull Mastiff than in other breeds. Upon the material researched, there was no possibility to determine form of lymphoma, but it was observed that cutaneous lymphoma in dogs are increasing.

Keywords: dog, lymphoma, frequency, morphology.

ISPITIVANJE LIPIDNOG STATUSA I HEMATOLOŠKIH I BIOHEMIJSKIH PARAMETARA INFLAMACIJE KOD GOJAZNIH PASA

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Uvod: Masno tkivo luči veliki broj aktivnih materija (adipokina) koji utiču na imunološki status i energetske homeostazu organizma.

Cilj: Cilj našeg ispitivanja je bio da utvrdimo da li kod klinički zdravih pasa koji su ocenjeni kao gojazni, postoje promene u lipidnom statusu, krvnoj slici i biohemijskim markerima inflamacije u koje spadaju koncentracija fibrinogena, CRP-a i aktivnost faktora koagulacije (faktori koagulacije spadaju u proteine akutne faze), a u odnosu na normalno hranjene pse.

Materijal i metode: Ispitivanje je izvedeno na 14 klinički zdravih vlasničkih pasa različitih rasa, oba pola. Po uzimanju uzoraka venepukcijom rutinskim kliničkim metodama je određena vrednost za trigliceride, holesterol, HDL i LDL, CRP, fibrinogen, APTT i PT

Rezultati: Utvrđeno je da su kod gojaznih pasa povećane koncentracije ukupnih triglicerida, holesterola, i njegovih frakcija (HDL i LDL), kao i da su skraćena grupna vremena koagulacije. Koncentracija CRP-a i fibrinogena nije bila značajno različita između ispitivanih grupa.

Zaključak: Rezultati ovog ispitivanja pokazuju da kod gojaznih pasa dolazi do promena u lipidnom statusu koji se odražava kroz povećane trigliceride i ukupnog holesterola. Skraćenje u vremenu grupnih testova koagulacije najverovatnije ukazuje na postojanje subkliničke inflamacije u organizmu gojaznih životinja.

Ključne reči: gojaznost, psi, lipidni status, koagulacija, inflamacija.

EXAMINATION OF LIPID STATUS, HEMATOLOGICAL AND BIOCHEMICAL PARAMETERS OF INFLAMMATION IN OBESE DOGS

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Introduction: Adipose tissue is secreting numerous active substances (adipokines) which interfere with immune system and energy homeostasis of organism.

The Aim: The objective of this study was to determine whether in clinically healthy dogs, which have been assessed as obese there are changes in lipid status, blood count, and biochemical markers of inflammation, which include the concentration of fibrinogen CRP and the activity of coagulation factors (coagulation factors are included in acute phase proteins), compared to normally nourished dogs.

Material and Methods: The study was conducted on 14 clinically healthy pet dogs of different breeds, of both sexes. After taking samples by vena puncture, routine clinical methods were used to determine the value of triglyceride, cholesterol, HDL and LDL, CRP, fibrinogen, PT and APTT.

Results: It was found that concentrations of total triglycerides, cholesterol and its fractions (HDL and LDL) were increased, and that the group coagulation times were shortened in obese dogs. The concentration of CRP and fibrinogen was not significantly different between the groups.

Conclusion: The results of this study indicate that there are changes in lipid status, which is reflected by increased triglycerides and total cholesterol in obese dogs. Shortening of the times of group coagulation tests probably indicates the existence of subclinical inflammation in the organism of obese animals.

Keywords: obesity, dogs, lipid profile, coagulation, inflammation.

HRONIČNA OBOLJENJA TANKIH CREVA KOD PASA (LIMFOCITNO-PLAZMOCITNI ENTERITIS)

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Uvod: Hronična oboljenja tankih creva kod pasa predstavljaju oboljenja digestivnog trakta kod kojih klinički simptomi traju duže od dve do četiri nedelje. Kod ovih oboljenja kao klinički znaci javljaju se dijareja, povraćanje, gubitak telesne mase, a neretko hipoproteinemija i apatija. Limfocitno-plazmocitni duodenitis predstavlja infiltrat ćelija inflamacije unutar lamine proprije, tunike mukoze zida duodenuma. Čelije koje se mogu naći u ovom infiltratu su limfociti i plazmociti, mada su mogući nalazi čistih infiltrata (samo jedan tip ćelija).

Cilj: Utvrđivanje infiltrativnih limfocitno-plazmocitnih duodenitisa, postavljanje konačne dijagnoze i edukacija vlasnika koji imaju pse sa ovim oboljenjem.

Materijal i metode: Ispitano je četrnaest pasa koji su ispoljavali kliničke simptome hroničnih oboljenja tankih creva. Nakon uzete anamneze urađen je opšti klinički pregled (adspekcija, auskultacija i palpacija), tokom kojeg je uzeta krv za hematološke i biohemijske analize venepunkcijom. Nakon kliničkog pregleda urađen je endoskopski pregled prilikom kojeg su uzeti biopsijski isečci tkiva koji su pripremljeni za histopatološki pregled.

Rezultati: Histopatološkim pregledom biopsijskih isečaka kod deset pasa je pronađen limfocitno-plazmocitni infiltrat, a kod četiri psa je pronađen limfocitni infiltrat. Stepen infiltracije nije bio direktno proporcionalan sa kliničkim simptomima.

Zaključci: Limfocitno-plazmocitni duodenitis je često oboljenje. Klinička slika često ne odgovara stepenu infiltracije ćelija inflamacije unutar lamine proprije. Pas sa limfocitno-plazmocitnim enteritisom može da živi kvalitetno sa ovim oboljenjem i nije osuđen na smrt. Da bi lečenje ovih pacijenata bilo uspešno potrebna je potpuna saradnja i kvalitetna komunikacija vlasnika i veterinara, kao i pravilna edukacija vlasnika.

Ključne reči: IBD, limfocitno-plazmocitni enteritis, psi.

CHRONIC DISEASES OF THE SMALL INTESTINES IN DOGS (LYMPHOCYTIC-PLASMACYTIC ENTERITIS)

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Introduction: Chronic diseases of small bowel in dogs are diseases of digestive system in which the clinical symptoms last longer than two to four weeks. In these diseases main clinical symptoms are diarrhea, vomiting, weight loss and often low serum protein and apathy. Lymphocytic-plasmacytic duodenitis is characterized by inflammatory cell infiltrate in the lamina propria of duodenal mucosa. The cells infiltrating the lamina propria are lymphocytes and plasma cells, although it is possible to find single-cell type of infiltration.

The Aim: Determination of lymphocytic-plasmacytic duodenitis as definitive diagnosis and education of owners who have dogs with this disease.

Materials and Methods: A total of 14 dogs manifesting clinical symptoms of chronic diseases of small intestines were tested. After anamnesis, a general clinical examination was made (inspection, auscultation and palpation), during which blood was taken for hematological and biochemical analysis by puncture of *v. cephalica antebrachii*. Endoscopic examination was performed and tissue samples for histological examination were obtained by biopsy.

Results: Histological examination of tissue samples revealed lymphocytic-plasmacytic infiltrate in ten dogs, while lymphocytic infiltrate was found in four dogs. The degree of infiltration was not directly proportional to the clinical symptoms.

Conclusion: Lymphocytic-plasmacytic duodenitis is a common disease in dogs. The clinical signs often do not correspond to the extent of infiltration of inflammatory cells inside lamina propria. A dog with lymphocytic-plasmacytic enteritis can have a quality life and is not sentenced to death. In aim to treat these patients successfully, a full cooperation and quality communication between the owner and the veterinarian, as well as proper education of the owner is required.

Keywords: IBD, lymphocytic-plasmacytic enteritis, dogs.

PROMENE U BIOHEMIJSKIM I HEMATOLOŠKIM PARAMETRIMA KOD PASA SA HRONIČNOM INSUFICIJENCIJOM BUBREGA

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Uvod: Hronična bubrežna insuficijencija predstavlja progresivno oboljenje koje u većini slučajeva dovodi do krajnjeg stadijuma oboljenja koji zahteva dijalizu i transplantaciju bubrega.

Cilj rada: Uzimajući u obzir ovu činjenicu velika pažnja posvećena je dijagnostici oboljenja bubrega u ovoj fazi bolesti kako bi se ona što pre otkrila i primenila odgovarajuća terapija.

Materijal i metode: Ispitivanje hematoloških i biohemijskih parametara sprovedeno je na 8 prirodno obolelih vlasničkih pasa, oba pola, različitih rasa, prosečne starosti starosti 8,5 godina.

Rezultati: Na osnovu skale koje je propisalo Međunarodno društvo nefrologa od 8 ispitivanih pasa, 3 psa su bila u trećem a 5 pasa u četvrtom stadijumu bubrežne insuficijencije. Analizom krvne slike kod ispitivanih pasa 75% je imalo leukocitozu, 50% limfopeniju, granulocitiza je zabeležena kod 62,5% a smanjen broj eritrocita kod 50% pasa. Koncentracija ukupnih proteina u serumu bila je u granicama fizioloških vrednosti kod 87,5% slučajeva, dok je u 37,5% slučajeva zabeležena hipoalbuminemija. Hiperfosfatemija zabeležena je kod 62,5% pasa, hiperkalcemija i hiperkaliemija kod 25%. Pozitivna korelacija između ispitivanih parametara krvnog seruma uočena je između koncentracije uree i neorganskih fosfata, uree i kalijuma, kalijuma i neorganskih fosfata i koncentracije kreatinina i neorganskih fosfata.

Zaključak: Na osnovu rezultata dobijenih u ovom ispitivanju možemo zaključiti da su sve životinje ispoljavale kliničke znake koji su bili u korelaciji sa promenama u hematološkim i biohemijskim parametrima krvi i krvnog seruma. Najizraženije promene su bile azotemija, hiperfosfatemija, hipo i izostenurija, na osnovu čega je donet zaključak o postojanju hronične bubrežne insuficijencije.

Ključne reči: psi, hronična bubrežna insuficijencija, azotemija.

CHANGES IN BIOCHEMICAL AND HEMATOLOGICAL PARAMETERS IN DOGS WITH CHRONIC RENAL FAILURE

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Introduction: Chronic renal failure (CRF) is a progressive disease that in most cases leads to end stage renal disease requiring dialysis and kidney transplantation.

The Aim: Taking into account this fact, great attention is devoted to the diagnosis of kidney disease at early stage so that appropriate therapy can be applied as soon as the condition is discovered.

Materials and Methods: Examination of haematological and biochemical parameters was carried out in 8 naturally infected dogs, of both sexes and different breeds, aged 8.5 years on average.

Results: Eight observed dogs were assigned upon symptom-scale prescribed by the International Society of Nephrology as following: 3 dogs were in the third and 5 dogs in the fourth stage of CRF. Haematology revealed leucocytosis in 75% of dogs, while 50% had lymphopenia, granulocytosis was observed in 62.5% and anaemia was observed in 50% of dogs. Total serum protein concentration was within the physiological limit in 87.5%, whereas in 37.5% of cases hypo-albuminemia was observed. Increased serum phosphate was observed in 62.5% of dogs, while increased serum potassium and calcium was revealed in 25% of the dogs. The following parameters showed positive correlation: concentration of urea and inorganic phosphate, than urea and potassium, potassium and inorganic phosphate and creatinine concentration and inorganic phosphate.

Conclusion: Based on the results obtained in this study, we conclude that all animals exhibited clinical signs that were in correlation with changes in haematological and biochemical parameters of blood. The most pronounced changes were increased nitrogen concentration, change in inorganic phosphate concentration and urea, which were the findings that led to the conclusion that chronic renal failure existed in all dogs included in this investigation.

Keywords: dogs, chronic kidney disease, nitremia.

ISPITIVANJE EFIKASNOSTI FILTRACIJE POMOĆU MODIFIKOVANOG SPOLJAŠNJEG FILTERA U TROPSKOM AKVARIJUMU

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Uvod: U spoljašnjem filteru najbolje se kombinuju sve vrste filtracije: fizička, hemijska i biološka. Pogodan je za upotrebu u svim vrstama akvarijuma.

Cilj rada: Cilj istraživanja je postizanje kvalitetnije filtracije akvarijumske vode, lakše čišćenje predfiltera, manji utrošak vremena prilikom ispiranja filtracionih materijala i ređe čišćenje celokupnog filtera.

Materijal i metode: Ispitivanje je urađeno na dva akvarijuma. U jednom je korišćen stari model, a u drugom modifikovan, unapređen model filtera. Prilikom upoređivanja rada oba filtera meren je: nivo vode u komori za čistu vodu; vreme koje prođe između dva čišćenja predfiltera; vreme neophodno za čišćenje filtracionih materijala.

Rezultati: Uvođenjem taložnika kao dela filtera sprečava se prodiranje čestica nečistoće u biološki filtracioni materijal. Znatno je smanjena količina nečistoće koja dolazi do prvog sloja u predfilteru. Vreme koje je potrebno za održavanje ovog filtera je svedeno na vreme koje je neophodno za redovnu nedeljnu zamenu dela vode iz akvarijuma i iznosi prosečno oko 20 minuta. Svi predfiltracioni materijali, za fizičku filtraciju su lako dostupni, lako se vade i vraćaju u filter. Višestruko je povećana količina biološkog filtracionog materijala, čime je značajno poboljšana efikasnost metabolizovanja azotnih materija. Kroz biološki filtracioni materijal znatno bolje prolazi vodena struja koja je konstantana, jer su komore u kojima se nalazi manjih dimenzija. Sve ovo doprinosi da se u velikoj meri sačuva vitalnost kolonija azot-fiksirajućih bakterija u filtracionom medijumu.

Zaključak: Ovim načinom filtriranja postignuto je kvalitetnije prčišćavanje vode i manje uloženog vremena pri čišćenju filtera.

Ključne reči: filter, taložnik, filtracioni materijali, vrste filtracije, akvarijumi.

RESEARCH OF EFFICIENCY OF FILTRATION WITH MODIFIED EXTERNAL FILTER IN TROPICAL AQUARIUM

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Introduction: External filter contains best combination of all filtration types: physical, chemical and biological. It is suitable for use in all types of aquariums.

The Aim: The aim of research is achievement of high quality water filtration in aquarium, easier cleaning of pre-filter; less time spend for cleaning of filtration medium; less general cleaning of filter during the year.

Materials and Methods: Research has been done on two aquariums. In one of them old model of filter has been used, and in other one the modified, improved model. During comparison of work of both filters the level of water in clear-water chamber; the time between two cleaning of pre-filter; time needed for cleaning of filtrating materials has been measured.

Results: By introducing the clarifier as a part of filter, penetration of impurities in biological filtrating medium has been prevented. Amount of dirt that accumulates in first layer of sponge in pre-filter has been reduced. Time necessary for maintaining of this filter is above 20 minutes. All pre-filtration materials, for physical filtrations are easily available. Amount of biological filtrating medium has been enlarged several times, and it significantly improved the effect of metabolism of nitrogen. Water flow, trough biological filtrating materials, is better because of dimension of chamber they are in. All this contributes to preservation of vitality of colonies formed by nitrogen-fixating bacteria in filtration medium.

Conclusion: With this method of filtration the more quality water filtration has been achieved, and less time spend for cleaning of filter.

Keywords: filter, clarifier, filtration materials, types of filtration, aquariums.

KOMPARACIJA METODA ZA DETEKCIJU MIKROSPORIDIJA IZ RODA NOSEMA KOD MEDONOSNE PČELE (APIS MELLIFERA)

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Uvod: Mikrosporidije iz roda *Nosema* (*N. apis* i *N. ceranae*) uzročnici su nozemoze adultnih pčela. Za postavljanje dijagnoze i stepena infekcije kod ovog oboljenja koristi se nekoliko mikroskopskih i PCR metoda.

Cilj: Cilj našeg rada bilo je poređenje mogućnosti i pouzdanosti dijagnostičkih metoda.

Materijal i metode: Analize su obavljene na uzorcima pčela iz 24 pčelinje zajednice. Prateći preporuke OIE-a, detekcija spora je obavljena mikroskopskim pregledom srednjih creva adultnih pčela, dok je kvantifikacija stepena infekcije dobijana brojanjem spora na Neubauer-improved hemocitometru. Pored mikroskopske za detekciju je korišćena i simplex-PCR metoda, dok je duplex-PCR metodom obavljena identifikacija vrste.

Rezultati: Mikroskopskim pregledom pčela iz sakupljenih uzoraka (N=24) spore su detektovane u 66.67% uzoraka. Analizom simplex-PCR produkata dobijeni su pozitivni rezultati kod svih 24 uzorka (100%). Urađen je i duplex-PCR radi identifikacije vrste nozeme, kojim su dobijeni pozitivni rezultati za 83,34% uzoraka, a svi uspešni uzorci pripadaju vrsti *N. ceranae*.

Zaključak: Veća pouzdanost simplex-PCR metode u odnosu na mikroskopski pregled, kako u detekciji niskih stepena infekcije nozomom, tako i zbog mogućnost detekcije i vegetativnih oblika nozeme, navodi nas da damo preporuku da se simplex-PCR uvede kao obavezna metoda za praćenje stanja pčelinjih društava na terenu radi što ranije detekcije i blagovremene prevencije infekcije nozomom. Specijska identifikacija mikrosporidija roda *Nosema* jednostavnija je putem duplex-PCR metode koju preporučuje OIE, ali veću pouzdanost daje PCR-RFLP metoda.

Ključne reči: *Nosema sp.*, *Apis mellifera*, mikroskopska analiza, simplex-PCR, duplex-PCR.

KOMPARATION OF METHODS FOR DETECTION MICROSPORIDIA OF THE GENUS *Nosema* IN HONEY BEE (*Apis mellifera*)

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Introduction: Honey bee microsporidia of the genus *Nosema* (*N. apis* i *N. ceranae*) cause nosemosis in adult honey bees. For diagnosis and determination of infection level, various microscopy and PCR methods are used.

The Aim: The aim of this research was to compare the properties and reliability of different diagnostic methods.

Materials and Methods: Honey bee samples were taken from 24 colonies. Following recommendations of OIE, the detection of *Nosema* spores was performed by microscopic examination of adult bee abdomen or ventriculus, while the quantification of infection level was determined by counting spores on Neubauer-improved haemocytometer. Along with microscopic detection, a simplex-PCR method was used. For species identification we used duplex-PCR.

Results: Microscopic examination revealed *Nosema* spores in 66.67% of analysed samples. With simplex-PCR method positive results were obtained in all samples (100%). Duplex-PCR method used for identification of *Nosema* species gave 83,34% positive samples and all of them were *N. ceranae*.

Conclusion: Simplex-PCR method had higher reliability compared to microscopic examination in detection low level of infections. Besides, it has possibility to detect vegetative *Nosema sp.* parasites present in the gut epithelium of the bees. This led us to give recommendation for usage simplex-PCR method as obligatory method for monitoring of honey bee condition for the purpose of early detection and timely prevention of *Nosema* infection. For species identification, duplex-PCR method recommended from OIE is easier for usage, but for higher reliability PCR-RFLP method should be used.

Keywords: *Nosema sp.*, *Apis mellifera*, microscopic examination, simplex-PCR, duplex-PCR.

UPOREDNA KARAKTERISTIKE POJEDINIH KOSTIJU ZADNJEG EKSTREMITETA SRNE (*Capreolus capreolus*) I OVCE (*Ovis aries*) U CILJU UTVRĐIVANJA PRIPADNOSTI VRSTE ŽIVOTINJA

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Uvod: Anatomске karakteristike su bitna karika u proučavanju morfoloških razlika domaćih i divljih životinja različitih vrsta. U radu smo se bavili uporednim anatomskim razlikama i karakteristikama između srne i ovce, kao predstavnika divljih i domaćih životinja.

Cilj: Cilj ovog rada jeste uočavanje i upoređivanje razlika pojedinih kostiju zadnjeg ekstremiteta ovce i srne i obezbeđivanje podataka bitnih za poznavanje razlika kostiju koji se kao takvi mogu iskoristiti u forenzičke svrhe.

Materijal i metode: Kostiju su mehanički odvojene od mekih tkiva, nakon čega je izvršena maceracija kostiju u periodu od pet do sedam dana u vodi sa odgovarajućim hemikalijama. Očišćene kosti su zatim potopljene u 5% - 10% koncentrovani vodonik peroksid zbog izbeljivanja i odmašćivanja. U svrhu utvrđivanja razlika, korišćeno je deset kostiju ovce i deset kostiju srne, a sve različitih starosnih dobi životinja.

Rezultati: Karlične kosti ovce i srne se dosta razlikuju. Dužina karlične kosti ovce je 20 cm, srne 17,5 cm, širina karlice u predelu krila kod ovce je 16,0 cm, srne 10,5 cm. Širina karlice u predelu acetabuluma kod ovce je 11,5 cm, srne 8,0 cm. Dužina butne kosti ovce je 17,5 cm, srne 14,0 cm. Butna kost ovce je kompaktna, a u srne vitkija i lakša. Patella (kolena čašica) je u srne lakša, relativno duža i iznosi 3,0 cm, dok je u ovce kraća i iznosi 2,5 cm. Skeleton cruris su potkolene kosti koje čine *Tibia* i *Fibula*, a kod procene ovih kostiju mora se uzimati u obzir i starost životinje.

Zaključci: Na svim delovima karlične i butne kosti može se videti razlika između kostiju ovce i srne što je dokazano i u ovom radu. Za potkolene kosti je to mnogo teže, jer pojava lisnjače (*fibule*) se vezuje za starost životinje. Na zglobnoj površini distalnog dela golenjače (*tibia*) razlike skoro i nema između kostiju ovce i srne tako da taj deo teško može da posluži za utvrđivanje vrste.

Ključne reči: ovca, srna, zadnji ekstremitet, kosti.

COMPARISON OF CHARACTERISTICS OF HIND LIMB BONES OF THE SHEEP (*Ovis aries*) AND THE ROE (*Capreolus capreolus*) IN AIM OF SPECIES DETERMINATION

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Introduction: Anatomical characteristics are important link in studying morphological differences in domestic and wild animals. In our research we studied differences in sheep and roe, as domestic and wild animal representatives.

The Aim: To notice and compare differences between hind limb bones of roe and sheep and provide the data important for application of these differences in forensic purposes.

Materials and methods: Bones were mechanically separated from soft tissue. Maceration was conducted in water with chemicals during a period of five to seven days. Afterwards bones were submerged in 5%-10% hydrogen peroxide to cleanse and remove grease. In order to determine differences, we used ten variously aged bones of each species.

Results: There are many differences in sheep and roe pelvic bones. The length of a sheep pelvic bone is 20 cm, roe pelvic bone is 17.5 cm. Pelvic width in a wing area is 16.0 cm in sheep and 10.5 cm in roe. Pelvic width in acetabulum in sheep is 11.5 cm and 8.0 cm in roe. The length of sheep femur is 17.5 cm and the length of roe femur is 14 cm. Sheep femur is more compact, with roe femur being more narrow and light. Roe patella is lighter and relatively longer being 3.0 cm long, while in sheep it was shorter being 2.5 cm long. To properly assess skeleton cruris, which consists of *Tibia* and *Fibula*, we must consider the age of the animal.

Conclusions: This research proves that many differences can be noticed in all parts of pelvic bone and femur between a roe and a sheep. This is much harder in bones of a lower leg, where we must take animal's age in consideration. Wrist area in distal part of tibia shows almost no difference between a roe and a sheep, so that part of the bone is not usefull in identification of the species.

Keywords: sheep, roe, hind limb, bones.

PROCENA VARIJABILNOSTI TELESNE GRAĐE SJENIČKO - PEŠTERSKE OVCE NA OSNOVU BIOMETRIJSKIH PARAMETARA

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Uvod: Morfometrijski parametri kao indikatori osobina sjeničko – peštarske ovce su prikazani u skladu sa preporukama FAO-a o morfološkoj karakterizaciji rasa.

Cilj rada: Dopuna podataka o morfološkim odlikama sjeničkog soja pramenke prema preporukama FAO – UNEPa.

Materijal i metode: Ukupno 11 ovaca sjeničko-peštarskog soja pramenke je izmereno pantljikom. Merenjima su utvrđene vrednosti sledećih parametara: visine životinje, dužine trupa, obima grudi, obima prednje cevanice, zatim kraniometrijskih odlika: dužine, širine glave, dužine ušiju, kao i dužine, prednje, srednje i zadnje širine sapi; i dužine repa. Izmerena grla se gaje u dobrim uslovima ambijenta i ishrane. Dobijeni rezultati su uporedno prikazani sa podacima o telesnim merama sjeničko-peštarske ovce iz dostupne literature.

Rezultati: Morfometrijska ispitivanja pokazuju da je prosečna visina ovaca 71,45 cm, a prosečna dužina trupa 73,45 cm, što pokazuje da su ovce gotovo kvadratičnog formata. Obim grudi je 106,54 cm, a obim prednje cevanice kao indikator razvijenosti skeleta 8,8 cm što ukazuje na čvrstu konstitucije sjeničko peštarske ovce. Glava je harmonične građe duga oko 31,27 cm, a razvijenost čeonog i ličnog dela je gotovo podjednaka. Širina glave iznosi 15 cm, a uska i duga glava ukazuje na kasnostasnost sjeničke ovce. Dužina pigmentiranih, horizontalnih ušiju je 12,64 cm. Pelvimetrijom je utvrđeno da je karlica prostrana, dovoljno duga (30,54 cm) i široka: prednja širina 30,73 cm, srednja 37,27 cm, a zadnja 31,9 cm zbog čega jagnjenje može biti olakšano. Dužina repa je 40,27 cm.

Zaključak: Rezultati ispitivanja ukazuju na varijabilnost morfoloških osobina i na veliku ambijentalnu uslovljenost telesne građe u sjeničko-peštarske ovce.

Ključne reči: Morfometrija, varijabilnost, sjeničko-peštarska ovca.

ESTIMATION OF MORPHOLOGICAL VARIABILITY UPON BIOMETRIC PARAMETERS IN SJENIČKO-PEŠTERSKA SHEEP

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Introduction: In the paper, parameters obtained by measuring of sjeničko-peštarska type sheep are presented as indicators of animal constitution upon criteria of FAO.

The Aim: Morphometric evaluation of Sjeničko-Peštarska sheep was performed in aim to obtain the data on morphology of this Zackel type in optimized breeding conditions and so meet the demands on AnGR characterization.

Material and Methods: Measuring was performed on 11 sheep bred in improved conditions and compared with the results obtained in the traditional breeding system. The following parameters were evaluated: wither height, body length, chest circumference, cannon circumference, head length and width and ear length, than pelvic length, pelvic inlet, midpelvis and pelvic outlet were also measured.

Results: Wither height of sheep was 71.45 cm, while body length was 71.45 cm. The hight/length ratio indicated almost square form of Sjenička sheep. Chest circumference was 106.54 cm, while cannon circumference was 8.8cm, indicating firm constitution. Craniometry revealed that head length was 31.27 cm and equally developed front and face. Head width was 15.00 cm, leading to the conclusion that head of Sjeničko-Peštarska sheep is long and narrow. Pigmented ears were long (12.64 cm), horizontally placed and carried. Pelvimetry revealed large and well balanced pelvis: pelvic length was 30.54; pelvic inlet was 30.73, midpelvis 37.37 cm and pelvic outlet was 31.90 cm revealing constitutional adjustment for easy lambing. Tail length was 40.27 cm.

Conclusion: Results obtained by morphometry of Sjeničko-Peštarska sheep revealed significant constitutional variation and suggested importance of ambient influence on characteristics in this sheep type.

Keywords: Morphometric parameters, variability, Sjeničko-Peštarska sheep.

PROFILAKSA I TERAPIJA ZARAZNE ŠEPAVOSTI OVACA PRIMENOM RASTVORA CINK SULFATA

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Uvod: Zarazna šepavost ovaca je najčešće oboljenje, sa velikom raširenošću i značajnim ekonomskim štetama u uzgoju ovaca u svim zemljama sveta. Prve promene nastaju u interdigitalnom prostoru.

Cilj: Cilj rada je da se ispita efikasnost 20% rastvora cink sulfata u profilaksi i terapiji zarazne šepavosti ovaca.

Materijal i metode: U stadu ovaca rase virttemberg (n=180) prosečne starosti od 3 godine, zarazna šepavost je bila prisutna kod 28% životinja. U profilaksi kod zdravih papaka je korišćen rastvor 20% cink sulfata kod 50 ovaca podeljenih u dve podgrupe formirane po starosti (1,5 i 2,5 godine). U terapiji promenjenih papaka korišćen je rastvor 20% cink sulfata uz dodatak 2% natrijum-lauril sulfata, u grupi ovaca sa lakšim lezijama bez triminga, a kod težih sa trimingom. Triming papaka je vršen priborom za deskvamaciju rožine, a nakon toga ovce su stajale u bazenu 300x200x10 cm 30 minuta po svakom tretmanu 1, 5, i 10. dana.

Rezultati: Kod profilaktičkog tretmana sa rastvorom 20% cink sulfata zarazna šepavost se pojavila kod 8% jedinki u grupi starijih ovaca. Kod terapijskog tretmana koji je sproveden u rastvoru 20% cink sulfata uz dodatak 2% natrijum-lauril sulfata došlo je do izlečenja zarazne šepavosti u grupi ovaca bez triminga u 84% slučajeva, a u grupi sa trimingom u 72% slučajeva. Profilaktička efikasnost sredstva po navedenoj proceduri iznosila je 96%, a kod lečenih ovaca je sa 28% svedena na 6,11%. Pre terapijskog tretmana nije potrebno sprovesti triming osim onih papaka koji su preterano deformisani i preasli.

Zaključci: Rastvor 20% cink-sulfata je dovoljan za uspešnu terapiju i bez triminga papaka, te preporučujemo da program suzbijanja i eradikacije treba da se bazira na primeni navedenog rastvora.

Ključne reči: zarazna šepavost ovaca, profilaksa, terapija, zink sulfat.

PROPHYLAXIS AND TREATMENT OF FOOTROT BY USING ZINC SULPHATE IN SHEEP

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Introduction: Footrot is the most frequent disease in sheep, with large, widespread and significant economic damage to sheep farming in all countries. Initial change occurs in the interdigital space.

The Aim: The aim of this study was to test the efficiency of 20% solution of zinc sulphate in the prophylaxis and treatment of footrot in sheep.

Materials and Methods: In a flock of 180 German Landrace sheep (Wurtemberg) aged 3 years on average, footrot was present in 28% of animals. Prophylaxis was conducted on healthy hooves (n=50) in two subgroups formed by age: 1.5 year and 2.5 year olds, treated with 20% solution of zinc sulphate. Therapeutic treatment of changed hooves was conducted with solution composed of 20% zinc sulphate with 2% sodium lauryl sulphate. The group with mild hoof lesions was treated without trimming, and in severely changed hooves were treated after trimming. Hooves were trimmed by accessories for horn desquamation, after which the sheep were kept standing in a pool (300x200x10cm) for 30 minutes during each treatment on the 1st, 5th, and the 10th day.

Results: Footrot occurred in 8% of sheep in a group of older sheep submitted to prophylactic treatment with 20% solution of zinc sulphate. Curative effect of therapeutic treatment, performed in 20% solution of zinc sulphate with 2% sodium lauryl sulphate, was observed in 84% of the sheep treated without trimming of the hoofs, while the therapy was successful in 72% of cases submitted to hoof trimming prior to dipping. The efficiency of the prophylactic procedure applied was 96%, while incidence of footrot was reduced from 28% to 6.11% in therapeutically treated sheep. It is not necessary to implement the hoof trimming before the therapy except in cases when hoofs are excessively misshapen and overgrown.

Conclusion: 20% solution of zinc sulphate is sufficient for successful treatment without hoof trimming, and we recommend that the control and eradication program should be based on the application of the above solution.

Keywords: footrot in sheep, prophylaxis, therapy, zinc sulphate.

PRIMENA METODE REAL-TIME PCR U BRZOJ IDENTIFIKACIJI GOVEĐEG HERPESVIRUSA 1 (BHV 1)

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Uvod: Infektivni bovini rinotracheitis / infektivni pustulozni vulvovaginitis je oboljenje goveda koje izaziva goveđi herpesvirus 1 (BHV 1). PCR je molekularna metoda koja omogućuje brzu i preciznu identifikaciju nukleinske kiseline virusa u uzorku. Prednosti PCR nad drugim metodama su veća osetljivost, brzina izvođenja i mogućnost korišćenja različitih vrsta uzoraka suspektnog materijala.

Cilj: Ispitivanje mogućnosti primene metode Real-Time PCR u brznoj i pouzdanoj identifikaciji nukleinske kiseline BHV 1 u uzorcima nosnih briseva goveda, bez prethodne izolacije virusa primenom standardnih metoda virusološke dijagnostike.

Materijal i metode: Ukupno je ispitano 65 uzoraka nosnih briseva goveda sa nekoliko farmi u Republici Srbiji. Životinje od kojih su uzimani brisevi imale su nespecifične kliničke znake respiratorne infekcije. Za izolaciju BHV 1 na kulturi tkiva i izvođenje testa virus – neutralizacije korišćena je ćelijska linija Vero. Korišćen je referentni soj goveđeg herpesvirusa 1 – TN-41 kao kontrola. Identifikacija virusa je vršena metodom virus-serum neutralizacije (VN test). Detekcija, identifikacija i kvantifikacija BHV 1 vršena je primenom metode Real – Time PCR za koju su korišćeni prajmeri i proba, specifični za deo gena na molekulu virusne DNK koji kodira sintezu glikoproteina B (gB).

Rezultati: Primenom metode izolacije virusa na kulturi tkiva nije ustanovljeno prisustvo goveđeg herpesvirusa 1 u ispitivanim uzorcima. Ispitivanjem istih uzoraka korišćenjem metode Real-Time PCR utvrđeno je prisustvo navedenog virusa kod tri uzorka nosnih briseva.

Zaključci: Potvrđena je opravdanost korišćenja molekularne metode Real – Time PCR za brzu identifikaciju goveđeg herpesvirusa 1 u uzorcima nosnih briseva goveda.

Ključne reči: BHV 1, Vero ćelijska linija, Virus-serum neutralizacija (VN test), Real-Time PCR.

THE APPLICATION OF REAL-TIME PCR IN DETECTION OF BOVINE HERPESVIRUS 1 (BHV 1)

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Introduction: Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis is a disease of cattle caused by bovine herpesvirus 1 (BHV 1). PCR is a molecular diagnostic technique that allows rapid and sensitive identification of viral nucleic acid in suspected samples. Compared with other methods, the PCR has the primary advantages of being more sensitive, more rapid and permitting the use of different types of suspected samples.

The Aim: Analysis of possibility of the use of Real-Time PCR in rapid and reliable identification of BHV 1 nucleic acid in cattle nasal swabs without prior virus isolation.

Materials and Methods: A total of 65 samples of cattle nasal swabs were examined. Swabs originated from animals with clinical signs of respiratory infection. Vero cell line was used for virus isolation and virus neutralization test. Laboratory strain TN 41 of bovine herpesvirus 1 served as a control in the experiment. A virus neutralization test (VNT) was performed for virus identification. The PCR assay used primers for viral gB glycoprotein coding region.

Results: Results showed that BHV 1 virus was not isolated by using virus isolation method. Examination of the same samples of nasal swabs by using Real-Time PCR confirmed the presence of BHV 1 virus in three samples.

Conclusion: It can be concluded that Real-Time PCR can be successfully used for rapid detection and identification of bovine herpesvirus 1 in clinical samples.

Keywords: BHV 1, Vero cells, virus - neutralization test (VN-test), Real-Time PCR.

UTICAJ TELESNE KONDICIJE NA HORMONALNI STATUS VISOKO – MLEČNIH KRAVA U PERIPARTALNOM PERIODU

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Uvod: U peripartalnom periodu kod krava nastaju najznačajnije promene u metabolizmu organskih i neorganskih materija. Nedovoljno prilagođavanje endokrinog sistema u tom periodu predstavlja etiopatogenetski činioc odgovoran za nastanak poremećaja zdravlja visoko – mlečnih krava.

Cilj: Cilj ovog rada je bio da se utvrdi koji od endokrinih pokazatelja energetskog statusa pokazuje najveći stepen korelacije sa telesnom kondicijom krava tokom peripartalnog perioda.

Materijal i metode: Ogladne životinje su bile krave Holštajn – frizijske rase. Ukupno 20 visokosteonih krava, podeljeno je u dve grupe, kontrolnu (optimalno uhranjene; OTK \leq 3,5) i oglednu (gojazne krave; OTK \geq 4,25). Telesna kondicija krava uključenih u ogled ocenjena je na kraju perioda zasušenja i u toku ranog puerperijuma. Za ocenjivanje telesne kondicije korišćen je model Elanco Animal Health AI. Uzorci krvi od svih životinja uzimani su punkcijom vene jugularis. Određivanje koncentracije insulina, trijodtironina i tiroksina objavljeno je RIA – metodom.

Rezultati: Hormonalni status gojaznih visokosteonih krava, (OTK \geq 4,25), u poređenju sa kravama optimalne telesne kondicije (OTK \leq 3,5), se karakteriše nižom koncentracijom T3 ($x=2,17 : 1,80$ nmol/l) i T4 ($x= 24,50 : 33,13$ nmoli/l) u antepartalnom periodu. U periodu posle partusa koncentracije T3 ($x= 1,37 : 1,80$ nmol/l) i T4 ($x=21,44 : 28,21$ nmol/l), nisu se značajno razlikovale između ispitivanih grupa krava. Dobijene koncentracije insulina antepartalno ($x=16,26 : 20,18$ mIU/l) kao i postpartalno ($x= 11,69 : 14,17$ mIU/l) ne pokazuju značajnu razliku između grupa krava uključenih u ogled.

Zaključak: Rezultati ukazuju da smanjenje nivoa tireoidnih hormona u antepartalnom periodu predstavlja obeležje hormonalnog statusa gojaznih krava.

Ključne reči: krava, peripartalni period, hormoni.

INFLUENCE OF BODY CONDITION ON HORMONAL STATUS DAIRY COWS IN PERIPARTURIENT PERIOD

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Introduction: Major changes in metabolism of organic and inorganic substances occur in post-calving period in cows. Lack of adaptation of the endocrine system during this period is the etiological factor responsible for pathogenesis of health disorders in dairy cows.

Objective: The objective of this study was to determine which endocrine parameters of energetic status shows the highest correlation with the body condition of cows during the puerperium.

Material and methods: A total of 20 highly pregnant Holstein cows were divided into two groups, control (optimally fed; BCS \leq 3.5) and experimental (obese cows; BCS \geq 4.25). Body condition of cows in the experiment was evaluated at the end of the dry period and during the early puerperium. Elance AI Animal Health model was used for assessment of body condition. Blood samples from all animals were taken by jugular vein puncture. Determination of serum insulin, thyroxin and triiodothyronine was carried out by RIA method.

Results: Hormonal status in highly pregnant obese cows (BCS \geq 4.25) is characterized by lower concentrations of T3 ($x = 2.17 : 1.80$ nmol / l) and T4 ($x = 24.50 : 33.13$ nmol / l) in ante-parturient period compared with cows in optimal body condition (BCS \leq 3.5). Post-parturition concentrations of T3 ($x = 1.37 : 1.80$ nmol / l) and T4 ($x = 21.44 : 28.21$ nmol / l) did not differ significantly between the groups of cows. Ante-parturient ($x = 16.26 : 20.18$ mIU / l) and puerperal insulin concentration (mean = 11.69 : 14.17 mIU / l) did not differ significantly between groups of cows in the experiment.

Conclusion: The results obtained suggest that reduced levels of thyroid hormones in ante-parturient period characterize the hormonal status of obese cows.

Keywords: cows, peri-parturient period, hormone.

STADNI STERILITET KOD KRAVA

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Uvod: Stadni sterilitet mlečnih krava je sindrom više patoloških stanja stada koja se dovode u vezu sa poremećajima reprodukcije. Stadni sterilitet mlečnih krava započinje onda kada se u stadu oteli manje od 80% krava na godišnjem nivou. On je prouzrokovan sa više faktora, od kojih su najvažniji alimentarni, hereditarni, hormonalni, infektivni i greške pri veštačkom osemenjavanju.

Cilj rada: Osposobljavanje mlečnih krava za ponovnu reprodukciju, optimalno između 65 i 96 dana posle teljenja, tako da u stadu bude najmanje 85% steonih krava ili 80% živorođene teladi godišnje.

Materijal i metode: Na jednoj farmi Korporacije PKB Beograd tokom dva meseca praćena je plodnost 30 mlečnih krava. Registrovani su najčešći oblici steriliteta mlečnih krava i njihova plodnost u stadu. Krave su Holštajn frizijske rase, držane u vezanom sistemu. Starost krava je bila 2 do 6 godina, sa prosečnom proizvodnjom mleka oko 7500 litara u laktaciji u toku 305 dana. Ishrana ovih krava vršena je grupno prema visini proizvodnje mleka.

Rezultati: Najčešći uzroci stadnog steriliteta bili su endometritisi, slaba telesna kondicija i hipofunkcija jajnika. Endometritisi su se gotovo u svim slučajevima javili kod grla koja su imala težak porođaj (*partus gravis*) i zaostajanje posteljice (*retentio secundinarum*). Od ukupnog broja grla u ogledu (30 krava), 5 krava (16%) su imale težak porođaj koji je rezultirao zaostajanjem posteljice, pri čemu je kod 4 grla ili 80% od ovih 5 kasnije dijagnostikovano endometritis. Od navedenih 30 krava 11 grla ili 37% imalo je ocenu telesne kondicije 2,5 i manje, pri čemu je kod njih rektalnom palpacijom dijagnostikovana hipofunkcija jajnika, što se povezuje sa deficitarnom i neizbalansiranom ishranom. Ostalih 19 grla (63%) imalo je ocenu kondicije od 3 do 3,5. Ugojenih krava nije bilo.

Zaključci: Telesna kondicija od ocene 2,5 i manje rezultirala je smanjenjem plodnosti mlečnih krava. Uvođenjem kvalitetnog menadžmenta reprodukcije omogućeno je da se od 30 praćenih krava na oglednoj farmi do 90. dana posle teljenja osemeni 13 grla ili 40%.

Ključne reči: krava, sterilitet, stadni.

HERD STERILITY IN CATTLE

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Introduction: Herd sterility in dairy cows is the part of daily herd pathology. Herd sterility is presented in cases when calving rate drops under 80%. It is caused by several factors: alimentary, hereditary, hormonal, infectious, and occurs due to mistakes in insemination.

The Aim: Preparing cows for new pregnancy between 65 and 96 days after calving in aim to achieve at least 85% of cows pregnant, or 80% of calf birth rate during one year.

Materials and methods: During two months, 30 Holstein cows on the banded system farm were observed. We were researching the most frequent forms of sterility and parameters of fertility in the herd. The cows included in investigation were old between 2 and 6 years, with average milk production of 7500l during lactation of 305 days. These cows were grouped and fed upon their milk production.

Results: The most common causes of herd sterility are: endometritis, low body condition score and ovarian hypofunction. Endometritis was diagnosed in every cow that had difficult calving and retained placenta. Among 30 cows included in the research, 5 had difficult calving (16%) leading to retained placenta and endometritis developed in 4 cases (80%) after parturition. It was observed that 11 cows (37%) had body condition score 2.5 or less and ovarian hypofunction related to unbalanced nutrition was diagnosed in all cases. The remaining 19 cows had body condition score between 3 and 3.5 (optimal).

Conclusion: Body condition score 2.5 and less resulted in decreasing fertility in dairy cows. By using appropriate procedures and protocols for management of reproduction 13 out of 30 cows observed were successfully inseminated until 90 days post partum.

Keywords: cow, sterility, herd.

ISPITIVANJE OSETLJIVOSTI UZROČNIKA SUPKLINIČKIH MASTITISA NA ANTIMIKROBNE LEKOVE

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Uvod: Supklinički mastitisi kod krava u intenzivnom načinu gajenja dovode do značajnih ekonomskih gubitaka. Pravilna i pravovremena terapija mastitisa, zasnovana na primeni najefikasnijeg antimikrobnog leka, pored profilakse, ključna je za dobro zdravstveno stanje zapata.

Cilj rada: Cilj ovog istraživanja je bio da se ispita osetljivost sojeva koagulaza pozitivnih stafilokoka i *Streptococcus agalactiae* (*S. agalactiae*), koji su izolovani iz uzoraka mleka uzetih iz pojedinih četvrti vimena krava u slučaju intramamarnih infekcija, na odabrana antimikrobna sredstva.

Materijal i metode: Iz 280 uzoraka mleka izolovano je 14 sojeva koagulaza pozitivnih stafilokoka i 14 sojeva *S. agalactiae*. Izolacija uzročnika vršena je na krvnom agaru. Identifikacija koagulaza pozitivnih stafilokoka izvršena je na osnovu makromorfoloških osobina, katalaza i koagulaza testa, dok je identifikacija *S. agalactiae* izvršena na osnovu makromorfoloških osobina, katalaza testa i CAMP- testa. Disk difuzionom metodom po Kirbi Baueru ispitana je osetljivost izolovanih sojeva na sledeća antimikrobna sredstva: penicilin G, amoksicilin, amoksicilin/klavulanska kiselina, kloksacilin, ceftriakson, ceftiofur, penicilin/novobiocin, gentamicin, linkomicin, linkomicin/neomicin, tetraciklin, sulfametoksazol/trimetoprimom (kotrimoksazol), eritromicin, i tetradelta.

Rezultati: Ispitivanjem osetljivosti sojeva koagulaza pozitivnih stafilokoka, ustanovljeno je da su svi izolovani sojevi bili osetljivi na amoksicilin/klavulanska kiselina, kloksacilin, penicilin/novobiocin, linkomicin/neomicin i na tetradelta, dok je 92,86% bilo osetljivo na ceftiofur, gentamicin, tetraciklin, kotrimoksazol i eritromicin, a na penicilin, amoksicilin i linkomicin bilo je osetljivo 71,43% izolata. Izolovani sojevi *S. agalactiae* su u visokom procentu bili rezistentni na gentamicin (78,57%), dok su prema ostalim antimikrobnim sredstvima bili osetljivi.

Zaključak: Izolovani sojevi *S. agalactiae* su bili osetljiviji na beta-laktamske antibiotike od izolovanih sojeva koagulaza pozitivnih stafilokoka.

Ključne reči: mastitis, koagulaza pozitivne stafilokoke, *Streptococcus agalactiae*, antibiotici, osetljivost.

INVESTIGATION OF SUSCEPTIBILITY OF CAUSATIVE AGENTS OF SUBCLINICAL MASTITIS TO ANTIMICROBIALS

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Introduction: Subclinical mastitis in cows leads to considerable economic losses in intensive dairy production. Apart from prophylaxis, regular, well timed therapy of mastitis based on the application of the most efficient antimicrobials is very important for good health in dairy cows.

The Aim: The aim of this research was to test susceptibility of the strains i.e. coagulase positive staphylococci and *Streptococcus agalactiae* (*S. agalactiae*) isolated from milk sampled from separate quarters of infected cow udder, on selected antimicrobials.

Materials and Methods: A total of 14 strains of coagulase positive staphylococci and 14 strains of *S. agalactiae* have been isolated from 280 milk samples cultivated on blood agar. Coagulase positive staphylococci were identified upon macro-morphological characteristics, catalase and coagulase test, while identification of *S. agalactiae* included macro-morphological features, catalase test and CAMP – test. Kirby Bauer disc diffusion method was used for antimicrobial susceptibility testing on the following antimicrobials: penicillin G, amoxicillin, amoxicillin/clavulanic acid, cloxacillin, ceftriaxone, ceftiofur, penicillin/novobiocin, gentamicin, linkomycin, linkomycin/neomycin, tetracycline, sulfamethoxazole/trimethoprim (cotrimoxazole), erythromycin and tetradelta.

Results: It has been established that all isolated strains of coagulase positive staphylococci were susceptible to amoxicillin/clavulanic acid, cloxacillin, penicillin/novobiocin, linkomycin/neomicin and tetradelta, while 92.86% was susceptible to ceftiofur, gentamicin, tetracycline, cotrimoxazole and erythromycin, than 71.43% of the investigated strains were susceptible to penicillin, amoxicillin and linkomycin. High level of resistance to gentamicin was observed in 78.57% of the isolated strains of *S. agalactiae*, and all isolated strains were susceptible to other antimicrobials tested.

Conclusion: The isolated strains of *S. agalactiae* were more sensitive to beta-lactam antibiotics than the isolated strains of coagulase positive staphylococci.

Key words: mastitis, coagulase positive staphylococci, *Streptococcus agalactiae*, antibiotics, susceptibility.

ANTIMIKROBNA SVOJSTVA SOJEVA IZ RODA BACILLUS SPP. IZOLOVANIH IZ SIROVOG I PASTERIZOVANOG MLEKA

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Uvod: Pripadnici roda *Bacillus* su poznati po produkciji različitih antimikrobnih supstanci, uključujući peptidne i lipopeptidne antibiotike i bakteriochine. Bakteriocini *Bacillus* spp postaju sve važniji shodno njihovom širem spektru dejstva od većine bakteriočina bakterija mlečne kiseline. Pored Gram pozitivnih bakterija, antimikrobni spektar bakteriočina *Bacillus* spp uključuje Gram negativne bakterije, gljivice i kvasce, među kojima su neki od predstavnika poznati uzrokovaci oboljenja kod ljudi i/li životinja.

Cilj rada: Cilj ovog rada je da se ispita potencijal antimikrobne aktivnosti sojeva *Bacillus* spp. izolovanih uz sirovog i pasterizovanog mleka u odnosu na odabrane indikator mikroorganizme (*L. monocytogenes*, *S. aureus* i *B. subtilis*).

Materijal i metode: Materijal ispitivanja predstavljali su sojevi *Bacillus* spp izolovani iz sirovog i pasterizovanog mleka, ukupno 120 sojeva. Za ispitivanje antimikrobnih svojstava sojeva *Bacillus* spp. primenjen je agar difuzioni metod u bunarićima (Agar Well Difusion-AWD), a kao indikator mikroorganizmi korišćeni su *L. monocytogenes* ATCC19115, metilicilin rezistentan *S. aureus* i *B. subtilis* ATCC 6633B.

Rezultati: Od 120 testiranih sojeva *Bacillus* spp, 14 (11,6%) sojeva je pokazalo zonu inhibicije u odnosu na jedan ili dva indikator mikroorganizma, 6 sojeva *Bacillus* spp je inhibisalo rast *S. aureus*, 6 sojeva *B. subtilis* a 2 soja su inhibisala rast *S. aureus* i *L. monocytogenes*.

Zaključak: Sa aspekta bezbednosti i održivosti namirnica, ispitivani sojevi *Bacillus* spp. imaju potencijal primene u biološkoj kontroli mikroorganizama kvara i patogena. Inhibitorni učinak ispitivanih sojeva *Bacillus* spp. u odnosu na metilicilin rezistentni soj *Staphylococcus aureus* ukazuje na mogućnost eksploatacije njihovih bakteriočina kao alternative postojećoj antimikrobnoj terapiji.

Ključne reči: *Bacillus* spp, bakteriocin, inhibicija rasta.

ANTIMICROBIAL PROPERTIES OF GENUS BACILLUS SPP STRAINS ISOLATED FROM RAW AND PASTEURISED MILK

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Introduction: Members of the genus *Bacillus* are known to produce a wide arsenal of antimicrobial substances, including peptide and lipopeptide antibiotics, and bacteriocins. *Bacillus* bacteriocins are increasingly becoming more important due to their sometimes broader spectra of inhibition (as compared with most Lactic Acid Bacteria bacteriocins), which may include Gram-negative bacteria, yeasts or fungi, in addition to Gram-positive species, some of which are known to be pathogenic to humans and/or animals.

The Aim: The aim of this work is to investigate potential antimicrobial activity of bacterial strains from genus *Bacillus*, isolated from raw and pasteurised milk, against selected indicator microorganisms.

Material and methods: Material for this examination was 120 *Bacillus* spp. isolates. Agar Well Difusion (AWD) method was used to show antimicrobial activity of tested *Bacillus* spp. isolates against indicator microorganisms listed: *Listeria monocytogenes* ATCC19115, metilicilin rezistentan *Staphylococcus aureus* (MRSA) and *Bacillus subtilis* ATCC6633.

Results: Fourteen (11.6%) out of 120 isolates showed antimicrobial activity against one or two indicator microorganisms. Among them 6 isolates inhibited growth of *S. aureus*, 6 isolates inhibited growth of *B. subtilis* and 2 isolates inhibited growth of *S. aureus* and *L. monocytogenes*.

Conclusion: Using bacteriocins of *Bacillus* spp. as bio preservatives in food industry as well as alternative to conventional antibiotics is promising since results of this study showed that antimicrobial substances possess a large-scale potential to inhibit growth of some important human and animal pathogenic bacteria such as MRSA and *L. monocytogenes*.

Keywords: *Bacillus* spp, bacteriocins, antimicrobial activity.

ODREĐIVANJE REZIDUA ANTIBIOTIKA U SIROVOM MLEKU

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Uvod: Prisustvo rezidua antibiotika i hemoterapeutika u hrani predstavlja značajan problem sa aspekta bezbednosti hrane. Kako bi se osigurao visoki tehnološki kvalitet mleka i bezbednost po potrošača u praksu se uvodi integrisani sistem kontrole rezidua antibiotika i hemoterapeutika, sa podeljenom odgovornošću između proizvođača, prerađivača-industrije i veterinarske inspekcije.

Cilj: Cilj ovog rada je da se utvrdi količina antibiotika i hemoterapeutika u sirovom mleku primenom »screening« metode.

Materijal i metode: Materijal ispitivanja je predstavljalo 108 uzoraka sirovog mleka, od toga 98 uzoraka pojedinačnih proizvođača, a 10 zbirnih uzoraka. Za detekciju uzoraka antibiotika u sirovom mleku primenjen je Twinsensor i Trisensor test.

Rezultati: Od ukupno testiranih 108 pojedinačnih i zbirnih uzoraka sirovog mleka, rezidue antibiotika su dokazane u 11 uzoraka, što čini 10,18 %. U pojedinačnim uzorcima sirovog mleka rezidue β -laktama su dokazane u 11,22% uzoraka, dok rezidue tetraciklina nisu dokazane. Testiranjem 10 uzoraka zbirnog mleka na prisustvo β -laktama i tetraciklina, rezidue antibiotika nisu dokazane. Na prisustvo rezidua sulfonamida ispitivano je 16 uzoraka sirovog mleka, od toga 14 pojedinačnih i 2 zbirna uzorka. Rezidue sulfonamida nisu dokazane.

Zaključci: Iako uzorci pojedinačnih mleka pozitivnih na prisustvo β -laktama ulaze u sastav zbirnog mleka, usled faktora razblaženja, u linijama dovoza zbirnog mleka se ne dokazuje prisustvo rezidua antibiotika. Integrisani sistem kontrole rezidua antibiotika i hemoterapeutika, sa podeljenom odgovornošću između proizvođača, prerađivača-industrije i veterinarske inspekcije ne funkcioniše.

Ključne reči: rezidue antibiotika i hemoterapeutika, sirovo mleko, integrisani sistem kontrole

DETERMINATION OF ANTIBIOTIC DRUG RESIDUES IN RAW MILK

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Introduction: The presence of antimicrobial drug residues in milk represents a public health issue. To ensure a high technological quality of the milk and the safety of the consumers, an integrated system is applied, with shared responsibilities of the dairy farmer, the processing establishment, and the veterinary inspection.

The Aim: The investigation was conducted in aim to find the quantity of antibiotic and chemotherapeutic in raw milk by using »screening« method.

Materials and Methods: A total of 108 samples raw milk were submitted to investigation, 98 of these samples originated from individual producers, and 10 were collective samples. Antibiotic detection in samples of raw milk was performed by Twinsensor and Trisensor test.

Results: Residues of antibiotics were detected in 11 samples of raw milk (10.18 %) out of 108 tested. In individual samples of raw milk residues of β -lactams were detected in 11.22% samples, while residues of tetracycline were not detected. Presence of sulphonamide residues was tested in 16 samples of raw milk, 14 of them were individual and 2 collective and sulphonamide residues were not detected.

Conclusion: Although, individual samples tested positive on presence β -lactams, when diluted in total milk collected, no positive test was revealed due to dilution. Integrated control system for residues of antibiotics and chemotherapeutics with responsibility divided between producer, producer-industry and veterinary inspection is not functional.

Keywords: antibiotic and chemotherapeutic residues, raw milk, integrated system of control.

MIKROBIOLOŠKA KARAKTERIZACIJA AUTOHTONIH SIREVA

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Uvod: Iako zaštita biodiverziteta živoj sveta danas predstavlja temu od posebnog interesa, veoma malo pažnje se poklanja očuvanju mikroorganizama, pre svega bakterija mlečne kiseline poreklom iz tradicionalnih proizvoda od mleka.

Cilj: Cilj ovog rada je karakterizacija izolata glavnih mikrobnih grupa bakterija mlečne kiseline prisutnih u tradicionalno proizvedenim sirevima, pre svega u odnosu na njihovu zastupljenost, brzinu kišeljstva, proteolitičku aktivnost i potencijal patogenosti.

Materijal i metode: Materijal korišćen u radu je predstavljalo 10 uzoraka sireva od sirovog mleka. Uzorci (20 g) su pomešani sa 180 ml puferisane peptonske vode, homogenizovani u stomaheru. Odgovarajuće razblaženje je preneseno na specifične podloge – broj laktokoka je određen na M17 agaru inkubacijom pri 30°C tokom 48-72 h; broj laktobacila na MRS agaru inkubacijom pri 37°C tokom 48-72h; broj enterokoka na Kanamicin Aeskulin Azid (KAA) agaru inkubacijom pri 37°C tokom 48h. Brzina kišeljstva određivana je merenjem promene pH posle 6, 12 i 24 h inkubacije ispitivanih sojeva laktokoka u sterilisanom 10% rekonstituisanom obranom mleku u prahu. Proteolitička aktivnost je određena zasejavanjem ispitivanih sojeva laktobacila na površinu mlečnog agara, pri inkubaciji na 30°C i 37°C u periodu 24 h – 48 h i pri sobnoj temperaturi (20°C±1°C) tokom pet dana. Potencijal patogenosti enterokoka određen je zasejavanjem na površinu Columbia agara obogaćenog sa 5% govede krvi posle inkubacije od 72 h pri temperaturi od 37°C.

Rezultati: Dominantnu populaciju bakterija mlečne kiseline kod ispitivanih autohtonih sireva predstavljaju laktokoke. Kod većine ispitivanih sojeva laktokoka optimalna pH vrednost se ostvaruje nakon inkubacije od 24 časa. Proteolitička aktivnost je dokazana kod 19 od 43 ispitivanih soja laktobacila. Sojevi enterokoka ne pokazuju hemolitičku aktivnost na krvnom agaru.

Zaključci: Brzina kišeljstva je veoma varijabilna, ali postoje sojevi koji već za 6h dostižu optimalan pH od 4,6 i time ih smatramo dobrim producentima kiseline.

Proteolitička aktivnost je najizraženija je na sobnoj temperaturi. Ispitivani sojevi enterokoka ne poseduju potencijal patogenosti kako ne ispoljavaju hemolitičku aktivnost.

Ključne reči: autohtoni sirevi, bakterije mlečne kiseline, biotehnoški potencijal.

MICROBIOLOGICAL CHARACTERIZATION OF AUTOCHTHONOUS CHEESES

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Introduction: Although protection of the world's biodiversity is currently a topic of particular concern, little attention has been given to the preservation of microorganisms, particularly lactic acid bacteria from artisanal milk products..

The Aim: The aim of this paper is characterization of microbial isolates and the main groups of lactic acid bacteria present in the traditionally produced cheeses, especially in relation to their number, their speed of acidification, proteolytic activity and potential pathogenicity.

Materials and Methods: The material of investigation was consisted of 10 raw milk cheeses. Samples (20g) were diluted with 180 ml of buffered peptone water, homogenized in a stomacher. Appropriate dilution was transferred to the specific substrate and the number of lactococci was determined in M17 agar incubated at 30°C for 48-72h, the number of lactobacilli on MRS agar incubated at 37°C for 48-72h; the number of enterococci on Kanamycin Aeskulin Azide (KAA) agar incubated at 37°C for 48 h. Speed of acidification was determined by measuring the change in pH after 6, 12 and 24h incubation of strains of lactococci in sterile, 10% reconstituted skim milk powder. Proteolytic activity was determined by seeding strains of lactobacilli on the surface of milk agar with incubation at 30°C and 37°C during 24h - 48h, and on room temperature (20°C ± 1°C) for five days. The potential pathogenicity of enterococci was determined by plating on the surface of Columbia agar enriched with 5% bovine blood after 72 h of incubation at 37°C.

Results: The dominant population of lactic acid bacteria in the studied autochthonous cheeses are lactococci. In the majority of tested strains of lactococci optimal pH value is achieved after incubation for 24 hours. Proteolytic activity was proved in 19 of 43 of tested strains of lactobacilli. The strains of enterococci did not show haemolytic activity on blood agar.

Conclusion: The speed of acidification is very variable, but there are strains that need 6h for reaching the optimal pH of 4.6 and thus are considered good acid producers. The proteolytic activity is most prominent at room temperature. The tested strains of enterococci do not have the pathogenic potential because they do not show haemolytic activity.

Keywords: autochthonous cheeses, lactic acid bacteria, biotechnological potential.

NALAZ KOAGULAZA POZITIVNIH STAFILOKOKA U SIRU I PRIKAZ NJIHOVOG ENTEROTOKSOGENOG POTENCIJALA

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Uvod: Stafilokokna trovanja se smatraju jednim od vodećih alimentarnih bolesti kod ljudi širom sveta, a povezana su sa kontaminiranim namirnicama životinjskog porekla, poput mleka i mlečnih proizvoda.

Cilj: Cilj rada je da se utvrdi broj koagulaza pozitivnih stafilokoka u ispitivanim uzorcima sireva proizvedenim od sirovog mleka i njihov enterotoksogeni potencijal, a u matriksu sireva ispitati moguće prisustvo enterotoksina.

Materijal i metode: Materijal korišćen u radu je predstavljalo 10 uzoraka sireva od sirovog mleka. Uzorci (25g) su pomešani sa 225 ml puferisane peptonske vode, homogenizovani u stomaheru, zasejani na Baird-Parker agar i aerobno inkubirani na 37°C 24 i 48h. Određen je broj karakterističnih i nekarakterističnih kolonija stafilokoka, koje su ispitane mikromorfološki bojenjem po Gramu i na produkciju katalaze. Katalaza pozitivni sojevi su korišćeni za koagulaza test. Upotrebom miniVIDAS®, po principu ELFA testa, je ispitao potencijal produkcije enterotoksina koagulaza pozitivnih izolata stafilokoka, kao i moguće prisustvo enterotoksina u uzorcima sireva.

Rezultati: Broj kolonija karakterističnog izgleda *Staphylococcus spp.* na Baird-Parker agaru je iznosio od $<10^2$ do $1,7 \times 10^5$ CFU/g, dok se broj nekarakterističnih kretao od $<10^2$ do $8,91 \times 10^5$ CFU/g. Od ukupno 47 sojeva kod 24 je dokazana produkcija koagulaze, a od tih 24 soja kod 10 sojeva je dokazan enterotoksogeni potencijal. U uzorcima sireva nisu detektovani target enterotoksini.

Zaključci: U ispitivanim uzorcima sireva dokazane su koagulaza pozitivne stafilokoke sa potencijalom enterotoksogenosti. Enterotoksogene izolate stafilokoka čine i sojevi koji na površini Baird-Parker agara ne daju morfološki karakterističnu za koagulaza pozitivne stafilokoke i time postoji mogućnost njihovog zanemarivanja i neobjektivne procene rizika.

Ključne reči: sirevi od sirovog mleka, koagulaza pozitivne stafilokoke, enterotoksini.

THE PREVALENCE OF COAGULASE POSITIVE STAPHYLOCOCCI IN CHEESE AND REVIEW OF THEIR ENTEROTOXIGENIC POTENTIAL

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Introduction: Staphylococcal food poisoning is considered one of the leading foodborne illnesses in humans worldwide and is associated with contaminated foods of animal origin, such as milk and dairy products.

The Aim: The aim of this study was to determine the prevalence of coagulase positive staphylococci in the analyzed samples of raw milk cheeses and their enterotoxigenic potential. The possible presence of enterotoxins in cheese matrix was also evaluated.

Materials and Methods: The material of investigation was prepared of 10 raw milk cheeses. Samples (25g) were diluted with 225 ml of buffered peptone water, homogenized in a stomacher, seeded onto Baird-Parker agar and incubated aerobically at 37°C for 24 and 48h. The several colonies showing typical and non-typical aspect of coagulase-positive staphylococci were subjected to Gram staining, catalase and coagulase test. The automated instrument miniVIDAS® based on ELFA was used for the evaluation of enterotoxigenic potential of strains and detection of staphylococcal enterotoxins in cheese matrix.

Results: The count of typical and non-typical staphylococcal colonies ranged from $<10^2$ to $1,7 \times 10^5$ CFU/g and from $<10^2$ to $8,91 \times 10^5$ CFU/g, respectively. Out of 47 totally analysed strains, 24 were characterized by coagulase production and 10 of these strains showed enterotoxigenic potential. Enterotoxins were not detected in cheese matrix.

Conclusion: The coagulase positive staphylococci with enterotoxigenic potential were detected in analysed cheese samples. Interestingly, the pool of enterotoxigenic staphylococcal isolates was represented not only by typical, but also by non-typical colonies of coagulase positive staphylococci so there was a possibility to ignore their presence and underestimate the risk.

Keywords: raw milk cheeses, coagulase positive staphylococci, enterotoxins.

REZISTENCIJA NA ANTIBIOTIKE KOD SOJEVA ENTEROKOKA I STAFILOKOKA IZOLOVANIH IZ SIREVA

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Uvod: Nekontrolisana primena antibiotika dovela je do sve češće pojave sojeva mikroorganizama koji su rezistentni na antibiotike. Ova pojava može biti posledica horizontalnog transfera gena rezistencije između mikroorganizama, kao i činjenice da namirnice animalnog porekla predstavljaju jedan od glavnih medijuma u kojima se on odigrava. Prema ovoj teoriji, enterokoke i stafilokoke, čije je stanište organizam sisara, a mogu se izolovati i iz namirnica od sirovog mleka, predstavljaju potencijalni rezervoar gena rezistencije za druge mikroorganizme.

Cilj: Cilj ovog rada je ispitivanje osetljivosti, odnosno rezistencija na odabrane antibiotike kod sojeva stafilokoka i enterokoka poreklom iz sireva proizvedenih od sirovog mleka.

Materijal i metode: Materijal ispitivanja predstavljalo je 39 sojeva enterokoka i 47 stafilokoka, izolovanih iz 10 sireva proizvedenih od sirovog mleka. Ispitivanje rezistencije sojeva enterokoka na 9 antibiotika i stafilokoka na 10 antibiotika je objavljeno primenom disk difuzione metode korišćenjem BBL diskova impregniranih odgovarajućim antibiotikom. Kategorizacija sojeva: S (osetljivo), I (intermedijarno) i R (rezistentno) je izvršena poređenjem očitanih zona inhibicije sa referentnim vrednostima proizvođača.

Rezultati: Približno polovina (53,19%) ispitivanih sojeva stafilokoka pokazala je rezistenciju na najmanje jedan od testiranih antibiotika, sa tim da se najčešće utvrđuje rezistencija na penicilin, ampicilin i oksacilin. Među populacijom enterokoka, 97,44% ispitanih sojeva pokazuje rezistenciju na najmanje jedan od testiranih antibiotika, najčešće na linkomicin i streptomycin.

Zaključak: Rezultati ispitivanja ukazuju da sirevi od sirovog mleka mogu poslužiti kao sredstvo prenosa sojeva enterokoka i stafilokoka rezistentnih na antibiotike.

Ključne reči: sirevi od sirovog mleka, enterokoke, stafilokoke, rezistencija na antibiotike.

ANTIBIOTIC RESISTANCE IN STRAINS OF ENTEROCOCCI AND STAPHYLOCOCCI ISOLATED FROM CHEESE

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Introduction: Uncontrolled use of antibiotics gave rise to resistance in increasing number of strains of microorganisms. The increasing resistance resulted from horizontal gene transfer occurring in food of animal origin as important media. According to this theory, enterococci and staphylococci as natural inhabitants of mammal organism can be isolated from raw milk products behaving as potential resistance genes reservoirs for other microorganisms.

The Aim: The aim of the research was to estimate sensitivity of strains of staphylococci and enterococci isolated from cheeses produced from raw milk, to selected antibiotics.

Materials and Methods: A total of 39 strains of enterococci and 47 strains of staphylococci isolated from 10 cheeses produced from raw milk were investigated for resistance. Testing of resistance in strains of enterococci (9 antibiotics) and staphylococci (10 antibiotics) was performed by disk diffusion method using BBL disks impregnated with the appropriate antibiotic. Categorization of strains: S (sensitive), I (intermediate) and R (resistant) was performed by comparison of the inhibition zones to manufacturer's reference values.

Results: Approximately half (53.19%) of the tested staphylococci exhibited resistance to at least one of the antibiotics tested. The most frequent finding was resistance to penicillin, ampicillin and oxacillin. The resistance to at least one antibiotic, mostly to linkomycin and streptomycin has been confirmed in 97.44% of all enterococci isolated.

Conclusion: Upon the results obtained it can be concluded that raw milk cheeses can perform as media for transmission of antibiotic resistant strains of microorganisms.

Keywords: raw milk cheeses, enterococci, staphylococci, antibiotic resistance.

ZNAČAJ POJEDINAČNOG UZORKOVANJA MLEKA U CILJU IDENTIFIKACIJE KRAVA SA POREMEĆENOM SEKRECIJOM VIMENA

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Uvod: Poremećaj sekrecije mlečne žlezde krava ima veliki značaj, jer utiče na higijensku ispravnost, hemijski sastav i količinu mleka. Uzroci poremećaja sekrecije mogu biti fizičkog, hemijskog, alimentarnog, a najčešće su mikrobiološkog porekla. Glavni pokazatelj poremećene sekrecije mlečne žlezde je povećanje broja somatskih ćelija u mleku.

Cilj rada: Cilj našeg istraživanja je da se kontrolom broja somatskih ćelija u mleku, pomoću DRAMIŃSKI mastitis detektora, utvrde odstupanja u poremećaju sekrecije između četvrti vimena jedne krave, krava u istoj fazi laktacije, krava u različitim fazama laktacije i između krava različite rase.

Materijal i metode: Uzorci mleka su uzimani u dva navrata tokom 2011. godine, u mesecu aprilu i junu, na dva privatna gazdinstva. Na jednom gazdinstvu krave su holštajn, a na drugom simentalске rase. U oba uzorkovanja uključeno je 33 krave, odnosno 132 četvrti vimena, od toga 18 krava holštajn, a 15 krava simentalске rase, u različitim fazama laktacije. Uzorci su pregledani na licu mesta, pomoću DRAMIŃSKI mastitis detektora.

Rezultati: Rezultati istraživanja ukazuju da je u svim fazama laktacije kod određenog broja krava utvrđeno povećanje broja somatskih ćelija. Statističkom obradom rezultata, pomoću t-testa i χ^2 testa, utvrđena je statistička značajnost razlike u broju somatskih ćelija.

Zaključak: Kontrolom broja somatskih ćelija u mleku, pomoću DRAMIŃSKI mastitis detektora, utvrđena su odstupanja u poremećaju sekrecije između četvrti vimena jedne krave, krava u istoj fazi laktacije, krava u različitim fazama laktacije i između krava različite rase.

Ključne reči: krava, mleko, faza laktacije, poremećaj sekrecije, broj somatskih ćelija.

THE IMPORTANCE OF THE INDIVIDUAL MILK SAMPLING IN ORDER TO IDENTIFY COWS WITH UDDER SECRETION DISORDER

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Introduction: Disruption of mammary gland secretion of cows is of great importance because it affects the hygienic properties, chemical composition and quantity of milk. Causes secretion may be physical, chemical, alimentary, and most are of microbial origin. The main indicator of impaired secretion of the mammary gland to increase the number of somatic cells in milk.

The Aim: The aim of our research is to control the number of somatic cells in milk, using DRAMIŃSKI mastitis detector, determine the variation in disorders of secretion between the fourth udder of a cow, a cow in the same phase lactation, cows in different stages of lactation and between cows of different breeds.

Materials and Methods: Milk samples were taken twice during 2011. year, in April and June, the two private farms. At one farm were Holstein cows, and the other Simmental. In both sampling included 33 cows and 132 quarters of the udder, from which 18 Holstein cows and 15 Simmental cows at different stages of lactation. Samples were examined on site, using DRAMIŃSKI mastitis detector.

Results: The results indicate that in all stages of lactation in a number of cows showed an increase of somatic cells. The statistical evaluation of results, using t-test and χ^2 test, the statistical significance of differences in the number of somatic cells.

Conclusion: Control of somatic cells in milk, using DRAMIŃSKI mastitis detector, are determined by differences in secretion between neighborhood disorder udder of a cow, a cow in the same stage of lactation, cows in different stages of lactation and between cows of different breeds.

Keywords: cows, milk, stage of lactation, secretion disorder, somatic cells.

