KINESITHERAPY IN RESPIRATORY DISORDERS IN CHILDREN

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Sažetak

Plućne bolesti su među najčešćim bolestima u djetinjstvu. Nedavno je zabilježen neverovatan porast alergijskih reakcija kod djece i postoji posebna briga svu djecu - pacijenti da budu tretirani i da pruži odgovarajuću dijagnozu, liječenje i praćenje stanja u cilju poboljšanja kvaliteta života.

Poremećaj funkcije respiratornog sistema, povezan je sa patološkim promjenama u mehaniku disanja (poremećaj u pravilnom kombinacijom faza udisaja i izdisaja, površno, frekventno, neefikasno disanje i poremećaj koordinacije respiratornih pokreta). To dovodi do poremećaja plućne ventilacije i razmjenu gasova, kao i pojavljivanje manjka kisika u disanje.

Ovi poremećaji su uzrokovane smanjenjem respiratorne površine, pogoršanjem bronhijalne prohodnosti ili usporenosti u mali krug cirkulacije kao posljedica patoloških procesa različitih profila. Paralelno sa smanjene pokretljivosti dijafragme i grudi i smanjenje kontraktilne sposobnosti mišića da dišu i pokretačka aktivnost pacijenata.

Najčešće respiratorne bolesti kod djece su, hronične opstruktivne bolesti pluća (COPD), bronhitis, bronhijalna astma, upala pluća, plućni apsces, emfizema pluća, restriktivne bolesti pluća.

Tokom rehabilitacije i liječenje respiratornih bolesti stavlja poseban akcenat na ulogu kineziterapiju.

Ključne riječi: respiratorni sistem, plućna ventilacija, bronhitis, bronhijalna astma, pneumonia, kineziterapija;

Abstract

The pulmonary diseases are among the most common diseases in childhood. Recently was recorded an incredible increase in allergic reactions in pediatric patients and there is special concern all children - patients to be treated and to provide appropriate diagnosis, treatment and monitor the situation in order to improve their quality of life.

The disorder of the function of the respiratory system, is associated with pathological changes in the mechanics of respiration (disruption in proper combination of the phases of inhaling and exhaling, the appearance of the surface, and frequently inefficient breathing, impaired coordination of respiratory movements). This leads to disruption of pulmonary ventilation and gas exchange, as well as the emergence of an oxygen shortage in breathing.

These disorders are caused by the reduction of respiratory area, worsening of bronchial patency or slowdown in the small circle of circulation as a consequence of pathological processes from different backgrounds. Parallel with the reduced mobility of the diaphragm and chest and decrease the contractile ability of muscles to breathe and the driving activity of patients.

The most common respiratory disorders among children are, chronic obstructive pulmonary disease (COPD), bronchitis, bronchial asthma, pneumonia, pulmonary abscess, pulmonary emphysema, restrictive lung disease.

During the rehabilitation and treatment of respiratory diseases puts special emphasis on the role of kinesitherapy.

Keywords: respiratory system, pulmonary ventilation, bronchitis, bronchial asthma, pneumonia, Kynesitherapy;

The aim of the study is: to show the prevalence of respiratory diseases in children in RM in the period from 2011 to 2015 and to explain the basic means and methods of kinesitherapy at rehabilitation of respiratory disease in children.

The main motive and challenge is prevention of lung diseases, the development of a healthy young population, and to improve the quality of life of the children with lung diseases. Ethical attitude to young patients and their concerned parents is a very important prerequisite for achieving the set goals.

Methods of research

The survey is conducted in PHI "Institute of Lung Diseases in Children - Kozle", Skopje. It is a health care institution for treatment of children with lung disease aged 0 to 16 years.

The Institute treated children from all over the country. During a year, they treated around 3500-3700 sick children, and specialist outpatient services provided to about 27,000 patients.

For diagnostics and conservative treatment of diseases of the respiratory organs are made: functional testing of lung function, bronchoscopy, Allergologic tests (cutaneous tests prick method and non-specific bronchial provocative test), oxygen therapy, prevention of lung and other diseases, control weight weight, ECG, ultrasound diagnosis and monitoring of pleural effusions. The study involved patients who reserved hospitalized at the Institute of Lung Diseases in Children - Kozle.

Table 1. Total number of performed outpatient examinations in PHI "Institute of Lung Diseases in Children - Kozle" in Skopje in the period from January to December 2015.

Month	Skopje	Other cities in Macedonia	Total
January	796	280	1076
February	696	278	974
March	933	437	1370
April	923	389	1312
May	854	374	1228
June	661	313	974
July	489	90	579
August	407	134	541
September	665	305	970
October	1008	337	1343
November	1044	349	1393

December	1251	372	1623
Total	**9725**	**3658**	**13 383**

Table 2. Total number of patients who used the services of physical therapy in PHI "Institute of Lung Diseases in Children - Kozle" in Skopje in 2015.

Physical treatment	**Inpatients**	**Outpatients**	**Total**
Percussion	3684	714	4398
Vibro massage	3062	653	3715
Bacteriological	2400	2967	5367
Eosinophils in drainage	1074	1220	2294
Solux	147	159	306
Inhalations	25	75	100
Respiratory exercises	1095	270	1365
Total	**11 487**	**6058**	**17 545**

Kinesitherapy in respiratory disorders in children

By applying kinesitherapy can can be achieved improvement of the situation of the child with respiratory disease. This is achieved through the proper combination of complex physical exercises with general - tonic character and focused breathing exercises. The goal of KT is to include all supplies of young organism to overcome the disruptions in breathing and protect the patient from complications. Thus, kinesitherapy represents an important link in the rehabilitation of patients with reduced airway capacity and can be applied both in acute and in chronic phase, in all its degrees. To achieve the goal of effective lung ventilation and satisfying the needs of oxygen during rest and during exercise, respiratory gymnastics have to pass through several stages and subsequently implemented a number of specific tasks:

- Correction and suppressing the pathological type of breathing,

- Training of the patient for physiological type of breathing (respiratory reeducation),

- Combining the new kind of physiological breathing with daily and professional activities.

Before starting the procedure for respiratory gymnastics, it is necessary to be done a functional examination of the patient to determine the extent of respiratory disorders, the type of breathing disorders, respiratory reserve and condition of the cardiovascular system. The obtained results, together with data for the clinical condition of the patient, are used to optimize respiratory exercises by character, scope and duration and serve as a basis for monitoring the therapeutic effect.

From the methodical view point, during kinesitherapy in respiratory diseases,the confidence and active participation of the patient plays a major role. It is appropriately (depending on age) to familiarize the child with the opportunity for targeted action of external breathing, for the

mistakes made by the inhalation and exhalation and consequences of it. It should be explained the the positive effects of proper application of respiratory gymnastics.

The next step is the achievement of general psychological relaxation of the patient and therefore the relaxation of the respiratory muscles. Special attention is given to the muscles of the neck and chest, of the shoulder girdle and the abdominal muscles. For this purpose we use appropriate starting relaxing positions, massage, elements of autogenous training and more. After achieving a general relaxation, the next step is to relax and unblock the diaphragm from different starting positions (lying on the back with knees bent, lying on the hip, lying on the stomach, knees leverage, sitting and standing position). Unblocking, maximum movement and proper use of the diaphragm in the act of breathing, is of prime importance in respiratory gymnastics and represents the basis and key of the respiratory rehabilitation.

With the adoption of diaphragmatic breathing, begin the reeducation of breathing in the form of slower and deeper breathing - so called orchestrated breathing. In parallel with the improvement of diaphragmatic breathing, ise working on strengthening and increasing the contractile ability of the abdominal muscles. It is important to achieve proper synchronization of the movements of the diaphragm and the contraction and relaxation of the abdominal muscles by breathing: by inhalation diaphragm descends down, with simultaneous relaxation of the abdominal muscles and raising the abdominal wall to the outside. During exhalation diaphragm pulls upward with simultaneous contraction of the abdominal muscles and the abdominal wall indentation maximum inwards.

Next step is to adopt a segmental chest breathing and strengthening the intercostal muscles. It is recommended to comply with the already adopted abdominal - diaphragmatic breathing from different starting positions. It begins with a combination of diaphragmatic breathing with lower costal breathing, then with lower and middle costal breathing, and finally, with the, lower middle and upper costal breathing. In this way is achieved completely physiological breathing.

Good adoption of the combined costal - diaphragmatic breathing allows to be ventilated separate segments of the lung, thus blocking other segments by using an appropriate starting position and the position of the limbs. In all cases is saved respiratory synergism between the movements of the diaphragm and chest, whereby during inhalation and exhalation the leading role has the diaphragm.

It should be emphasized the characteristics related to the type of respiratory disorders:

in disorders of obstructive type is recommended slowly, extended and completely exhale with unblocking the diaphragm and engaging basal (lower-costal) breathing;

in respiratory disorders of restrictive type, because of reduced elasticity of the lung tissue, attention is paid to breathing, with maximum involvement of all types of costal breathing (lower, middle and upper costal breathing), synchronized with diaphragmatic - abdominal breathing.

It should be emphasized the necessity of nasal breathing. The exercises with forced breathing, extended retention of breathing and effort are contraindicated. At this stage of the respiratory rehabilitation, patients need to be trained for an active drainage of the lungs (primarily orchestrated coughing from appropriate starting positions).

Patients with chronic breathing shortage are trained for properly combination of the physiological type of breathing with movement of limbs from different starting positions, and later, with different types of activities - like walking, climbing stairs, conversation, reading aloud and others. The final objective is automating the new stereotype of breathing.

The last phase of the respiratory rehabilitation consists in adapting patients to gradually increase the physical burdens with dynamic character, through adequately dosed training with cyclical exercises - as dosed walking, swimming, tourism, and more. The objective is gradually to reach 50-60% of the individual maximal aerobic capabilities.

Conclusion:

The exposed sequence of methods of kinesitherapy for correction and normalization of respiratory function, is applicable for all respiratory diseases. Depending of the specific clinical case, kinesitherapy is directed mainly towards resolving one or another therapeutic tasks, depending on the condition of the respiratory organs and functions, as well as other organs and systems in the body of the patient (especially the cardiovascular system).

References

1. Informator za respiratorna terapija kaj pacienti so HOBB – prevzemeno od: http://cardiosurgery.com.mk/Uploads/114%20INFORMATOR%20ZA%20RESPIRATORNA%20TERAPIJA%20KAJ%20PACIENTI%20SO%20HOBB.pdf

2. Karanesev, G., Venova, Lj. (1991). Rakovodstvo za prakticeski upraznenija po lecebna fiskultura. Sofija.

3. Marekov, M. (2006) Kineziterapija – osnovi I sredstva. Sofija.

4. Mary Atkinson.(2009) „Iscjeljujući dodir za djecu: Masaža, refleksoterapija i akupresura za djecu od 4 do 12 godina“ISBN 9789532571158 Planetopija. 01/2009.

5. Nikolova, L.V. (1983): Novosti v fizikalnata I kurortnata terapija, Sofija.
6. Nikolovska, Lence (2014) Fizikalna medicina I rehabilitacija 1i 2 opst I specijalen del ISBN 978-608-244-130-6.
7. Nikolovska, Lence and Krstev, Toshe and Vasileva, Dance and Stratorska, Tamara (2014) Praktikum po klinicka kineziterapija ISBN 978-608-244-131-3.
8. Parizkova, J. (1996). Nutrition, Physical Activity, and health in Early Life. Boca Raton. CRC

9. Rjazkova M. (2002) Fizikalna terapija терапия, Sofija.
10. Sokolov, B., Milceva, D., (1991) Lecebna fiskultura pri nervni I detski zaboljavanija. Sofija.