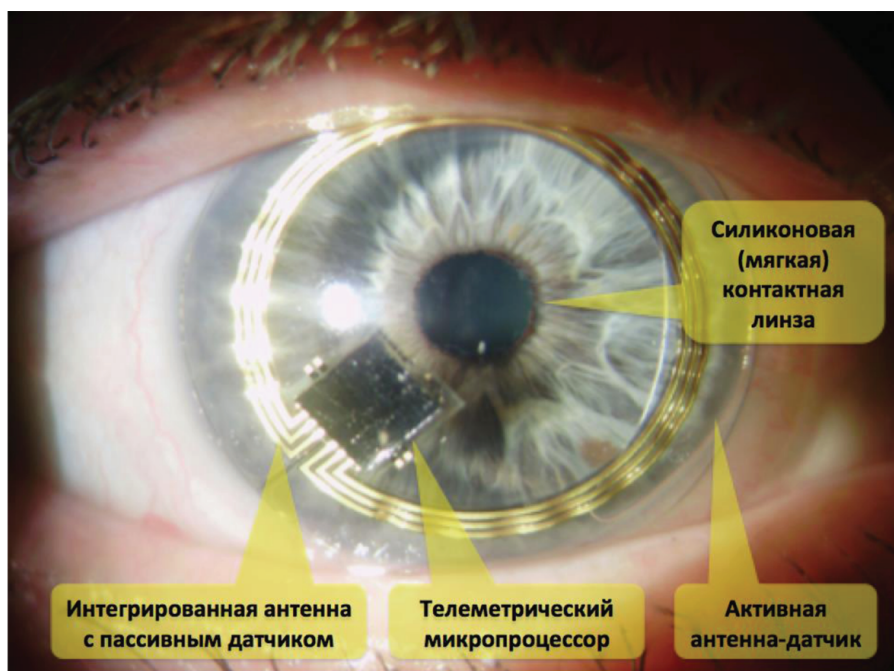




BULGARIAN FORUM GLAUCOMA

БЪЛГАРСКИ ФОРУМ
ГЛАУКОМА



BULGARIAN FORUM GLAUCOMA

Edition of the „National Academy Glaucoma” Foundation, Sofia, Bulgaria

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„National Academy Glaucoma” Foundation X International Symposium of „National Academy Glaucoma” Foundation

SESSIONS: GLAUCOMA & RETINA

Sofia, 8 April 2017, Hotel „Forum”

Фондация „Национална Академия Глаукома”

Уважаеми колеги,

Имаме честта да Ви поканим на X Международен Юбилеен Симпозиум на Фондация „Национална Академия Глаукома”, който ще се състои в гр. София на 8 април 2017 г. в Хотел „Форум”.

В рамките на симпозиума ще се проведе и сесия „Ретина”.

При желание от Ваша страна да изнесете доклад в рамките на симпозиума, моля да изпратите резюме със заглавие, автори и институция на български и английски език до 15-ти февруари 2017 г. на електронната поща на фондацията.

За контакти, регистрация и информация: E-mail: botio.ang@abv.bg

Проф. д-р Ботьо Ангелов д.м.

Учредител и Управител на Фондация „Национална Академия Глаукома”

Analysis of visual field changes in patients with early diagnosed open-angle glaucoma and ocular hypertension by standard computer-assisted perimetry

S. Gazepov

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Abstract

Introduction: Modern diagnostics of glaucoma today is unimaginable without computerized perimetry and OCT. This article is focused on comparison of results from patients with ocular hypertension and from patients with incipient glaucoma measured by standard computer perimetry.

Objective: Early detection of changes in the visual field in patients with glaucoma and ocular hypertension with an automated computer perimetry, and reconciling the results in order to help clarify the morphology and pathophysiology of the phenomenon ocular hypertension.

Material and methods: The study includes 105 patients (210 eyes), 69 women and 36 men; 90 eyes with early detected glaucoma, 60 eyes with ocular hypertension and a control group - 60 eyes. All of the patients are divided in three age groups: less than 40 years old, 41 to 59 years old and above 60 years old.

Discussion: Automatic computer perimetry provided information about the status of the visual field. This is a very precise assessment regarding the amount of visual field loss, and retinal thickness in initial or developed scotoma.

We compared the pathological changes from the group with early detected glaucoma and the group with ocular hypertension. In all three age groups a tendency for continuous raise of the PD index and MD is present.

Conclusion: In conclusion, the correct and timely diagnosis of glaucoma is the only mechanism in the fight against this dangerous disease. Standard computer perimetry offers us a number of new opportunities. It should also be used to separate the different stages of the disease like ocular hypertension and transition into manifested glaucoma.

Key words: glaucoma, ocular hypertension, standard computer perimetry.

Introduction

According to the second edition of the European Glaucoma Society Guidelines 2003 [1-2], glaucoma is a chronic, slowly progressive optic neuropathy with characteristic morphological changes of the optic disk and retinal nerve fiber layer, excluding other optic disk diseases or congenital anomalies, followed by progressive death of the retinal ganglion cells and loss of visual field. Glaucoma, besides cataract, is one of the most common challenges in everyday clinical practice in ophthalmology [3, 4, 5]. This explains the increasing interest of improved early diagnosis and assessment of the disease. Despite all advanced diagnostic methods and modern equipment, there are still many clinical aspects to be clarified [6, 7, 8].

Treatment success depends on the stage of the disease and timely diagnosis. Glaucoma is a slowly progressing disease and is often missed at an early stage. It usually affects both eyes, but significant asymmetry in the course of the disease can be observed too [9, 10, 11].

The diagnosis is based on routine clinical tests: intraocular pressure and central corneal thickness measurements, gonioscopy, biomicroscopy, funduscopy, assessment of optic nerve (ON), and retinal nerve fiber layer (RNFL) structure by OCT, typical visual field changes (computer assisted perimetry) and assessment of different risk factors [12, 13, 14, 15].

Pathological structural and related functional changes in primary open angle glaucoma progress slowly. Therefore, it is logical to propose that at the beginning of the disease there

should not be a big difference between the function of healthy eye, eye with ocular hypertension (OH) and an eye with early POAG [16, 17, 18]. In our study, we examined the differences in visual field findings among patients with POAG, with OH and healthy control group. For that purpose we used the PTS 910 perimeter (Fig. 1).



Fig. 1. Optopol PTS 910.

by biomicroscopy. Lack of pathologic findings at fundoscopy. Lack of other ocular diseases. Cup/disk area ratio up to 0.3 p.d without asymmetry. IOP corrected per CCT from 22 mmHg up to 32 mmHg without therapy. No perimetric or OCT pathologic findings. Lack of other risk factors for glaucoma.

Criteria for Healthy people:

Lack of clinical data and medical history data for any disease. Best corrected visual acuity of both eyes equal to 1.0. Clear cornea and transparent lens and vitreous examined by biomicroscopy. Lack of pathologic findings at fundoscopy. Cup/disk area ratio up to 0.3 p.d without asymmetry. IOP corrected per CCT up to 21 mmHg

Results

For the purpose of comparing the visual field findings in the three groups, we used the global indices MD and PD and calculated their average values for each group and every age subgroup in the three groups.

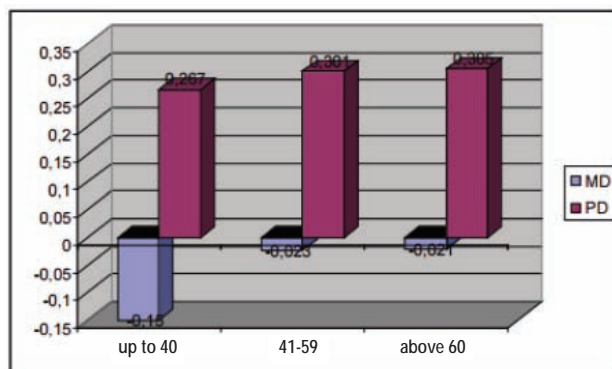


Fig. 3. Average values of MD and PD within the control group.

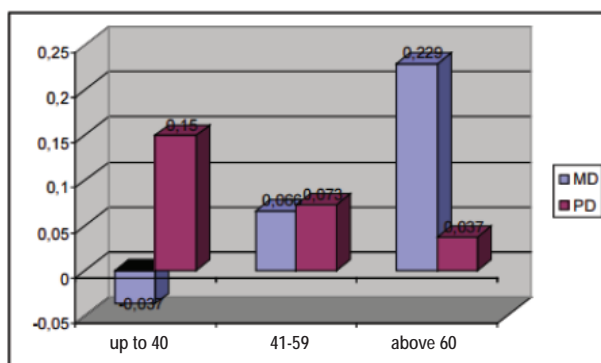


Fig. 4. Results for MD and PD for people with early detected POA glaucoma.

With the help of automated computer-assisted perimeter we tested the visual fields of the participants in the control group and calculated the average values of MD and PD for each age subgroup.

The average value of MD for the patients up to 40 years was -0.037, while PD was 0.15. Taking in regard that according to the scientific literature the normal value range of MD is from -1 to +1, this data shows us that in this age group we have reasonable values within normal limits. In the group 41 - 59

years, the average values of the indices were 0.066 and 0.073 for MD and PD respectively, all within the normal range. In the third group of people above 60 years, average value of MD was 0.22 and of PD was 0.003.

The information presented in Fig. 4. represents a breakdown of the visual field results of people that already have been diagnosed with early POAG. For the first group of patients, with an age range up to 40 years, the average values of the indices

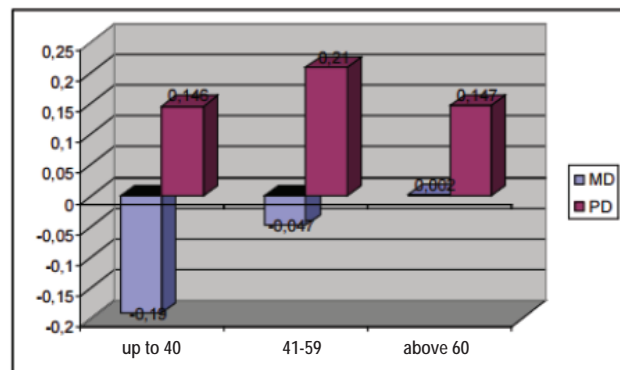


Fig. 5. Results for MD and PD for people with OH.

were MD = -0.15, and PD = 0.267; for the age range 41 - 59 years were respectively MD = -0.023, and PD = 0.301 and for the age range above 60 years MD = -0.021 and PD = 0.305. It is obvious that in all subgroups the average MD value keeps relatively low, around zero and PD is gradually increasing with the increase of age of the patients.

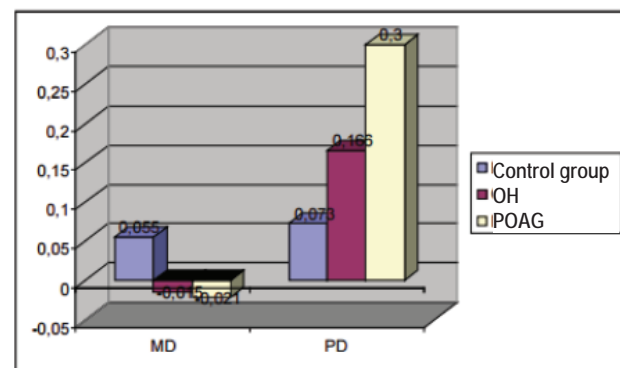


Fig. 6. Summarized values of MD and PD for the patients with early detected POA glaucoma, OH and the control group.

In the group of patients with OH, as in the control group we received data that does not follow the rules of changing typical for the group with early detected POA glaucoma. For example, PD does not show firm tendency to increase with the increase of age. For patients up to age 40, the average values of the indices are for the MD = -0.19, and PD = 0.146. For the age range 41 - 59 years, MD = -0.047, and PD = 0.21. Finally, for the age range above 60 years MD = 0.002 and PD = 0.147.

Analysis of the received data from the three compared groups show that the worst values of MD = -0.021 and PD = 0.3 belong to the group with early diagnosed POAG. There is a strong tendency for decrease in MD and PD in the group with POAG in comparison with the control one and the one with OH.

Discussion

The number of patients diagnosed with glaucoma is constantly increasing due to many risk factors, the way of life and the fact that the disease is multifactorial. That number can vary around 2% of the population. Thereby, it is our duty to improve the early diagnosis of POAG and be very cautious with patients with OH. The main point is if and how many patients with OH in their lifetime will develop glaucoma, having in mind that OH is a risk factor for glaucoma. The early diagnosis of glaucoma is the safest way to successfully preserve the visual acuity even at advanced age. SAP with the improved software lately provides a lot of opportunities for early diagnosis of glaucoma, especially because the method is not invasive and is accessible for the patients.

With SAP we get valuable information about the condition of the visual field. We can very precisely see the degree of visual field loss, the depth and location of the initial or developing scotoma, that also gives us a precise picture about the damage of the retina.

The visual field changes that we received from the group with early detected POA glaucoma and the group with OH were expected. Comparing the three groups, we see a strong tendency for continuous increase in both indices (MD and PD) from the control group (healthy subjects) through the OH group and up to POAG group.

Conclusion

In conclusion, we can say that by following the patients with OH with SAP, in 20% of them we obtained results, which showed later the indices MD and PD to be increased compared to the average values of MD and PD of the POAG group, which means that 20% of the patients with OH developed early POAG. That proves the importance of SAP as one of the leading methods for early diagnosis of glaucoma.

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