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PREVENTION AND TREATMENT OF RISK FACTORS FOR THE DEVELOPMENT OF MYOPIA

Resume: With myopia, the image does not fall on a certain area of the retina, but is located in the plane in front of it. Therefore, it is perceived by us as fuzzy.

This is due to the discrepancy between the strength of the optical system of the eye and its length. Usually, with myopia, the size of the eyeball is increased (axial myopia), although it can also occur as a result of excessive force of the refractive apparatus (refractive myopia). The greater the discrepancy, the stronger the myopia.

Key words: myopia, diagnosis, refraction, anomaly.

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ПРОФИЛАКТИКА И ЛЕЧЕНИЕ ФАКТОРОВ РИСКА РАЗВИТИЯ БЛИЗОРУКОСТИ

Резюме: При близорукости изображение приходится не на определенную область сетчатки, а расположено в плоскости перед ней. Поэтому оно воспринимается нами как нечеткое.

Происходит это из-за несоответствия силы оптической системы глаза и его длины. Обычно при близорукости размер глазного яблока увеличен (осевая близорукость), хотя она может возникнуть и как результат чрезмерной силы преломляющего аппарата (рефракционная миопия). Чем больше несоответствие, тем сильнее близорукость.

Ключевые слова: миопия, диагностика, рефракция, аномалия.

Relevance. Myopia is an eye disease, perhaps the most common, better known as myopia[2].

We can assume that the first mention of myopia is found in the IV century BC – Aristotle's. He noted that some people, wanting to examine an object, are forced to bring it close to their eyes, and at the same time often squint[7].

Studies show that in 2000, approximately 25 percent of the world's population suffered from nearsightedness, but by 2050, it is expected that about half of the people on the planet will have nearsightedness.

The frequency of myopia in the developed countries of the world is 19-42%, reaching 70% in some countries of the East. In elementary school students, the frequency of myopia is 6-8%, in older students it increases to 25-30%. In gymnasiums and lyceums, this figure reaches 50%. Along with the frequency of myopia, its degree also increases, reaching 6.0 dptr or more in 10-12% of nearsighted[4].

According to the results of the All-Russian medical examination, the incidence of myopia in children and adolescents has increased 1.5 times over the past 10 years. In the USA and Europe over the past 2-3 decades, the frequency of myopia has increased by 1.5 times, in China, Hong Kong, Taiwan - by 2 times or more[3].

Despite the undoubted successes achieved in recent years in the prevention and treatment of this disease, it often leads to the development of irreversible changes in the fundus and to a significant decrease in vision at a young working age[6].

The conditions for the occurrence of complicated myopia are laid during the period of active progression of myopia, coinciding with schooling. Detection, prevention of the development and progression of myopia and its complications should be carried out during this period[8].

The first signs of myopia appear at the age of 7 to 12 years and progress to 20 years in women and 22 years in men[5]. In the future, as a rule, vision

stabilizes, but it may deteriorate further. With an increase in the anterior-posterior axis of the eye, the retinal cells located in the zone of maximum light sensitivity are thinned like the mesh of a stocking that is pulled over the leg, which can lead to other diseases[1]. For example, age-related macular degeneration usually develops after 55 years, and it joins severe myopia at a much earlier age.

The purpose of the study. The aim of the study is to analyze and treat risk factors for the development of myopia.

Materials and methods of research. We gathered 150 patients who had suffered myopia and applied to the Department of Ophthalmology of the ASMI to perform the task assigned to us, and conducted a clinical analysis of their overall complexity.

The results of the study. The hereditary factor in myopia is presented as the most significant. Refraction is also more important than +0.75 diopters (dptr) at the age of 6-10 years, the length of the anterior-posterior axis of the eye is more than 23.5 mm, pseudomyopia, the values of relative accommodation reserves are less than 1.0 dptr, the ratio of the length of the eye and the radius of the cornea (AL/SR) is more than 3, the ratio of accommodative convergence and accommodation (AK/A) is more than 4 dptr/dptr, relative peripheral hypermetropia and asymmetry of off-axis refraction: refraction of the nasal half of the eye above the temporal. The influence of the environment and urbanization is particularly noted. A high level of education and the social status of the family increase the risk of developing myopia.

Disposable risk factors were identified: physical inactivity with high visual load, time spent outdoors less than 10 hours a week. Reliable preventive measures include: parental control of the child's visual activity, limitation of visual load, active outdoor activity for at least 10-14 hours a week, physical education and some sports, home accommodation training, correction compensating for peripheral hypermetropia and/or inducing myopic defocus,

local drug therapy. Early detection of risk factors and their influence directly or indirectly prevents the development of myopia or delays its start at a later age, which reduces the frequency of high-grade myopia, reduces the number of complicated forms of myopia and their severity.

In the course of this study, an algorithm has been developed for a comprehensive assessment of ocular blood flow based on modern research methods (flowmetry and duplex scanning of extraocular vessels). For the first time in conducting such studies, the principle of standardization of groups was used on the basis of the sequential conduct of these tests in conditions of incomplete and complete correction of myopia with soft contact lenses, as well as before and after visual load. The standardization of groups, to a certain extent, reduced the possible impact on the results of studies of errors related to the individuality of functional indicators and patients' understanding of the essence of tests.

General diseases of the body, weakness of the supporting connective tissue and other factors, which are often assigned a leading role in the origin of myopia, favor that the cause (working at close range in conditions of weak accommodative ability) should turn into a consequence - myopic refraction, the values of the relative accommodation margin of more than 5.0 dptr are always overestimated.

Obtaining inflated ZOA values indicates dissociation between accommodation and convergence, exclusion of one eye from the act of reading and further registration of absolute rather than relative accommodation.

With complete correction of mild and moderate myopia, an increase in pulse ocular blood flow (by 3.19 μl/sec and 0.47 μl/sec, respectively) and pulse volume (by 1.95 μl and 0.71 μl, respectively) was revealed in relation to incomplete optical correction.

With high-grade myopia, these indicators remained unchanged. Hemodynamic parameters determined by duplex scanning of extraocular vessels did not depend on the completeness of myopia correction.

Repeated sclerotic-strengthening interventions in children at risk reduces the rate of progression of myopia by an average of 4 times and ensures its stabilization in the long-term period (up to 10 years) by 75%, reduces the frequency of chorioretinal dystrophic changes by 2.5 times

Conclusion. Thus, an increase in the degree of myopia is expected to lead to a deterioration in both volumetric and linear hemodynamic parameters of ocular blood flow. A tendency to increase the volume parameters of blood flow and improve accommodation data with complete correction of mild and moderate myopia was revealed. The revealed patterns can be used as one of the criteria for an adequate selection of the optical power of correction.

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