

MORPHOMETRIC CHARACTERISTICS OF THE SCLERA OF THE EYEBALL WITH PROGRESSIVE MYOPIA IN ADOLESCENTS WITH SCLEROMALACIA

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Abstract. *In this article, the results of the examination of the morphological state of scleromalacia in the sclera of the eyeball in developing myopia, the comparative assessment of the morphological characteristics of the last connective tissue, that is, the reaction of the sclera, after the introduction of an experimental xenotransplant.*

Keywords: *myopia, experiment, xenotransplant, LLC*

As part of the disease of the organ of vision, the frequency of myopia in different regions of the Republic of Uzbekistan ranges from 20 to 60.7% . It is known that 22% of the disability among blind adolescents is caused by young people with advanced complex myopia .

Both in our country and abroad, high myopia is often combined with the development of retinal and optic nerve disease, collagenous diseases and their complications, scleromalacia, in teenagers and "old adults", thereby complicating the diagnosis of the pathological process. The medical and social importance of the problem is explained by the fact that developing myopia affects people of the most working age. The development of myopia in adolescents can lead to serious irreversible changes in the eye, causing various complications and significant loss of vision. According to the results of a medical examination in Uzbekistan, the incidence of myopia among teenagers has increased 10 times over the last 1.5 years. Among adults with visual impairment due to progressive myopia and its complications, 46% have congenital myopia, and the rest are acquired, including during school years. The results of complex epidemiological and clinical genetic studies have shown that myopia is a multifactorial disease . Understanding the pathogenetic and morphological mechanisms of visual impairment in epilepsy remains one of the urgent issues of ophthalmology. The morphological characteristics of the sclera play an important role in myopia. They are especially important in the pathogenesis of eyeball elongation. Dystrophic and structural changes occur in the sclera of people who are short sighted. Adults with progressive myopia have been found to have significantly greater scleral dilation and deformation than emmetropia, especially in the anterior and posterior axis. An increase in the length of the eye in myopia is now considered as a result of metabolic disorders in the sclera, as well as changes in regional hemodynamics. The elastic properties of the sclera and changes in the length of the anterior-posterior axis (OOO') have been of interest to scientists for a long time. The evolution of the study of the anatomical parameters of the eyeball is reflected in the works of many authors. E.J. According to Tron, the length of the emmetropic eye axis 27,30 mm varies from 22.42. Regarding the variation of OOO' length from 0.5 to 22.0 D with myopia, E. J. Tron provides the following information: - with myopia OOO' length 0.5D–6.0 D - from 22.19mm 28.11 mm;

- from 6.0 D to 22.0 D to 28.11 mm to 38.18 mm with mi opium .

E.S. According to Avetisov, the OOO' length of the eye with emmetropia is 23.68;

- with myopia 0.5-3.0 D -24,77 mm;

- with myopia 3.5–6.0 D -26.27mm;
- 6.5-10.0D -28.55mm with myopia.

Very specific parameters of emmetropic eyes are given in the national manual of ophthalmology: OOO' length of an emmetropic eye is on average 23.92 1,62 mm. In 2007, I.A. Remesnikov created a new anatomical-optical and corresponding reduced optical scheme of an emmetropic eye with a clinical refraction of 0.0 D and OOO'.23,1 mm

As mentioned above, in developing myopia, there is stretching of the sclera, dystrophic changes in the retina, which is probably a violation of blood flow in the choroidal and peripapillary arteries, as well as its mechanical stretching.

Adolescents with high myopia have been shown to have a lower average thickness of the retina and choroid in the subfovea than emmetropes. Thus, the longer OOO' is, the higher the "growth" of the membranes of the eyeball and the lower the tissue density: sclera, choroid, retina. As a result of these changes, the number of tissue cells and cellular substances also decreases: for example, the pigment epithelial layer of the retina becomes thinner, the concentration of active compounds, possibly carotenoids, decreases in the macular region. It is known that the total concentration of carotenoids: lutein, zeaxanthin and mesozeaxanthin in the central part of the retina is the macular pigment optical density (MPOZ). Macular pigments (MP) absorb the blue part of the spectrum and provide strong antioxidant protection against free radicals and lipid peroxidation. According to a number of authors, a decrease in the MPOZ index is associated with the risk of developing maculopathies and a decrease in central vision.

In addition, many authors agree that there is a decrease in MPOZ with age. The study of MPOZ level in healthy population in patients of different ages and in patients of different ethnic groups in many countries of the world is a very controversial situation.

Unfortunately, in Central Asia and the Republic of Uzbekistan, large-scale studies on the MPOZ index have not been conducted in a healthy population, in patients with refractive errors, pathological changes in the macular zone, and other ophthalmological diseases. This question is still open and very interesting. The only study of MPOZ in a healthy population in 2013 E. It started in N. Eskina and others. 66 healthy volunteers aged 20 to 75 participated in this study. In age groups, the average index of MPOZ varied from 0.30 to 0.33, and the correlation coefficient showed that there is no correlation between the value of MPOZ and age in normal age-related processes in the organ of vision. At the same time, the results of a clinical study conducted by foreign authors measured MPOZ values in healthy volunteers using heterochromatic flicker photometry and optical congeret tomography (OCT). It confirms a positive correlation with central retinal thickness ($r=0.30$). Therefore, in our opinion, it is of particular interest to study MPOZ not only in a healthy population of patients of different ages and in patients of different ethnic groups, but also in dystrophic ophthalmopathies and refractive errors, especially myopia. In addition, the fact that the length of OOO' affects the topographic-anatomical and functional parameters of the vision analyzer (in particular, the MPOZ, thickness of the retina, choroid, etc.) remains interesting. The relevance of the above fundamental issues determined the goals and tasks of this research.

Objective: Morphometric characteristics of the eyeball in developing myopia in adolescents and their influence on visual functions,

assessment of anterior and posterior axis (OOO') length of the eye and morphofunctional parameters of the vision analyzer in the development of scleromalacia.

Materials and methods: 36 adolescent patients (71 eyes) participated in the study. All patients in the study were divided into 4 groups according to the size of the anterior and posterior axis of the eyeball (OOO').

consisted of adolescents with mild myopia and patients with OOO' value up to 23.81 ;25,0 mm

- The second is the average myopia of teenagers and the value of OOO' is 28,5 mm up to 25.01;

-Third-high myopia teenagers, 29,0 mm above the value of OOO';

-Adolescents with the fourth-refraction are close to emmetropia and the value of OOO' is 23,8 mm up to 22.2. According to the standard, in addition to the ophthalmological examination, adolescents underwent the following set of diagnostic measures: exobiometry, A-scan, digital photography of the fundus, anterior and posterior optical coherence tomography.

Results: the mean age of the patients ranged from 16.0 to 15.0 years. In the statistical processing of the results of the studied indicators, a decrease in some of them is noted with the prolongation of OOO': maximum corrected visual acuity ($p=0.01$), sensitivity in the fovea ($p=0.008$), average thickness of the retina in the fovea ($p=0.01$), nose and temporal sectors ($p=0.005$; $p=0.03$). In addition, a statistically significant inverse correlation was found between OOO' -0.4 in all groups of subjects; as well as the thickness of the retina at the fovea -0.6; choroidal thickness at fovea -0.5 and sensitivity at fovea -0.6; ($p < 0.05$).

Conclusion: a detailed analysis of the obtained average values of the studied parameters revealed a general decreasing tendency of the morphofunctional parameters of the eyeball with increasing OOO' in the groups. Correlation data obtained from a clinical trial show a close relationship between the morphometric and functional parameters of the vision analyzer.

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