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RESEARCH ARTICLE

ESTIMATION OF VITREOUS DENSITY BY MULTISPIRAL COMPUTED TOMOGRAPHY (PILOT REPORT)

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ABSTRACT

Conducting a retrospective analysis of multispiral computed tomography of the orbit in healthy individuals aged from 10 to 35 years allowed to determine the vitreous density. A certain correlation between the indicator and the age of patients was tracked: in children aged 10-12 years, the density did not exceed + 1 + 3 HU. In patients older than 12 years and up to 35, the fluctuations were already +1 to +4 HU. The results of the study give grounds for continuing research in patients with diabetes mellitus in the same age group.

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INTRODUCTION

Biomechanics is a young section of science studying influence of mechanical properties of tissues on, apparently, completely not mechanical processes in an organism, such as growth, development or formation. In modern ophthalmologic practice, considerations about biomechanical properties of cornea, sclera, lens, cribri form plate, etc. are widespread, while data on biomechanical properties of vitreous humor (VH), vascular coat and retina is limited (Tsaturyan *et al.,* 2006). In spite of the fact that VH is the largest intraocular structure, its studying is complicated by high degree of transparency and intravital inaccessibility. It is well-known, that VH is a three-dimensional collagenic structure forming some kind of a skeleton. Hyaluronic acid supports the specified collagenic structure in the straightened condition and provides buffer properties of VH (Gorban *et al.,* 1993). According to the modern view, the collagenic skeleton of VH is presented by the fibrous plates (laminas) forming cisterns, vitrealtracts and optical emptiness within them. Vitrealtracts and vitreal plates have increased mechanical strength directed to the repayment of fluctuations during numerous and sharp movements of an eye (Tsaturyan *et al.,* 2006). But as soon as vitreous is undergone to a pathological changes, these very fibrous structures become the reason for traction of retina, ciliar body and other structures (Worst *et al.,* 1995). But when there comes that turning-point of transition of normal vitreous to pathologically changed one? Whether vitreous is exposed to consolidation in diabetes or,as a number of researchers consider, these are its posmortem changes? And is hardened vitreous in experimental animals is a result of toxic influence of alloxan or streptozocine? All these questions demand the detailed studying as the role of vitreous is studied not only at retinal pathology, but also at development of glaucoma, and also at cataractal and refractional interventions. In other words, ophthalmologists need a search of the lifetime quantitative method of estimation of vitreous density. In spite of the fact that the spectrum of ray researches in ophthalmology is wide enough (linear X-ray-tomography, ultrasonic scanning), existing techniques do not allow us to receive objective representation about vitreous which does not have any visible changes. Advantages of a multispiral computer tomography (MSCT) are simultaneous visualization of bone and soft tissues structures, possibility of use in children, and also rapidity of technique, that considerably reduces ray loading on patient's organism. Considerable advantage of MSCT is a possibility to estimate density of investigated structures. In this connection the purpose of the retrospective analysis of tomograms performed by us was an estimation of similarity of indicators of vitreal density in healthy subjects of the same age group.

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Material and methods of the research

To estimate the condition of vitreous, we performed the retrospective analysis of MSCT of orbits and vitreous of patients directed to the imaging concerning the internal ear pathology. Thus the patients having inflammatory, endocrine and other chronic diseases were excluded from the analysis. Also, the results of patients having any degree of head injury/ trauma in anamnesis were not included into the analysis of vitreous condition. The study group consisted of 47 patients aged 10-35 years. This age was chosen intentionally as vitreous is fully matured by age 10 years, and its ageing processes start to be realized at age 35. The results of our study showed that the average density of vitreous in healthy young men ranges from +1+3 to +2+4 HU. And we did not found any difference in density of pair eyes, or any difference in vitreous density in its preretinal and central departments in observed patients. Also, there was no difference in vitreal density found depending on gender of patients. However, there was a clear difference in density between individuals aged 10-12 years and persons aged 13 years or older. Vitreal density in all patients aged 10-12 years (n=13) did not exceed +1+3 HU. And inpatients of age 13 or older vitreal density varied from +1 to +4HU. In spite of the fact that the difference between vitreal density does not look statistically significant, it can be the starting point for the further comparative studies. For example, in patients with age-related dilution of vitreous or its hardening on the background of diabetes.

Conclusion

Thus, for the first time we have the tool for a lifetime quantitative estimation of vitreal density. The results received give us the background for continuation of study and estimation of vitreous condition in persons of the same age group with diabetes.

REFERENCES

Gorban, A.I., O.A. Dzhaliashvili, 1993. Ophthalmic microsurgery, mistakes and complications. – Saint-Petersburg: Hippocrates, 250 p. (in Russian)

Red, A.K., Tsaturyan, A.A., Stain, M. 2006. Biomechanics: achievements and perspectives, Moscow University. 245 p. – Modern problems of biomechanics. Vol. 11. (in Russian)

Worst J.G.F., L.I. Los, 1995. Cisternal Anatomy of the Vitreous / by Worst J.G.F. and L.I. Los – Amsterdam, - Kugler Publications, 193 p.

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