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The investigation of meridional accommodative disorders in children with the rule astigmatism and their treatment

Background: Astigmatism is one of the most frequent refractive abnormalities in children and offers 34.5-39% among all forms of refractive abnormalities. Adaptation of visual system to astigmatism is provided with two mechanisms-irregular accommodations in main meridians and regular fluctuations of optic setting, thank to different focal lines that connect with retina. The main method of correction of astigmatism is usage of ocular correction (glasses). The investigation of adaptation to astigmatism by irregular accommodation in different meridians of astigmatic eye is an actual and interesting problem in pediatric ophthalmology.

Aim: To investigate accommodative disorders in different forms of with-the-rule astigmatism, to increase the effectiveness of treatment refractive amblyopia in children by using the modiflicated original method of treatment accommodative disorders by its training in the weak meridian.

Methods: Visual acuity for far and for near, proxymetria in main meridians, common indexes of accommodation, keratometria, refractometria and ophthalmoscopia.

Results: 183 children (358 eyes) from 5 to 14 years old with different forms of with-the-rule astigmatism (mixed astigmatism, simple hyperopic astigmatism, simple myopic astigmatism) were investigated. The degree of astigmatism: 0.75-5.0 D. The presence of irregular accommodation in main meridians of the eye in the majority cases of the investigated forms of astigmatism was shown. Different forms of meridional accommodation were determined by comparing the quantity of difference of nearest point of clear vision in diopters in main meridians with the degree of astigmatism. The role of irregular accommodation upon non-corrected and corrected visual acuity for far and for near was investigated. The treatment of accommodative disorders by using the original proposed methodic was conducted. We proposed the original methodic of training accommodative ability in weak meridian by using changing of positive and negative cylindrical lenses in order to increase non-corrected and corrected visual acuity for far and for near in children with astigmatism. The significant efficiency of modiflicated original methodic by training the accommodative ability in weak meridian was shown in all investigated forms of astigmatism.

Conclusion: The presence of irregular accommodation in the majority cases of investigated forms of astigmatism in children was shown. Different forms of meridional accommodation were determined. The influence of meridional accommodation upon visual acuity was shown. The use of proposed method of accommodative training in weak meridian is effective in all forms of with-the-rule astigmatism.

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