RETINAL CONDITION IN CHILDREN WITH INTERMITTENT STRABISMUS

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Background. Intermittent strabismus is a form of strabismus characterized by an alternating deviation of one eye with episodes of orthotropia. A comprehensive analysis of the retinal and optic nerve microarchitecture, conducted using high-resolution spectral-domain optical coherence tomography, will allow for the identification of specific patterns of neuroretinal changes that correlate with various types of intermittent strabismus.

Objective: To analyze the retinal condition in children with intermittent strabismus using optical coherence tomography.

Materials and Methods. Between 2021 and 2025, 111 children (162 eyes) were under our observation, including 86 children (137 eyes) with intermittent strabismus and 25 healthy children (25 eyes) in a control group. The patients were divided into 3 subgroups: Group 1 consisted of 28 children (43 eyes) diagnosed with intermittent exotropia, divergence excess type; Group 2 included 32 patients (52 eyes) diagnosed with intermittent exotropia, convergence insufficiency type; and Group 3, the main group, comprised 26 children (42 eyes) diagnosed with intermittent exotropia, basic type. All patients underwent ophthalmological examinations.

Results. In Group 1 patients (divergence excess, n=43), the morphometric parameters of the peripapillary retinal nerve fiber layer (RNFL) were within normal values (114.2±1.48 μm vs. 109.2±1.5 μm in the control group, $p<0.05$), while the neuroretinal rim (NRR) volume was 1.64±0.02 mm2, which was somewhat lower than the same indicator in the control group (1.75±0.03 mm2), with statistical significance.

In Group 2 patients (convergence insufficiency, n=52), a 20.2% decrease in peripapillary RNFL thickness was found compared to control values (87.8±1.02 μm, $p<0.001$), with predominant thinning in the superior and inferior temporal quadrants, which topographically corresponds to the papillomacular bundle. The NRR area was reduced by 19% (1.42±0.03 mm2, $p<0.001$), and retinal thickness in the foveolar region was reduced to 217.6±1.3 μm ($p<0.001$), accompanied by a flattening of the foveal contour.

Morphological changes were also recorded in Group 3 patients (basic type strabismus, n=42), where a 13.7% decrease in RNFL thickness was noted (94.3±1.38 μm, $p<0.001$), with a characteristic sectoral thinning pattern in the outer and inner segments. The NRR thickness was 1.45±0.03 mm2 (17.2% lower than control values, $p<0.05$) with a relatively preserved optic disc area (1.78±0.03 mm2 vs. 1.83±0.04 mm2 in the control group).

Conclusions: The identified neurostructural changes indicate the involvement of the afferent component of the visual analyzer in the pathogenesis of intermittent strabismus, especially in variants with predominant convergence impairment. This may be due to visual pathway dysfunction and a deficit in binocular integration at the level of the primary visual cortex.