

MORPHOLOGICAL CHANGES IN STRABISMUS-AFFECTED EYEBALL MUSCLES IN THE PATIENT AND IN THE CONTROL GROUP

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Objectives. The complex eyeball muscle development leads to a difficult assessment of morphological changes that could disclose strabismus morphopathogenesis. The study aimed to evaluate the distribution and appearance of myosin, dystrophin, collagen IV, PGP 9.5, VEGF, and TGFβ1 in strabismus-affected human eyeball muscles.

Materials and Methods. 25 strabismus patient eyeball muscle specimens obtained during correction surgery and 5 controls obtained during a post-mortem autopsy were examined. Specimens used were the property of the Institute of Anatomy and Anthropology of the Rīga Stradiņš University. Besides histological assessment biotin-avidin immunohistochemistry (IMH) method was used. Results were evaluated semi-quantitatively. Mann-Whitney U-test and Spearman's rank correlation coefficient were calculated. Significance was considered with $p < 0.05$.

Results. In the patient group inflammation, neoangiogenesis, variously sized and newly formed skeletal striated muscle fibres were observed. The patients had diminished amount of myosin, dystrophin, and collagen IV positive structures compared to the controls. Mann-Whitney U-test between the patients and the controls revealed statistically significant differences in myosin ($p = 0.028$), dystrophin ($p = 0.008$), and collagen IV ($p = 0.001$). Spearman's rank coefficient stated two high positive correlations in the patient group between myosin and collagen IV ($p = 0.010$); dystrophin and collagen IV ($p = 0.001$). Numerous to moderate positive structures of TGFβ1 and PGP 9.5, and a moderate number of VEGF-positive structures were found in the patients.

Conclusions. Strabismus-affected eyeball muscles demonstrated degenerative changes. A decrease in myosin and dystrophin indicates muscular dystrophy. Diminished collagen IV-positive structures revealed basal membrane damage. A moderate number of VEGF-positive structures, neoangiogenesis are in favour of ischemia. Due to PGP 9.5-positive structures innervation disorders are excluded. Additionally, TGFβ1-positive structures indicated connective tissue regeneration.