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VITREOUS COMPOSITION MODIFICATION AFTER TRANSPALPEBRAL ELECTRICAL STIMULATION OF THE EYE: BIOCHEMICAL ANALYSIS

Oral

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Purpose:

Despite the growing literature on animal models, few data are available about biochemical changes induced by electrical stimulation (ES) of the eye in humans. The purpose of the study was to investigate the possible mechanism that regulates the beneficial effects of ES on retinal cells function and survival in humans.

Methods:

28 patients undergoing pars plana vitrectomy (PPV) for idiopathic epiretinal membrane (iERM) were randomly divided in two groups: 13 patients were treated with transpalpebral ES before surgery and 15 underwent surgery with no prior treatment. Vitreous samples were collected for biochemical analysis during PPV.

Results:

ES treatment leads to a reduction in the vitreous expression of both proinflammatory cytokines, namely IL-6 and IL-8, and proinflammatory lipid mediators, such as lysophosphatidylcholine. Indeed, we observed a 70% decrease of lysophosphatidylcholine 18:0, which has been proven to exert the greatest proinflammatory activities among the lysophosphatidylcholine class. The content of triglycerides is also affected and significantly decreased following ES application.

Conclusions:

The vitreous composition displays significant changes following ES treatment. Proinflammatory cytokines and bioactive lipid mediators expression decreases, suggesting an overall antiinflammatory potential of ES. The investigation of the mechanism by which this treatment alters the retinal neurons is essential for supporting ES therapeutic application in various types of retinal diseases.