The effect of topical anti-glaucoma eye drops on human Tenon’s capsule fibroblasts survival
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Purpose: There are several topical antiglaucoma eye drops. However, there is limited data about their effects on human Tenon’s capsule fibroblast (HTF), which is a key player in wound healing in the eye. The purpose of this study is to investigate the cell viability in HTFs exposed to topical antiglaucoma medications.

Subjects and methods: Small biopsy samples containing HTF were obtained during strabismus surgery with informed consent from patients. The human tenon explants were cultured in a medium consisting of DMEM supplemented with 10% FBS. The explants were incubated at 37°C with 5% CO2. Primary HTFs that migrated out from the tissue were propagated in the same medium. When confluence achieved, cells were detached with 0.25% trypsin, centrifuged at 1200 rpm, 4°C for 5-10 min and counted with a CEDEX (Roche) cell counter. HTFs of less than passage 5 were used. Experimental groups were designed as follows: Control: Complete medium only; travatan, lumigan, xalatan; oftagen, glokoprost; timolol, timosol; T omec, Cosopt, Azarga; Duotrav, Xalacom, Ganfort; Alphagan, Combigan, Azopt. Primary cells were treated for 5 or 10 min. After then, cells were washed in PBS and maintained in DMEM for 48 hrs before analyses. Cellular survival in the presence or absence of the drugs was determined by MTT assay. Data were expressed as the mean percent fraction of control ± standard error of mean and statistical significance ascertained by one way analysis of variance followed by Tukey’s multiple comparison test. p value less than 0.05 was considered to be significant.

Results: Cell viabilities after treatment with topical antiglaucoma drops at 5 and 10 minutes were significantly reduced in all experimental groups except Travatan, Duotrav and Alphagan treated cells. This effect might be due to having less preservative in these agents.

Conclusions: Almost all topical antiglaucoma medications have deleterious effects on ocular surface. Newer topical antiglaucoma agents with less preservative or preservative free agents are needed to improve ocular surface side effects. Further studies are needed to evaluate the effect of these agents on ocular surface.