

## COMPARISON BETWEEN DIFFERENT TOPICAL HYPOTENSIVE DRUGS IN TWO EXPERIMENTAL MODELS OF GLAUCOMA IN THE RABBIT

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Glaucoma is a common, pathological condition whose most important risk factor is an increased intraocular pressure (IOP). The medical treatment of glaucoma focuses mainly on the pharmacological reduction of IOP. The aim of our study was to compare the efficacy of latanoprost, a prostaglandine derivative, timolol, a topical  $\beta$ -blocker and dorzolamide, a topical carbonic anhydrase inhibitor in reducing IOP and inflammatory response in two experimental models of glaucoma in rabbits such as carbomer-induced glaucoma and  $\alpha$ -chymotrypsine-induced one (inflammatory model).

High IOP levels were obtained injecting carbomer 0.25%, 0.1 ml into anterior chamber (in the carbomer-induced glaucoma), and 750  $\mu$ l of  $\alpha$ -chymotrypsine injection in posterior chamber (in the  $\alpha$ -chymotrypsine-induced one) in pre-anesthetized rabbits. The IOP increase was tested, every 30 minutes during the first three hours, and at least three times a day until stabilization.

As soon as the IOP was stabilized on high levels, the drugs in study were administered for 4 weeks and IOP was measured, at least twice each day using the same tonometer.

Aqueous humor (both posterior and anterior chamber fluids) was withdrawn before inducing ocular hypertension, when IOP was increased and after each week of treatment with the drugs in study, and used for cGMP, cAMP level determination. In  $\alpha$ -chymotrypsine model, aqueous humor was also used for cytokines (IL-1 $\beta$ , TNF- $\alpha$  and PGE<sub>2</sub>) determination.

Timolol treatment lowered IOP levels, did not significantly modify cGMP and increased cAMP levels. Latanoprost and dorzolamide were more effective in lowering IOP, but did not significantly modify cGMP and cAMP levels in both experimental glaucoma models. Dorzolamide and latanoprost determined a reduction of cytokine levels in aqueous humor.

Color Doppler of the ophthalmic artery was performed in basal condition, after carbomer or  $\alpha$ -chymotrypsine injection, with high levels of IOP and during the treatments. The results of our study showed a non significant reduction of the mean systolic peak flow velocity in ophthalmic artery with timolol and latanoprost; dorzolamide treatment displayed a significant haemodynamics improvement.

At the end of the experimental procedures, the animals were sacrificed and ciliary bodies analyzed under light microscopy. The morphological observation showed a thin connective tissue layer with alteration in the epithelial lining of timolol, latanoprost and dorzolamide treated eyes.