

Safety of Intracameral Injection of Gatifloxacin, Levofloxacin on Corneal Endothelial Structure and Viability

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Purpose: To investigate the safety of intracameral injection of gatifloxacin, levofloxacin in a rabbit model as prophylaxis against endophthalmitis.

Methods: 24 eyes of NZW rabbits were randomly divided into 3 treatment groups: levofloxacin, gatifloxacin, and balanced salt solution (BSS) control groups. After 100 µl of each antibiotic (BSS) was injected into the anterior chamber, endothelial toxicity was evaluated by measuring the central corneal thicknesses and the clinical toxicity scores at post-procedure days 3 and 7. The % of dead cells was determined by vital staining with alizarin red and trypan blue at 7 days after injection. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) were performed.

Results: The toxicity scores were increased at post-procedure days 3 and 7, but the difference among the groups was not statistically significant. With regard to baseline corneal thickness, only the levofloxacin group exhibited a significant increase from baseline ($p=0.028$), whereas other treatment group showed no difference from baseline. The mean corneal endothelial showed no statistically significant difference noted among the groups. SEM revealed a well-preserved hexagonal endothelial cell mosaic and normal microvilli on the endothelial cell surface in the gatifloxacin, and control group. However, the levofloxacin group showed slightly disintegrated cellular borders. TEM revealed that each group maintained normal intracellular organization, whereas the levofloxacin group exhibited flat cell configuration, with irregular folds on the apical cell surface.

Conclusion: Intracameral injection of gatifloxacin and levofloxacin was non-toxic in terms of clinical toxicity score, corneal thickness, and viability. However, there were changes on electron microscopy in the levofloxacin group, which may indicate microstructural damage to corneal endothelial cells.