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Assessment of intraocular pressure using ocular response analyzer and Goldman applanation tonometry before and after penetrating keratoplasty (PKP)

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Purpose: To compare the obtainability and values of IOP measurements by Goldmann Applanation Tonometry (GAT) and Ocular Response Analyzer (ORA) before and after penetrating keratoplasty (PKP) testing the degree of their agreement and the impact of corneal biomechanical factors on IOP measurement.

Patients & Method: The study is a comparative prospective study in which patients scheduled for penetrating keratoplasty (PKP) undergo intraocular pressure measurement (IOP) using the Ocular Response Analyzer (ORA) then the Goldman applanation tonometer (GAT), one day before surgery to be repeated one month after their surgery.

Results: Forty (40) patients undergoing PKP were enrolled in the study, 28 males (70%) and 12 females (30%). The mean age of patients involved is 42.8±15.4, ranging between 9 and 75 years. Obtainability of ORA (92.5% of the patients) was significantly higher than GAT (60%) postoperatively ($p<0.001$), while no significant difference was elicited pre-operatively. The mean cornea corrected IOP (IOPcc) was significantly higher than GAT and Goldmann related IOP (IOPg) both pre- and postoperatively. In addition, both mean IOPcc and GAT postoperatively (19.2±8.31, 15.65±6.99 mmHg respectively) were significantly higher than their preoperative values (14.44±7.03, 11.78±4.55 mmHg, respectively). Strong correlations existed between GAT and ORA measurements both pre- and postoperatively. The level of agreement between GAT and IOPg was higher than IOPcc.

Conclusion: ORA has proven to be superior to GAT in the ability to obtain reliable IOP measurements post PKP. IOPcc measurements also proved to be relevant, independent on corneal biomechanical factors (CH and CRF) but judging the accuracy of its values needs further large-scale studies.

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