

Changes in corneal biomechanics and intraocular pressure following femto-lasik using Goldman Applanation tonometry and ocular response analyzer

Abstract

AIM: To compare intraocular pressure (IOP) measurements before and after laser in situ keratomileusis (LASIK) with a femtosecond laser for flap creation using ocular response analyzer and Goldmann applanation tonometry, and to identify factors that may influence the preoperative and postoperative IOP.

METHODS: A prospective study conducted on myopic patients who underwent LASIK using a Femtosecond Laser for flap fashioning. Enrolled patients were evaluated preoperatively, 6 weeks and 3 months postoperatively for manifest refraction (MR), Keratometric (K) readings and central corneal thickness (CCT) using a scheimpflug-based topography. Corneal resistance factor (CRF), corneal hysteresis (CH), Goldmann correlated IOP (IOPg) and corneal compensated IOP (IOPcc) were measured using Ocular Response Analyzer (ORA) besides IOP assessment by Goldman Applanation Tonometry (GAT).

RESULTS: There was a statistically significant decrease in measures of IOPg by (3.35 ± 0.83) (mmHg), followed by GAT which decreased by (2.2 ± 0.44) (mmHg), and the least affected by operation was IOPcc which decreased only by (0.87 ± 0.1) (mmHg) after 6 weeks. After 3 months follow up there was a statistically significant decrease in IOPcc which decreased only by (0.76 ± 0.4) mmHg, followed by IOP GAT by (1.6 ± 0.5) mmHg, and the most affected by operation was IOPg which decreased by (2.3 ± 0.3) mmHg. Correspondingly, there was a statistically significant decrease in CH and CRF after 6 weeks and 3 months. At 3 month, the preoperative MR and preoperative GAT were prominent significant

predictors of the postoperative GAT changes. The prediction equation was subsumed.

CONCLUSION: IOP measurements and corneal biomechanical factors reduced significantly after LASIK with a femtosecond laser for flap creation. The IOPcc values were less influenced by changes in corneal properties than were IOPg and GAT, indicating that IOPcc may provide the most reliable measurement of IOP after this procedure.