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Reproducibility of Dynamic Contour Tonometry, Applanation Tonometry and Corneal Hysteresis in Healthy Subjects

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Purpose: To evaluate the intraobserver reproducibility of dynamic contour tonometry and applanation tonometry, as well as corneal hysteresis and corneal resistance factor measurements.

Methods: A total of 182 eyes of 94 healthy volunteers were examined. Three measurements using the Goldmann applanation tonometer, dynamic contour tonometer (Pascal) and Ocular Response Analyzer (ORA) were taken from each eye in a total of nine measurements per eye. The measurements were performed by the same observer in a random order with a 10-minute interval between each device.

Results: The within-eye standard deviations (SD) of Goldmann and Pascal tonometries were 0.78 mm Hg and 0.91 mm Hg, respectively. Regarding ORA measurements, the Goldmann correlated and the corneal compensated intraocular pressures within-eye SD were 1.26 mmHg and 1.50 mm Hg, respectively. The within-eye SD of corneal hysteresis and corneal resistance factor were 0.85 mmHg and 0.76 mmHg.

Conclusions: The Goldmann and Pascal tonometers have satisfactory intraobserver reproducibility. The reproducibility of the intraocular pressure measurements provided by the ORA is unsatisfactory. The corneal hysteresis and corneal resistance factor readings show a moderate intraobserver reproducibility.