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### **Influence of Age, Race and Corneal Properties on Intraocular Pressure, Corneal Thickness and Hysteresis**

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Purpose: To evaluate the influence of age and race on intraocular pressure (IOP) measurements, central corneal thickness (CCT), and corneal hysteresis. In addition, we evaluated the influence of corneal properties on IOP.

Methods: A cross-sectional study including 179 eyes of 93 healthy volunteers was performed. The CCT was obtained using ultrasonic pachymetry. The mean and astigmatic keratometry readings were based on the corneal topography. The corneal hysteresis was obtained using the ocular response analyzer (ORA). IOP measurements were taken using Goldmann applanation tonometry (GAT), ORA, and dynamic contour tonometry (DCT). For GAT and DCT measurements as well as corneal hysteresis, which were taken in random order among the devices, the median of three readings made by the same examiner was used for analysis. The median of five CCT readings was used for the analysis.

Results: There were no statistically significant correlations between GAT, DCT and CCT, and age within each race. The corneal hysteresis reduced with increasing age at a mean rate of 0.04 mm Hg/ year (95% confidence interval [CI], 0.02 to 0.07;  $P=0.001$ ) in the Asians. There were no statistically significant differences in GAT ( $P=0.15$ ), DCT ( $P=0.33$ ) and CCT ( $P=0.08$ ) measurements between the races. The corneal hysteresis was lower in the Black race (mean difference, 0.72 mm Hg; 95% CI, 0.05 to 1.38 mmHg;  $P=0.03$ ) and Asian race (mean difference, 0.74 mm Hg; 95% CI, 0.10 to 1.38 mmHg;  $P=0.02$ ) when compared with the White race.

The mean keratometric reading was correlated with GAT ( $P=0.001$ ), DCT ( $P<0.001$ ), and ORA Goldmann-correlated IOP ( $P=0.001$ ). On the other hand, astigmatic keratometric reading was not correlated with any tonometry. The central corneal thickness was positively correlated with GAT ( $P=0.001$ ), ORA Goldmann-correlated IOP ( $P<0.001$ ), and ORA corneal-compensated IOP ( $P=0.03$ ), but not with DCT ( $P=0.40$ ). The corneal hysteresis was correlated only with ORA corneal-compensated IOP ( $P<0.001$ ).

Conclusions: The age and race do not influence the IOP and CCT measurements, but are associated with the corneal hysteresis. Among the corneal properties, the mean keratometry and central corneal thickness are the main corneal factors related to IOP readings.

