Reproducibility and Clinical Evaluation of Rebound Tonometry

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**PURPOSE** To establish the reproducibility of a rebound tonometer in humans and the effect of corneal thickness on measurements, comparing it with Goldmann applanation tonometer.

**METHODS** In a first study designed to examine the reliability of the RBT, three experienced ophthalmologists undertook three consecutive intraocular pressure (IOP) measurements in 12 eyes of 12 normal subjects. A cross-sectional study was then performed to compare measurements obtained using the two tonometers in 147 eyes of 85 patients with ocular hypertension or glaucoma.

**RESULTS** Intraobserver coefficients of correlation obtained in the reproducibility study were 0.82, 0.73, and 0.87. Interobserver correlation was 0.82. There was a good correlation between IOP readings obtained by the RBT and the GAT (r = 0.865, P < 0.0001). RBT readings were consistently higher than GAT measurements (median difference, 1.8 ± 2.8 mm Hg). A Bland-Altman plot indicated the 95% limits of agreement between the two methods were −3.7 to 7.3 mm Hg (slope = −0.022, P = 0.618). Using RBT, the point that best discriminated between patients with an IOP ≤ 21 mm Hg and those with >21 mm Hg, as determined by the GAT was >23 mm Hg (sensitivity, 70.5%; specificity, 95.1%). In terms of pachymetry, the two tonometers behaved in a similar way, with correlation observed between IOP measurements and central corneal thickness.

**CONCLUSIONS** Rebound tonometry is a reproducible method of determining IOP in humans. In general, it tends to overestimate IOP compared with Goldmann applanation tonometry. The tonometers used in both methods are similarly affected by pachymetry.