

Evaluation of the Icare-ONE rebound tonometer as a self-measuring intraocular pressure device in normal subjects.

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Source

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Abstract

PURPOSE: To compare Icare ONE rebound self-tonometer (ICRBT) measurements with Goldman applanation tonometry (GAT).

METHODS: A trained examiner instructed each of 60 normal subjects on use of the ICRBT. Each subject then took two measurements of his/her own pressure using the ICRBT. Finally, a different examiner, who was masked to the earlier readings, measured IOP by GAT. Bland-Altman limits of agreement (LOA), intraclass correlation coefficients (ICCs), Kappa values, and paired t-test were used to assess the agreement between the two methods. Pearson's correlation coefficient was used for correlation analysis.

RESULTS: All of the subjects were able to obtain correct measurements with ICRBT after three attempts. The mean intraocular pressure with ICRBT and GAT measurements were 16.0 ± 3.3 mmHg and 13.7 ± 2.5 mmHg respectively. The mean difference between patient's ICRBT and technician's GAT measurements was 2.3 mmHg ($p < 0.001$). In 63 % (38/60) of the cases the IOP difference (ICRBT - GAT) was within ± 3 mmHg. The weighted Kappa for the IOP measurements of the two methods was 0.49 (95% CI: 0.30-0.68, $p < 0.001$), indicating acceptable agreement. A significantly positive correlation was found between ICRBT IOP measurements and central corneal thickness (CCT) ($r = 0.48$, $p < 0.001$). In addition, the difference in IOP measurements (ICRBT - GAT) between the two methods was positively correlated with CCT ($r = 0.31$, $p = 0.015$), indicating that greater thickness is associated with greater differences between the two methods.

CONCLUSION: The ICRBT was reliable in the hands of normal subjects, and may be used for self-monitoring of IOP. ICRBT measurements generally overestimated GAT measurements.

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