

AGREEMENT IN THE INTRAOCULAR PRESSURE MEASUREMENT: COMPARISON OF THE ICARE® REBOUND TONOMETER WITH A NON-CONTACT TONOMETER

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Purpose: To compare the new tonometer, ICare® with the non-contact tonometer (NCT) currently used in the clinic.

Patients and Methods: Forty participants with no history of corneal opacity or disorders were enrolled in the study from January to June 2006. Intraocular pressure (IOP) was first measured by the NCT and followed by ICare®. Central corneal thickness (CCT) was determined by an ultrasonic pachymeter. All measurements obtained from the participants' right eyes were analyzed. The inter-method agreement between the uses of the two tonometers was assessed by the Bland-Altman method. The inter-tonometer difference in the IOP readings in relation to CCT was evaluated by linear regression analysis.

Results: The average IOP detected by ICare® and the NCT were 16.1 ± 3.4 and 16.3 ± 4.0 mmHg, respectively. The mean difference between the two devices in the IOP measurement was -0.1 ± 3.4 mmHg at 95% limits of agreement (i.e. mean bias ± 1.96 S.D.). When CCT was less than $530 \mu\text{m}$, the IOP measured by ICare® tended to have a higher value than that detected by the NCT. Conversely, when CCT was more than $530 \mu\text{m}$, the ICare® tonometry tended to yield a lower IOP reading than the non-contact tonometry ($r = -0.418$, $p = 0.007 < 0.01$).

Conclusion: Although ICare® shows an agreement with the NCT in measurement, the effect of CCT in shifting the trend of this agreement should be considered to adjust the IOP reading accordingly. Because of its portable feature, ICare® might be a reliable IOP reader used in screening the public for the risk of glaucoma.

Key words: Rebound tonometer, Non-contact tonometer, central corneal thickness

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