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The advantage of transpalpebral scleral tonometry for individuals wearing contact lenses

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Abstract

Purpose : Measurement of intraocular pressure (IOP) is needed for the screening, diagnosis and monitoring of glaucoma. People wearing contact lenses should take them off for a common IOP measurement using corneal tonometry. Modern transpalpebral scleral tonometry is not directly influenced by corneal issues and it has been shown to provide reliable IOP-measurement results. Whether the transpalpebral scleral tonometry gives reliable results when measuring with contact lens worn is evaluated.

Methods : 67 anamnestic healthy individuals (43 female. 24 male; age 24.0(22.5–35.0) years [median(1st quartile–3rd quartile)] with ametropia of different grades participated in the study. IOP was assessed in both eyes of each study participant with transpalpebral scleral tonometry (Diaton tonometer, Tonom Ltd) by two raters independently and once with corneal tonometry using Ocular Response Analyzer (ORA, Reichert. Inc). The IOP was measured again with Diaton by one rater in the same individuals after putting on a soft daily disposable contact lens. Data was analyzed using non-parametric statistics.

Results : Individuals without contact lenses showed ORA IOPcc of 12.7(11.6–14.5) mmHg in the right eye (OD), 12.6(11.1–14.5) mmHg in the left eye (OS) and transpalpebral IOP of 14.0(12.0–16.0) mmHg in OD and 14.0(13.0–17.0) mmHg in OS. The coefficient of variation between two raters in transpalpebral tonometry amounted to: OD: 6% (0%–14%) and OS: 6% (5%–10%). IOP difference between ORA and Diaton readings was statistically significant in both eyes (p= 0.027 and p=0.001 correspondingly), while Bland-Altman analysis show a good agreement between the methods. After putting on a contact lens

the transpalpebral IOP amounted to: 14.0(12.0–16.0) mmHg in OD and 14.0(12.0–15.5) mmHg in OS showing marginal not significant differences vs. the measurement without the lens: p>0.2 in both eyes.

Conclusions : Transpalpebral scleral Diaton tonometry provides a reliable supplementary method of measuring the IOP. Diaton tonometry values remain stable after putting on a contact lens. In the whole group the IOP measured with ORA and transpalpebral IOP-values were in a good agreement but showed supposedly a systematic discrepancy of 1 – 1.5 mmHg between each other. This study confirms the reliability of transpalpebral scleral tonometry and its independence on corneal issues as well as its advantage for clinical use in individuals wearing contact lenses.

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