Repeatability of corneal biomechanical measurements in children wearing spectacles and orthokeratology lenses

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Purpose: To determine the repeatability of measurements of corneal hysteresis (CH) and corneal resistance factor (CRF) in children wearing spectacles and children under orthokeratology (ortho-k) therapy using the Ocular Response Analyzer (ORA; Reichert Ophthalmic Instruments, Buffalo, NY, USA).

Method: CH and CRF were measured twice within ten-minute interval using ORA on the same day in both eyes of 25 children (mean age=10.6±1.2 years) wearing spectacles and 34 children (mean age=10.9±1.0 years) wearing ortho-k lenses for over 6 months. Four measurements were obtained from each eye at each visit. Only data from the right eyes were analyzed.

Results: No significant between-measurement differences in CH and CRF were found in either group of subjects (paired t-tests, p>0.05) and no correlations were found between the mean differences and their means (Pearson's correlations, -0.09<r<0.04, p>0.05). The 95% limits of agreement (LA) were -1.87mmHg to +2.59mmHg and -1.53mmHg to +1.41mmHg for CH and -1.86mmHg to +2.22mmHg and -1.45mmHg to +1.57mmHg for CRF in the spectacle and ortho-k groups, respectively.

Conclusions: Repeatability of CH and CRF measurements using the ORA is within ±2 mmHg in children wearing spectacles or ortho-k lenses.

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