

Repeatability and Comparability of Corneal Power and Corneal Astigmatism Obtained from a Point-Source Color Light-Emitting Diode Topographer, a Placido-Based Corneal Topographer and a Low-Coherence Reflectometer

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PURPOSE

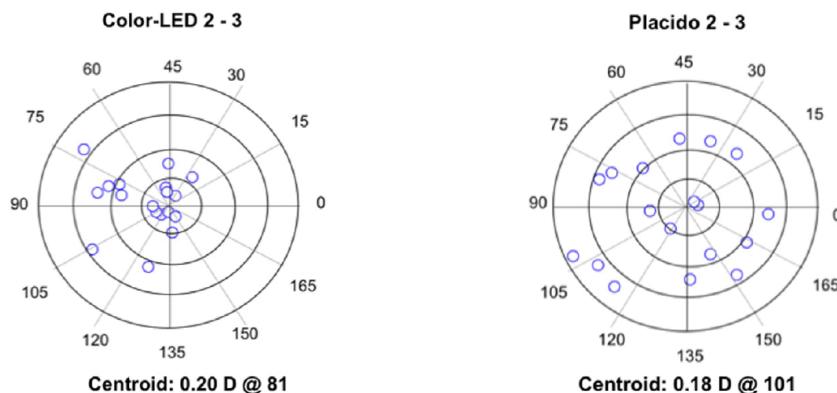
To assess the repeatability and agreement of corneal power and astigmatism obtained from the Cassini point-source color light-emitting diode (LED) topographer, Humphrey Atlas 9000 Placido-based corneal topographer, and Lenstar LS-900 low-coherence reflectometer in normal eyes.

METHODS

Consecutively enrolled patients with normal corneas were enrolled. Three sets of measurements were obtained using the color-LED topographer, the Placido topographer, and the reflectometer. Vector analysis was used in the astigmatism analysis. The repeatability was evaluated using the within-subject standard deviation, coefficient of variation (CoV), and intraclass correlation coefficient (ICC). Agreement was verified using Bland-Altman plots. The paired Student t-test was used to assess statistical significance.

RESULTS

Thirty-two eyes (32 patients) were evaluated. All devices provided highly repeatable corneal power and astigmatism measurements (ICC > 0.9) except for the Placido topographer with regard to J45 (ICC \leq 0.721). The color-LED topographer and the reflectometer obtained similar mean values of corneal power, astigmatism magnitude, J0, and J45 ($P > .05$), which was also true when comparing the color-LED topographer and the Placido topographer, except for the mean corneal power ($P \leq .0007$). The Bland-Altman plots showed a wide data spread for all analyzed variables.



CONCLUSION

The color-LED topographer provided highly repeatable corneal power and astigmatism measurements. Even though it obtained values similar to those of the reflectometer and the Placido topographer, the wide data spread discourages their interchangeable use to assess corneal power and astigmatism.