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Comparison of corneal power, astigmatism, and wavefront aberration measurements obtained by a point-source color light-emitting diode–based topographer, a Placido-disk topographer, and a combined Placido and dual Scheimpflug device

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PURPOSE

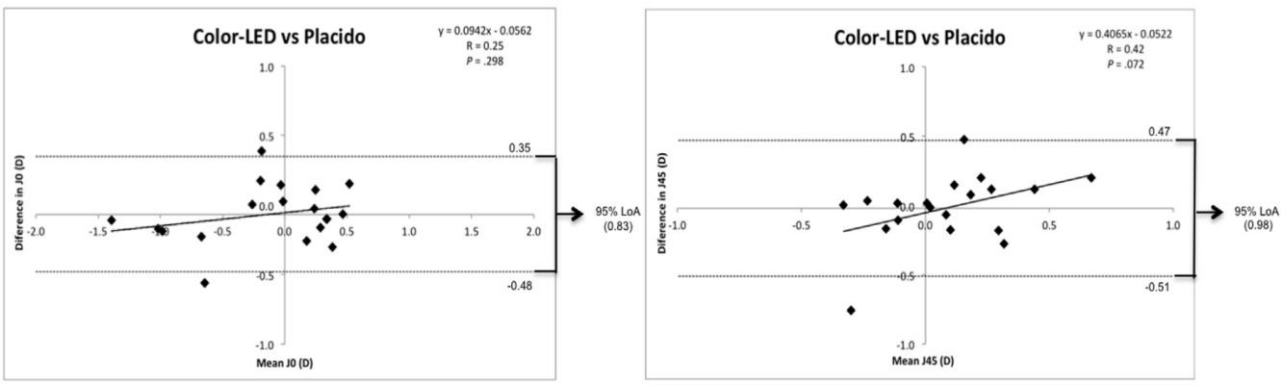
To evaluate and compare the performance of a point-source color light-emitting diode (LED)–based topographer (color-LED) in measuring anterior corneal power and aberrations with that of a Placido-disk topographer and a combined Placido and dual Scheimpflug device.

METHOD

Normal eyes and post-refractive-surgery eyes were consecutively measured using color-LED, Placido, and dual-Scheimpflug devices. The main outcome measures were anterior corneal power, astigmatism, and higher-order aberrations (HOAs) (6.0 mm pupil), which were compared using the t test.

RESULTS

There were no statistically significant differences in corneal power measurements in normal and post-refractive surgery eyes and in astigmatism magnitude in post-refractive surgery eyes between the color-LED device and Placido or dual Scheimpflug devices (all P > .05). In normal eyes, there were no statistically significant differences in 3rd-order coma and 4th-order spherical aberration between the color-LED and Placido devices and in HOA root mean square, 3rd-ordercoma, 3rd-order trefoil, 4th-order spherical aberration, and 4th-order secondary astigmatism between the color-LED and dual Scheimpflug devices (all P > .05). In post-refractive surgery eyes, the color-LED device agreed with the Placido and dual-Scheimpflug devices regarding 3rd-order coma and 4th-order spherical aberration(all P > .05).



CONCLUSION

In normal and post-refractive surgery eyes, all 3 devices were comparable with respect to corneal power. The agreement in corneal aberrations varied.