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Comparison of refractive target accuracy between optical biometry, LED topography and intraoperative aberrometry keratometric values after cataract surgery

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PURPOSE

To evaluate the post-operative refractive outcomes of optical biometry, LED topography, and intraoperative aberrometry techniques in surgical planning following cataract surgery.

METHOD

This study is a single-center, retrospective, non-interventional, observational study of 21 eyes who previously underwent cataract surgery and had a preoperative measurements with an optical biometer (IOL Master 500, Carl Zeiss AG), LED topographer and guidance (Ambient and Connect; Cassini Technologies, B.V.), in addition to live intraoperative aberrometry (IA) (ORA; Alcon Vision, LLC). The primary endpoint was the percentage of eyes with MRSE ≤0.50D.

RESULTS

Data pool screening resulted in collection of 21 eyes in total with 1 month post op measurements. Following ORA recommended IOL power implantation, manifest refraction spherical equivalent (MRSE) was -0.41±0.54D (mean±SD) with 76% of eyes ≤0.50D. Mean residual cylinder was 0.36D±0.42D, and BCDVA at ≥20/20, ≥20/30, ≥20/40 were 67%, 90%, and 95% respectively. For back calculation, we replaced IA cylinder power with the preoperative planned cylinder power taken from either LED topography or optical biometry. Analysis of the residual cylinder with this method revealed the following percentages for residual cylinder ≤0.50D: 86% for Ambient, 81% for IOL Master 500; compared to 86% for ORA.
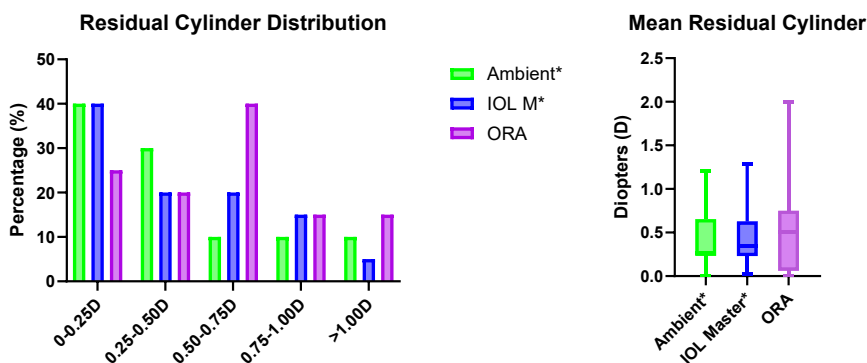
CONCLUSION

Results from this pilot study could suggest that clinical astigmatic outcomes of IA may be comparable to LED topography under surgical guidance. After back-calculation, the results from Ambient showed lower mean residual cylinder and greater % of eyes ≤0.50D compared to IOL Master 500 and ORA, however, these were not statistically significant. A prospective comparator study approach with larger sample size is required to draw definitive conclusions.