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Comparing Astigmatic Accuracy with Keratometric Measurements from a Point Source LED Topographer versus Swept Source OCT Biometer for Surgical Planning

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PURPOSE

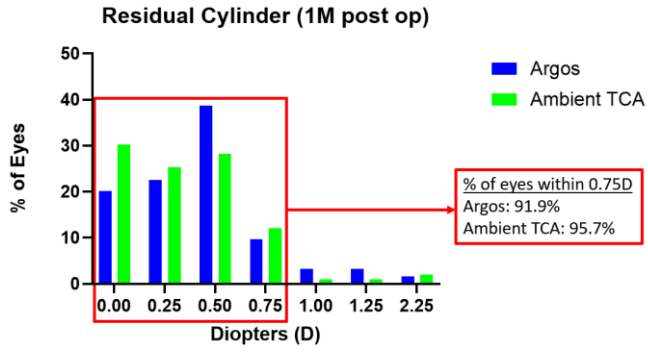
To compare the accuracy of astigmatic outcomes based on direct anterior and total corneal astigmatism measurements from a point source LED topographer versus keratometric values captured by swept source OCT in eyes undergoing cataract surgery.

METHOD

Retrospective, single surgeon, single site, non-interventional study of 161 eyes that underwent previous toric IOL implantation following cataract surgery with preoperative biometry measurements using an LED topographer (Ambient; Cassini Technologies, B.V.) and swept source OCT biometer (Argos; Alcon Vision LLC.). The Ambient LED topographer captures a direct measurement of the total corneal astigmatism, whereas the Argos SS-OCT biometer provides a predictive posterior corneal astigmatic value. Residual cylinder, prediction errors, manifest refraction, and UCDVA, BCDVA were collected at one month postoperatively.

RESULTS

In 99 eyes (Group A) data were obtained with both LED topography and SS-OCT; in 62 eyes (Group B), only SS-OCT data were collected and results were, respectively: mean residual cylinder 0.36±0.45D vs 0.43D±0.31D (p=0.22); mean prediction error -0.33±0.31D vs –0.34±0.45D (p=0.79); BCDVA at ≥20/20, ≥20/30, ≥20/40 were 57%, 89%, and 100% for Group A vs 60%, 95%, and 98% for Group B (p=0.64). The percentage of eyes within 0.25D, 0.50D, and 0.75D were respectively measured as: 55.6%, 83.8%, and 95.7% in Group A vs 43.6%, 82.3%, and 91.9% in Group B. Within Group A, analysis of flat K values demonstrated that Ambient had lower SD vs Argos (1.78 vs 1.96) was statistically significant. (p=0.0029).



	Argos	Ambient TCA
Number of values	99	99
Minimum	39.13	39.59
25% Percentile	41.53	41.75
Median	43.25	43.55
75% Percentile	44.24	44.17
Maximum	49.14	48.82
Range	10.01	9.23
Mean	43.10	43.27
Std. Deviation	1.957	1.775
Std. Error of Mean	0.1966	0.1784

CONCLUSION

Results suggest that clinical astigmatic outcomes of Ambient LED topography are comparable to Argos SS-OCT biometry for toric IOL power calculation. However, the Ambient demonstrated significantly greater precision in measuring keratometric values compared to the Argos when measuring the same eyes.