

Impact of Dry Eye Disease on Keratometric Measurements and Intraocular Lens Power Calculations



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AIM: To evaluate the impact of dry eye disease on intraocular lens (IOL) power and toric axis calculations based on biometric measurements.

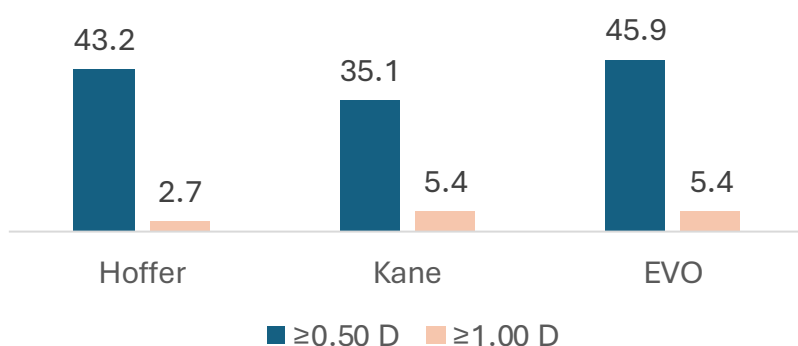
METHODS:

- ✓ Retrospective study, 37 eyes applying for cataract surgery
- ✓ Biometry (IOLMaster 700) followed by ocular surface evaluation: TBUT, NIBUT, Schirmer, corneal staining, OSDI
- ✓ Dry eye disease diagnosis: TFOS DEWS III criteria
- ✓ Dry eye disease treated before surgery
- ✓ All measurements repeated after treatment (mean 17.4 days)
- ✓ IOL calculations using EVO, Kane, and Hoffer Q (ESCRS platform)

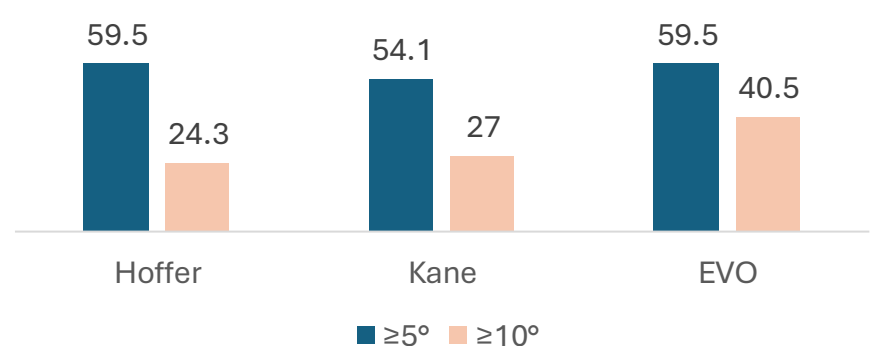
RESULTS:

- ✓ OSDI and corneal staining scores improved after treatment
- ✓ No statistically significant change in IOL power calculations before and after treatment, however
 - ✓ ≥ 0.50 D change observed in 35–45% of eyes depending on formula
 - ✓ Large deviations (≥ 1.00 D) were rare (2.7–5.4%)
- ✓ Toric IOL axis measurements showed substantial variability as well

Variability in IOL Power Calculations



Variability in Toric IOL Axis Calculations



DISCUSSION:

- Dry eye disease affects the reliability of preoperative biometric measurements
- Previous studies have shown that tear film instability impacts keratometry and IOL calculations
- In our study, toric axis measurements were more affected than IOL power
- These findings support the importance of ocular surface optimization before cataract surgery

CONCLUSION:

Dry eye disease appears to affect both toric IOL axis measurements and IOL power magnitude, with a more pronounced effect on axis variability. Optimization of the tear film and ocular surface prior to cataract surgery improves the accuracy of IOL power calculations and toric IOL axis alignment.

Dry eye disease significantly affects both toric IOL axis calculations and IOL power, with a markedly greater impact on axis measurements.