Evaluation of posterior and total corneal astigmatism with colour-LED topography

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PURPOSE

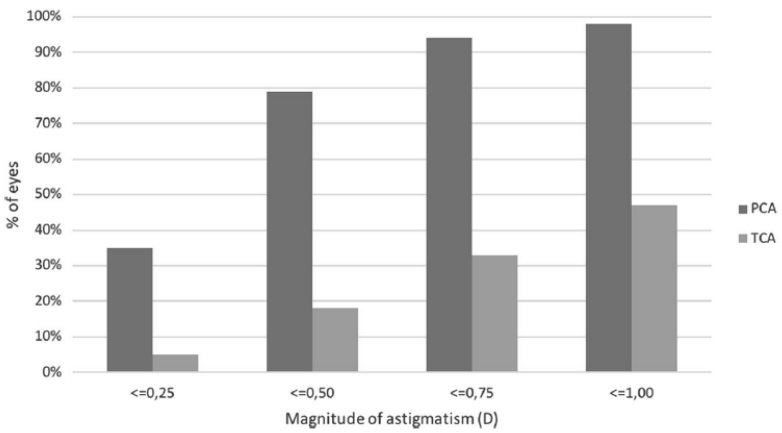
To characterise the posterior and total corneal astigmatism using colour point-source light-emitting diodes (LED) topography.

METHOD

In a prospective case series 400 eyes from 400 patients were evaluated by colour-LED topography (Cassini Topographer). Only eyes with normal topographies were considered. The following parameters were studied: magnitude and distribution of SimK and posterior corneal astigmatism, correlation between SimK and posterior corneal astigmatism, and differences in magnitude and axis between total and anterior corneal astigmatism.

RESULTS

The mean SimK corneal astigmatism was 1.21 ± 0.94 D. The mean posterior corneal astigmatism was 0.37 ± 0.24 D. Posterior astigmatism was vertically oriented in 68% of eyes. Twenty-two percent of eyes showed a posterior corneal astigmatism ≥ 0.50 D. The correlation coefficients between SimK and posterior corneal astigmatism were: r2 = 0.066; p = 0.371 in WTR eyes, r2 = 0.112; p = 0.173 in ATR eyes and r2 = −0.019; p = 0.879 in oblique eyes. A difference between SimK and total corneal astigmatism ≥ 0.50 D was found in 7% of eyes. A difference in axis between SimK and total corneal astigmatism ≥ 10° was found in 24% of eyes.



Distribution of the magnitude of posterior corneal astigmatism (PCA) and total corneal astigmatism (TCA). The mean difference in axis difference between SimK and TCA was 14.81 ± 34.27°, with eyes with SimK ATR astigmatism showing the largest difference (mean 21.07°; p = 0.009)

CONCLUSION

The percentage of eyes with posterior corneal astigmatism ≥ 0.50 D and the differences between anterior and total corneal astigmatism were higher than those previously reported in the literature. Therefore, this study supports the consideration of total corneal astigmatism (TCA collected by Cassini Topographer) magnitude and axis is mandatory for a precise surgical correction of astigmatism.