

Consistency of Scleral Topography in Non-lens Wearing Eyes

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PURPOSE

To determine if variability in scleral and overlying conjunctival shape occurs with time of day or from one day to the next, and the implications on scleral lens fitting.

METHODS

18 eyes of 10 individuals were measured with sMap3D scleral topography at 4 different time and date points. 2 readings were done in the morning (prior to 10 am) and 2 readings were done in the afternoon or evening (after 4 pm). In addition, all 4 measurements were taken on different days to allow for possible variation in the conjunctival and scleral shape. After ensuring a high quality map was obtained, sagittal height and toricity readings were collected for each scan. The variation in data was compared to previous repeatability studies on sMap3D to determine if the variation in results was greater than or consistent with previously published data on consecutive scans.

RESULTS

The average total range in difference in SAG between 4 unique examinations was 94 microns with a standard deviation of 49 microns. Afternoon / evening scans were an average of 9 microns deeper than the morning scans, but there was no statistical significance. Average difference between morning scans on different days was 55 microns with a standard deviation of 37 microns. There was no trend in SAG data indicating a pattern of any significance. The mean difference in sMap3D principle toricity magnitude between examinations was 0.06 diopters (D) with an standard deviation of .12 D. This data, obtained at different times and over different days, compared to published repeatability data in consecutive scans, demonstrates more variability in outcomes, but with no significant trends.

CONCLUSIONS

Scleral shape readings demonstrate more variability in sagittal height when done on different days or separated by several hours than prior repeatability studies would suggest based simply on consecutive, intertest variability, suggesting that the conjunctival and / or sclera shape changes subtly over time. However, there was no pattern to suggest how to obtain the most accurate scan or that time of day would suggest a more accurate measurement. Practitioners should understand that the sclera and overlying conjunctiva can change slightly from hour to hour and day to day.

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