Corneal thickness after overnight wear of an intraocular pressure fluctuation contact lens sensor

Florentina J. Freiberg¹, Jeanette Lindell², Luisa A.-L. Thederan¹, Swetlana Leippi¹, Yanan Shen¹, Thomas Klink¹

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Purpose: To assess the effect of overnight wear of a contact lens-based sensor (CLS) for monitoring of 24-hr intraocular pressure (IOP) fluctuations on central corneal thickness (CCT).

Materials and Methods: Changes in the CCT, mid-peripheral corneal thickness and central corneal radius (CCR) during overnight CLS wear in 20 eligible patients with ocular hypertension or established glaucoma were prospectively studied using ultrasound pachymetry and topography. Corneal thickness and CCR changes were evaluated from pre-to-postsleep, with the fellow eye as control. Paired t-test or Wilcoxon signed-rank test was used as appropriate and with α = 0.05. Relationship between the IOP profile recorded by the CLS and the pre-to-postsleep corneal thickness differences was assessed using the Spearman correlation coefficient.

Results: After CLS wear, mean CCT had changed from 523 to 537 μm (p = 0.015) in the study eye and from 518 to 522 (p = 0.206) in the fellow eye (n = 15). There was no difference in CCT change between eyes (p = 0.075). There were no statistically significant changes in horizontal or vertical CCR in either eye (p > 0.05 for all). No correlation was found between the pre-to-postsleep differences in the CLS signal and the pre-to-postsleep differences in ultrasound CCT measurements (p = 0.974).

Conclusion: The continuous IOP monitoring does not appear to be affected by differences in corneal thickness that occur during overnight CLS wear, although the CLS did induce some corneal swelling. This effect was not statistically significantly different from the control eye and does not seem to influence the CLS IOP profile.

Author Affiliations: ¹Department of Ophthalmology, Julius Maximilians University, Wuerzburg, Germany, ²Sensimed AG, Lausanne, Switzerland