

READING, CORNEAL TOPOGRAPHY AND CONTACT LENSES

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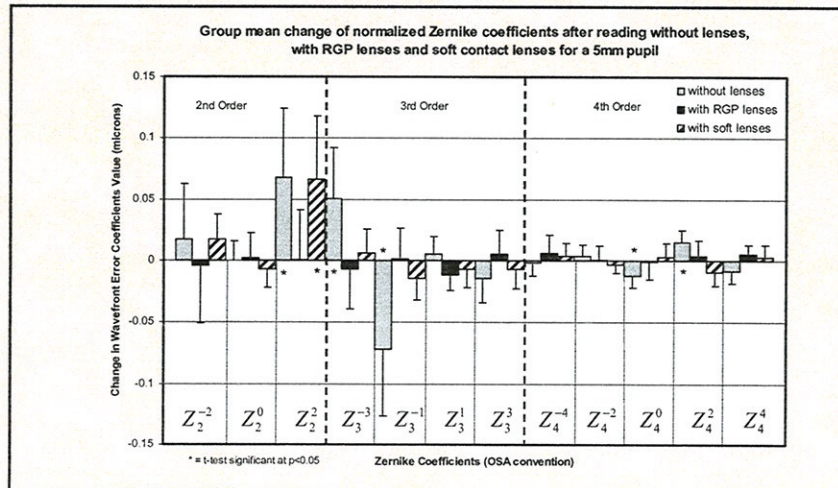
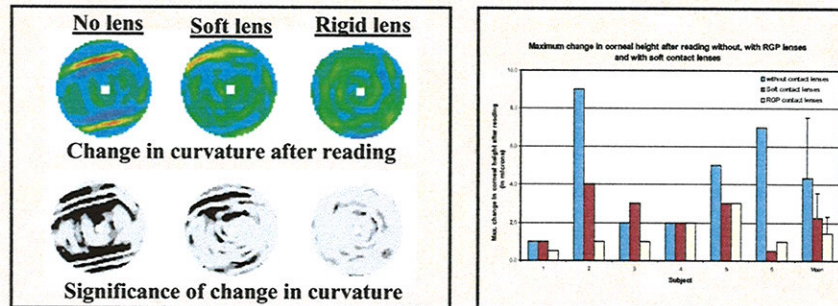
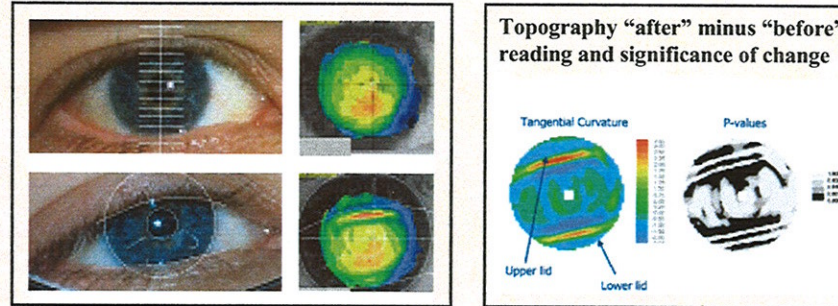
Purpose: In a previous study we have shown that many individuals have significant changes in the shape and optical characteristics of the cornea following 1 hour of reading. In this study we investigated the potential masking effect of contact lenses on corneal deformation produced by eyelid pressure during reading.

Methods:

Three conditions were investigated on separate days:

1. reading without contact lenses,
2. reading with soft contact lenses,
3. reading with rigid contact lenses.

The reading tasks were performed in natural downgaze for a period of one hour. Six measurements of corneal topography were made with a videokeratoscope before and after reading, the results of the six maps were averaged, and the difference in corneal topography was calculated. T-tests were applied to topographic height differences at all points within the maps. Six contact lens wearers with normal ocular health were recruited for the study.



Results: In all six subjects, significant topography changes were present after reading without contact lenses. These corneal changes correlated to lid position during reading and were highly significant in magnitude ($p < 0.001$). Most subjects showed a reduction in the corneal changes caused by lid pressure when wearing soft contact lenses. In the rigid contact lens wearing trial the corneal changes found after reading were minimal.

Conclusions: Rigid contact lenses substantially diminish the effect of lid pressure on corneal topography during reading, while soft lenses mask a smaller amount of the lid pressure effect. The changes in corneal shape associated with lid forces during reading affect both the low and high order aberrations of the eye. If rigid contact lens wear can slow myopia progression in some individuals, then the ability of the lenses to absorb lid forces and minimize optical changes in the cornea during reading is a possible mechanism of action.