

Angle Kappa Changes After One Year of Overnight Orthokeratology Treatment For Myopia

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Abstract

Purpose

This study evaluated changes in angle kappa after one year of overnight orthokeratology (Ortho-K) lens wear and its correlation with corneal parameters.

Methods

A prospective cross-sectional study was conducted at Chandraprabha Eye Hospital, Assam, with 65 myopic subjects aged 5 to 21 years. Corneal topography and angle kappa measurements were obtained using the Scheimpflug-based Wavelight Oculyzer II before and after 12 months of Ortho-K wear. Analyzed parameters included keratometry values (K1, K2), central corneal thickness (CCT), corneal astigmatism (CA), and angle kappa (AK). Statistical analysis involved a paired sample *t*-test and Pearson correlation.

Results

Angle kappa increased significantly after 12 months ($p < 0.01$), from 0.22 ± 0.21 mm to 0.32 ± 0.19 mm. Corneal flattening was indicated by reduced K1 (43.23 ± 1.7 D to 41.94 ± 1.9 D, $p < 0.01$) and K2 (44.27 ± 1.7 D to 43.23 ± 1.7 D, $p < 0.01$). CCT decreased from 546.36 ± 35.03 μ m to 537.12 ± 35.85 μ m ($p < 0.01$), while CA increased from -1.12 ± 0.68 D to -2.10 ± 1.29 D ($p < 0.01$). Angle kappa positively correlated with lens power ($r = 0.22$), CA ($r = 0.30$), and K1 ($r = 0.30$), while negatively correlating with CCT ($r = -0.52$) and K2 ($r = -0.37$).

Conclusion

Ortho-K wear significantly alters angle kappa, affecting optical alignment and visual perception. These findings highlight the importance of considering angle kappa in Ortho-K fitting to optimize visual outcomes. Further research is needed to assess clinical implications and refine fitting strategies.

Keywords

Orthokeratology, Angle Kappa, Myopia Control, Corneal Topography, Visual Axis, Contact Lens Fitting

