

R1  R2  R3  PG0  PG1  Estagiário  Tecnólogo   
PIBIC Last Name - Stillitano First Name - Iane Middle - Gonçalves

Service (sector) Refraction and Contact lenses N° CEP

### **Orthokeratology: Short-Term Corneal Changes and Wavefront Analysis**

Stillitano IG, Chalita MR, Höfling-Lima AL, Maidana E, Lui MM, Lipener C. **Purpose:** To evaluate corneal changes and ocular aberrations in patients submitted to short-term corneal reshaping by overnight orthokeratology (ortho-k) fitting test. **Methods:** Forty randomly eyes exhibiting sphere from -0.50D to -4.50D and up to -1.50D with-the-rule astigmatism were prospectively submitted to ortho-k fitting test and evaluated once during pre-test and then after 1 and 8 nights following the removal of overnight ortho-k contact lens (Be Free, *Mediphacos Ltda, Belo Horizonte, Brazil*). Data on uncorrected visual acuity (UCVA), cycloplegic refraction, corneal topography (Medmont) and optical pachymetry were collected. Wavefront measurements of optical higher-order aberrations (HOA) were determined for 6.5mm pupil size using the LADARWave device. **Results:** The mean spherical equivalent reduced from  $-2.24 \pm 0.98D$  to  $0.15 \pm 0.76D$  ( $p < 0.001$ , paired t test). All patients presented UCVA up to 20/30 and 69.2% up to 20/20. It was observed significant decrease in apical radius: baseline ( $7.82 \pm 0.25$ ), 1st night ( $8.00 \pm 0.25$ ) and 8th night ( $8.20 \pm 0.24$ ). Changes in central and nasal pachymetry was not observed, however it had an increase of 14 microns in temporal cornea thickness from baseline to the 1st night, without difference between 1st and 8th nights ( $p > 0.001$ ). HOA root mean square increasing 2.5-fold from  $0.42 \pm 0.16\mu$  to  $1.04 \pm 0.24\mu$  due to increase of coma and spherical aberration. Horizontal coma increased towards positive direction in the right eyes and negative direction in the left eyes ( $p < 0.001$ , ANOVA). **Conclusions:** Short-term efficacy on myopia reduction and improving of UCVA was obtained during ortho-k fitting test. However, HOA, particularly spherical aberration and coma increased significantly. Increase of temporal thickness and change in coma direction between right and left eyes (faster temporal wavefront) is possibly related to the wise effect of the treatment zone to the temporal side.