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The effects of overnight orthokeratology: preliminary results in Brazil

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Purpose: The purpose of this study was to assess visual, refractive and topographic changes in patients that underwent overnight use of contact lens for orthokeratology (ortho-k). Methods: Both eyes (74 eyes) of thirty-seven 10 to 49 year-old patients with myopia between -0.75D and -5.00D and astigmatism ≤1.50D were fitted with BE Free reverse geometry contact lenses (BE; Ultravision Pty Ltd, Brisbane, Australia). The mean follow up period was about 20.5 ±21.3 weeks. The subjects were divided into two groups: teenagers (group I, n=12, mean age 14.1 ±2.5 years) and adults (group II, n=25, mean age 29.9 ±6.4 years). The mean value of Uncorrected Visual Acuity (UCVA) and refractive correction were achieved as well as slit lamp examinations. Changes in simulated K readings (Sim K) and apical radius were performed with the Medmont corneal topographer. The contact lens base curve radius was selected using a computer fitting software (BE Enterprises Studio).Two-tailed paired Student t-tests were carried out to compare changes before and after ortho-k and ANOVA was also used to compare the two groups, with a critical p-value of 0.05. Results: On average, patients moved from a mean spherical equivalent of -3.04 ±1.15D before lens wear to a mean spherical equivalent of -0.39 ±0.62D ($p < 0.0001$). 87.8% of the patients improved their UCVA up to 20/30 or better. Corneal topography showed significant central flattening (mean change in apical radius was 0.30 ±0.19mm and mean change in Sim K was 1.45 ±0.65D). No statistical differences in refractive changes, keratometry measurements and apical radius between the two groups were detected ($p>0.05$). No adverse responses to lens wear were reported by subjects or revealed by biomicroscopic examination. Conclusions: Corneal and visual changes confirm previous reports on the effects of ortho-k lens wear. The preliminary results of this study indicate that improvement in unaided visual acuity appear to be favorable; however, future studies are needed to determine the long-term outcomes of treatment.