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Overall performance of an Orthokeratology Lenses with 5mm Optical Zone Diameter

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Purpose: To evaluate lens performance in terms of visual acuity, corneal topography, ocular surface integrity and symptomatology after 1-month of wearing orthokeratology (OK) lenses with a 5mm optical size diameter (OZD) in an adult population.
Method: This was a prospective, randomized, double-masked, 1-month, trial evaluating OK lenses (Paflufocon D) with a 5mm OZD. Subjects were eligible for enrollment if both eyes had refractive myopia between -0.50D and -6.00D, with or without -1.75D of refractive astigmatism, and no corneal abnormalities. Subjects were fitted bilaterally with OK, and evaluated after 1-day, 1-week and 1-month of lens wear. LogMAR uncorrected distance visual acuity (UDVA), corneal topography, ocular surface integrity, and subjective comfort and vision using a visual analogue scale (VAS) were measured at each visit.
Results: 40 eyes from 20 subjects with age range 18 to 40 years (26.73±7.16) were enrolled and successfully fitted with OK lenses. All subjects completed the study with no adverse events reported. At baseline, the mean sphere was -2.34±1.32D and UDVA was -0.15±0.08 LogMAR. After 1-month of overnight wear 5 mm orthok OZD, the mean sphere was -0.10±0.33D, being statistically significant compared to baseline ($p<0.05$). A statistically significant improvement in UDVA was observed across time (1-day, 1-week and 1-month) 0.01±0.22, -0.19±0.10, -0.18±0.13 ($p<0.001$). Flat and Steep K-readings increased by 0.15±0.32 mm and 0.14±0.26, respectively, being statically significant ($p<0.05$). Both, subjective comfort and vision on lens application showed a statistically significant improvement across time ($p<0.001$). Ocular surface integrity was clinically acceptable for the 5mm OZD ($p> 0.05$).
Conclusions: OK lens with 5mm OZD showed excellent clinical performance after 1-month of wear with significant improvements in UCVA, subjective comfort and vision. Further studies are needed with DreamLite OK lens using lens designs with smaller back OZD to evaluate the impact on slowing the progression of myopia in children.
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