An Assessment of Orthokeratology Lenses Having Two Different Optic Zone Sizes

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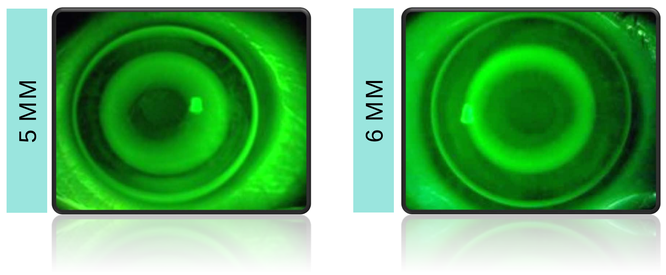
PURPOSE

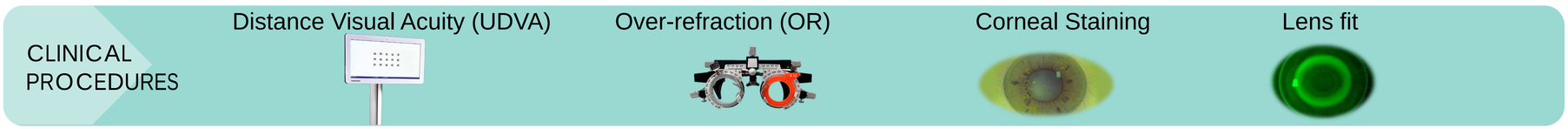
To evaluate lens fitting characteristics, visual acuity, treatment zone size, and ocular surface integrity after 1-month of wearing Boston XO lenses (Hexafocon A) orthokeratology (OK) from Procornea (CooperVision Inc.) in an adult population.



METHODS

"This was a prospective, randomized, double-masked, 1-month,crossover trial comparing DreamLite lenses with a standard 6mm optic zone diameter (OZD) to lenses with the smaller 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 randomly fitted bilaterally with OK lenses with one of the two different zone sizes, and evaluated after 1-day, 1-week and 1-month of lens wear with each pair. Lens fit, logMAR uncorrected distance visual acuity (UDVA), and ocular surface integrity were measured at each visit. Corneal treatment zone diameter (TZD) was measured in the horizontal and vertical meridian at the 1-month visit.

Figure 1. Visit Schedule procedure



CONCLUSION

DreamLite OK lenses in both designs showed excellent clinical performance after 1-month of wear with no adverse events reported, similar fitting, and visual performance. However, the 5mm design produced a smaller corneal treatment zone compared to the 6mm. It would be interesting to evaluate the impact of a reduced treatment zone with these lenses in children and the impact on slowing the progression of myopia.

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RESULTS

20 subjects 16 women and 4 men with a mean age of 26.73±7.16 years (range:18-40 years).
Mean sphere at **baseline** was **-2.34 ± 1.32D** (range: -0.75/-4.75D) and visual acuity **-0.15 ± 0.08** LogMAR (range: 0.06/-0.30 LogMAR)

Table 1. Results of the clinical variables for both lens designs during the visits of 1 night, 1 week and 1 month. (mean ± SD). H: Horizontal; V: Vertical

	1 NIGHT			1 WEEK			1 MONTH		
Lens	**5mm**	**6mm**	**P-value**	**5mm**	**6mm**	**P-value**	**5mm**	**6mm**	**P-value**
UDVA (LogMAR)	0.01 ± 0.22	0.00 ± 0.15	0.752	-0.19 ± 0.10	-0.20 ± 0.09	0.802	-0.18 ± 0.13	-0.23 ± 0.07	0.931
Over-refraction (D)	-0.89 ± 0.90	-0.69 ± 0.50	0.399	-0.11 ± 0.35	-0.05 ± 0.26	0.561	-0.10 ± 0.33	-0.03 ± 0.28	0.437
Corneal Staining	0.05 ± 0.22	0.20 ± 0.43	0.496	0.00 ± 0.00	0.15 ± 0.37	0.159	0.05 ± 0.22	0.05 ± 0.22	0.699
Lens Fit (0-4)	3.16 ± 1.03	3.30 ± 0.47	0.285	3.55 ± 0.51	3.60 ± 0.50	0.716	3.35 ± 0,49	3.55 ± 0.51	0.163
H TZD (mm))	2.20 ± 0.12	2.30 ± 0.09	0.745	2.30 ± 0.11	2.30 ± 0.12	0.738	**2.40 ± 0.10**	**2.60 ± 0.13**	**0.046**
V TZD (mm))	2.20 ± 0.11	2.20 ± 0.14	0.851	2.20 ± 0.12	2.40 ± 0.11	0.247	**2.40 ± 0.15**	**2.90 ± 0.15**	**0.035**

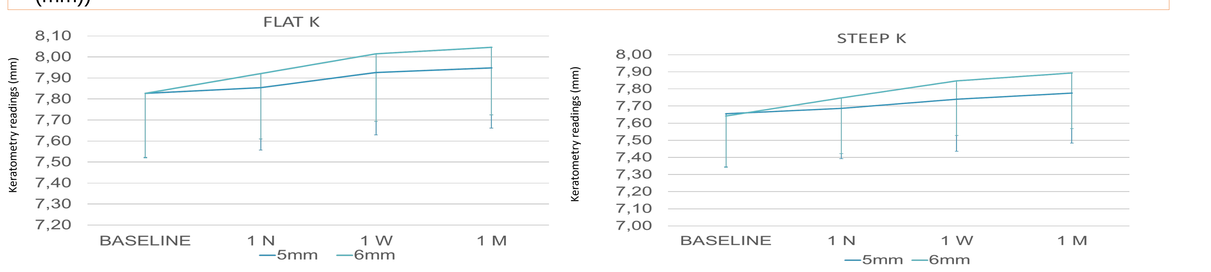

Figure3. Keratometry readings for both lenses before and after treatment (mean ± SD). BASELINE= Baseline visit; 1N = 1 night of wearing; 1W= 1week of wearing; 1M= 1 month of wearing.

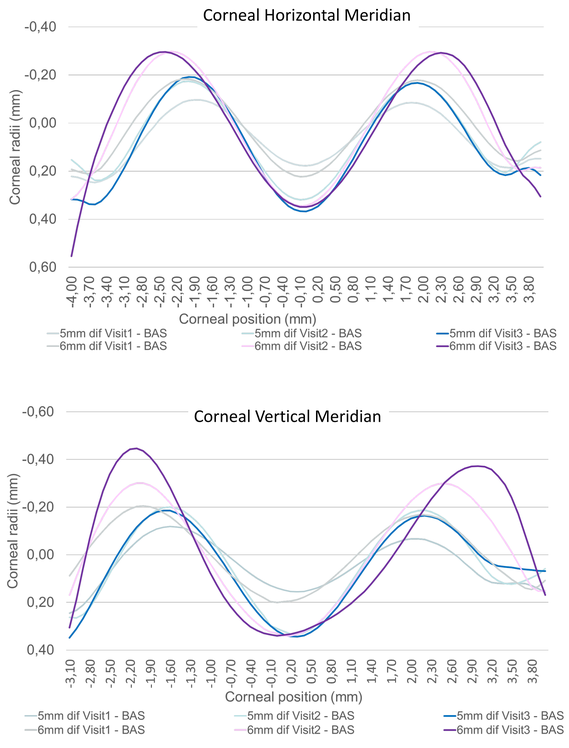

Figure 2. Change in curvature (mm) of the anterior face in the horizontal and vertical axis between the baseline (BAS) and after 30 nights of use of orthokeratology lenses.