

Title

Real World Effectiveness of Myopia Control Spectacle Lenses in Children of Different Age Groups

Purpose

To evaluate the 1-year effectiveness of two myopia control spectacle lenses: Diffusion Optics Technology with contrast modulation (MC1) and Defocus Incorporated Multiple Segments (MC2) to slow myopia progression in Asian Canadian children by age groups.

Methods

Clinical records from a Canadian independent practice were reviewed to identify children ages 6 to 10 who had worn either MC1 or MC2 for at least 1-year. Both eye data were first averaged within-individual, and differences in the mean axial length (AL) elongation from baseline (BL) and at 1-year were analyzed by lens type and age group (young: age 6-7 vs older: age 8-10 at the time of dispensing). Results were also compared to extant data from the DOT CYPRESS clinical trial.

Results

112 children with 1-year follow-up [52% females; 54% MC1 and 46% MC2 wearers; 35% young and 65% older]. Mean AL elongation after 1-year with MC1 was 0.10 mm less compared to MC2 (95% CI [0.04, 0.17], $p=0.003$). For age-specific analysis, BL mean AL (\pm SD) for age 6-7 was 23.81 \pm 0.63mm and for age 8-10 was 24.42 \pm 0.82mm. Independent of lens types, AL elongation after 1-year was 0.16mm more with the younger age group, compared to the older age group (95% CI [0.09 to 0.23], $p < 0.0001$). For MC1 mean AL change from BL (\pm SD) was 0.24 \pm 0.17 and 0.12 \pm 0.13 mm for the younger and older group respectively with a difference of 0.13 mm (95%CI [0.05 to 0.20], $p=0.0015$). For MC2 mean AL change from BL (\pm SD) was 0.46 \pm 0.23 and 0.21 \pm 0.15mm for the younger and older group respectively with a difference of 0.25 mm (95%CI [0.14 to 0.36], $p<.0001$). When converted to relative effect size, MC1 had 48% less axial elongation than MC2 in the younger group and 43% less axial elongation in the older group. The MC1 AL change by age-group result is consistent with changes in the DOT 1-year CYPRESS of 0.22 \pm 0.15 mm in the younger ($n=27$) and 0.12 \pm 0.14 mm in the older ($n=52$) group.

Conclusion

These 1-year real-world results demonstrate the impact of myopia control spectacle lenses in younger children, age 6 and 7 years old, who have the highest unmet need due to faster progression and limited available treatment options. Additionally, it shows that contrast-based spectacle lens (MC1) effectively slow axial elongation in an Asian Canadian population.

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