Real-world effectiveness of Diffusion Optics Technology (DOT) spectacle lenses for myopia control in Asian Canadian children

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Purpose

To evaluate the efficacy of Diffusion Optics Technology (DOT) spectacle lenses in a real-world clinical population and compare to clinical trial results from the Control of Myopia using Peripheral Diffusion Lenses: Efficacy and Safety Study (CYPRESS).

Method

Clinical records from a Canadian independent practice were reviewed to identify children who were prescribed DOT spectacle lenses as monotherapy between October 2020 to December 2022. Non-cycloplegic subjective refraction, Snellen visual acuity (VA) and axial length (AL) measurements were recorded. Spherical equivalent refraction (SER), VA and AL progression was calculated after 12-months (± 90 days) of DOT spectacle lens wear.

Results

A total of 39 patient records were identified. Mean age was 8.02 years at baseline (range 4-13 years) and all children were of Asian ethnicity. Baseline mean SER ± SD was -2.50 ± 1.34 D (range -0.50 to -6.06 D) and mean AL was 24.14 ± 0.96 mm (range 21.88 to 26.49 mm). Visual acuities were 20/20 or better at each visit. After 12 months, mean progression was -0.28 ± 0.32 D in SER (n=39) and 0.15 ± 0.17 mm in AL (n=36). SER progression was limited to -0.25 D or less in 56% of children after 12 months of wearing DOT spectacle lenses.

Age-matched untreated myopic eye data from the Singapore Cohort Study of the Risk Factors for Myopia (SCORM) predict mean annual axial elongation of 0.39 mm. DOT lenses slowed AL progression by 62% (0.24 mm) when compared to SCORM data. The AL elongation observed after 12 months of wearing DOT spectacle lenses was similar to age-matched emmetropic eye growth (considered physiological eye growth) predicted by SCORM data (0.14 mm).

The clinical practice data also align closely with the CYPRESS 12-month results (DOT group AL progression: 0.15 mm, Control group AL progression: 0.30 mm, difference: 0.15 mm, $p<0.0001$).

Conclusion

DOT spectacle lenses successfully slowed the progression of myopia compared to published data from untreated myopic children. These real-world clinical case record results are consistent with the outcomes from the CYPRESS clinical trial and demonstrate DOT spectacle lenses effectively slow myopia progression in clinical practice.

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