Myopia control effect of Defocus Incorporated Multiple Segments spectacle lenses in an Indian population with progressive myopia

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Purpose: Defocus Incorporated Multiple Segments (DIMS) spectacle lenses have a proven efficacy in inhibiting myopia progression with several published studies in different populations. There is a dearth of literature on the effectiveness of DIMS lenses from the South Asian population. We conducted a prospective study to evaluate myopia progression during a 6-month period before and a 1-year period after the utilization of DIMS spectacle lenses.

Methods: In this 18-month study, 57 children (114 eyes), aged 7 to 17 years, with cycloplegic refraction between -1.00 D to -9.00 D and astigmatism ≤-1.50D, progressive myopia of ≥-0.5D in the preceding 6 months, and no history of previous myopia control strategies, were included. At diagnosis, all children were prescribed single-vision spectacles and monitored for 6 months for documented myopic progression. DIMS lenses were prescribed to 32 children (self-selected) at this visit (V1), and the children were monitored at 6 months (V2) and 12 months (V3). A self-selected, age-matched control group of 25 children was also monitored with single vision glasses for the same period. Refractive error (cycloplegic autorefraction) using NIDEK ARK -510A and axial length (AL) using NIDEK AL scan were measured at each visit.

Results: The mean age was 11.1 ± 4 years. The mean baseline spherical equivalent refraction (SER) was -4.D ± 2.1D, mean AL was 24.74 ± 0.9 mm. For the DIMS group, the mean SER progression from baseline to V1 visit was -0.8 ± 0.4D, V1 to V2 was -0.18 ±0.3D and V1 to V3 was -0.25D ±0.2D. The mean AL change from baseline to V1 visit was 0.33 ± 0.1 mm, from V1 to V2 was 0.08±0.1 mm and V1 to V3 was 0.13± 0.1mm. At 12 months, 32% of eyes had no SER progression and 67.1% of eyes showed progression of <-0.50D. At 12 months, 42% of eyes had axial length change < 0.1 mm. The difference in SER for the controls over 1 year was -0.7 ± 0.5D with mean axial length elongation of 0.3±0.1 mm. The DIMS group had significantly less SER progression and AL elongation ($p<0.001$) than the control group.

Conclusions: DIMS spectacle lenses are effective in slowing myopia progression in this South Asian population with documented progressive myopia by 0.46 D at 1 year ($p<0.001$) and axial length by 0.17 mm at 1 year($p<0.001$). Future long-term studies in different age groups and levels of myopia are required to study the effects of DIMS on South Asian children.
Keywords: DIMS, Indian, South Asian, spectacle lens, myopia progression