

The Effect of DIMS Lenses on Choroidal Thickness in Myopic Children

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Abstract

Purpose: Myopia is a prevalent vision problem, especially among school-aged children. Interventions like defocus incorporated multiple segments (DIMS) spectacle lenses have been employed to control myopia progression and reduce associated complications. This one-year study aimed to evaluate how DIMS lenses influence subfoveal choroidal thickness (SfChT). Changes in the choroid, the vascular layer of the eye, may be a key factor in understanding the ability of myopia control methods to predict and mitigate future myopia progression.

Methods: Myopic school-aged children aged 8–13 years were recruited in a two-year study investigating the effect of DIMS spectacle lenses on myopia progression. The treated group received DIMS spectacle lenses (n = 48), while the control group was treated with a pair of single vision (SV) spectacle lenses (n=42). SfChT was monitored at 4-, 8-, and 12-months post lens wear using spectral-domain optical coherence tomography.

Results: SfChT increased significantly after 4 months of DIMS spectacle lens wear compared to those wearing SV spectacle lenses. The thickness of the choroid increased to $13.64 \pm 2.62 \mu\text{m}$ after 12 months of DIMS lens wear, while the choroid thinned in the SV group ($-9.46 \pm 2.55 \mu\text{m}$). Choroidal changes demonstrated a significant negative association with axial elongation over 12 months in both the DIMS and SV groups. Choroidal change at four months significantly predicted the changes in axial length at 12 months after controlling for the effect of age and gender.

Conclusions: Our study demonstrated significant choroidal thickening in response to myopic defocus incorporated in a spectacle lens. The results suggested that choroidal changes at four months may help predict changes in axial length after one year.