

Short-term effect of two modified Defocus Incorporated Multiple Segments spectacle lenses on choroidal thickness in children

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PURPOSE

- The prevalence of myopia is predicted to rise, with approximately 50% of the world population (5 billion people) projected to be myopic in 2050 (1). While myopia control (MC) interventions exist, their effectiveness varies and cannot completely halt the progression (2).
- Short-term choroidal thickness changes may serve as a predictor of myopia progression (3).
- Our previous study demonstrated a significant choroidal thickening after 1 week of Defocus Incorporated Multiple Segments (DIMS) spectacle lens wear (4).

Aim

- To investigate the short-term effect of two modified myopia control lenses on choroidal thickness in school children

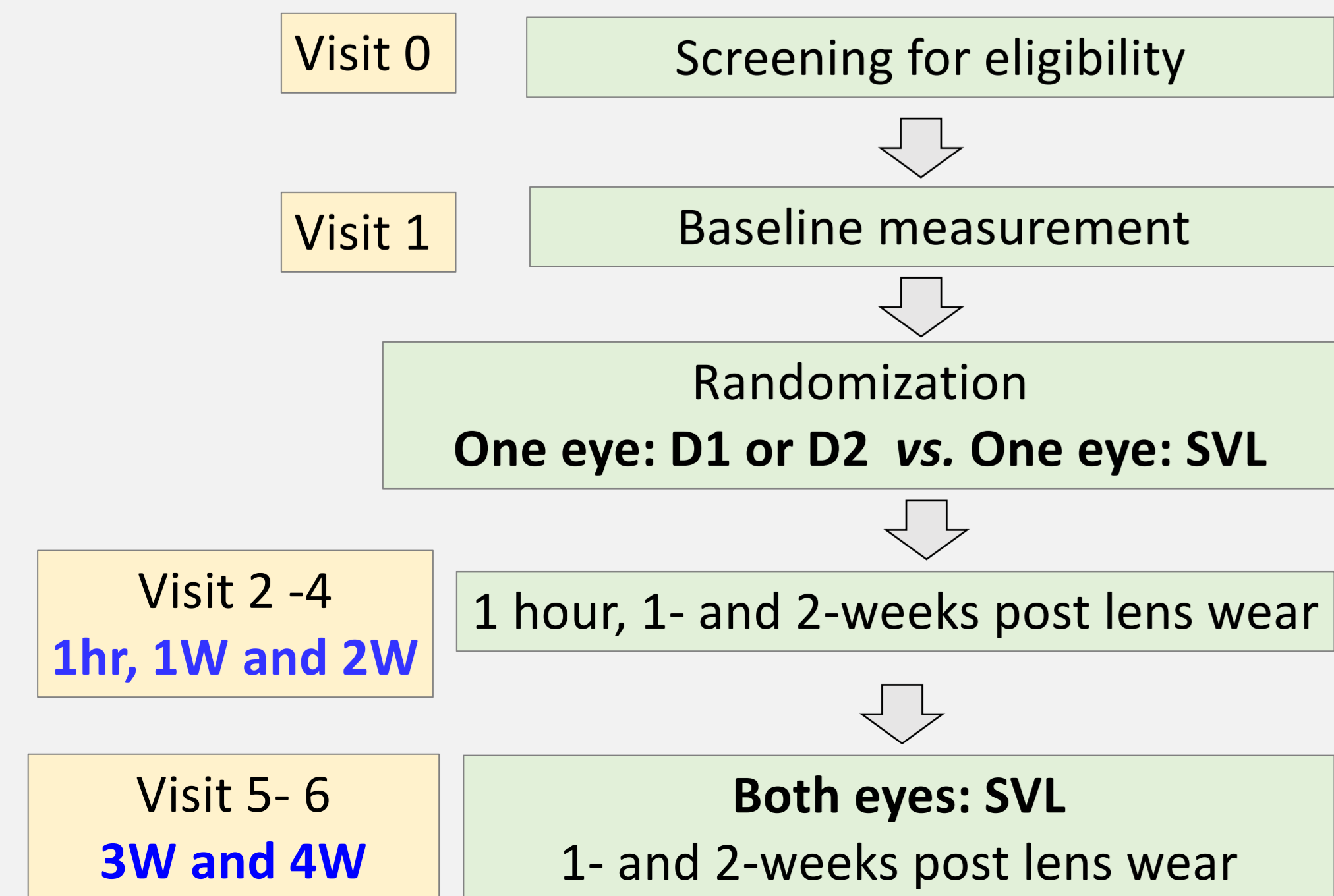
METHODS

Subjects

Inclusion criteria

- Age: 6 to 13 years old
- Myopia: -1.00 to -10.00D in both eyes
- Spherical Equivalent Refraction (SER): ≤ -10.00 D
- Astigmatism: ≤ -4.00 D
- Anisometropia: ≤ -1.50 D
- No prior MC interventions

Flow diagram



METHODS

Image acquisition

- Swept source optical coherence tomography (DRI OCT Triton, Topcon)
- Scanning protocol: 2 radial scan sizes of 9.0mm (1024 x 12 line scans)
- Captured at V1 to V6

Outcome measures

- Changes in subfoveal choroidal thickness relative to baseline

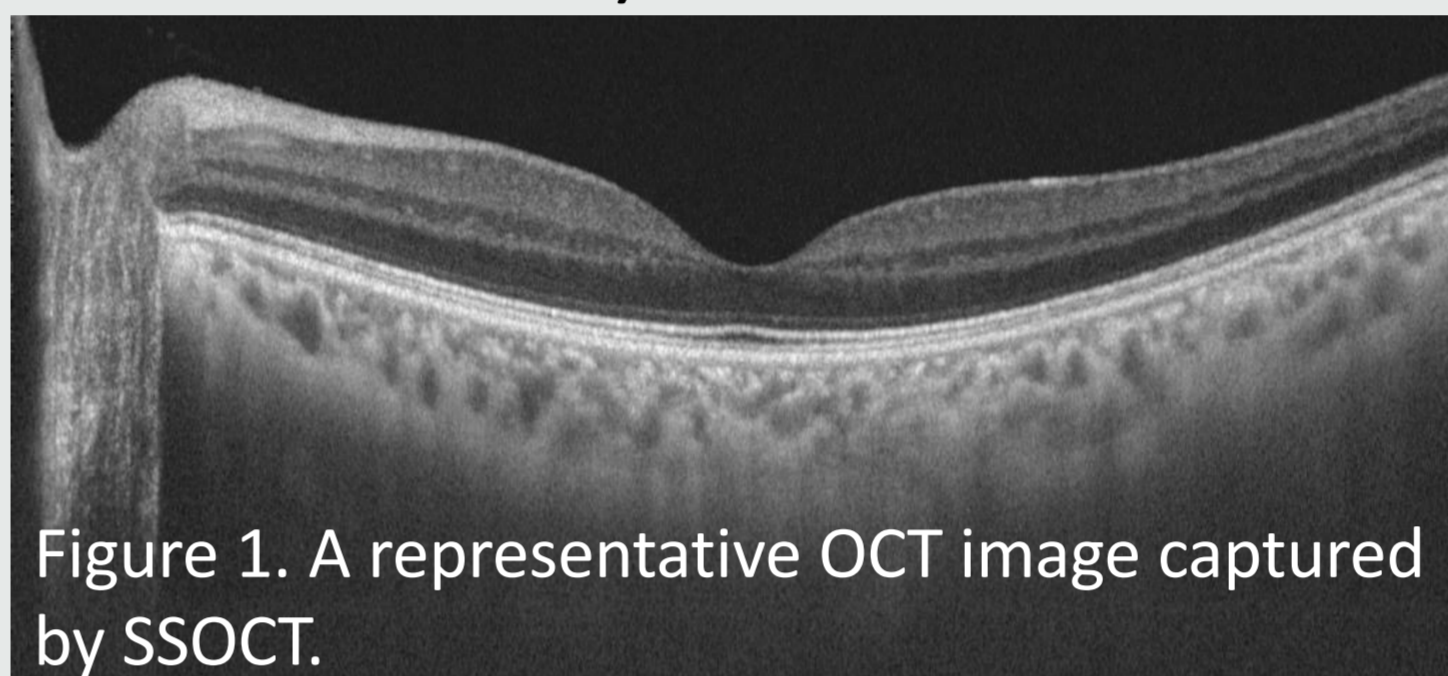


Figure 1. A representative OCT image captured by SS-OCT.

RESULTS

Table 1. Baseline demographics data

	D1 group (n = 44)	D2 group (n = 45)
Age (years)	9.78 ± 1.95	9.72 ± 1.80
Gender (F:M)	22: 22	22: 23
Refractive errors in SE (D)	Treated: -2.83 ± 0.97 Control: -2.79 ± 1.09	Treated: -2.64 ± 1.17 Control: -3.05 ± 1.24
Axial length (mm)	Treated: 24.73 ± 0.97 Control: 24.71 ± 1.00	Treated: 24.63 ± 0.88 Control: 24.63 ± 0.87
Subfoveal choroidal thickness (μm) (mean ± SEM)	Treated: 204.12 ± 6.43 Control: 205.02 ± 7.12	Treated: 209.34 ± 7.03 Control: 204.88 ± 7.18

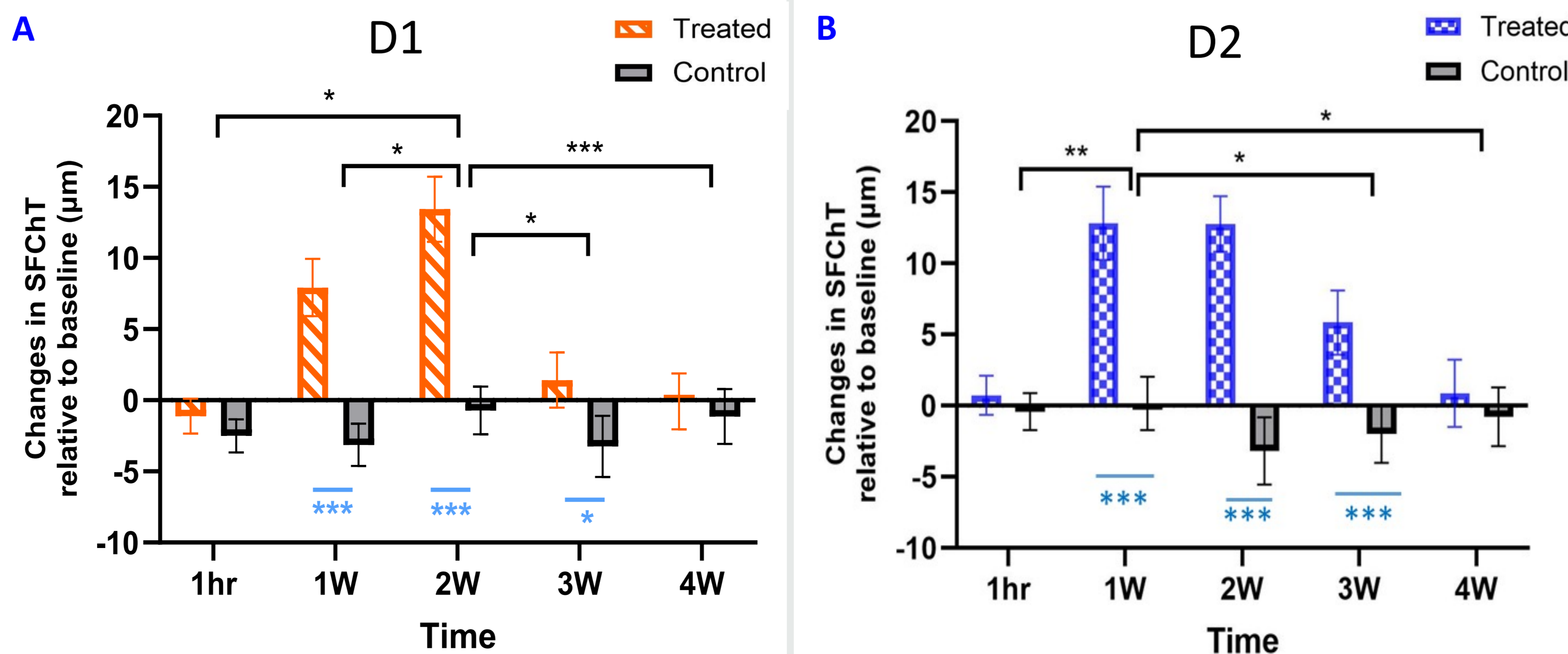


Figure 2. Effect of D1 (A) and D2 (B) spectacle lens on the change of choroidal thickness relative to baseline over 4 weeks. Black asterisks: mixed between-within subjects ANOVA; Blue asterisks: paired t-test, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

RESULTS

- Choroidal thickness was significantly increased after 1 week of D1 and D2 lens wear compared to the contralateral eyes with single vision lens as control.
- Choroidal thickening continued after 2 weeks of lens wear.
- Choroidal thickening was reversible after removal of D1 and D2 spectacle lenses.

CONCLUSION

- Both lenses induced significant choroidal thickening in school children after short-term of lens wear.
- This observed thickening supports the potential effectiveness of the modified design of spectacle lenses for myopia control.

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