

Can changes in Refraction and Axial Length in the first 6-months of MiYOSMART wear predict future progression in UK children?

Saunders KJ¹, McCullough, SJ,¹ Barr H,² Fulton J,¹ Logan NS,³ Nagra M,² Pardhan S,² Richardson P,¹ Whayeb Y,³ Williamson P,³ Vlasak N⁴

1 Centre for Optometry & Vision Research, Ulster University, Coleraine, N. Ireland, United Kingdom

2 Vision & Eye Research Institute, School of Medicine, Anglia Ruskin University, Cambridge, England, United Kingdom

3 School of Optometry, Aston University, Birmingham, England, United Kingdom

4 HOYA Vision Care, Amsterdam, The Netherlands

Purpose: MiYOSMART spectacles lenses are well tolerated and retard myopia progression in Chinese children compared to single-vision spectacle lenses. Data presented are from a 3-year observational trial of MiYOSMART spectacle lens wear among UK children. We explore whether short-term changes in refractive error and axial length are predictive over a longer-term.

Methods: Recruits aged 5-15 years (cycloplegic spherical equivalent refraction [SER] -0.50 to -8.50D) were prescribed MiYOSMART spectacle lenses full-time. SER (cycloplegic autorefraction) and axial length (AL) were measured at baseline, after 6- and 18-months. Changes in AL and SER over the first 6-months were compared with respective changes occurring over the subsequent 1-year using partial correlation, controlling for age, SER and AL at baseline.

Results: Participants were 101 children (54% female), mean±SD age 10.1 ±2.2 years (66% White, 17% Indian Asian, 7% Chinese, 5% Other Asian, 5% Other). Mean changes in SER and AL within the first 6-months and subsequent 12-months were -0.23±0.27D, -0.24±0.39D, 0.08±0.12mm and 0.15±0.14mm respectively. There was a statistically significant positive partial correlation between change in AL over the 1st 6-months and the change in AL for the subsequent 12-month period ($r^2=0.25$, $p=0.012$). This correlation was not present for change in SER ($r^2=-0.14$, $p=0.18$).

Conclusions: Change in AL within the first 6-months of MiYOSMART wear was significantly predictive of future axial elongation; faster progression in AL within the first 6-months is likely to result in fast progression in the subsequent 12-months with MiYOSMART wear. In this cohort, progression in SER in the first 6-months was a poorer predictor of future myopia progression. These findings support the use of short-term changes in AL as a predictor of future treatment efficacy in MiYOSMART wearers.

Conflicts of Interest: Study funded by HOYA Vision Care

