

Impact of parental myopia on myopia control efficacy of spectacle lenses with cylindrical annular refractive elements (CARE)

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Purpose

To explore the impact of parental myopia on 1-year myopia control efficacy in children wearing spectacle lenses (SPL) with cylindrical annular refractive elements (CARE) compared to single vision (SV) SPL.

Methods

In an ongoing 2-year prospective, double-masked, multi-center clinical trial (NCT05288335), 240 Chinese children aged 6-13 yrs., spherical equivalent refractive error (SE) -0.75D to -5.00D, were enrolled and randomly assigned to one of three groups: (1) single vision spectacles (SV, N=80); (2) MyoCare (ZEISS) with CARE mean surface power of +4.6D and a central clear zone of 7mm (N=80); or (3) MyoCare S (ZEISS) with CARE mean surface power +3.8D and 9mm central clear zone (N=80). Cycloplegic SE and axial length (AL) were measured at six-monthly intervals, and change in SE and AL from baseline was determined. Parental myopia (none, one, or both) was determined at baseline. One-way ANOVAs were calculated to evaluate the effect of parental myopia (yes or no) on SE and AL progression over 12 months in SV, MyoCare, and MyoCare S wearers, respectively.

Results

In SV lens wearers, there was a relationship between myopia progression and parental myopia, with significantly higher progression of SE ($F(1, 63)=5.33, p=.02$) and a statistical trend for higher progression of AL ($F(1, 63)=3.33, p=.07$) in children with parental myopia (one or both parents myopic: $-0.73\pm 0.39\text{D}/0.35\pm 0.17\text{mm}$) compared to no parental myopia ($-0.47\pm 0.41\text{D}/0.27\pm 0.16\text{mm}$). In contrast, SE and AL progression was not significantly related to parental myopia in MyoCare (without parental myopia: $-0.33\pm 0.34\text{D}/0.18\pm 0.12\text{mm}$; with parental myopia: $-0.34\pm 0.43\text{D}/0.19\pm 0.17\text{mm}$) and MyoCare S wearers (without parental myopia: $-0.37\pm 0.32\text{D}/0.23\pm 0.06\text{mm}$; with parental myopia: $-0.35\pm 0.39\text{D}/0.20\pm 0.16\text{mm}$).

Conclusions

In children wearing single vision SPL, myopia progressed faster in those with parental myopia. In comparison, in children wearing SPL incorporating CARE, myopia progression was not significantly related to parental myopia.

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