

Probability of surviving fast progression and eye growth reversal after 1-year of spectacle wear with cylindrical annular refractive elements

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Purpose

To analyze the likelihood of -0.75D progression after 1-year of wearing next-generation spectacle lenses (SPL) with cylindrical annular refractive elements (CARE) technology compared to single vision (SV) SPL through the use of survival techniques and additionally to reporting incidents of reversed eye growth.

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) -0.75 D to -5.00 D 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 $+4.6\text{ D}$ and a central clear zone of 7 mm ($N=80$); and (3) MyoCare S (ZEISS) with CARE mean surface power $+3.8\text{ D}$ and 9 mm central clear zone ($N=80$). Cycloplegic SE and axial length (AL) were measured at six-monthly intervals. Change in SE and AL from baseline was determined. Survival analysis or time to event outcome were determined for annual progression of worse than (\leq) -0.75D using Kaplan-Meier analysis and a log-rank test for differences between groups. Additionally, the percentage of eyes showing AL and/or SE reversal was determined, and differences assessed using grouped T-test.

Results

Both MyoCare and MyoCare S groups had higher survival rates for progression of $\leq -0.75\text{D}$ at both 6 and 12 months (6M: 0.974 for both CARE groups as compared to 0.896 for SV; 12M: 0.857 and 0.833 for MyoCare and MyoCare S as compared to 0.494 for SV, $p<0.001$). Post hoc comparisons found significant differences between SV and MyoCare and MyoCare S, respectively, but there were no differences between the test groups. Percent eyes showing AL reversal were 3.9%, 14.1%, and 9.1% at 6 months and 1.3%, 6.4%, and 3.9% at 12 months with SV, MyoCare, and MyoCare S, respectively.

Conclusions

While progression of $\leq -0.75\text{D/yr}$ occurred in one of every two children with myopia wearing SV, the risk of fast progression was significantly reduced with the use of MyoCare and MyoCare S with only one of every 13 to 16 eyes experiencing fast progression. Furthermore, some eyes wearing MyoCare and MyoCare S had reversal of eye growth.

Reference until publication in IOVS:

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