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

Poster #144 – A0444

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Purpose

Faster progression of myopia (annual change of ≤ -0.50D or higher) is associated with greater risk of: visual impairment, more frequent optical device changes, more severe myopia and myopia-related complications in adult life.[1-3] We analyzed the likelihood of progression of -0.75D or worse after 1-year of lens wear and incidents of axial length (AL) reversal with single vision spectacles compared to MyoCare spectacle lenses incorporating cylindrical annular refractive elements (CARE).

Methods

- Interim analysis of 12-month data from an ongoing 2-year prospective, double-masked, multi-center clinical trial (NCT05288335) (Figure 1)

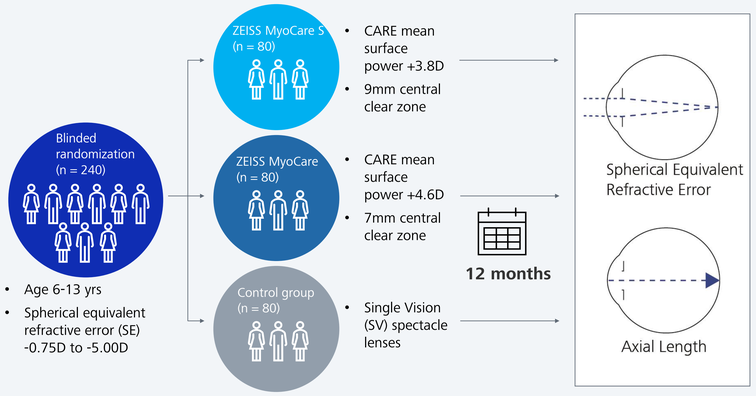

Figure 1. Overview of the randomized controlled clinical trial.

- Change in spherical equivalent refractive error (SE) and axial length (AL) from baseline was determined.
- Survival analysis was determined for fast annual progression ≤ -0.75D (i.e., -0.75D or worse) using Kaplan- Meir Survival analysis with a log-rank test for differences between groups.
- Percent eyes exhibiting AL reversal at 6 and 12 months were determined.

Results

- At baseline, there were no differences between the groups for any of the characteristics. Participant flow through the trial is presented in Figure 2.

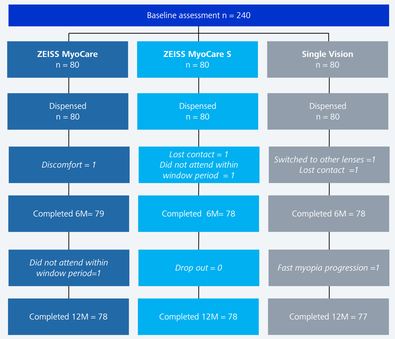

Figure 2. Participant flow over 12 months.

Table 1. Baseline characteristics

Characteristic	MyoCare (n = 80)	MyoCare S (n = 80)	Single Vision (n = 80)
Age (years)	9.9 ± 1.7	9.8 ± 1.7	9.8 ± 1.6
Gender (M/F)	45(36.6%)/ 35(29.9%)	39(31.7%)/ 41(35.0%)	39(31.7%)/ 41(35.0%)
Parental Myopia			
None	14(20.5%)	21(31.3%)	18(26.9%)
One	26(38.2%)	23(34.3%)	23(34.3%)
Both	28(41.2%)	23(34.3%)	26(38.8%)
Cycloplegic SE(D) RE	-2.23 ± 0.98	-2.30 ± 1.06	-2.31 ± 1.01
AL (mm) RE	24.44 ± 0.73	24.34 ± 0.74	24.43 ± 0.73

Probability of surviving fast progression (≤ -0.75D)

- Of the SV wearers, probability of surviving fast progression was 0.896 and 0.493 at 6 and 12 months (Figure 3).
- In comparison, both MyoCare lenses had a higher probability of survival that was significant compared to SV but similar between MyoCare and MyoCare S lenses at both 6 and 12 months.

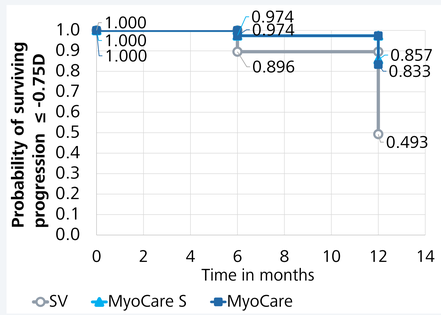

Figure 3. Probability of surviving progression of ≤ -0.75D.

Reversal of axial length

- A small number of eyes demonstrated reversal at both 6 and 12 months. Reversal was greater with MyoCare lenses compared to SV (Figure 4).
- MyoCare > MyoCare S > SV but not significant.

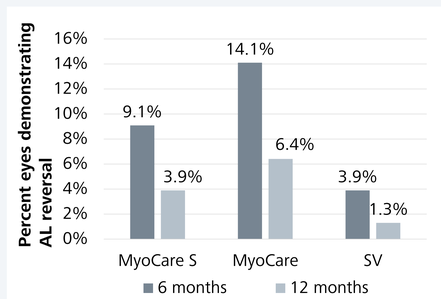

Figure 4. Percent eyes demonstrating axial length reversal.

Discussion

- Estimated annual myopia progression in Asian children with myopia (mean age 9.3 yrs) was -0.82D (95% CI, -0.71 to -0.93D).[4] In children wearing SV contact lenses, 41% had fast progression (-0.75D or worse).[3]
- In this trial, after 12 months of SV wear, probability of surviving fast progression was 0.493 or, one of every two SV wearing eyes experienced fast progression. In comparison, nearly 83% and 86% of MyoCare and MyoCare S wearing eyes survived fast progression. The differences in surviving fast progression were not different between MyoCare and MyoCare S, but significantly different compared to SV. Furthermore, at both 6 and 12 months, more eyes wearing MyoCare and MyoCare S exhibited axial length reversal.
- Our results indicate slower eye growth with MyoCare and MyoCare S compared to SV. AL reversal or shortening was reported with orthokeratology, atropine and low-level red-light therapy.[5-7] In the current study, AL shortening was greater at 6 months with a slight acceleration in eye growth thereafter. It has been suggested a thickened choroid, shrunken vitreous chamber or possibly a thinner cornea may be responsible.[7]

Conclusion

Probability of surviving fast progression was greater with MyoCare than SV. Whilst 51% of SV eyes experienced fast progression (-0.75D or worse) in myopia after 12 months, only 17% of MyoCare and 14% of MyoCare S wearing eyes experienced fast progression.

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