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

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Christina Boeck-Maier[1], Padmaja Sankaridurg[1,2], Arne Ohlendorf[1], Katharina Rifai[1], Siegfried Wahl[1,3], Xiaoqin Chen[4], Cui Yu[5], Min Wu[6], Yi Zhu[7], Youhua Yang[7], Lihua Li[4]

[1] ZEISS Vision Care, Carl Zeiss Vision International GmbH, Aalen, Germany; [2] School of Optometry and Vision Science, University of New South Wales, Sydney, NSW, Australia; [3] Institute for Ophthalmic Research, Eberhard Karls University of Tübingen, Tübingen, Germany; [4] Tianjin Eye Hospital Optometric Center, Tianjin, Tianjin, China; [5] Shenyang He Eye Hospital, Shenyang, Liaoning, China; [6] Beijing Tongren Vision Care, Beijing Tongren Hospital CMU, Beijing, Beijing, China; [7] ZEISS Vision Care, Carl Zeiss Vision (Guangzhou) Ltd., Guangzhou, Guandong, China

Purpose

Parental myopia is associated with both a greater risk of myopia onset and faster myopia progression.[1,2] However, evidence for whether parental myopia affects the efficacy of myopia control solutions is limited. We explored the impact of parental myopia on 1-year myopia control efficacy in children wearing MyoCare spectacle lenses (incorporating cylindrical annular refractive elements (CARE)) versus those wearing single vision (SV) spectacle lenses.

Methods

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

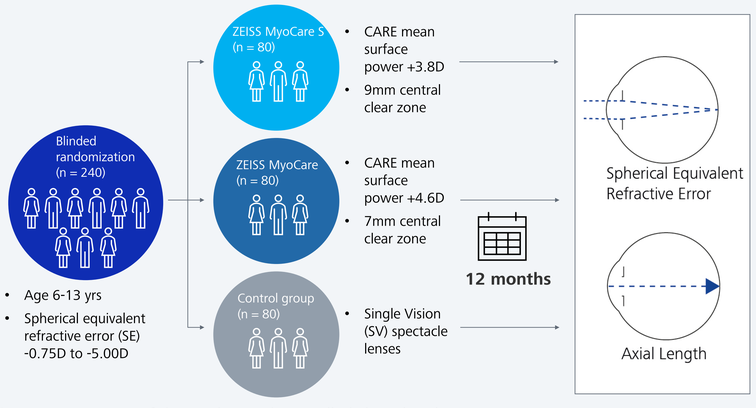

Figure 1. Overview of the randomized controlled clinical trial.

- One-way ANOVAs used to evaluate the effect of parental myopia (none vs one or both parents myopic, Table 1) on SE and axial length (AL) progression over 12 months in SV, MyoCare, and MyoCare S wearers

Table 1. Baseline characteristics

	SV		MyoCare		MyoCare S	
Parental myopia	No (n = 18)	Yes (n = 49)	No (n = 21)	Yes (n = 46)	No (n = 14)	Yes (n = 54)
Age (years)	9.83 ± 1.98	9.67 ± 1.49	10.00 ± 1.52	9.96 ± 1.62	10.14 ± 2.07	9.98 ± 1.69
Gender (N female)	12	22	10	23	6	20
Baseline SE (D; OD)	-2.36 ± 1.17	-2.33 ± 0.96	-2.10 ± 1.05	-2.35 ± 1.11	-2.17 ± 1.02	-2.30 ±0.95
Baseline AL (mm; OD)	24.51 ± 0.66	24.43 ± 0.73	24.25 ± 0.59	24.40 ± 0.77	24.33 ± 0.63	24.45 ±0.74
Wearing time (h)	12.67 ± 3.55	13.21 ±1.04	14.10 ± 0.79	13.35 ± 1.58	13.07 ± 1.82	13.33 ± 1.12

Results

- 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 SV wearers with parental myopia compared to no parental myopia
- In contrast, SE and AL progression were not significantly related to parental myopia in MyoCare and MyoCare S wearers

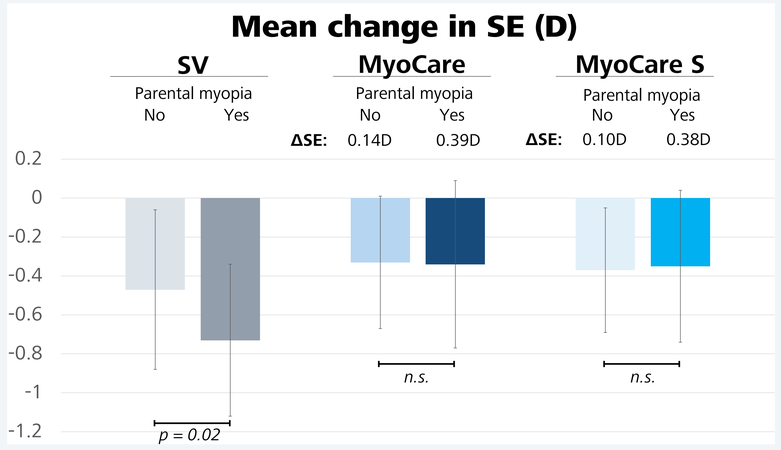

Figure 2. Mean ± sd change in SE from baseline to 12-months follow-up for SV, MyoCare and MyoCare S wearers with and without parental myopia. ΔSE indicates absolute differences compared to SV wearers.

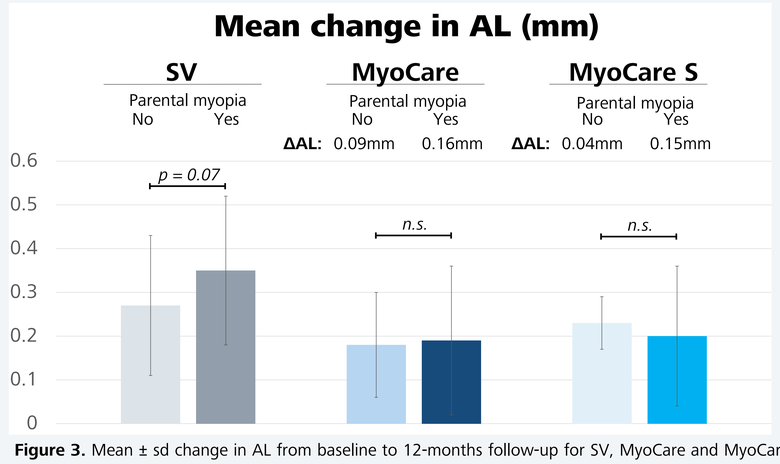

Figure 3. Mean ± sd change in AL from baseline to 12-months follow-up for SV, MyoCare and MyoCare S wearers with and without parental myopia. ΔAL indicates absolute differences compared to SV wearers.

Discussion

- Parental myopia was a significant risk factor for myopia progression in SV wearers, but not in children wearing MyoCare or MyoCare S.
- A similar association was previously reported for the COMET study, where the number of myopic parents was directly related to myopia progression among children wearing SV, but not among those wearing progressive addition lenses. However, the clinical effect was relatively small.[3]
- Parental myopia may predispose children to the development and rapid progression of myopia through shared genetic variants that make them more susceptible to risk factors, as well as by passing on a myopiagenic lifestyle. [1]
- Analysis needs to be replicated in larger and more diverse cohorts, also accounting for a dose-response relationship between parental myopia and childhood myopia.
- Our data suggests that parental myopia is a factor that predicts individuals at greater risk for progression and also indicates that these individuals are most likely to benefit from myopia control interventions.

Conclusion

In children wearing single vision spectacle lenses, myopia progressed faster in those with parental myopia. In comparison, in children wearing MyoCare and MyoCare S, myopia progression was not significantly related to parental myopia. Children with parental myopia might particularly benefit from wearing myopia control solutions.

References

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www.zeiss.com/vision-myopia

Email: christina.boeck@zeiss.com

Disclosures: CBM (E), PS (E), AO (E), KR (E), SW (E), YZ (E), YY (E), XC (F), CY (F), MW (F), LL (F) – ZEISS Vision Care; PS (P) – Brien Holden Vision Institute; PS (F) – Shamir; PS (R) – Essilor International, SightGlass Vision