A dual focus contact lens successfully slows myopia progression in both fast and slow progressors

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Background

For an individual child with myopia, the response to treatment is unknown until time in treatment has elapsed. Randomized controlled trials typically report mean spherical equivalent refractive error (SERE) and axial length (AL) change for cohorts but do not describe individual eye variability. Collecting eye growth data over a period of time before initiating treatment enables comparison of growth rates prior to and during treatment for individual faster and slower progressing eyes.

Purpose

Comparison of eye growth rates prior and during myopia control treatment with a dual focus soft contact lens.

Methods

The control cohort wearing single vision contact lenses (omafilcon A, CooperVision, Inc., Proclear® 1 day) from the 3-year clinical trial of MiSight® 1 day myopia control contact lenses (Part 1)[1] were switched to the treatment lens (omafilcon A, CooperVision, Inc., MiSight® 1 day) for a second 3-year period (Part 2) and is termed the 'T3' group. **(Figure 1)**

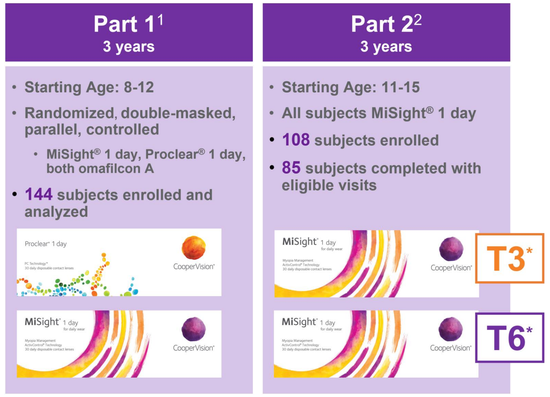

Figure 1: MiSight® 1 day multicenter clinical trial:
*T3 and T6 had worn MiSight 1 day for a total of 3 and 6 years respectively

Methods (continued)

Average age at initiation of treatment was 10.1 ± 1.4 years and 92 eyes from 46 subjects were followed for six years and included in this analysis. At baseline and at each annual visit, cyclopleged refractive errors and axial lengths were recorded. **(Figure 2).**

Individual longitudinal datasets pre and during treatment were used for correlation analysis. The eyes that responded to treatment were divided into 4 quartiles (Q) with Q4 being the fastest progressing quartile and Q1 being the slowest progressing quartile

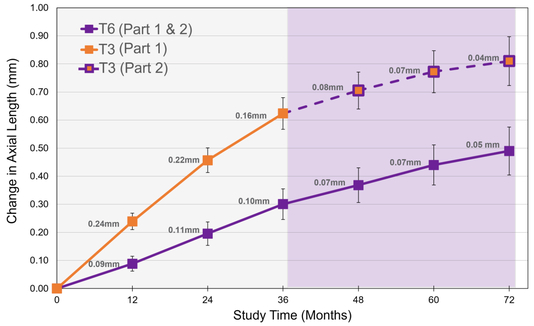

Figure 2: Mean change in axial length over 6 years (n=92 in T3 group)

Results

Axial length growth rates of individual eyes during treatment correlated with their growth rates prior to treatment. **(Figure 3)**

Bivariate analysis across sequential 3-year periods reveals:

- Nine eyes (10%) grew at the same pre-treatment rate during treatment.
- 90% of eyes can be described by a common model in which eye growth slowed to 22% of its pre-treatment rate
- If left untreated these same eyes would only have slowed to 73%-83% of pre-treatment rates due to age alone.[2,3]

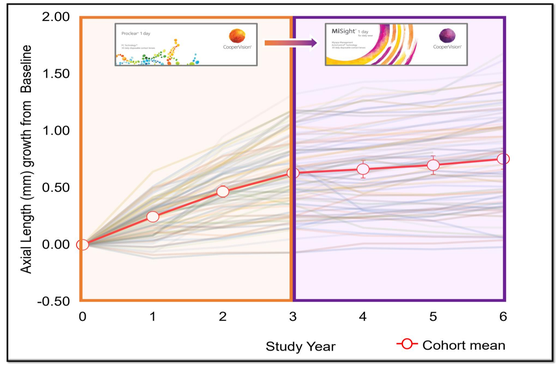

Figure 3: Year by year growth patterns of T3 group responding to treatment (n=83)

Results (continued)

Comparing observed growth to that expected if left untreated:

- Faster growing eyes **(Q4)** slowed the most during treatment
- Eyes progressing slowly prior to treatment (Q1) effectively stopped progressing

(Figure 4)

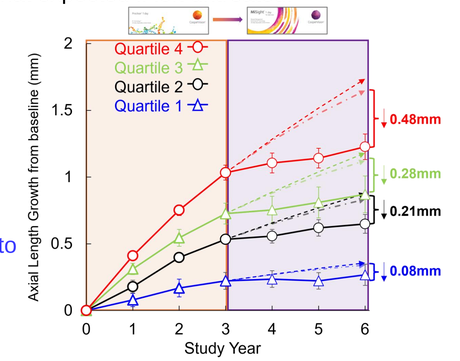

Figure 4: Quartile analysis of the T3 responders compared to estimates of untreated growth[2,3]

Conclusions

Pre-treatment growth rates and myopia progression can be used to assess treatment efficacy when growth rates during treatment are compared to expected slowing due to age norms.

90% of eyes responded to MiSight 1 day treatment, with growth in treatment related to pre-treatment progression rate

- MiSight 1 day treatment stopped progression in slower progressing myopes
- The largest treatment effect occurs in faster growing eyes

REFERENCES:

1. Chamberlain P, Peixoto-de-Matos SC, Logan NS, Ngo C, Jones D, Young G. A 3-year Randomized Clinical Trial of MiSight Lenses for Myopia Control. Optom Vis Sci. 2019 Aug;96(8):556-567.
2. Jones, L. A., et al. (2005). Comparison of ocular component growth curves among refractive error groups in children. Investigative Ophthalmology & Visual Science, 46(7), 2317-2327.
3. Shamp, W., Brennan, N. A., Bullimore, M. A., Cheng, X., & Maynes, E. (2022). Influence of Age and Race on Axial Elongation in Myopic Children. Investigative Ophthalmology & Visual Science, 63(7), 257-A0111.

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CooperVision® Myopia Management

Indications for use: MiSight® 1 day (omafilcon A) soft (hydrophilic) contact lenses for daily wear are indicated for the correction of myopic ametropia and for slowing the progression of myopia in children with non-diseased eyes, who at the initiation of treatment are 8-12 years of age and have refraction of -0.75 to -4.00DS (spherical equivalent) with ≤ 0.75DC. The lens is to be discarded after each removal.