Change in Myopia Over Three Years Among Wearers of Continuous Wear Silicone Hydrogel Lenses and Daily Wear Hydrogel Contact Lenses

B. Long1, P. Bergenske2, R.L. Chalmers3, S.M. Dillehay1, J.T. Barr4, P. Donselik5, G. Secor6, J. Yoakum7

1CIBA Vision Corp, Duluth, GA, USA; 2College of Optometry, Pacific University, Forest Grove, OR, USA; 3Clinical Trial Consultant, Atlanta, GA, USA; 4College of Optometry, The Ohio State University, Columbus, OH, USA; 5Health Center, University of Connecticut, Bloomfield, CT, USA; 6Private Practice, Huntington Beach, CA, USA; 7Groate Eyecare Associates, Greensboro, NC, USA

Purpose:
Earlier studies with continuous wear (CW) of silicone hydrogel lenses showed that users had a lower rate of myopic progression compared to subjects who wore hydrogel lenses on a 6 night extended wear (EW) schedule. The purpose of this study was to compare the long-term results for lotrafilcon A CW lens wear compared to hydrogel daily wear (DW).

Methods:
Subjects were enrolled in a 3-year non-randomized trial in which investigators could choose to place a subject in CW with lotrafilcon A lenses or 2 weekly replacement DW with hydrogel lenses. Age matched subsets were randomly selected by a masked investigator from among the CW and DW subjects who completed the study. Baseline and 3-year spectacle subjective refractive errors were compared to test whether there was a significant difference in the change in refractive error over time.

Results:
36 CW subjects aged 27.9 ± 12.4 years had baseline refractive error of -3.59 ± 1.99 DS. The 36 DW subjects were aged 27.9 ± 12.5 years and had baseline refractive error of -2.10 ± 1.78 DS (p<0.01). CW subjects increased in myopia by 0.03 DS while DW subjects increased in myopia by 0.40 DS (p=0.007). There was no significant change in corneal curvature by keratometry for the CW subjects and there was slight but significant increase in the steepness of the steep K reading for the DW subjects (p<0.05). The proportion of CW subjects with presenting VA of 20/20 or better remained relatively stable, varying from 80 to 86% during the study, while the proportion for DW subjects ranged from 63% to 78% at follow-up visits through 36 months in the study.

Conclusions:
Subjects with higher refractive errors were placed in the CW group by investigators in this study. Notwithstanding, there was a larger amount of myopic progression among the age matched users of DW hydrogel lens wearers that caused a portion of them to present with under-correction during scheduled annual visits. CW silicone hydrogel lenses maintained a more stable refractive error over the 3-year observation period in this study.

Subject Profile:
317 patients were enrolled in the lotrafilcon A arm and 86 in the low Dk daily wear arm for this trial and followed through 36 months. Comparison of subject profiles at Enrollment between the groups found statistically significant differences in average age between the lotrafilcon A and low Dk daily wear arms.

Results:
360 subjects with presenting VA of 20/20 or better remained relatively stable, varying from 80 to 86% during the study, while the proportion for DW subjects ranged from 63% to 78% at follow-up visits through 36 months in the study. The changes in SPE and steep K from baseline to 36 months were statistically different between the lotrafilcon A and low Dk daily wear arms.

Discussion / Conclusion:
Myopia progression has been reported to continue into adult years1 and it has been reported to be increased with soft contact lens wear2, although the data was from low Dk lenses. Dumbleton et al reported no increase in the spherical myopia component with lotrafilcon A wear and an increase of 0.30 diopters among low Dk contact lens wearers in a 9 month study.3 The current trial over a period of 36 months shows that among age and sex matched arms (n=36) there was a change in SPE over 36 months of -0.03 DS among lotrafilcon A wearers and -0.40 DS among low Dk wearers. This reduction in myopia progression adds to the benefits that have been reported elsewhere for lotrafilcon A lenses.

References: