



Title: Any Plus, Anywhere: Center-Distance or Center-Near Multifocals for Myopia Control — Which Is the Best?

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Abstract:

Purpose

The present study compared the change in choroidal thickness following short-term wear of a distance-centred myopia control soft lens (L1 MiSight, Omafilcon A, Cooper), a near-centred multifocal lens (L2 MyDay MF, Stenfilcon A, Cooper) and a single-vision control lens (L3 Acuvue Oasys, Senofilcon A, J&J).

Methods

A randomised, prospective, single-blind study was conducted, with 34 participants (28 females and 6 males; mean age: 23.8 years; myopes -2.44 diopters) enrolled. Each participant was requested to wear the three lenses in a random order. For each lens, a measurement of the choroid (OCT Spectralis, Heidelberg) and optical aberrations (iTrace, Clarion) were taken before and after 30 minutes of wear, with participants being asked to look at a computer at near distance (40 cm). Data from one eye (random) was analysed. Differences in choroidal volume changes were analysed for five prespecified retinal areas (ETDRS study) using a repeated measures ANOVA (3x5) followed by a post hoc (Bonferroni). Total HOAs, SAs and Comas were analysed using the same approach.

Results

33 eyes were included in the statistical analyses (1 excluded because of the poor quality of OCT images). For high-order aberrations (HOAs), there is a statistical difference among lenses ($F=15.02$; $p<0.001$): L1 generated more positive Spherical aberrations



(SA) and (HOAs) than L2; L2 generated more coma; while L3 generated higher negative SA. Differences were not statistically significant. L1 and L2 are consequently considered equivalent on this aspect. For the choroidal thickness, L2 made the choroid thinner while L1 and L3 led to corneal thickening, especially within perifoveal quadrants. Again, no statistical difference was found ($F=1.644$; $p=0.201$).

Conclusion

In the present study, the two multifocal lenses were found to be statistically indistinguishable with regard to aberrations induced and the impact on choroidal thickness. This similarity can be attributed to the retinal reaction to loss of contrast, irrespective of the sign of defocus. The short exposure time and the participants' individual response to the defocus dose can also be considered contributing factors. The study thus confirms that centre-near multifocals may be considered equivalent to centre distance in influencing retinal response.