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Paper Abstracts
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Short-term effects of blue-light-filtered contact lenses on choroidal thickness

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Purpose: Measurement of the effect of a contact lens with blue light filter on the choroidal thickness and retinal vascular network, in comparison with a standard contact lens and a ring-boost technology lens for myopia control, in a population of young myopic adults.
Method: This was a prospective, randomized study conducted with institutional IRB approval and in accordance with the tenets of the Declaration of Helsinki. Twenty participants were recruited and randomized to wear three different contact lenses. All lenses were made of senofilcon A, L1 and L3 with class 1 UV blocking, and L2 with a 40% blue light blocking filter. Throughout the test period, participants are asked to watch a video on a computer screen without any stimulation impacting blood flow. Each of the 3 lenses, randomly selected, is worn for 30 minutes, followed by a 20-minute stabilization period with single vision glasses. Before and after each contact lens wear, the retinal vascular network and choroidal thickness were measured by OCT (Triton, Topcon, Tokyo, Japan). Data were segmented according to ETDRS quadrants (9 zones). Results from the right eye only were kept for statistical analysis, which included a repeated-measures ANOVA followed by a Bonferonni test for significant statistical differences.
Results: There is an increase in superficial vascular density in all zones except R1. This reaction is present in L2 and L3, but is more marked with the lens containing a blue filter. In comparison, superficial density is reduced in all regions except R4 when L1 is worn. Results are more variable for deep vascular density. When L1 is worn, two areas show reduced density (R1 and R4), while 3 are increased (R2, 3 and 5). When L2 is worn, all zones have reduced vascular density except R3. For L3, all zones increase in density except subfoveal (R1). When we consider total density, it is reduced in all zones with L1. With L2, three out of nine zones are increased (3-4-5), while all zones are increased when L3 is applied. Due to the small number of subjects, these differences, although obvious, are not considered statistically significant.
Conclusions: The blue-filtered lens seems to increase the superficial vascular network more than the others, while it is associated with a reduction in deep vascular density in 8/9 regions. The single vision lens (L1) is associated with a general reduction in superficial vascular density, while only 3/9 areas of the deep retina increase in vascular density. Finally, the myopia control lens results in a moderate increase in the superficial vascular network, to a lesser extent than L2, but generates a significant response in the deep vascular network. While it is known that the superficial vascular network is negatively correlated with axial elongation, and considering its lower impact on the deep network, it is therefore possible to conclude that blue filter would not further contribute to myopia control. However, this hypothesis needs to be validated in a larger number of subjects over the long term.

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