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Commentary

Multifocal Soft Contact Lens on Peripheral Refraction of Myopic Eyes

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ABOUT THE STUDY

The association between peripheral defocusing of hyperopia and progression of myopia is well established. Effects of new Multifocal Soft Contact Lenses (MFSCL) and Single Vision Soft Contact Lenses (SVSCL) to find superior optical methods for slowing the progression of myopia in children who have to work in close proximity for extended periods of time. Peripheral refraction compared when looking at both distant and near targets. It is generally accepted that the global prevalence of myopia has increased significantly in recent decades, especially in Asia. By 2050, it is estimated that nearly 5 billion people, about 50% of the world's population, will be affected by myopia, and 1 billion people, about 10% of the world's population, will be affected by severe myopia. These predictions show that myopia has doubled from 22% in 2000 and high myopia has increased five-fold from 2% in 2000. The study generally agrees that many commercial MFSCLs are unable to reduce the magnitude of relative peripheral hyperopia or induce relative peripheral myopia. In our study, the novel MFSCL may induce a large relative myopia defocus of up to 5.50 diopters at an eccentricity of 30° in the periphery, especially in the temporal retina. If the relative peripheral defocusing of myopia helps slow the progression of myopia, the new MFSCL is expected to provide an efficient method. The near-peripheral defocus profile can be due to three factors: (1) Changes in hyperopic RPRE during adjustment. (2) Changes in hyperopic defocus across the horizontal retinal eccentricity due to accommodation delay. (3) Effect of contact lenses on changing defocus profile. First, all measurements were made on young adults, not children. Second, if participants look at a nearby target with a single eye, the regulatory response may be underestimated to some extent, as it may eliminate converging regulatory components. However, it was found that the difference between the accommodation measurement values of monocular and binocular was clinically small. The average difference is 0.125D for a target distance of 33 cm. Third, changes in peripheral refraction were measured only immediately after the start of accommodation. The data we collect can only show the initial effect of regulation on peripheral refraction, not the change after longer close-up work.

Both spherical equivalent refraction and astigmatism were greater in the temporal retina. Many other researchers have also found that astigmatism throughout the retina exhibits temporal asymmetry of the nose, resulting in greater temporal astigmatism. The asymmetry can be due to the misalignment between the visual axis and the optical axis. This suggests that foveal astigmatism is not at the center of this symmetry. This is usually a combination of axial astigmatism and oblique astigmatism. This idea suggested that the temporal nasal asymmetry of the J180 could be removed by referring to the optical axis 5° in the time direction from the foveal line of sight. Another possible reason for this asymmetry is the temporal eccentricity of the contact lens that occurs when the eyelids blink, forcing the lens to move across the temporal nasal asymmetry of the corneal shape.

The new MFSCL caused severe myopia peripheral defocus when looking at a distant target. They also retain some degree of myopia peripheral defocus when looking at nearby targets, regardless of the hyperopic effect of accommodation delay and the hyperopic shift of RPRE during accommodation. It's a good way to slow the progression of myopia.

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