Neurovisual Developmental Considerations with Myopia Control Spectacles

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Dear Editor,

I would like to raise concerns regarding the use of myopia control glasses, such as Defocus-Incorporated Multiple Segments, Miyosmart (HOYA, Tokyo, Japan), Highly Aspherical Lenslets Technology, and Stellest (Essilor, Charenton-Le-Pont, France), in children. While these glasses are effective in slowing myopia progression by creating peripheral myopic defocus, their introduction during critical periods of neurovisual development warrants careful consideration.

A child's neurovisual system undergoes significant development up to around seven years of age,[1] but recent evidence suggests that certain forms of plasticity can persist even in older children and adults, particularly in response to specific interventions or therapeutic protocols.[2,3] During this period, disruptions in visual input can alter the maturation of essential visual functions like binocular vision, contrast sensitivity, and visuo-motor coordination. Myopia control glasses alter visual input, which might interfere with these developmental processes. Specifically, these lenses may affect reading acquisition—a task heavily dependent on visual acuity, binocular vision, and visuo-motor coordination. Given that children often begin learning to read during this sensitive developmental window,[4] the optical modifications of these glasses could hinder reading skills by reducing contrast sensitivity, disrupting binocular alignment, and potentially affecting ocular dominance, which plays a role in binocular coordination and reading fluency. Moreover, myopia control lenses intentionally induce peripheral blur to slow axial elongation, which could impair peripheral visual function and contrast sensitivity. These factors are vital for reading and other academic tasks, potentially contributing to difficulties in reading fluency, comprehension, and word recognition.[5] Additionally, the altered visual input might influence the development of the visual cortex and other neurodevelopmental processes that support cognitive tasks such as spatial awareness and pattern recognition. To mitigate these potential risks, I urge further research into the long-term neurovisual effects of these lenses. Longitudinal studies assessing both refractive outcomes and neurovisual development, particularly in relation to reading acquisition, are essential. In conclusion, while myopia control glasses show promise in reducing myopia progression, their impact on children's neurovisual development, especially in terms of reading, must be thoroughly evaluated. Until such data is available, I recommend a cautious approach to their use, particularly in children at crucial stages of reading development.

Ethics

Informed Consent: This article does not require patient consent.

Declarations

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