ALSPAC Study Does Not Support a Role for Vitamin D in the Prevention of Myopia

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Children who spend more time outdoors are less likely to become myopic. One possible mechanism is that time outdoors prevents myopia because bright visible light increases retinal dopamine release, which inhibits axial elongation. This hypothesis has substantial support from animal experimentation. It has been proposed alternatively that exposure to ultraviolet (UV) light outdoors prevents myopia onset, and associations between decreased vitamin D levels and increased myopia have been reported. However, this association would be expected from less time outdoors, without any causal implications.

The study by Guggenheim et al. in this issue addresses this alternative hypothesis using epidemiological data from the British Avon Longitudinal Study of Parents and Children (ALSPAC) longitudinal cohort study. Standard risk factor analysis and longitudinal survival models were used for analysis. Strong associations between refractive error and time outdoors were detected with both approaches, and controlling for serum vitamin D levels did not affect the associations. There was limited evidence for independent effects of vitamin D, but overall, after detailed and careful analysis, the authors concluded that "these analyses do not provide support for the hypothesis that elevation of vitamin D levels is the mechanism by which spending time outdoors protects against myopia."

Recent intervention trials have reported that increasing the amount of time that children spend outdoors reduces incident myopia, irrespective of the mechanism. However, which mechanism is involved does have clinical implications because, if the light–dopamine hypothesis is correct, prevention of myopia would be fully compatible with protection from UV, making the balance between preventing myopia and preventing UV damage much easier. Without evidence for a causal role for vitamin D, prevention of myopia with vitamin D supplementation is speculative and not evidence-based, whereas there is now good evidence from epidemiology, animal experimentation, and intervention trials to support the use of increased time outdoors to prevent incident myopia.

References


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