A brief note on myopia: Its associated risks and therapy.

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Description

Myopia, or nearsightedness, is an eye disorder that produces blurry distance vision. Nearsighted people have more difficulties seeing objects that are far away (such as when driving) than items that are close up (such as when reading or using a computer). Nearsightedness can cause squinting, eyestrain, headaches, and substantial vision impairment if not treated with corrective lenses or surgery. In 2010, myopia was the leading cause of distance refractive error, impacting 1.45 billion persons, or 27% of the world's population. Myopia affects more than 80% of people in particular age groups in some Asian countries. In Korea, Taiwan, and China, the incidence is currently between 84 and 97% among late adolescents and young adults. Although most scientists believe that people's refractive status is mostly influenced by genetics, a growing body of data suggests that early visual experiences may influence ocular development and ultimate refractive status.

The International Myopia Institute (IMI) offers a thorough analysis and synthesis of current scientific findings from animal models, genetics, clinical investigations, and randomised controlled trials as the foundation for its recommendations contained therein, by more than 85 multidisciplinary experts in the field. The risk factors for myopia development and progression are discussed as context for the necessity for myopia control. The following are highlights of the seven generated reports: (1) Myopia Definition and Classification; (2) Experimental Models of Emmetropization and Myopia; (3) Myopia Genetics; (4) Interventions for Myopia Onset and Progression; (5) Clinical Myopia Control Trials and Instrumentation; (6) Industry Guidelines and Ethical Considerations for Myopia Control; and (7) Clinical Myopia Management Guidelines.

Risks

Myopic macular degeneration (described as atrophic alterations or choroidal neovscularisation in the macular area in high myopia), retinoschisis, posterior staphyloma, glaucoma retinal detachment, and cataract are all related with an increased chance of developing sight-threatening disorders. The prevalence of visual impairment owing to pathologic myopia (high myopia with one or more characteristic fundus lesions) ranges between 0.1 and 0.5% in European studies and between 0.2 and 1.4% in Asian research. Pathologic myopia was responsible for 12.2% of visual impairment in a Japanese research. Myopic macular degeneration has been found to be the top cause of new instances of blindness in Shanghai, China, as well as the leading cause of monocular blindness in Tajimi, Japan. The prevalence of pathologic myopia is expected to rise if treatments to prevent the progression of myopia are not implemented.

Causes and Treatment

Myopia genes have been found, but genes are assumed to determine susceptibility to environmental variables. Several environmental influences have been found, including excessive time spent near work, insufficient time spent outdoor, low vitamin-D levels, insufficient light exposure, and poor diet. There is evidence that spending more time out can lessen the chance of getting myopia and-in those who already have myopia. Reduced rates of development in the summer compared to the winter also support the light theory concept. It has also been demonstrated in animal experiments that a defocused retinal picture can cause axial elongation of the eye.

While it is unlikely that a therapy will be developed that will totally prevent the development and progression of myopia, there are several potential therapies on the horizon. These include producing a focused vision at all retinal regions in order to eliminate the trigger axial eye elongation. Executive bifocal glasses, peripheral plus contact lenses, extended depth of focus contact lenses, and orthokeratology are some of the optical intervention strategies that have been shown to be useful in decreasing the progression of myopia (some by up to 51%).

In Asia, pharmacological medicines such as 0.01% atropine are being administered, and exemplify a reduction in the pace of advancement of myopia of up to 50%, but no reduction in the rate of axial elongation. Long-term studies are needed; however oral pills containing 7-Methylxanthine (7-MX) have been licensed for usage in children in Denmark for myopia treatment.

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