Myopia – a 21st-century pandemic leaving our children shortsighted?

To the Editor: Myopia (or near-sightedness) today is the consequence of an urbanised world in which children play indoors, lured by gaming, social media and Fourth Industrial Revolution technology. Myopia occurs because the eyeball is too long from front to back, or the structures of the eye that refract light, such as the cornea or lens, are too curved, or (rarely) due to the relative position of the lens and cornea. The resultant refracting power of the eye is too high, resulting in blurred distance vision.

Almost half of the world's population is projected to be myopic by the year 2050, unless myopia control strategies are implemented.[1] Complications from myopia are expected to become the most common cause of irreversible vision impairment and blindness, potentially affecting 10% of the world's population by 2050.[2] Myopia is a global public health crisis. Education about myopia, and its mechanisms of onset, progression and management strategy, is vital for eye care and mainstream healthcare workers. Most children are born farsighted. However, as they grow, the eye grows, and children become less farsighted, a process called emmetropisation.[3] The development and progression of myopia in children between 6 and 10 years old is generally influenced by genetics, time spent indoors and near-work activities. Genetics is a long-established risk factor for the development of myopia, particularly when both parents have the condition.[4] The axial length of the eye is <25 mm and, on average, the natural axial length in children increases by 0.1 mm per year until emmetropisation.[5] However, as infants grow, this can increase to 0.2 mm or 0.3 mm per year, resulting in axial elongation >25 mm, which results in myopia progression.[6] The historical correction of the central vision of myopes has been satisfactory; however, the peripheral defocus of vision results in a phenomenon called hyperopic defocus, which is the stimulus for axial elongation, which results in myopia progression.[7]

The traditional correction of myopia with single-vision spectacles is no longer considered adequate in curbing myopia progression. Behavioural interventions should include 2 hours of daily outdoor play: natural light stimulates dopamine and nitric oxide, which arrest axial elongation. Continual near work, at <20 cm for >45 minutes, should be replaced with visual hygiene practices that consciously limit unhealthy near-working habits in young children. Myopia control spectacles, multifocal soft contact lenses, executive bifocals and short-corridor multifocal spectacles all use a near prescription that neutralises the hyperopic peripheral defocus to stabilise refraction progression and axial elongation. Orthokeratology represents a successful, invasive optical intervention that uses rigid contact lenses to reshape the cornea while an individual sleeps. Low-concentration atropine eye drops at night are a successful pharmaceutical intervention. All of these interventions can be used in isolation, or in various combinations, to curb myopia progression. The mainstream medical community may have a role to play in the myopia crisis by educating parents at the primary care level to fight off the myopia that is threatening our children's sight. The key is to arrest the progression during childhood.

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