ORTHOKERATOLOGY LENSES FOR MYOPIA PROGRESSION

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Prevention of myopia has always remained an enigma for eyecare scientists and practitioners. Being the most common refractive error and responsible for low vision, visual impairment due to complications and progression, it has always been the topic of many researches aimed at either curtailing its progression or minimizing it[1]. Most of these studies have taken place in Far East population or Asians (as they are called in USA). The reason for this is because myopia is quite prevalent in that population (upto 87% in Taiwan, for example). The progression that takes place in myopia is thought to be due to axial elongation of the eyeball[2,3].

Some of the therapies that have been tried to date include low dose Atropine eye drops4, bifocal & multi-focal glasses,[5-8] soft and rigid gas permeable contact lenses,[9-14] etc. Low dose atropine has gained a lot of popularity in recent times, but practitioners have also been skeptical due to adverse effects of atropine[15,16]. Attention has therefore been shifted these days to Orthokeratology lenses. The design of the these lenses (also called reverse geometry design) is such that it flattens the central part of cornea due to its flatter base curve as compared to the secondary curve. This creates a positive pushing pressure in the centre and a negative pulling pressure in mid periphery. The epithelial cells are re-distributed to the mid periphery from central area resulting in central corneal thinness. The cornea becomes plateau shaped which in turn causes peripheral myopic de-focus[17-19]. The latter neutralizes the hyperopic peripheral defocus found in myopic eyes and which is thought to be the stimulus for progressive axial eye elongation in myopic eyes[20-22]. Many studies have supported the hypothesis of this neutralization of peripheral defocus and successful clinical trials also held to further strengthen this theory[23]. However follow up of these studies is often limited to less than five years. Only two studies have follow up of 7-8 years but they too have showed encouraging results[24,25].

Some studies have shown that Orthokeratology has a synergistic effect when combined with a low dose atropine therapy[26].

The main drawback to this therapy, just like any contact lens use, is chance of infection (microbial keratitis). This risk is all the more important since the Orthokeratology lens has to be worn overnight, further making the eye susceptible to pathogenic invasion. This may be minimized by proper fitting of the lens, proper care, and regular follow up by an experienced optometrist or ophthalmologist[26].

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