Atropine in the management of myopic progression

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With a worldwide prevalence of 20 percent, myopia is one of the most common ocular disorders worldwide.\(^1\)\(^2\) Typical rates of myopic progression in children are between -0.76D to -1.19D per year; children with higher amounts of myopia initially tend to have greatly higher myopia at the progression plateau than their less myopic counterparts.\(^1\) Since progressive myopia is often associated with high risk of retinal detachment as well as other vision-threatening conditions as opposed to other forms of refractive error,\(^1\)\(^4\) it is of particular interest to find a way to reduce its progression.

Atropine is a non-selective muscarinic antagonist that results in mydriasis and cycloplegia.\(^1\)\(^-\)\(^6\) These two mechanisms are hypothesized to prevent the progression of myopia by either reducing the signals for axial length elongation or relaxing accommodative effort.\(^1\) However, these mechanisms of action also result in adverse reactions such as photophobia and blurred near vision;\(^1\)\(^-\)\(^6\) and can thereby lead to non-compliance, discomfort outdoors, or poor school performance.\(^3\)

To minimize these adverse effects, several clinical trials - both prospective and retrospective - have attempted to ascertain the least concentration of atropine necessary for reducing myopic progression.\(^2\)\(^-\)\(^5\) At this time, 0.5 percent and 1 percent atropine used once daily for up to two years has shown a decrease in the rate of myopic progression to -0.208D and +0.160D, respectively.\(^1\) In fact, for subjects treated with 1 percent atropine, myopic progression was halted and reversed with instillation of the medication.\(^1\) While concentrations lower than 0.5 percent and 1.0 percent showed some decreased rate of myopic progression,\(^2\)\(^-\)\(^5\) the long-term effectiveness of these concentrations is still unclear.\(^1\)

Atropine (0.5 percent and 1 percent) has been shown to be a viable option in reducing myopic progression in children, but it is important to address the adverse effects of this drug with bifocal lenses and sun protection prior to initiating lengthy treatment regimen.\(^1\)\(^6\)

References:

Dr. Kuhn obtained her optometry degree from the Southern California College of Optometry in Fullerton, Calif. in 2012. She recently completed the Cornea and Contact Lens Residency at Northeastern State University Oklahoma College of Optometry for the 2012 to 2013 academic year. Although specializing in complicated contact lens fittings, Dr. Kuhn is also skilled at diagnosis, treatment and management of ocular disease states, and has joined a private practice in Tucson, Arizona. In her spare time, Dr. Kuhn enjoys reading, making elaborate cupcakes with her daughter, Arleigh, and hiking with her husband, Justin.