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Effect of low-dose atropine (0.01%) on crystalline lens power among school-aged children with progressive myopia

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Abstract

Purpose: To evaluate the change in crystalline lens power (LP) in a cohort of Indian children with progressive myopia receiving atropine (0.01%) compared with an untreated control group.

Design: Nonrandomised clinical trial.

Methods: The study included 120 children (70 in the atropine group; 50 in the control group) with progressive myopia (≥0.5 D/year) with a 1-year follow-up. The atropine group received 0.01% atropine eye drops once daily in both eyes, whereas the control group received no treatment. Changes in cycloplegic spherical equivalent, axial length (AL), keratometry (KER), anterior chamber depth (ACD) and lens thickness (LT) were recorded. LP was calculated using the formula proposed by Bennett.

Results: Mean myopia progression at year 1 was significantly less in the atropine group (-0.18 D [0.2]) than in the control group (-0.59 [0.21]; $p < 0.001$). The increase in AL was significantly different between the two groups (atropine: 0.21 mm [0.12]; control: 0.29 mm [0.11], $p < 0.001$). A significantly greater loss of LP was noted in the atropine group (-0.67 D [0.34]) than in the placebo group (-0.28 D [0.42]; $p < 0.001$). The change in LT was significantly different between the atropine and control groups ($p = 0.02$), whereas the change in ACD and KER was similar in the two groups.

Conclusion: The greater loss of LP could contribute to the anti-myopia effect of atropine and should therefore be evaluated in studies reporting the efficacy of atropine on myopia to assess its actual effect on myopic progression.

Keywords: atropine; lens power; lens thickness; myopia prevention; ocular biometry; progressive myopia.

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