

# The Efficacy of Atropine Combined with Orthokeratology

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Previous clinical studies have found that topical low-dose atropine can slow axial elongation in myopic children. Several ongoing trials have applied atropine combined with orthokeratology for myopia management, but few studies explored the effect of the treatment strategy on axial elongation. This meta-analysis conducted by researchers in China evaluated the impact of topical low-dose atropine combined with orthokeratology (OrthoK) on axial elongation to provide a reference for further research.



A total of five studies involving 341 children younger than 18 years old met the inclusion criteria (165 were prescribed topical low-dose atropine and OrthoK vs. 176 using OrthoK alone). Axial elongation was lower in the combination group (0.25mm) than that of the OrthoK group (0.35mm). Axial elongation was lower in the combination group of atropine and orthokeratology than that of the orthokeratology group (0.25mm vs. 0.35mm; Weighted Mean Difference=-0.09 mm).

Because all participants included in the meta-analysis wore OrthoK lenses, the researchers concluded that the effect of atropine mainly caused the axial length difference between the two groups. As pupil dilation occurs in both high-dose and low-dose atropine, they also speculate that this effect may strengthen the efficacy of OrthoK in all doses of atropine.

This meta-analysis demonstrates that atropine combined with orthokeratology is effective in slowing axial elongation in myopic children. This effect may be superior to that of orthokeratology alone. This study has important implications for future research because myopia is considered an axial length disease.

## **Abstract**

### **The Efficacy of Atropine Combined with Orthokeratology in Slowing Axial Elongation of Myopic Children: A Meta-Analysis**

**Canran Gao, Shuling Wan, Yuting Zhang, Jing Han**

**Objectives:** Previous studies have found that atropine can slow axial elongation and control the progression of myopia. Some ongoing trials have applied atropine combined with orthokeratology for myopia control, but few studies explored the effect of the strategy on axial elongation. This meta-analysis made a preliminary evaluation of the effect of atropine combined with orthokeratology on axial elongation to provide a reference for further research.

**Methods:** We performed a specific search on PubMed, EMBASE, Cochrane library, Web of Science, Ovid, and Chinese electronic databases of VIP and Wanfang for randomized controlled trials, cohort studies, and case-control studies conducted up to December 2019. The weighted mean difference (WMD) of mean change in axial elongation between the combination group of atropine and orthokeratology and the orthokeratology group was used for evaluation. Publication bias was detected using the funnel plots test.

**Results:** A total of five studies involving 341 participants younger than 18 years old met our inclusion criteria. The axial elongation was lower in the combination group of atropine and orthokeratology than that of the orthokeratology group (0.25 vs. 0.35; WMD=-0.09 mm, [95% confidence intervals, -0.15 to -0.04], Z=3.39, P=0.0007).

**Conclusions:** This meta-analysis demonstrates atropine combined with orthokeratology is effective in slowing axial elongation in myopic children. This effect may be superior to that of orthokeratology alone.

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