

The long-term effects of topical latanoprost 0.005% treatment on pupillary functions: A 2-year longitudinal study

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Abstract

Purpose

To investigate the long-term effects of topical latanoprost 0.005% treatment on pupillary functions in early-stage primary open-angle glaucoma (POAG) eyes using automated pupillometry.

Methods

This prospective study involved 20 eyes of 20 treatment-naive subjects with early-stage POAG. After comprehensive ophthalmic examination, static and dynamic pupillometry measurements were performed before treatment, at the 1st follow-up visit (1.10 ± 0.30 months) and the 2nd follow-up visit (25.85 ± 10.26 months) after treatment initiation. Dynamic parameters included resting diameter (mm), amplitude (mm), latency (ms), duration (ms), and velocity (mm/s) of pupil contraction and dilation. Static pupillometry parameters were pupil diameter (PD, mm) in high-photopic, low-photopic, mesopic and scotopic conditions.

Results

The velocity of pupil dilation significantly decreased during the 1st visit ($p = 0.008$) and the 2nd visit ($p = 0.0003$) of treatment compared to the pre-treatment visit. The resting PD was also significantly higher after the 1st visit ($p = 0.003$) and the 2nd visit ($p = 0.001$) compared to the pre-treatment visit. However, the difference in resting PD measured between the 1st and 2nd visits did not reach statistical significance ($p = 0.065$). There were no significant changes in other dynamic parameters ($p > 0.05$ for all). Additionally, a mild, but not significant, mydriatic effect was observed in PD measurements under scotopic, mesopic and low photopic lighting conditions after follow-up. None of the static and dynamic parameters correlate with age, changes in intraocular pressure (IOP) or mean deviation (MD) values of visual field tests.

Conclusion

The long-term topical latanoprost 0.005% treatment in early-stage POAG has a slight mydriatic effect on the pupil. Further longitudinal clinical studies with larger patient cohorts are necessary to better understand the effects of latanoprost on pupillary functions.