Paromita Dutta, Uttam Dhaka, Parul Jain, Sachin Verma & Palash Patni

Quantitative automated pupillometry in pseudoexfoliation and evaluation of contributory factors

***Int Ophthalmol* 45, 455 (2025).**

https://doi.org/10.1007/s10792-025-03827-5

Abstract

Purpose

To study differences in automated pupillometry parameters between patients with Pseudoexfoliation (PEX) and healthy individuals, and to assess contributory parameters.

Methods

Forty phakic patients with PEX (with or without early-moderate glaucoma) were categorised into Affected (eyes with clinical signs of PEX present, n = 55 eyes) and Unaffected group (clinically normal fellow eyes, n = 23 eyes), along with 80 age-matched healthy controls. Participants were tested on an automated pupillometer. Static pupillometry was tested at high photopic (100 cd/m^2), low photopic (10 cd/m^2), mesopic (1 cd/m^2), and scotopic (0.1 cd/m^2) illumination. Dynamic responses were obtained with white-light flashes (total luminance 100 cd/m^2, stimulus on time 200 ms, off time 3300 ms). Retinal nerve fibre thickness (RNFLT), iris thickness 1 mm and 2 mm from the pupillary edge (IT1 and IT2), and maximum pupillary dilation (MPD), were measured.

Results

Glaucoma was present in 12.8% of PEX (n = 10). Static pupillary diameters (PD) were significantly different in both Affected and Unaffected groups of PEX, compared to controls. Both PEX groups showed significantly lower amplitude of contraction and percent pupillary contraction ($p < 0.001$), slower velocities of contraction and dilation ($p < 0.001$), and increased latency of contraction compared to controls ($p = 0.001$). The Affected and Unaffected groups did not differ in pupillometry parameters. Inferior quadrant RNFLT had a positive correlation with multiple pupillary parameters. An equation was derived by linear regression to predict MPD.
MPD = 4.34 + 0.61 × Scotopic PD − 0.37 × Mesopic PD + 0.35 × Velocity of contraction.

Conclusion

Abnormal pupillary kinetics are present in both eyes of patients with PEX. PEX is associated with asymptomatic inferior quadrant RNFLT thinning. Pupillometry can be used to predict maximum pupillary dilation in PEX