Evaluation of static and dynamic pupil characteristics in hyperopic anisometropic amblyopia

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Purpose:

The aim of this study is to perform a comparison of static and dynamic pupillometry measurements in patients with hyperopic anisometropic amblyopia and age-matched controls.

Methods:

This prospective cross-sectional study consisted of 38 patients with hyperopic anisometropic amblyopia and 80 control subjects. A quantitative pupillometry system was used to evaluate the pupil characteristics of higher hyperopic eyes (Group 1), the fellow eyes (Group 2), and healthy eyes (Group 3). Static pupillometry measurements were taken including scotopic pupil diameter, mesopic pupil diameter, low-photopic pupil diameter, and high-photopic pupil diameter. Subsequently, dynamic pupillometry measurements were taken including resting diameter, amplitude of pupil contraction, latency of pupil contraction, duration of pupil contraction, velocity of pupil contraction, latency of pupil dilation, duration of pupil dilation, and velocity of pupil dilation.

Results:

Groups 1 and 2 had statistically significantly lower scotopic and high-photopic pupil diameter values compared with Group 3 ($p < 0.05$). The amplitude of pupil contraction values were also statistically significantly lower in Groups 1 and 2 compared with Group 3 ($p = 0.001$ and $p = 0.003$). However, there were no significant differences between the study and the control eyes with respect to mesopic and high-photopic

pupil diameter, resting diameter, latency of pupil contraction, duration of pupil contraction, velocity of pupil contraction, latency of pupil dilation, duration of pupil dilation, and velocity of pupil dilation values ($p > 0.05$, for all).

Conclusion:

Static and dynamic pupil characteristics of higher hyperopic eyes and their fellow eyes are similar. This may support that amblyopia is not a monocular disorder, but can affect both eyes.

Keywords Anisometropia, amblyopia, dynamic pupillometry, static pupillometry