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Static and dynamic pupillary features in graves disease without orbitopathy

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Abstract

Purpose

Pupillary contraction and dilatation are organized by the autonomic nervous system, which can also be affected by Graves' disease (GD). In this study, it was aimed to investigate the static and dynamic pupillary responses of Graves' patients in the hyperthyroid and euthyroid periods and to compare these results with the values obtained from healthy controls.

Methods

48 eyes of 24 newly diagnosed Graves' patients with clinical activity score ≤ 2 and 46 eyes of 23 age- and sex-matched healthy controls were included in the study. Patients with GD were evaluated separately in the hyperthyroid phase and after euthyroidism was achieved. After a detailed ophthalmological examination, patients undergone automatic quantitative testing to obtain static (scotopic, mesopic, low photopic, and high photopeak pupil diameters) and dynamic (pupillary contraction amplitude, latency, velocity and duration, and pupil dilation latency, velocity and duration) pupil measurements.

Results

A statistically significant difference was found between the control [4.7 mm (3.7–6.9)] and hyperthyroid [5.1 mm (3.6–7.8)] groups for mesopic pupil diameter ($p = 0.003$). Dynamic pupillometry measurements showed that hyperthyroid and euthyroid groups had greater pupil dilation delay and lower pupil dilation rate compared to the control group ($p < 0.05$ for all).

Conclusion

Even in the absence of orbitopathy, patients with GD have autonomic dysregulation of pupillary functions. These changes, which prevail in the hyperthyroid phase, do not reverse when the TSH receptor antibody titer drops and the patient becomes euthyroid. Future studies are needed to elucidate the mechanism of these pupillary changes in GD.