Benign Episodic Mydriasis as a Cause of Isolated Anisocoria

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Case Presentation: A 22-year-old female presented to the emergency department with a dilated right pupil and mild blurry vision. Physical examination revealed a dilated, sluggishly reactive right pupil, without other ophthalmic or neurologic abnormalities. Neuroimaging was normal. The patient was diagnosed with unilateral benign episodic mydriasis (BEM). The mydriasis resolved prior to her follow-up ophthalmology appointment three weeks later, and she had no recurrences.

Discussion: BEM is a rare cause of acute anisocoria with an underlying pathophysiology that is not well understood. The condition has a female predominance and is associated with a personal or family history of migraine headaches. It is a harmless entity that resolves without intervention and results in no known permanent damage to the eye or visual system. Benign episodic mydriasis is a diagnosis of exclusion that may be considered only after the life- and eyesight-threatening causes of anisocoria.

Keywords: benign episodic mydriasis; anisocoria; migraine headache.
The first step in the evaluation of isolated anisocoria is to determine which pupil is abnormal.\(^1\) If the larger pupil is found to be abnormal and a third nerve palsy has been excluded, pilocarpine may be used to determine the cause of unilateral mydriasis. Pupillary constriction in response to dilute (0.1%) pilocarpine indicates Adie tonic pupil. In the absence of a response to dilute pilocarpine, concentrated (1%) pilocarpine may be administered; pupillary constriction indicates BEM, whereas the lack of a response suggests pharmacologic mydriasis.

Benign episodic mydriasis is a rare cause of acute anisocoria and a diagnosis of exclusion. While typically unilateral, the affected eye may alternate in recurrent episodes and there may be bilateral involvement during a single episode.\(^2\) Patients with BEM may have isolated anisocoria or experience a wide variety of concomitant symptoms, such as blurry vision, photophobia, orbital pain, nausea, eye redness, double vision, or headache.\(^3\)

The underlying pathophysiology of BEM is not well understood. Several studies have suggested that BEM may be caused by hyperactivity of the sympathetic nervous system (which causes pupillary dilation) or hypoactivity of the parasympathetic nervous system (which causes pupillary constriction).\(^4\) It occurs predominantly in females and has been connected to a personal or family history of migraine headaches, particularly in patients with recurrent episodes, but the significance of these associations is not clear.\(^2,3\)

An episode of BEM may resolve within minutes to hours or persist for weeks to months.\(^3\) Aside from the cosmetic inconvenience and discomfort of migraine-associated symptoms (if present), BEM is a harmless entity, and there is no known irreversible damage to the eye or visual system.\(^2\)

The authors attest that their institution does not require Institutional Review Board approval. Patient consent has been obtained and filed for the publication of this case report. Documentation on file.

**REFERENCES**