Accommodative Spasm: Case Series

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Abstract

This study highlights the importance of cycloplegic refraction to detect accommodative spasm (AS) patients and the role of atropinisation for its management. This retrospective case series study was conducted at a tertiary care eye hospital in Chennai, India. Four patients, presenting with complaints of sudden onset blurring of vision and asthenopic symptoms with history of aggravation of symptoms with prolonged near work and under stressful conditions, were included. Refraction was initially showing myopic refractive error. After cycloplegia, there was hypermetropic shift and VA was 20/20 for distance in all patients with their hyperopic correction, and N6 with up to +3.00 dioptres for near. Diagnosis of AS was made. Bifocal glasses were prescribed and atropinisation (1%) with avoidance of aggravating factors was started. Patients were tapered gradually to prevent recurrence over three months and were observed for six months in which none had recurrence. Post cycloplegia, the condition resolved and asthenopic symptoms were improved.

Keywords: Accommodative spasm, atropinization, cycloplegia, pseudomyopia

Introduction

Accommodative spasm (AS) is an asthenopic condition due to prolonged contraction of ciliary muscles. Cycloplegic refraction is the key modality to unmask AS presenting as pseudomyopia along with asthenopia. Management includes determining its underlying etiology and inhibiting the excessive accommodation and excessive convergence using strong cycloplegic agents and bifocal lenses. Recurrence is sometimes associated with AS. In this study, we used cycloplegic refraction in case of pseudomyopia with the presence of aggravating factors and observed the effect of slow weaning effect of atropine eye drops along with the avoidance of aggravating factors to prevent its recurrence.

Case Reports

This retrospective case series study was conducted in a tertiary eye care hospital in Chennai, India.

Sample size: The sample size was eight eyes of four patients.

All the patients diagnosed as transient myopia along with the presence of aggravating factors were asked to undergo cycloplegia with cyclopentolate eye drops. If there was a shift from myopia to hypermetropia after cycloplegia, patients were started on bifocal or plus glasses along with atropine (1%) or homatropine (2%) eye drops on weekly twice a week basis and were evaluated every week. Eye drops were tapered every month gradually over 3 months and patients were observed up to 6 months.

Case 1

An 11-year-old female was presented with complaints of sudden onset blurring of vision for distance and near and headache with a history of excessive near work. Ocular examination including extraocular movements was normal.

Management

The patient was managed with bifocal glasses with cycloplegic correction and +3.00 add for near vision. She was started on atropine on weekly twice a week basis (1% eye drops) and was tapered over 3 months. On subsequent visits, there was symptomatic relief and condition resolved. No recurrence was noted over 6 months.

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Case 2
A 12-year-old female was presented with complaints of sudden onset blurring of vision for distance and headache with a history of psychological stress. Ocular examination including extraocular movements was normal [Table 2].

Management
The patient was managed with plus power glasses with cycloplegic correction and +3.00 add. She was started on homatropine 2%w/v eye drops on weekly twice basis and was tapered over 3 months. On subsequent visits, there was symptomatic relief and condition resolved. No recurrence was noted over 6 months.

Case 3
A 13-year-old male was presented with complaints of sudden onset blurring of vision for distance and near and headache with a history of psychological stress. Ocular examination including extraocular movements was normal [Table 3].

Management
The patient was managed with bifocal glasses with cycloplegic correction and +2.50 add for near vision. He was started on atropine on weekly twice basis (1% eye drops) and was tapered over 3 months. On subsequent visits, there was symptomatic relief and condition resolved. No recurrence was noted over 6 months. After 6 months, there was again similar episode which was managed with similar protocol.

Case 4
A 12-year-old male was presented with complaints of sudden onset blurring of vision for distance and near and headache with a history of psychological stress. Ocular examination including extraocular movements was normal [Table 4].

Management
The patient was managed with bifocal glasses with cycloplegic correction and +2.50 add for near vision. He was started on atropine on weekly twice basis (1% eye drops) and was tapered over 3 months. On subsequent visits, there was symptomatic relief and condition resolved.

**DISCUSSION**
AS is characterized by frontal headache, blurred vision (pseudomyopia), miosis, acute acquired concomitant esotropia (AACE), diplopia, and sometimes macropsia and mostly presents in children and young adolescents. It can be a part of spasm of the near reflex (SNR). Ophthalmoplegic migraine needs to be differentiated from it in the presence of AACE and diplopia [3].

Apart from psychological stress and excessive near work, certain conditions predispose to it:
- Topical miotics (parasympathomimetics and cholinergics)
- After refractive surgery: LASIK surgery and photorefractive keratectomy
- After head trauma
- Due to central lesion involving dorsal midbrain or idiopathic intracranial hypertension
- Rare causes reported are bimatoprost induced, secondary to long-standing intermittent exotropia.

The diagnosis of AS is clinical based on the presence aggravating factors and shift of refraction after cycloplegia. Kanda et al.
showed excessive accommodation in AS objectively by open-field Hartmann–Shack wavefront aberrometry. There was an increase in negative spherical aberrations along with more negative average standard deviation refractive power in patients of AS as compared to healthy individuals.\[13\] Goldstein and Schneekloth showed cases of AS a part of spectrum of SNR and had described five such cases. AS was graded as minimal when small minus and small plus values were present and marked when small plus and high minus values were present.\[2\] Hussaindeen et al. treated adult onset concomitant esotropia associated with AS with cycloplegics for 1 year and condition resolved completely without recurrence.\[3\] Rutstein et al. studied 17 cases of AS and treated them with plus lenses, orthoptic exercise, and psychological counseling, but only four cases resolved completely.\[4\] In our study, we found complete resolution of condition without recurrence which is similar to observations of Hussaindeen et al. Addition of glasses with cycloplegics gives comfortable working vision to the patient.\[5\]

In our case series, we had four cases which were diagnosed on basis of hypermetropic shift after cycloplegia and the presence of predisposing factors such as psychological stress and excessive near work. Atropine (1%) eye drops provided powerful cycloplegia with symptomatic relief; one patient with milder symptoms was put on homatropine instead of atropine. Atropine was started twice a week and was tapered over 3 months. On the 6th month follow-up, recurrence was not noted in any of the patients. After 6 months, one patient presented again with similar complaints due to exposure to psychological stress and was treated similarly. Larger sample size with longer follow-up is required to reach to a definite conclusion.

**Conclusion**

AS can be misdiagnosed as myopia if cycloplegic refraction is not done. Triggering factors also provide key to diagnosis. Slow weaning of atropine prevents recurrence.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

**References**