



**SPASM OF ACCOMMODATION: A GRAVE CONCERN IN THE PRESENT ERA OF ELECTRONIC GADGETS**

**Ophthalmology**

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**ABSTRACT**

**Aim:** To study spasm of accommodation in patients using electronic gadgets for prolonged hours. We studied 76 patients with accommodative spasm out of 300 patients presenting with asthenopia. Most patients were clinically emmetropic. The probable etiology of the accommodative spasm(AS) for most patients as revealed by case histories was found to be excessive usage of digital screens of electronic gadgets such as mobile phones, laptops etc. for more than 6 hrs in a day. Treatment consisted primarily of plus reading lenses and cycloplegic drops along with orthoptic exercises and intermittent rest. Follow up ranged from 10-12 months . Visual symptoms improved for most of the patients.

**KEYWORDS:**

Accommodative spasm, Asthenopia, Digital screens

**INTRODUCTION**

Spasm of accommodation been rarely reported. Accommodative spasm (AS) is an involuntary condition when there is greater than normal accommodative response than accommodative stimulus.<sup>[1]</sup> It may begin suddenly, is more likely to be bilateral, is constant or intermittent, occurs at distance and/or near, is frequently associated with pupillary miosis and convergence spasm, disappears with cycloplegia, and may resolve spontaneously.<sup>[1]</sup> A hint for accommodation may be seen with dynamic retinoscopy. With AS, hyperopes may appear less hyperopic, emmetropes may appear myopic, and myopes may appear more myopic. The other causes of AS are head trauma, emotional problems, sedatives and others.<sup>[2,3]</sup> AS can also be intentionally induced like in hysteria. Diagnosed mostly in children, adolescents, and young adults, AS is rare and occurs in less than 3% of patients with accommodative disorders.<sup>[4]</sup> It occurs sporadically and familial cases have not been reported. This presentation documents AS occurring in adults and adolescents engaged in excessive near work.<sup>[2,3]</sup> The study is conducted to draw the concern towards usage of digital screens for prolonged hours.

**MATERIALS AND METHODS**

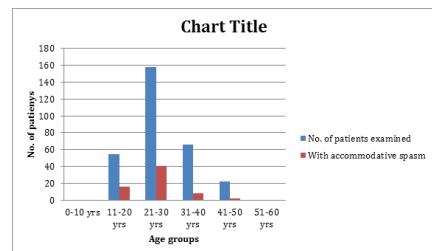
Functional spasm of accommodation is sufficiently infrequent to retain a slightly bizarre flavor. The cases which occur sporadically in outpatient department of hospital tend to be dismissed as relatively unimportant and is rare to be able to obtain an effective follow up in hospital work. For this reason, material for this paper has been obtained from the combined records of government and private set up, who are engaged in excessive near work via use of mobile phones, laptops, notepads etc. for more than 6 hrs in a day.

Each patient was thoroughly enquired about asthenopic symptoms and discomfort after using digital screens and examined for their visual acuity and refractive errors. Preliminary refraction was done without cycloplegics. Where spasm was suspected, cycloplegics were employed before definitive diagnosis was made. These tests showed that spasm was not confined to any one type of refraction.

**RESULT**

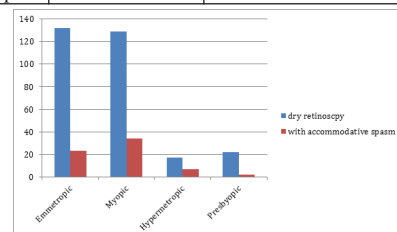
Out of 300 patients presenting with asthenopia, 76 patients showed spasm of accommodation, diagnosed after appropriate cycloplegic refraction. Adolescents seemed to be worst affected accounting for about 28% followed by young adults 25% in the age group 11-20 and 21-30 yrs respectively. Case history revealed constant use of digital screens of modern day electronic gadgets for more than 6 hrs a day. There were 31 females as against 45 males and males seemed to be affected the most, myopes being worst affected of all.

| Age group | No. of patients examined | With accommodative spasm | Percentage (%) |
|-----------|--------------------------|--------------------------|----------------|
| 0-10      | nil                      | Nil                      |                |
| 11-20     | 54                       | 16                       | 28             |
| 21-30     | 158                      | 40                       | 25             |
| 31-40     | 66                       | 8                        | 5              |
| 41-50     | 22                       | 2                        | 0.4            |
| 51-60     | nil                      | Nil                      |                |



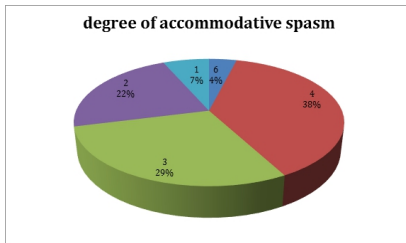
**DRY AND WET RETINOSCOPY**

| Refractive status | No. of patients (Dry retinoscopy) | With accommodative spasm (After cycloplegic refraction) (76) |
|-------------------|-----------------------------------|--|
| Emmetropic        | 132                               | 23   |
| Myopic            | 129                               | 34   |
| Hypermetropic     | 17                                | 7  |
| Presbyopic        | 22                                | 2  |



**DEGREE OF SPASM ACHIEVED**

| DIOPTERS | NO. OF PATIENTS (Total 76) |
|----------|----------------------------|
| 6        | 3                          |
| 4        | 29                         |
| 3        | 22                         |
| 2        | 17                         |
| 1        | 5                          |



**VISUALACUITY**

| VA (Snellen's) | Without cycloplegia | With cycloplegia |
|----------------|---------------------|------------------|
| <6/60          | 3                   | -                |
| 6/24 – 6/60    | 51                  | -                |
| 6/9 – 6/18     | 22                  | 34               |
| 6/6 or better  | -                   | 42               |

**DISCUSSION**

Functional spasm of accommodation was described by Von Graefe in 1856. The condition is characterized by dysfunction of the ciliary muscle of the eye that is responsible for regulating the curvature of the lens. As a result, the eye loses its ability to focus on objects that are on it at various distances. The etiology of AS has been associated with diverse organic causes including closed head trauma,[2,3] multiple sclerosis,[5] intracranial hypertension due to a pineal cyst,[6] a blocked ventriculo-peritoneal shunt,[7] laser-assisted in situ keratomileusis (LASIK),[8] acute respiratory disease,[9] and certain ocular or systemic pharmacological agents.[1]

main cause of spasm of accommodation is considered to be prolonged over-voltage level, which is usually the case during work at close distances. Adverse conditions for the eyes, as a rule, are in long-term reading, writing or working at the computer. The human eyes find it very difficult to focus on the pixel characters. The eyes focus on the plane of digital screens but cannot sustain that focus. Then it will relax on to a focus behind the screen. This point is called resting point of accommodation (RPA) or dark focus. RPA is different from person to person. The eyes are constantly relaxing to RPA and straining to refocus on to the screen.<sup>[10]</sup> The constant changing of focusing by the ciliary body creates fatigue to the eye and causes accommodative symptoms. The extent to which individuals experience visual symptoms often depends on the level of their visual abilities and the amount of time spent looking at a digital screen. Uncorrected vision problems like farsightedness and astigmatism, inadequate eye focusing or eye coordination abilities, and ageing changes of the eyes, such as presbyopia, can all contribute to the development of visual symptoms when using a computer or digital screen device.<sup>[11]</sup>

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