

How to treat accommodative spasms in adults and children

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Abstract

The objective of this study was to show the results in patients being treated for accommodative spasms from childhood to adulthood. An ophthalmic examination was completed using a 1% solution of cyclopentolate on two children and two adult. Each of them were being treated for accommodative spasms, one of them also had strabismus. We compiled the data of the type of examination, the type of treatment, and the results themselves. The primary treatment was optical correction accompanied by cycloplejic to help interrupt the spasms. The total improvement of visual acuity in one of the two children was seen within a few days, the other child in a month, and the adult with esotropia in a period of four months. We should further explore the intervention of refractive objectives with cyclopentolate or atropine in cases where we suspect a blocking of accommodation, independent of age. Measuring visual acuity with improved correction using cycloplejic can aid diagnosis. The treatment with cycloplejic can be considered as an alternative in the resolution of accommodative spasms, adding to the total correction of refraction.

Key words: Accommodative spasm, pseudomyopía, cycloplegic, refraction.

Introduction

When a patient presents a sustained dysfunction of the ciliary muscle we will be facing an accommodative spasm, where the difficulty of relaxing the muscle will lead to a main symptomatology such as blurred vision in distant vision and pseudomyopia, isolated, although it can also be accompanied by alteration in myosis and convergence (greater accommodation-convergence ratio). Considering that it could be related to excessive work in near vision as one of the causes, it is more common in children and young people.^{1,2,3} The treatments

described are the advice of visual hygiene, positive lenses, visual therapy and/or cyclopegic drop to relax the ciliary muscle. ⁴

Objectives

The aim of this study is to show the results in patients treated for accommodative spasms, in childhood and in adulthood.

Method

The cases of 4 patients, two children and two adults, who came to the consultation presenting accommodative spasm were reviewed. The complete ophthalmological examination included measurement of refraction with 1% cyclopentolate solution.

Results

The first patient, 14 years old, went to a visit referred by the optician because they could not measure refraction by obtaining values of variable diopters. The patient had symptoms of blurred vision for 3 months, dizziness and sporadic episodes of horizontal diplopia. It coincides with a period of very rapid growth. As shown in Table 1, visual acuity by far did not reach 100% with the best correction and although there was no strabismus (endophorias) stereopsis was negative. The rest of the scan was normal. It was diagnosed as isolated accommodative spasm and treated with glasses (Right eye +2.50-1.00x180°, left eye +2.50-1.00x170°) and 1% cyclopentolate for 10 alternate days with option after visual therapy. The cycloplegic examination allowed to define the diagnosis.

After 1 month the visual acuity improved progressively and treatment with therapy was not necessary.

Table 1:

The second patient, aged 12 years, was similar to the first case, although in this case he had only had a week of diffuse disease in a distance and no diplopia. Table 2 shows how visual acuity in a distance did not reach 100% with the best correction and although it did not present strabismus (orthotropia) again and stereopsis limited to 400"arc were blocked. The rest of the scan was normal. It was diagnosed as isolated accommodative spasm and treated with glasses (right eye +0.50, left eye +0.50) and 1% cyclopentolate on weekends with possible subsequent treatment of visual therapy if the accommodative spasm was not resolved. The cycloplegic examination and pseudomyopia allowed to define the diagnosis. After 1 month visual acuity improved progressively, stereopsis improved to 40" arc and treatment with therapy was not necessary.

Table 2:

The third patient, 30 years old, differs from the other two cases by being an adult and presenting convergent strabismus. The main reason for the visit was strabismus, which increased in adulthood. Table 3 shows how visual acuity in distance did not reach 100% with the best correction. The stereopsis was negative and showed the cover convergent strabismus test of the left eye mainly (20 Δ in far and 18 Δ in close with and without correction). The rest of the scan was normal. It was diagnosed as accommodative spasm accompanied by convergent strabismus. Se treated with glasses (Right eye -0.50, left eye -0.50) to drive, cyclopentolate 1% and subsequent strabismus surgery was evaluated. The

cycloplegic examination and pseudomyopia allowed to define the diagnosis. After 1 month the visual acuity improved without correction (OD 0.4 / OI 0.5), but a residual pseudomyopia still remained. Subsequently, strabismus surgery was performed with Faden protocol both middle rectum and 4 mm recoil of the left middle rectum. At one year the visual acuity remained similar to (OD 0.5 / OI 0.4), but the stereopsis better or to 200"arc. At two years the acuity visual improved slightly in the left eye (OD 0.4 / OI 0.6) and the stereopsis better or even more up to 140"arc.

Table 3:

Figure 1:

The fourth patient, 26 years old, came to the consultation for migraine, pain in both eyes, photophobia and visual loss. The difficulty in opening his eyes at the first visit prevented the eye and visual exploration. Being the result of normal neurological examination, including cranial magnetic resonance imaging (MRI), after 15 days with artificial tear treatment the symptoms began to decrease and the patient was able to collaborate with the ophthalmological examination. The results showed visual acuity in far and about 100% with the best correction (+0.75 of farsightedness in both eyes), the stereopsis' was normal and the cover test showed orthotropia in far and near. On the other hand, the study of accommodation indicated an inflexibility in accommodation and secondary convergence insufficiency that is further affected by the repetition of the near point of convergence test. Given the initial symptomatology and accommodative dysfunction, compatibility with accommodative spasm was diagnosed and treated as such, glasses (Right eye +0.75, left eye +0.75), Atropine 0.5% from the first week and artificial tear. During the treatment the visual acuity was maintained at

100% and the symptoms were progressively reduced. Although an attempt was made to initiate vision therapy to help relax the accommodation, the patient reported eye discomfort when practicing it and the treatment was stopped.

Figure 2:

Conclusion:

The main key in these 4 cases was the exploration with cycloplegic to diagnose the accommodative spasm. Begin the treatment with cycloplegic drops 1% and glasses with the complete refraction obtained with cycloplegic helps to resolve the spasm totally or partially. In some cases it was necessary to use Atropine at 0.5%. Adulthood combined with convergent strabismus hinders the recovery process. Since accommodative spasm accompanied by convergent strabismus could worsen the deviation by the effort of accommodative excess, it may be necessary to add convergent strabismus surgery to the initial treatment of glasses and cycloplegics. Although pseudomyopia is one of the reference signs of spasm, reduced or absent stereopsis is another associated characteristic, although there is no presence of strabismus. The objective should combine recovery of visual acuity, relax accommodation and improve binocular vision (stereopsis).

Bibliography

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Table 1: Values of visual acuity and refraction with cycloplegic in the first visit of case 1.

Uncorrected visual acuity (decimal VA)	Subjective refraction and VA with better correction	Objective refraction with cycloplegic	AV with better correction and with cycloplegic
Right eye (RE): 0.5	RE: +2.50-1.00x175° (0.6)	RE: +2.75-1.25x175° LE: +2.75-1.25x165°	RE: 0.9 THE: 0.9
Left eye (LE): 0.6	LE: +3.00-0.75x165° (0.6)		

Table 2: Values of visual acuity and refraction with cycloplegic in the first visit of case 2.

AV without correction (decimal)	Subjective refraction and VA with better correction	Objective refraction with cycloplegic	AV with better correction and with cycloplegic
RE: 0.5 THE: 0.6	RE: -0.75 (0.6) THE: -0.50 (0.6)	RE: +1.25-0.25x175° LE: +1.00-0.50x165°	RE: 0.7 THE: 0.8

Table 3: Values of visual acuity and refraction with cycloplegic in the first visit of case 3.

AV without correction (decimal)	Subjective refraction and VA with better correction	Objective refraction with cycloplegic	AV with better correction and with cycloplegic
RE: 0.15 THE: 0.15	RE: -1.50-0.25x130° (1) LE: -1.50-0.50x60° (1)	RE: -0.25x130° LE: -0.75x55°	RE: 1 THE: 1

Figure 1: Convergent strabismus of the left eye at first visit with Hirschberg test.



Figure 2: Exploration of the near point of convergence in case of convergence insufficiency secondary to accommodative dysfunction. Image 1: Convergence is maintained. Image 2: When approaching the fixation stimulus the left eye breaks the convergence.

