Short communication

Myopia and retinal striae induced by topiramate

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ABSTRACT

Clinical case: A 23-year-old woman who was seen due to decreasing far visual acuity 24 hours after starting treatment with topiramate. In the cycloplegic refraction, RE showed –4.25 and LE –4.50. Retinal striae could be seen in the macula of both eyes. The alterations ceased 48 hours after the drug treatment was interrupted.

Discussion: Drug induced acute myopia is an infrequent phenomenon, the aetiology of which is still not fully known.

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Introduction

This paper describes a case of topiramate-induced acute myopization with associated retinal striae in both eyes (BE). Topiramate is an antiepileptic drug utilized in patients with partial crisis resistant to other treatments and occasionally for preventing migraine attacks. There are several theories that explain the physiopathology of myopization although none is conclusive.

Clinical case

A 23-year-old woman who was seen due to sudden visual acuity reduction in BE. Her ophthalmological records only indicated the presence of myopia –0.75 in BE. She referred beginning...
the day before a treatment prescribed by her urologist with orally administered topiramate 25mg Topamax® (Topiramato, Janssen-Cilag) at 12 hour intervals as a remedy for migraine.

The initial assessment revealed corrected visual acuity (CC VA) of 0.2 in BE which improved to 0.4 with stenopeic. Pupil motility was normal, intraocular pressure (IOP) was of 18mm Hg in BE and anterior biomicroscopy did not reveal alterations (BMA). Refraction under cycloplegia (RUC) was of –4.50 in BE. The ocular fundus (OF) included retinal striae in the macula of BE (figs. 1 and 2). Computerized axial tomography (CAT) did not exhibit anomalies in the orbitary region nor asymmetries or alterations in the position of the irido crystalline diaphragm.

The topiramate treatment was interrupted and the patient reassessed 24 hours later. The CC VA was of 0.6 in BE and RUC of –1.75 in BE. The OF did not exhibit striae (figs. 3 and 4) and the angiofluoresceingraph did not show alterations (figs. 5 and 6). Campimetry revealed an arch-shaped defect which was more marked in the left eye. One week later, the patient’s CC VA was of 1, RUC of –0.75 and the visual field defects had disappeared.
Discussion

Topamax® (Topiramato, Janssen-Cilag) is an antiepileptic drug utilized in patients with partial crisis who are resistant to other treatments and as prevention for migraines. The main side effect is nephrolithiasis and at the ocular level it can cause diplopia, nystagmus, conjunctivitis and accommodation anomalies. Closed angle acute glaucoma secondary to topiramate exists as a differentiated entity.1 Acute elevation of IOP usually occurs in the first 2 weeks after treatment and is more frequent in female patients. It is important to carry out a differential diagnostic with small angle acute glaucoma due to pupil obstruction because conservative management with aqueous humor production suppressant drugs generally controls IOP, making it unnecessary to perform iridotomy. in addition, miotics are contraindicated because they could precipitate a relative pupil obstruction whereas treatment with miotics could resolve the condition.

Acute myopia could be induced by various drugs, the most common of which include sulphamides, acetazolamide, chlortyacide, etoxzolamide and chlortalidone.2 The literature comprises several cases of transient myopia associated to topiramate2,3 as well as various theories to explain its mechanism of action. One of the most accepted theories suggests that it is produced by a spasm in accommodation, but in our patient the pupils were not myotic and the refractive error persisted after administering 3 drops of cycloplegic at 10 minute intervals, which discarded this possible cause. When studying the prevalence of acute glaucoma among patients taking topiramate, other authors4 found that 25% exhibited myopia of up to −8.75 D and 50% of these exhibited suprachoroidal effusions. They proposed that an anterior displacement of the irido crystalline diaphragm could be the cause, but in our case the IOP was of 18 in BE and in BMA the anterior chamber did not exhibit any signs of narrowing. It has been suggested that the drug might cause an alteration in the sodium and chloride ions which leads to an accumulation of liquid in the lens that could explain the anterior displacement of the irido crystalline diaphragm and therefore myopization. However, some of the authors suggest that the cause could be an edema in the ciliary body which gives rise to an increase in the lens curvature.6 Possibly, with refraction under cycloplegia we halted the evolution of the condition by displacing the irido crystalline diaphragm backwards which, together with the interruption in the administration of the causative drug, resolved the process. Ultrasound biomicroscopy would be useful to clarify the existence of this possible thickening of the lens or the ciliary body.

There is only one case in the literature describing retinal striae, acute myopia and normal IOP associated to topiramate5 which also turned out to be rapidly reversible. Other authors describe the myopization associated to high IOP6 or maculopathies associated to topiramate.7 In addition, in our case, the early appearance of visual symptoms only one day after beginning treatment is worthy of note.

By way of conclusion, we recommend that patients taking topiramate and exhibiting visual alterations should undergo, in addition to the routine ophthalmological exploration, a measurement of the anterior chamber and lens thickness. The differential diagnostic with acute glaucoma due to pupil obstruction must be performed, reporting on the positive prognosis and the rapid recovery which occurs with an early interruption of the drug and prescribing miotics. It is important that the neurologist prescribing the drug should alert patients about the possible visual alterations and the convenience of visiting the ophthalmological practice as soon as possible.

Conflict of interest

None of the authors have declared any conflict of interest.

References