Topiramate-induced angle closure glaucoma: Two unique case reports

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Abstract:

The aim of this study is to report the side effects of oral topiramate in two young patients presented with bilateral ocular blurring and discomfort, causing unique development of secondary acute angle closure (AAC) after discontinuation of oral topiramate. Both patients, with a history of seizure and migraine, respectively, were taking oral topiramate to control their mentioned diseases. Both had secondary AAC and high intraocular pressure, after discontinuing topiramate. They were treated with topical medications and underwent initial and subsequent multimodal imaging to track up their response to the management. Ocular side effect, during topiramate use and possibly even after discontinuation, will improve early detection of secondary AAC. Topical management along with multimodal imaging of such cases can give optimal results.

Keywords:

Acute angle closure glaucoma, ciliochoroidal effusion, topiramate

Introduction

Topiramate is an oral drug used in the management of seizures, migraines, and neurogenic pain.[1-3] It has previously been reported that topiramate and other sulfa-containing drugs are associated with secondary acute angle closure (AAC) and myopic shift.[4,5] We report two cases of bilateral secondary angle closure glaucoma related to topiramate discontinuation and the use of multimodal imaging for establishing the diagnosis and tracking patients improvements. To the best of our knowledge, there is no report using multimodal imaging to diagnose and follow-up patients presented with topiramate-induced bilateral angle closure glaucoma after discontinuing oral topiramate.

Case Reports

Case 1

A 15-year-old girl presented to the emergency department with a complaint of 1-day blurry vision and ocular discomfort in both eyes, not associated with headache, vomiting, or nausea. Her medical history was notable for seizures. The patient was not on medications on presentation. She used topiramate 25 mg once daily for 4 days and then stopped the medication for 7 days before the presentation. On initial examination, her visual acuity (VA) was 20/400 in both eyes (OU) without correction, reaching 20/80 OU with pinhole (OD: −4.25–1.25 × 15 and OS: −4.50–1.00 × 15). Her intraocular pressure (IOP) measured 45 mmHg in the right eye and 37 mmHg in the left eye. Her pupils were normal. A slit-lamp examination showed conjunctival injections, mild corneal edema, and markedly shallow anterior chamber in both eyes. Gonioscopic examination showed appositional angle closure for 360° in both eyes. Fundus examination of both eyes was unremarkable, with healthy optic discs [Figure 1a]. B-scan ultrasonography showed 360° low-lying choroidal effusions [Figure 1b]. Ultrasound biomicroscopy (UBM) of both eyes revealed total closed angels, due to lens pushing the iris forward, choroidal effusion, and anterior rotation of ciliary body (CB) [Figure 1c and d]. The patient was diagnosed with bilateral AAC glaucoma secondary to topiramate. She was given stat topical atropine 1%, timolol maleate 0.5%, apraclonidine 0.5%, and prednisolone acetate 1% in both eyes for three doses 15 min apart. Once the IOP was deemed appropriate, the patient was

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discharged with topical combination of brimonidine 0.2%/timolol maleate 0.5% BID, bimatoprost 0.01% QHS, atropine 1% TID, and prednisolone acetate 1% QID in both eyes. One day after the initial examination, the patient comfort level was good and reported an improvement in her vision. VA with pinhole testing was 20/25 OU, and IOP measured 13 mmHg in the right eye and 11 mmHg in the left eye. The anterior chambers were still shallow, with minimal deepening centrally. After 1 week of initial presentation and treatment, the patient VA was 20/20 OU with correction (OD: +2.25–1.25 × 15, and OS: +2.25–1.00 × 15), and the IOP measured 12 mmHg in the right eye and 11 mmHg in the left eye. The anterior chambers were deep and quiet, and UBM and B-scan showed normal findings [Figure 1e and f]. The patient was kept on bimatoprost 0.01% once a daily; other antiglaucoma drops and prednisolone acetate 1% were discontinued; atropine 1% was changed to cyclopentolate TID. On her next follow-up, a week later, the patient's VA was 20/20 OU with the same correction, IOP was 11 mmHg in both eyes, complete recovery has been noted, and all drops were discontinued.

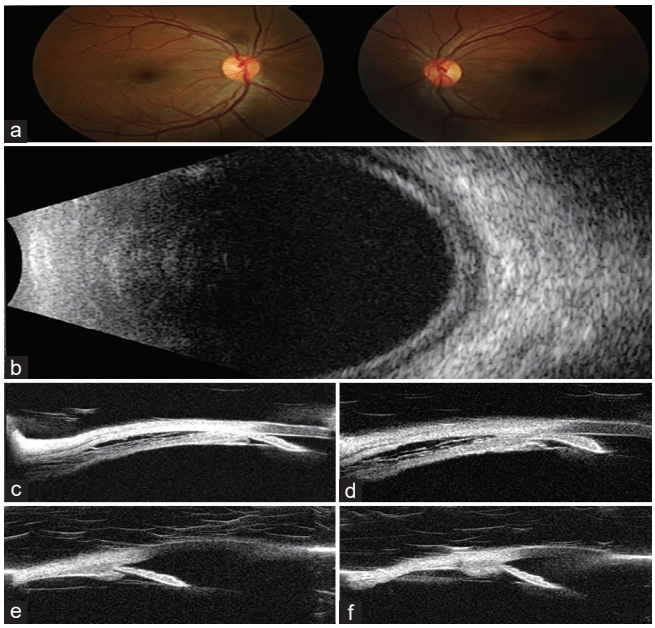

Figure 1: (case 1) (a) Fundus photograph with healthy optic nerve disc in both eye; (b) B-scan ultrasonography of the right eye manifesting 360° low-lying peripheral choroidal effusions; (c and d) an ultrasound biomicroscopy revealed both eyes with total closed angels, choroidal effusion, and anterior rotation of ciliary body at the time of the presentation of the patient (pretreatment) (c, right eye; d, left eye); (e and f) ultrasound biomicroscopy showing resolved choroidal effusion and deepening of the angle after treatment (e, right eye; f, left eye)

Case 2

A 24-year-old female presented with a complaint of bilateral ocular pain, associated with blurriness of vision, headache, and nausea. Her medical history is significant for migraine. She was on oral topiramate 25 mg per day for 1 week and discontinued the topiramate 4 days before her presentation. On initial examination, her uncorrected VA was 3/200 OU. Reaching 20/30 OU with correction of − 6.00 sphere OU, IOP was 35 OU and pupils were normal. A slit-lamp examination showed mild conjunctival injections, clear cornea, and markedly shallow anterior chamber in both eyes. Gonioscopic examination showed appositional angle closure for 360° in both eyes. Fundus examination of both eyes was unremarkable, with healthy optic discs. B-scan ultrasonography showed 360° choroidal effusions [Figure 2a and b]. UBM of both eyes revealed 360° narrow angels and CB detachment [Figure 2c and d]. Again, this patient was diagnosed with bilateral ACC glaucoma secondary to topiramate. She was given topical atropine 1%, timolol maleate 0.5%, apraclonidine 0.5%, and prednisolone acetate 1% in both eyes for three doses 15 min apart. One hour after the medications, her IOP dropped to 21 mmHg OD and 24 mmHg OS. The patient was discharged with topical combination of dorzolamide 2%/timolol maleate

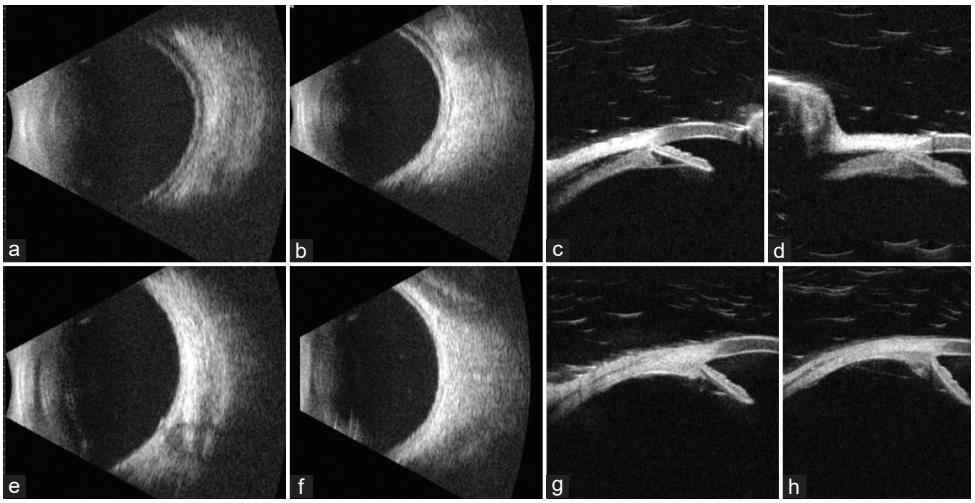

Figure 2: (case 2) (a and b) B-Scan ultrasonography of both eyes (a, right eye; b, left eye), showing 360° peripheral choroidal effusions at the time of presentation of the patient; (c and d) ultrasound biomicroscopy of both eyes (c, right eye; d, left eye) with closed angels, choroidal effusion, and anterior rotation of ciliary body (pretreatment); (e and f) recovery of choroidal detachment on B-scan after treatment (e, right eye; f, left eye); (g and h) ultrasound biomicroscopy with resolved choroidal effusion and deepening of the angle after treatment (g, right eye; h, left eye)

0.5% BID, latanoprost 0.005% once daily, brimonidine tartrate 0.15% BID, atropine 1% TID, and prednisolone acetate 1% QID for both eyes. Two days after the treatment, the patient expressed comfort and reported an improvement in her vision. VA with pinhole testing was 20/30 OU, and IOP measured 08 mmHg in the right eye and 11 mmHg in the left eye. The anterior chambers were still shallow. The patient was kept on brimonidine tartrate 0.15% BID, prednisolone acetate 1%, and atropine 1% TID; other antiglaucoma drops were discontinued. On her next follow-up, a week later, the patient's visual acuity was 20/30 OU with correction (OD: +0.25–0.75 × 180 and OS: PL–1.00 × 180), IOP was 11 mmHg both eyes, B-scan showed complete recovery of choroidal detachment [Figure 2e and f], UBM showed complete recovery of CB detachment [Figure 2g and h], and all drops were stopped.

Discussion

Topiramate, brand name Topamax, is an oral sulfamate medication used for epilepsy, migraine, and neuropathic pain management in adults and children older than 2 years.[1] The exact mechanism of topiramate is unknown. Since both migraine and epilepsy share some pathophysiologic properties, it is believed that topiramate exhibits same mechanism of action in both diseases. Several studies reported that the half-life of Topamax range from 21 h up to 27.2 days.[2,3]

The incidence of bilateral angle closure glaucoma secondary to topiramate use is rare.[4] Lan *et al*. reported two cases of bilateral AAC glaucoma while using topiramate for 3 weeks period.[5] Grewal *et al*. described one case with similar attack of bilateral angle closure glaucoma after using combination agent containing topiramate for weight loss for 1-week duration with complete recovery after medical treatment.[6] Moreover, Senthil *et al*. published a case series in which one of the cases had 4 days duration of topiramate usage.[7]

We report the third case report of topiramate-induced bilateral angle closure glaucoma after discontinuing the medication; both cases developed the symptoms 7 and 4 days, respectively, of stopping the topiramate medication. Two other published reports mentioned similar findings after disusing topiramate 14 and 7 days, respectively.[8,9] To the best of our knowledge, this is the first case report using multimodal imaging in diagnosing and following up patients utilizing different modalities. We believe that the persistent effect of topiramate after few days of discontinuation in our reported cases resulted in the presentation of bilateral angle closure glaucoma. This was supported by one third-level evidence trial that examined migraine frequency after the end of prophylaxis topiramate treatment, investigators noticed that topiramate treatment had persistent benefit, because the number of migraine days did not return to pretreatment values.[10]

Oral carbonic anhydrase inhibitors as well as hyperosmolar agents are frequently used in acute cases with marked elevation of IOPs.[11] Nevertheless, other reports recommend caution over the use of acetazolamide as this agent is also a sulfa-derived drug and may exacerbate the problem.[12]

In conclusion, the incidence of ocular complications appears to be rare. However, with increasing use of topiramate, it is necessary to inform and educate the patients about the possible complications, to seek assistance from healthcare providers at an early stage for appropriate management. Further studies needed to prove the persistent effect of topiramate after discontinuation. Topical treatment with antiglaucoma, steroid, and atropine only can help fasten the recovery and restore patients vision with optimal IOP. Finally, we encourage ophthalmologists to use multimodal imaging to diagnose and follow-up patients improvement.

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 initial s 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.

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