Topiramate induced sudden loss of vision

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Abstract

The case of a 20 year old female presenting with overnight acute loss of vision is reported. The patient was recently started on topiramate (Hitop) for her recurrent migraine and developed sudden loss of vision due to acute myopia. Topiramate was discontinued and the patient's vision returned to normal. Delayed and incorrect treatment may result in permanent vision loss, secondary to angle closure glaucoma; therefore it is imperative that prescribing physicians are aware of this rare but serious ocular emergency.

Keywords: Topiramate, Migraine, Acute myopia.

Introduction

Topiramate is sulfamate substituted monosaccharide that is FDA approved for the treatment of epileptic patients who suffer from partial onset or primary generalized tonic clonic seizures. It is indicated as an initial monotherapy in age group 10 years or older and adjunctive therapy for adults and paediatric patients aged 2-16 years or older. Recently it has also been approved by FDA for migraine prophylaxis.[1] Topiramate's mode of action involves multiple mechanisms including: inhibition of carbonic anhydrase activity, enhancement of gamma amino butyric acid (GABA) activity, sodium channel blockade, and antagonistic effects on glutamate receptors.[2] The multiple mechanisms of action of topiramate unfortunately also results in a diverse range of side effects such as neuropsychiatric cognitive adverse reactions and dysfunctions, oligohydrosis/hyperthermia, metabolic acidosis and ocular emergencies such as acute myopia and secondary angle closure glaucoma.

Case Report

A 20 year old female, banker presented to her general physician with an overnight history of bilateral loss of vision and swelling of the eyelids. Prior to her presentation, there was no history of visual problems with visual acuity of 6/6 and -1.50D refraction in each eye. Her past medical history was significant for migraine, for which she was recently started on topiramate (Hitop). Due to acute nature of severe visual loss, neuroimaging was advised and anti-histamines were started, by her general physician.

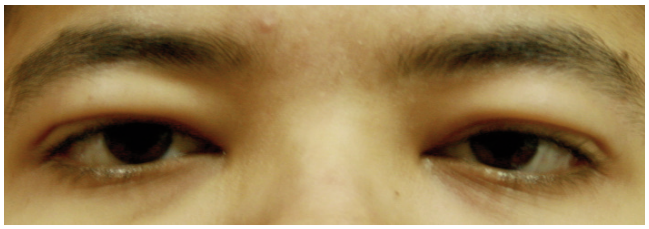

Figure-1: Topiramate induced ocular side effects; visible lid edema.

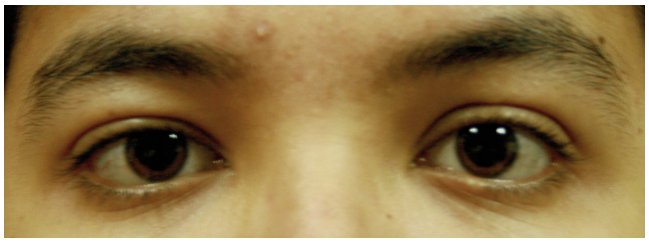

Figure-2: Topiramate discontinuation; resolution of lid edema.

Troubled by her visual loss the patient presented to us. On presentation the patient's visual acuity with glasses was less than 6/60 on Snellen chart. There was mild oedema of eyelids (Figure-1) and shallow anterior chamber. Gonioscopy revealed grade II occludable angles. There was no corneal oedema. Pupils were equal and reactive to light. There was no relative afferent papillary defect. Fundus examination of both eyes was normal and intra-ocular pressure in each eye was 14mmHg. Repeat refraction was -6.50D in each eye which improved the vision to 6/9.

The patient was diagnosed with impending secondary angle closure glaucoma, acute myopia, and eye lid oedema, secondary to topiramate use. She was advised to use cyclopentolate 0.5% eye drops, three times daily to dilate the pupil and to discontinue topiramate. Anti-Histamines were not given and neuro-imaging was deemed un-necessary. She was also advised to report back if any pain or redness developed. The patient was reviewed after 4 days. Her acute myopia was reversed, anterior chamber deepened and lid oedema improved. She was advised against using topiramate.

Discussion

Topiramate primarily causes ocular side-effects

through uveal and ciliary effusion which cause forward displacement of lens-iris diaphragm, leading to shallowing of the anterior chamber. The results of anatomical changes are; acute myopia, raised IOP and secondary angle closure.[2,3]

In an online study of topiramate drug use, out of 457 topiramate users interviewed, 95 percent were females with 37% falling in the 30-39 age range.[4] A detailed analysis of side-effects experienced by another set of 18,214 patients interviewed, revealed that 133 patients developed glaucoma with 68% developing it within 1 month of use. Incidentally majority of patients who experienced the ocular side effects were females, falling within the 30-39 age group.[5] An explanation for the gender bias in ocular side-effects, could be that a greater number of women use topiramate or either the shallowness of the anterior chamber, a normal anatomical variant found more commonly in women, makes women more prone to develop glaucoma.[6] A conclusive relationship between gender and ocular side effects of topiramate howevers remains to be studied.

The management of topiramate induced angle closure involves: discontinuation of the drug (with caution if advised for epilepsy), starting aqueous suppressants and cyclopegic agents, to lower intra ocular pressure (IOP) and resolve the uveal and ciliary effusions. Topiramate's ability to block sodium channels and alter membrane potential is a proposed mechanism through which fluid movements resulted in uveal and ciliary effusion,[4] and probably lid oedema as in our case. Therefore discontinuation of the drug resulted in resolution of ocular effusions.

Topical mitotics are contraindicated as a method of treatment and can worsen the condition since the angle closure glaucoma, in this case is not pupil block related. Similarly laser iridotomy and peripheral iridectomy are also not necessary.

Patient counselling is important to relieve the distress caused by the rapid onset of visual loss secondary to myopia, however, it is also important to emphasize the gradual reversal of ocular effects since the mean plasma elimination half life of the drug is about 21 hours.[7]

Conclusion

Migraine is the most common headache disorder for which patients seek hospital/ physician care in Pakistan.[8] It is imperative that general physicians recognize this ophthalmologic emergency secondary to the use of topiramate and refer to an ophthalmologist immediately. Secondly, physicians should counsel patients to report any symptoms of eye pain or blurred vision when commencing topiramate therapy, because if the symptoms remain unrecognised as a drug-related event, permanent ocular damage can occur.

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