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 a 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. 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. 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.

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 eyelid 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 however 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
cycloplegic 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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