



## Sudden Myopia Following Drugs

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There are several case reports of sudden myopia due to medications. The main cause of these changes is unknown. These medications are topiramate, flucloxacillin, carbamazepine, venlafaxine, trimethoprim/sulfamethoxazole, hydrochlorothiazide, chlorthalidone, bupropion, indapamide, metronidazole, isotretinoin, and escitalopram [1,2]. Below are the description of our case reports.

A 23-year-old woman came to visit to eye clinic. Her chief complaint were bilateral vision loss and periocular pain, headache, and dizziness from this morning. The patient had moderate migraine headache and consumed depakine chrono 500mg/daily, propranolol 20mg/daily, clonazepam 1mg/adily, and nortriptylin 25mg/daily during past month. Her physician added topiramate 25mg/daily to her drugs to improve headache in recent week. Previous medical history was unremarkable. On first examination, the patient had best corrected visual acuity (BCVA) of 20/150 in both eyes and improved by pinhole to 20/100. While, present glass was -2.50D/-3.75 D in 180 degree in right eye and -.75 D/-4.25 D in 5 degree in left eye, recent refraction showed significant myopic shift approximately by -10.00 D/-3.75 D in 180 degree in right eye -9.25 D/-4.25 D in 5 degree in left eye. On Slit lampy examination, there were mild conjunctival injection, and mild corneal edema. Gonioscopic examination revealed angle closure glaucoma. Intraocular pressure was recorded as 46 mm Hg in each eye. The size of pupils were 3 mm and poorly respond to light, and no relative afferent pupillary defect. Dilated fundus examination showed normal optic nerve and retinal vessels, but there was macular edema and uveal effusions in peripheral retina.

Ultrasonic examination by biometer showed an axial length of 23.84 mm in the right eye and 23.33 mm in the left eye and anterior chamber depth was recorded at 2.08 mm in the right eye and 2.03 mm in the left eye. On B-scan ultrasonography there were uveal effusions and shallow anterior chambers. Diagnosis was bilateral angle cluser glaucoma secondary to Topiramate medication. This type of glaucoma should be treated by cycloplegic agents, anti inflammatory medicines and cessation of topiramate. Firstly, oral acetazolamide, and atropine, betamethasone, and dorzolamide/timolol were administered. After 1 week, IOP became 10 mm Hg in each eye. The final refraction were equal with her present and BCVA of 20/20 in both eyes. Gonioscopic evaluation showed normal angle structure and in slit lampy assessment there were no evidence of conjunctival injection, and corneal edema. Biometric examination revealed an axial length of 22.57 mm in the right eye and 22.77 mm in the left eye and anterior chamber depth was recorded at 3.52 mm in the right eye and 3.43 mm in the left eye. On B-scan were normal with improvement of uveal effusions and shallow anterior chambers. She was tapered her medications in 7 days. Follow up 1 month assessment showed normal findings with any sign of glaucoma.

The second case was a 17 girl came to eye clinic for annual ocular examinations. Previous medical was not remarkable. She had 20/20 visual acuity in both eyes and her refraction were +0.25 D/-0.25 D in 180 degree in the right eye and +0.50 D/-0.25 D in 170 degree in the left eye. Her slit lampy assessment were normal anterior and posterior segments. She had IOP of 15 mm Hg in each eye and normal gonioscopic assesment. Fundus examination showed

normal optic nerve and retinal vessels and macula and peripheral retina. After 2 months, she came to clinic for blurred vision after consumption of accutane for treatment of severe acne from 1 month before. She pointed out history of 2 months before accutane 20 mg twice daily usage for 3 weeks caused blurred vision, photophobia, headaches, dry and brittle skin, dry eyes and mouth, nasal dryness, and myalgia. After cessation of accutane, all side effects without blurred vision resolved. She had 20/50 visual acuity in both eyes and her refraction was 2.75 D in the right eye and -3.00 D/-0.25 D in 175 degree in the left eye. Her full cycloplegic refraction was -2.50 D in the right eye and -2.50D/-0.25 D in 176 degree in the left eye. She had normal anterior and posterior segments. IOP was recorded as 15 mm Hg in each eye and normal gonioscopic examination. Fundus examination showed normal optic nerve and retinal vessels and macula and peripheral retina. Since we did not observe any evidence of glaucoma and uveal effusions, full cycloplegic refraction was prescribed to her. In 2-month follow-up assessments, she was satisfied with present glasses and BCVA was 20/20 and her ophthalmic examination showed normal findings without abnormal findings.

### Comment

These cases indicated rapid myopic shift due to drugs. Although in the case of topiramate, myopia reversed but in accutane case, refraction remained permanent. Several reports of drug-induced myopia had reported transient refractive changes [1-3,5]. Possible mechanisms of drug-induced myopia are included: spasm of the ciliary muscle or increased lenticular refractive power and/or ciliary body effusion and choroidal effusion. Spasm of ciliary muscle and ciliary body edema are essential causes of these refractive changes [3-5]. Isotretinoin has several side effects in eye such as abnormal meibomian gland dysfunction, increased tear osmolarity, blepharitis, conjunctivitis, corneal opacities, keratitis, myopia, photophobia, and night blindness [6]. In the first case there was angle-closure glaucoma and uveal effusion are evident which drug cessation and cycloplegic and anti-inflammatory drugs improved myopia. However, according to primary and secondary examinations in the second subject, we had no information of glaucoma and uveal effusion occurrence because the patient came to us late. In comparison of two examinations, myopia occurred after accutane and refraction did not change. Accutane causes lens protein changes, increased UV absorptivity, and cataract [7]. It seems this

refraction result from increased lenticular refractive power because of the water absorption.

In conclusion, accutane might induce permanent refractive change especially in youth and patients should regularly evaluate before and after usage with decreased vision.

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