Allopurinol-Induced Toxic Optic Neuropathy: An Unusual Cause

I.ER-RACHIQ, I. Elboukhani, S. Houmaid, A. Mchachi, L. Benhmidoune, A. Chakib, R. Rachid, M. Elbelhadj
Department of Adult Ophthalmology, Faculty of Medicine and Pharmacy, Hassan II University-Casablanca, Hospital 20 August 1953, IBN ROCHD UHC, Morocco

Abstract
Purpose. To report a rare toxic optic neuropathy due to allopurinol
Case report. A 47 year old women with history of hyperuricemia treated with allopurinol for one month, thyroidectomized 10 months ago for a papillary carcinoma having received an irathetomy and who is currently on replacement therapy. She presented with complaints of severely decreased vision in both eyes. Her symptoms started 24 hours earlier and had gradually worsened. Entering acuities measured 3/10 in both eyes. There was no improvement in acuities with pinhole or manifest refraction in either eye. Her pupils were round, equal, and reactive to direct and consensual light. There was no afferent pupillary defect in either eye. Slit lamp examination revealed an optic disc edema stage 1 in the both eyes. Neurological examination revealed no signs of intracranial hypertension, meningeal syndrome or cranial pair involvement. Cerebral scan with cerebral angio-MRI turned out to be normal. Lumbar puncture with monomeric study and CSF analysis proved normal. The infective and inflammatory results also turned out to be normal. The visual field objectified an absolute deficit at the level of paracentral and peripheral temporal visual field in the both eyes. The evolution was marked by the occurrence of a generalized macular rash associated with facial edema in a context of deterioration of the general state. The diagnosis of drug toxicities was retained at the dermatological emergencies where they indicated to stop taking allopurinol, and we retained the diagnosis of toxic optic neuropathy to allopurinol with maintenance of the stopping of the allopurinol.

Conclusion. If the suspected diagnosis is drug-related toxic optic neuropathy, and the withdrawal of one medication does not lead to visual recovery or there is a further deterioration of vision, the possibility of toxicity because of other medications should be considered.

Keywords: Allopurinol, toxic optic neuropathy, visual field, ocular side-effects

Date of Submission: 28-02-2020
Date of Acceptance: 13-03-2020

I. Introduction:
Optic neuropathy refers to injury to the optic nerve. Common mechanisms of optic neuropathy include compressive, inflammatory and ischemic insults to the optic nerve [1]. Toxic optic neuropathy is a side effect of some medication. Patient education about possible side effects is crucial in prompt diagnosis of drug-related toxic optic neuropathies and discontinuation of the causative agent to increase the chance of vision recovery [2].

We report what is to our knowledge the first case of allopurinol toxic optic neuropathy occurring in a patient treated for hyperuricemia.

II. Case Report:
A 47 year old women with history of hyperuricemia treated with allopurinol for one month, thyroidectomized 10 months ago for a papillary carcinoma having received an irathetomy and who is currently on replacement therapy. She presented to the ophthalmological emergencies with complaints of severely decreased vision in both eyes. Her symptoms started 24 hours earlier and had gradually worsened. She denied any headache, recent trauma or pain. Entering acuities measured about 3/10 in both eyes. There was no improvement in acuities with pinhole or manifest refraction in either eye. Her pupils were round, equal, and reactive to direct and consensual light. There was no afferent pupillary defect in either eye. Extraocular muscles demonstrated full motility in both eyes, with no pain or diplopia on eye movement.

Slit lamp examination revealed mild inferior punctuate epithelial erosions on both corneas, capped meibomian glands in both eyes, brown and flat irides and nuclear cataracts in the both eyes. Intracocular pressures by goldmann tonometry measured 14mmHg OD and OS. The vitreous was clear and quiet. Retinal vasculature was normal. The fovea was normal but in the optic disc we noted a cup to disc ratio

DOI: 10.9790/3008-1502010104
equal to 0.4 in OD and OS and a disc edema stage 1 in the both eyes. Neurological examination revealed no signs of intracranial hypertension, meningeal syndrome or cranial pair involvement. The general examination revealed a deterioration in the general condition classified OMS3, hemodinamycic and respiratorystability and body mass index estimated at 35kg / m2. We did a cerebral scan with cerebral angio-MRI which turned out to be normal. Lumbar puncture with monomeric study and CSF analysis proved normal. The infective and inflammatory results also turned out to be normal. The retinalangiography made confirmed the bilateralpapillaryedema and the visualfieldobjectified an absolutedeficit at the level of paracentral and peripheral temporal visualfield in the botheyes.

The evolution was marked by the occurrence of a generalized macular rash associated with facial edema in a context of deterioration of the general state.

The diagnosis of drugtoxicosiswasretained at the dermatological emergencies wheretheyindicat to stop takingallupurinol, and weretained the diagnosis of toxicopticneuropathy to allupurinolewith maintenance of the stopping of the allupurinole.

The evolution was marked after 4 weeks by a spontaneous recovery of a visual acuity estimated at 10/10 in the both eyes with regression of the papillary edema but a persistence of a slight pallor. However, thevisualfieldobjectified a persistence of the campimetricdeficit.

![Fig 1: Stereo photos demonstrating a disc edema in the OS and OD](image1.jpg)

![Fig 2: Retinalangiography made confirmed the bilateralpapillaryedema](image2.jpg)
Allopurinol-Induced Toxic Optic Neuropathy: An Unusual Cause

Fig 3: Absolute deficit at the level of paracentral and peripheral temporal visual field in OD and OS

Fig 5: Stereo photos demonstrating the regression of the papillary edema

Fig 6: Visual field demonstrating a persistence of the campimetric deficit
III. Discussion

Toxic optic neuropathy is the result of damage to the optic nerve caused by various toxins [3]. The medications that may cause toxic optic neuropathy are antituberculosis (ethambutol,isoniazid), antimicrobial (linezolid, ciprofloxacin), antiepileptic (vigabatrin), phosphodiesterase type 5 inhibitors (sildenafil, tadalafil, vardenafil), anti-tumor necrosis factor alpha agents, amiodarone, and tamoxifen [2]. No case of allopurinol toxic optic neuropathy has been described in the literature.

Differential diagnosis for toxic optic neuropathy includes nutritional and tobacco/alcohol, ischemic, compressive, demyelinating, and hereditary optic neuropathies [2].

Because the patient followed a healthy diet, showed normal serum B12 and red blood cell folate levels, nutritional optic neuropathy could be ruled out. Our patient was not tabagic or alcoholic. Ischemic optic neuropathy was unlikely because the patient did not have vasculopathy disease and his vision loss was bilateral. Demyelinating and compressive optic neuropathies could also be ruled out because of the magnetic resonance imaging of the brain and orbits. The hereditary optic neuropathy could also be ruled out because it typically presents at a younger age [4]. This case provides that allopurinol can cause bilateral optic neuropathy. Causality for optic neuropathies from drug toxicity generally requires a biologic mechanism, adequate duration of treatment, a dose-response curve related to the medication, recovery during treatment cessation, and involvement of both optic nerves at presentation or with progression [5]. The biologic mechanisms related to allopurinol optic neuropathy are not known at present. Clinicians need to be aware of this rare but important toxicity. Immediate determination of therapy is the only effective management that can stop the progression and allow recovery of vision [3].

IV. Conclusions

In conclusion, if the suspected diagnosis is drug-related toxic optic neuropathy, and the withdrawal of one medication does not lead to visual recovery or there is a further deterioration of vision, the possibility of toxicity because of other medications should be considered. We recommend considering baseline visual assessment if patients experience visual symptoms after commencement of allopurinol therapy and assessing visual acuity, color vision, and visual fields to detect early evidence of toxic optic neuropathy.

References: