An Unusual and a Rare Cause of Toxic Optic Neuropathy – Closantel Toxicity

Dear Editor,

An elderly couple from rural Telangana presented to Nizam's Institute of Medical Sciences with a history of painless, progressive vision loss of acute (5 days) onset in both eyes following accidental ingestion of "closantel." Closantel is a halogenated salicylanilide, which is well known for its antiparasitic effects, especially against *Haemonchus* spp. and *Fasciola* spp. infestations in sheep and cattle.[1,2] The couple mistook the compound for a cough syrup preparation (as the taste was palatable and raised no suspicion) and consumed approximately 25 ml (the elderly lady consumed 8 ml and the gentleman consumed 17 ml) over 2 days. At the time of admission, the visual acuity was "perception of hand movements close to the face" in the elderly gentleman and the lady had "no perception of light." The pupils had a sluggish reaction to light (no relative afferent pupillary defect), ocular movements were full, and the fundus study was suggestive of elevated disc margin (more changes in the nasal quadrant) with absent foveal reflex suggestive of macular involvement [Figure 1]. Rest of the neurologic examination was normal in both the patients. Optical coherence tomography (OCT) and retinal nerve fiber layer (RNFL) map revealed uniform thinning of the nuclear areas in both eyes (inferonasal and superonasal fibers had relatively more affection) [Figure 2]. On patterned visual evoked potential (VEP), no elicitable waveform was demonstrated [Figure 3]. Magnetic resonance imaging (MRI) of the brain was performed for the gentleman on day 1 of illness, which showed no significant optic nerve changes, and imaging of the brain was normal. (MRI was not done for the lady.) The couple was treated with 1 g methylprednisolone infusions over 5 days along with five cycles of high-volume plasma exchange (PLEX) over 10 days. The couple was also given multivitamin supplements (high doses of biotin, thiamine, vitamin E, vitamin B12, and vitamin C). Both the patients started to show improvement in visual acuity following PLEX. It improved to counting fingers at 3 m in the lady and counting fingers at 1 m in the gentleman. They were discharged on oral steroids and multivitamins. The couple is under close follow-up.

Closantel, a halogenated salicylanilide, acts on the energy metabolism pathway by blocking oxidative phosphorylation.[3] Literature on closantel toxicity in humans is very limited, and reports of accidental ingestion of closantel in humans have shown an association with visual manifestations.[4-7] The histopathologic changes (studied in animals) include severe myelinic edema, vacuolation, Wallerian degeneration, reactive astrocytosis and spongiform degeneration in the brain,

photoreceptor layer loss, and outer and inner nuclear layer damage in the retina.[8] In both our patients, the pretreatment OCT scans of macula of both eyes were suggestive of severe thinning of RNFL and features suggestive of a minimal macular thinning. The time of treatment onset has a key role: the earlier, the better.[5] The treatment options used in various case studies are intravenous pulse steroids, PLEX, erythropoietin, and multivitamins.[4-7] The exact mechanism of closantel toxicity is not well understood. However, there could be a role of inflammatory mediators. Therefore, it is reasonable to use high dose of corticosteroids at an early stage to minimize the toxic effects of inflammation.[3,5] The visual prognosis depends on various factors like the time of presentation following ingestion of closantel, dose of closantel consumption, visual acuity at presentation, and VEP and OCT changes.[5-7] Preservation of subfoveal inner and outer segment junction in OCT portends a better visual prognosis, according to case reports.[7]

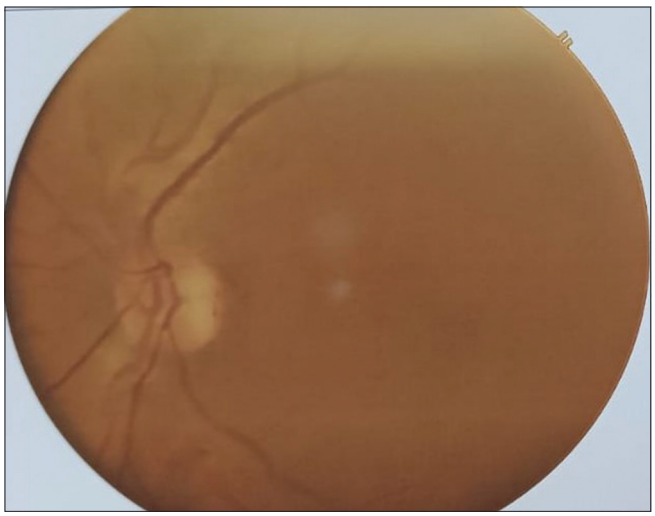

Figure 1: Fundus image suggestive of elevated disc margin

In this case report, the authors have intended to project an unusual cause of toxic optic neuropathy. Though rarely reported, it could be a preventable cause of severe vision loss, especially in the rural Indian context. This case report emphasizes on early treatment of patients presenting with accidental closantel ingestion. A close follow-up with periodic VEP, OCT, and field testing could help the treating clinician in the visual prognosis. Closantel is a veterinary drug causing serious side effects in the human retina and central nervous system. Public awareness and appropriate drug labeling about its side effects could prevent accidental toxicity, as there is no available antidote. Early treatment with plasmapheresis and systemic corticosteroid can be considered an effective intervention to reverse the toxic effects of closantel.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

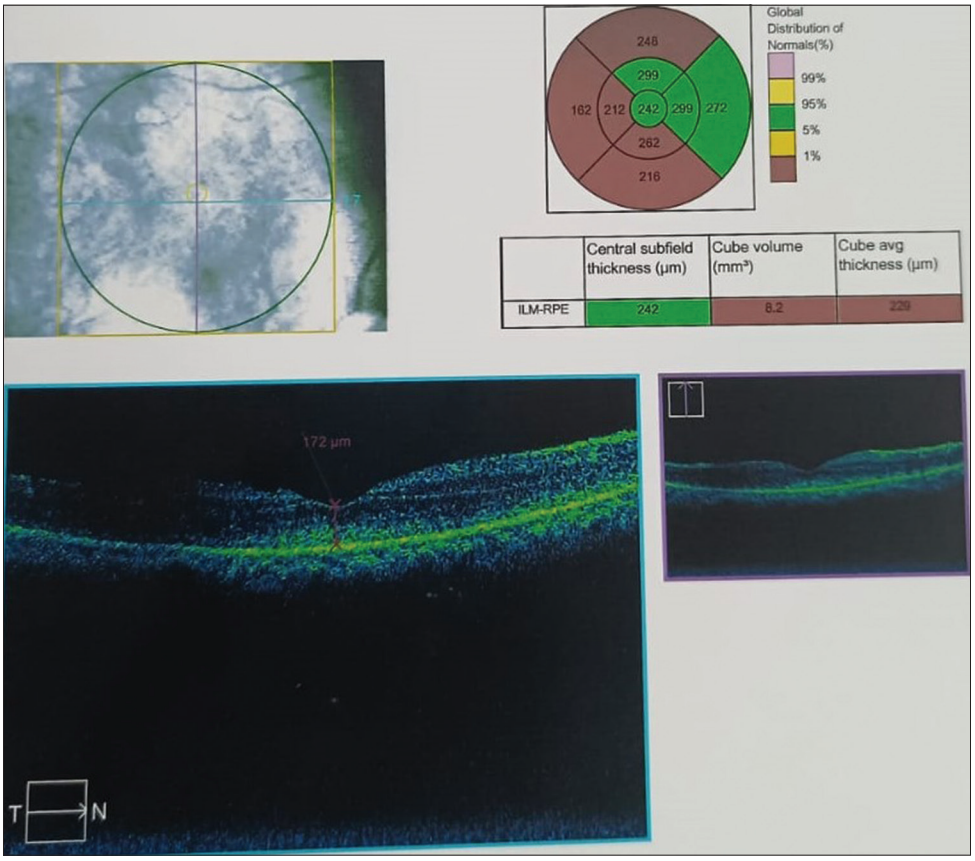

Figure 2: Optical coherence tomography (OCT) suggestive of macular nerve fiber thinning

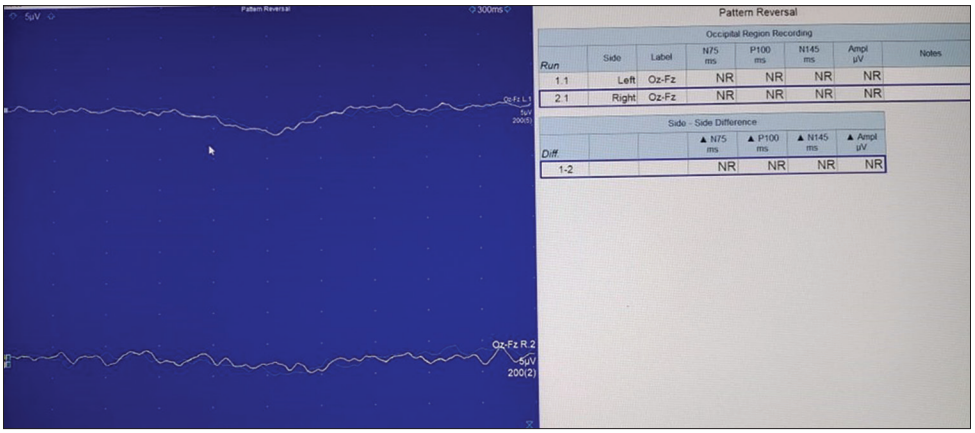

Figure 3: Patterned flash visual evoked potential (VEP) shows no elicitable waveform

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 initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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