

## Bilateral Optic Neuritis in a Patient with Enteric Fever: A Case Report

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### ABSTRACT

**Background:** Bilateral optic neuritis following enteric fever is a rare condition requiring early evaluation by an ophthalmologist and prompt treatment for visual rehabilitation.

**Case:** A 31-year-old female diagnosed with enteric fever presented to the Neuro-ophthalmology department with sudden painful loss of vision in both eyes for 10 days.

**Observations:** Her Best Corrected Visual Acuity (BCVA) was counting fingers close to face in left eye and 6/18 in right eye. Posterior segment examination showed blurring of disc margin on both eyes. On Magnetic Resonance Imaging (MRI) of brain and orbit there was mild thickening of retro-orbital portions of both optic nerves. She was started on steroid therapy which resulted in marked improvement of vision in both eyes.

**Conclusion:** Optic neuritis following enteric fever is a rare entity and requires early diagnosis with prompt treatment for improvement of visual acuity and prevention of visual impairment.

**Key words:** Bilateral optic neuritis; enteric fever; magnetic resonance imaging; steroid.

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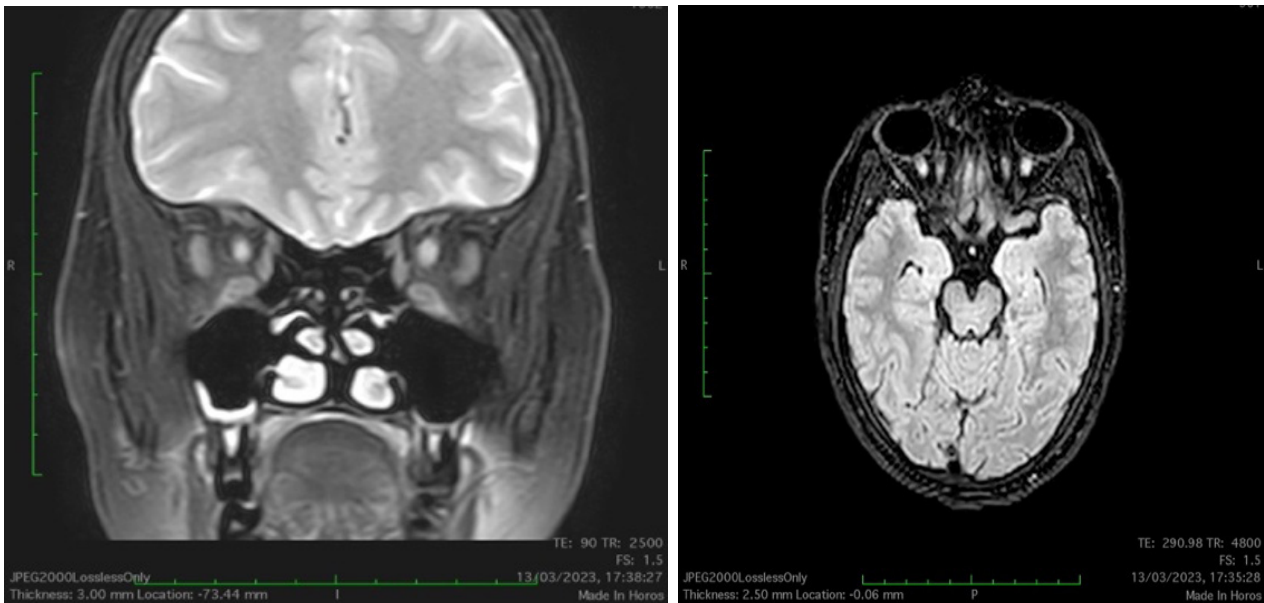
## INTRODUCTION

Enteric or Typhoid fever is a multisystem disease caused by *Salmonella typhi* or *paratyphi* affecting intestine, bone, liver, heart, and rarely the eyes. It causes a spectrum of clinical features like fever, abdominal pain, constipation and in severe cases causes delirium, intestinal hemorrhage, bowel perforation, and even death. Transmission of the disease is by feco-oral route, usually through contaminated food and water (Neupane et al., 2021). Typhoid fever affects the eye by direct invasion or by immune mediated mechanisms. (Relhan et al., 2014). Ocular manifestations of enteric fever are lid edema or abscess, dacryoadenitis, conjunctival petechiae or chemosis, corneal ulceration, uveitis, vitreous hemorrhage, retinal hemorrhage and detachment, stellate maculopathy, pigmentary retinopathy, optic neuritis, internal and external ophthalmoplegia, orbital hemorrhage or abscess. (Prabhushanker et al., 2017). Here we are presenting a case of bilateral optic neuritis in a 31-year-old female diagnosed with enteric fever treated with steroid therapy.

## CASE REPORT

A 31-year-old female diagnosed with enteric fever, undergoing treatment with intravenous ceftriaxone presented to the Neuro-ophthalmology department with painful loss of vision in both eyes for 10 days. She had been diagnosed with enteric fever for five days before having painful loss of vision in both eyes. Apart

from vision loss she also had a headache and nausea. On examination, her Best Corrected Visual Acuity (BCVA) was counting fingers close to face in the left eye and 6/18 in right eye. Color vision was examined using the Ishihara chart; patients could identify the demo chart in the right eye while the left eye could not be evaluated due to poor vision. Pupil was round, regular in both eyes and the relative afferent pupillary defect was positive in the left eye. Anterior segment was within normal limits and intraocular pressure was within normal range in both eyes. After examination of the anterior segment both the eyes were dilated for posterior segment examination. Blurring of disc margin were present in both eyes. There was a total field defect in both eyes in the Humphrey visual field analyzer. The patient was sent for a Magnetic Resonance Imaging (MRI) scan of brain and orbits for confirmation of the clinical suspicion of bilateral optic neuritis. MRI showed mild thickening of bilateral optic nerves in the retro-orbital portion with high signal intensity in T2 and FLAIR sequences suggestive of optic neuritis. She was then treated with injection methylprednisolone 1gm iv for three days followed by oral steroids 1mg/kg/day on tapering dose. On the seventh day of follow-up after starting steroid treatment, her BCVA improved to 6/6 in both eyes. Patient is on regular follow-up and has visual acuity of 6/6 and normal color vision in both eyes until her recent follow-up.



**Figure 1:** Axial FLAIR image (a) and coronal T2 fat suppressed image (b) show mild thickening with high signal intensity in the intraorbital portion of bilateral optic nerves suggesting optic neuritis.

## DISCUSSION

Spectrum of post enteric fever ocular manifestations include many entities of which optic neuritis a rare manifestation. Ocular manifestations usually occur 3-4 weeks after onset of enteric fever (Baruah et al., 2020). Immune mediated optic neuritis usually occurs a few days or weeks post enteric fever. Post-infectious immunologic effects leading to immune response that reacts to self-antigens leading to retinal vasculitis can be attributed (Baruah et al., 2020). In the same way homology between retinal antigens and microbial peptides has been observed. These retinal antigens, most notably S-antigen (also known as arrestin) and interphotoreceptor retinoid binding protein, are highly immunogenic (Boyd, 2021).

Case reports by Baruah et al., (2020) showed post typhoid fever optic neuritis showed an immune mediated mechanism leading to bilateral optic neuritis which had significant improvement in visual acuity using steroid therapy. In case of mild inflammation, cases resolve without treatment while in our case with bilateral optic neuritis, treatment with systemic steroid therapy resulted in marked improvement in vision.

## CONCLUSION

In conclusion, optic neuritis following enteric fever is rare but can occur which can be managed successfully with steroid therapy.



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