

A Clinical Study on Optic Neuritis in a Patient of Paediatrics Age Group Attending O.P.D. in a Tertiary Care Hospital in Assam - A Rare Case Report

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Abstract: To study a case of Optic Neuritis in a patient of Paediatrics age group attending O.P.D. (Out Patient Department) for Ophthalmic problem. This is a Hospital based study conducted on a patient attending Out Patient Department, Assam Medical College & Hospital, Dibrugarh, Assam. The study was done from the January, 2019 to the July, 2019. This study was conducted on the basis of mainly Ophthalmoscopic examination & Radiological investigations such as CT (Computerized Tomography) Scan, MRI (Magnetic Resonance Imaging), & Fundus Photographical examination. This rare case was enrolled in the study, according to our Hospital based study. Incidence of Optic Neuritis increases with the age, females were affected more than males.

Keywords: O.P. D, Optic Neuritis, Children, Gender, Assam

1. Introduction

It is a demyelinating inflammation of the optic nerve of unknown etiology¹

Inflammation of the optic nerve causes loss of vision usually due to the swelling and destruction of the myelin sheath covering the optic nerve. Direct axonal damage also plays a role in nerve loss in a lot of cases.

The most common etiology in adults is MS (Multiple Sclerosis) where an auto-immune inflammatory cascade is believed to mediate myelin destruction while that in children is considered to be para- infectious.

Symptoms of Optic neuritis include sudden loss of vision with a afferent pupillary defect in the affected eye, pain on movement of the affected eye, and impairment of visual function such as color vision, contrast sensitivity and visual field. In most of the cases there is spontaneous recovery of vision and this has been shown to have been accelerated by steroids.

Optic neuritis affects the children less commonly than the adults. Optic neuritis in children may occur as an isolated single episode having usually, a self limited course and carrying no prognostic implications with respect to rest of nervous system. Some cases may be followed by development of MS (Multiple Sclerosis), NMO (Neuromyelitis Optica) or Schilders Disease.

We derive most of our information about Paediatrics Optic Neuritis from Western Literature, and we have little data in Asian Countries. Since ONTT (Optic Neuritis treatment trials) excluded patients with Paediatrics Optic Neuritis, little is known about its spectrum and outcome. It has also been observed that the clinical profile and outcome of Optic

Neuritis among the adults in the Western Population differs significantly from the east and this may hold true for Paediatrics patients.

Epidemiology

- Female Male ratio is 2:1.
- Whites are more affected than Blacks.
- Age of onset is 15-40 years (average 30 years).
- Rapid decrease in visual acuity, with maximal visual deficit in 5 days.
- Incidence is 1-4: 100,000 per year.

Scenario in Asia

A large number of studies have shown that the features of Optic neuritis in Western population are not completely synonymous with the patients of Oriental descent.

- Optic neuritis as the first manifestation was reported in 56% of the patients with MS in Taiwan and 38.2% in China in contrast to 20% in patients of European descent.
- In contrast to findings that 92% of the patients had ocular discomfort in the ONTT, reports from Japan, Taiwan and Singapore found that only about half of the patients had these complaints.
- Retrobulbar Optic Neuritis was more common than anterior Optic Neuritis in the ONTT study (64.7%), in contrast anterior Optic neuritis was predominant in Asian countries.
- In contrast to the ONTT report that 48.7% of patients have abnormal findings on Brain MRI, patients with Optic Neuritis in Asia had a lower rate of similar lesions.

Etiological Risk Factors

- It occurs usually after viral infections like measles, mumps, chickenpox, pertussis and infectious mononucleosis.
- It can also occur after immunization.

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- It has also been referred as a result of **Biotinidase** deficiency.
- It may be related to the diseases of the adjacent sinuses or orbital structures and infectious and infiltrative diseases of the Brain or meninges that involve the Optic nerve.

2. Case Report

Aims and Objectives

- To study the visual outcome of a rare case of optic neuritis in a patient of Paediatrics age group seeking attention for ophthalmic problems.
- Early detection of the case and its management.
- To suggest recommendation for initiating correct counter measures.

3. Methodology

We selected a very rare case among the paediatrics age group from out patient clinic of Assam Medical College.

Type of study: A Hospital based study.

Place of study: Department of Ophthalmology, Assam Medical College & Hospital; Dibrugarh.

Study Duration: 7 months.

A 6 years old boy came to the **O.P.D.** of the Ophthalmology Department of Assam Medical College & Hospital, Dibrugarh with the complaint of sudden loss of vision of both the eyes since last 6 days which was associated with pain on eye movement. There was history of cold like symptoms 3 weeks before, with headache and a single episode of vomiting.



Figure 1: Appearance of the patient in first visit

On Ocular examination **Visual acuity** of the right eye was denial of **perception of light** and inaccurate projection of rays. The visual acuity of left eye was **hand movement** and inaccurate projection of rays. Extraocular movements were normal in both the eyes.

On Ocular examination pupillary reactions were found to be sluggish in both the eyes. Relative afferent defect was seen in the right eye. Anterior segment examination done with the

Slit lamp was found out to be normal.

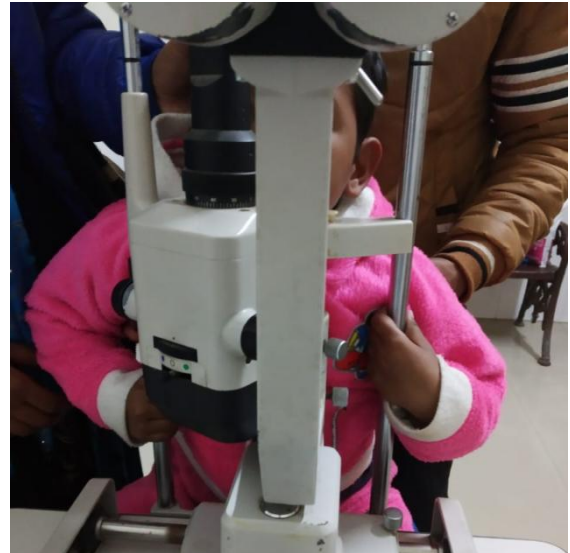


Figure 2: Slit lamp examination

Direct and Indirect **Ophthalmoscopy** showed the disc to be hyperemic in both the eyes with blurring of disc margin in all the 4 quadrants. The blood vessels were found to be engorged, dilated and tortuous. Hard exudates were seen near the optic disc.



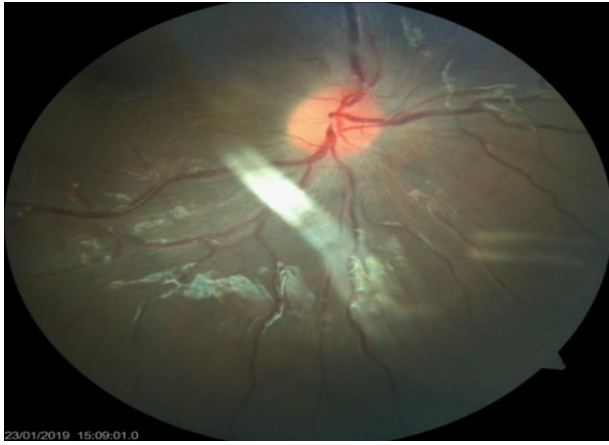


Figure 3: Fundus photography showing blurring of optic disc, hyperemic disc, attenuation of blood vessels and hard exudates near the optic disc.

Routine Blood Investigations were done and found out to be normal showing **Hb** (Haemoglobin) = **11.8 gm./dl.**, **TC** (Total Count) = **8,900/cmm**, **Neutrophil**= **44%**, **Lymphocytes** =**45%**, **Monocytes**= **3%**, **Eosinophils**= **8%**, **Basophil** not found. **RBS** (Random Blood Sugar)= **135mg./dl.**

CT (Computerized Tomography) Scan of the Brain was performed with **16 slice MDCT (OPTIMA 540)** followed by multiplaner reconstruction and volume rendering without administration of intravenous contrast agent and no significant abnormality was detected in brain and skull.

Infratentorial and supratentorial compartments were found out to be normal, there was no any evidence of any space occupying lesion, no focal areas of altered CT attenuation was noted in the cerebral parenchyma. There was no evidence of any extradural or subdural collections.

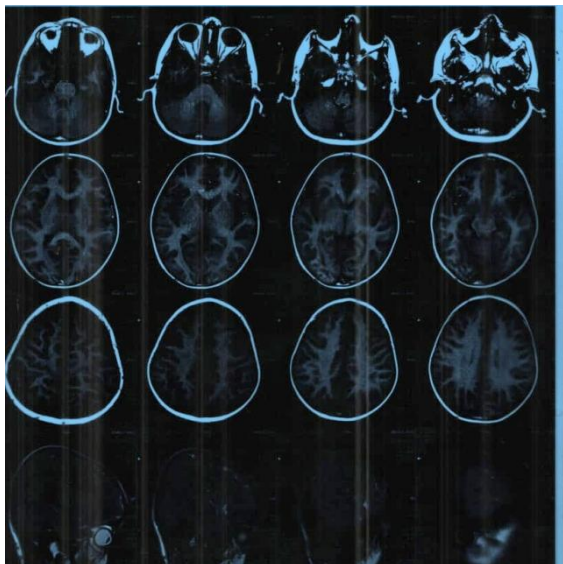


Figure 4: CT scan of the Brain

Plain imaging of the Brain was done using axial **T1**, **T2**, **Flair** diffusion with **ADC** map sequences and **GRE** where Brain parenchyma revealed normal. Signal Intensity and grey- white matter differentiation. The Cerebral gyri and sulcus showed normal morphology, Bilateral symmetry was

observed and there was no any evidence of any mass effect or midline shifting.

There was no evidence of any abnormal **T2** or **FLAIR** hyperintensities in **Bilateral Optic Nerve**.

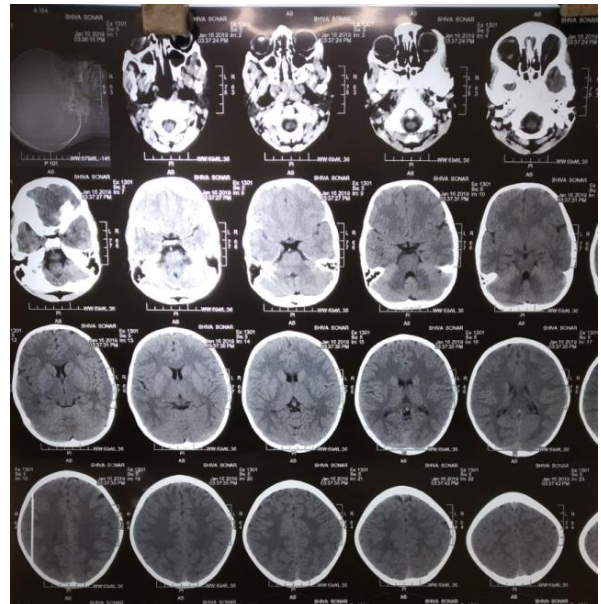


Figure 5: Plain MRI of the Brain

A Diagnosis of **Bilateral Optic Neuritis** was done and the patient was treated with intravenous **methylprednisolone 30mg./kg./day** for **5 days**..

The patient showed improvement in **visual acuity**, upon completion of the therapy after **2 weeks**. Best corrected **visual acuity** improved dramatically to **finger counting** at **2 meters** in both the eyes.

On follow up after **1 month** best corrected **visual acuity** further improved to **6/60** in both the eyes with completely normal findings on Ophthalmic examination and Colour vision test.

The patient showed best corrected **visual acuity** of **6/9** in both the eyes with completely normal findings on Ophthalmic examination and Colour vision test on the follow up on the **7th month**.

4. Discussion

Paediatrics Optic Neuritis is usually associated with good visual recovery, however a significant number (**22%**) of them have been found out to remain visually disabled.

Younger children are more likely to have bilateral disease and good **visual prognosis** whereas the children presenting with **unilateral involvement** have comparatively better visual prognosis, however they also have a greater frequency of developing **MS** (Multiple Sclerosis) than the children with bilateral involvement.

A normal **MRI** (Magnetic Resonance Imaging) of the Brain may be associated with a better outcome, whereas the children with the abnormalities in **MRI** at the time of

diagnosis of Optic Neuritis have an increased risk of developing Multiple Sclerosis.

High signal abnormalities on brain MRI is the strongest predictor of developing MS ,at 5 years absence of lesions indicate 16% chance, presence of 1-2 lesions indicate 37% risk,3 or more a 51% risk.

In most of the studies it has been shown that in the Paediatric Optic Neuritis patients, visual acuity was regained at 1 year regardless of baseline clinical characteristics.

The visual prognosis was relatively better in the patients receiving intravenous steroid treatment than in those without any treatment

Majority of the cases of Optic Neuritis are Idiopathic, Multiple sclerosis, SLE, Sjogrens syndrome, Lebers Mitochondrial Optic Neuropathy, Cat Scratch Disease (Bartonella Henselae) are also known associations.

Some drugs are also associated with the development of Optic Neuritis such as Ethambutol, Isoniazid, Aminodarone, Linezolid, Methotrexate, Sildenafil and Infliximab.

Chemotherapeutic agents such as Vincristine, Cisplatin, Carboplatin and Paclitaxel, Vitamin B12 deficiency have also been associated with development of Optic Neuritis.

5. Conclusion

From our study in children we conclude that Younger children are more likely to have Bilateral Optic Neuritis and a good Visual prognosis, and a normal MRI is associated with good prognosis.

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