

Optic Neuritis Following Japanese Encephalitis

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Abstract: Japanese Encephalitis (JE) is a common human endemic encephalitis occurring in various parts of the world including India. Most human infections are subclinical (80%) or manifest as febrile illness (20%). Usual clinical presentation is an acute febrile illness associated with behavioral abnormalities, altered sensorium, convulsion, abnormal movements, meningeal signs and focal neurodeficits in various combinations. Ocular complications of JE have been rarely documented in literature. We report a case of acute optic neuritis(ON) in a case of seropositive Japanese encephalitis. A 9 years old girl with left side optic neuritis,which manifested one month after an attack of Japanese encephalitis. Pattern reversal visually evoked potential (VEP) showed absence of wave formation. Pulse steroid therapy improved her complaints. An ocular examination, including ophthalmoscopy should be part of the routine evaluation of patients with clinically suspected Japanese Encephalitis infection during follow up.

Key Words: Japanese encephalitis, Optic neuritis, Pulse steroid

Introduction

JE is caused by a zoonotic flavivirus. it is a vector-borne viral disease that occurs in South Asia, Southeast Asia, East Asia, and the Pacific. Pigs are the most important biological amplifiers and reservoirs. The usually affected age group is 5-10 years⁽¹⁾

Ocular manifestations of JE infection includes ocular palsy, papilledema⁽²⁾ischaemic maculopathy⁽³⁾ during recovery stage .We report a rare case of ON 3 weeks after an attack of Japanese encephalitis. A delayed onset of ON after the initial infection and a prompt response to corticosteroid therapy may suggest an involvement of some autoimmune process in the pathogenesis of ON in

our case. Post encephalitic optic neuritis has been described in the literature but we could not find any such case in a serologically positive JE.

Case Report

A 9 year old girl presented on August 2008 with dimness of vision, and vague ocular pain in the left eye for one week. The patient had previously been admitted to paediatric ward of the hospital, three weeks prior to the onset of blurring of vision with febrile illness, severe headache, episodes of tonic seizures and vomiting. She was investigated thoroughly and was diagnosed to be suffering from JE. The investigations were as follows. The CSF was colourless, there was no deposit, cell count was 320 /cubic mm, polymorphs 30%, lymphocytes 70%, Glucose 69 mg%,CL 104meq/dl. Serum alkaline phosphatase was 492u/l, sputum for AFB was negative, Computerized tomography of brain showed focal posterior end enhancing falx. On the basis of clinical features and lumbar puncture report she was provisionally diagnosed as a case of encephalitis and treated accordingly. Serum titre for anti-JEV antibody in

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1st week was positive in 1: 160. She was discharged from hospital after recovery from encephalitis. After three weeks of febrile illness the child developed dimness of vision in the left eye.

On examination best corrected visual acuity in the left eye was FC 1 metre with accurate PR and 6/6 in the right eye. Except relative afferent pupillary defect (RAPD) in the left eye, anterior segment and fundus examination was within normal limits in both the eyes. Visual fields and colour vision could not be tested because of poor compliance. Pattern reversal VEP of left eye failed to show any wave formation (Fig 1). The intellectual, motor, and sensory functions were normal. Complete blood count, ESR was within normal limit. Brain and orbital MRI was suggested but the party denied the investigation. On the basis of RAPD and VEP we diagnosed the case as acute retro bulbar neuritis in a case of post-infectious JE. She was admitted to the hospital and underwent pulse steroid therapy. Dexamethasone 1.5mg/kg body weight (30 mg) in 100 ml dextrose 5% was given intravenously for 3 days followed by oral Prednisolone 30 mg /day for 11 days. Repeat serological report showed a significant rise of serum IgG (1 in 640) Visual acuity improved to 6/9 after 1 week and VEP recovered to normal range after one month (Fig 2). At 3 months follow up vision was 6/6, there was mild temporal pallor of the optic disc, colour vision was normal RAPD persisted for 3 months. Patient is maintaining the vision till last 1 year follow up.

Discussion

ON implies an inflammatory process involving the optic nerve. The fundus may appear normal or demonstrate oedema of the optic nerve head (papillitis). ON involving the optic nerve behind the globe is termed as retrobulbar optic neuritis (RBN)⁽⁵⁾ The optic disc appearance is normal in first – time episodes of RBN. ON is much less common in children than in adults but is not rare, In one combined series in United States, children comprised 5% of cases. In children, most cases (85%) of ON are due to an immune mediated process associated with a recent immunization, viral or other infection⁽⁵⁾. Post encephalitic optic neuritis has been described in the literature^(5,6) but we could not find any such case in JE.

The average age of ON in children is 10 years. In both children and adults, a female predominance exists. Clinical features include periocular pain, abnormal visual

acuity and fields, reduced colour vision, RAPD and abnormal VEP⁽⁷⁾. Headache is common in children with ON. Periorbital pain, especially if it worsens with eye movements, supports a diagnosis of ON. Less commonly, ON may be the first manifestation of multiple sclerosis (MS) or other demyelinating disorder. Possible mechanisms of inflammation in immune mediated ON are the cross-reaction of viral isotopes and the persistence of a virus in CNS glial cells⁽⁶⁾.

ON in children has several unique characteristics, that distinguish it from ON in adults. First, it is more often anterior. Second it is more often a bilateral (60%) simultaneous condition. Third, it often seems to occur within 1-2 weeks after a known or presumed viral infection. Fourth, it is less often associated with the development of multiple sclerosis. Finally it is often steroid sensitive and steroid dependent⁽⁴⁾. In our case the ON developed almost after a month following JE, it was unilateral, and it was a posterior affection of the optic nerve head. Obtaining an accurate history from children may be difficult. A review of systemic symptoms should be aimed at detecting recent infections, vaccination and vasculitis⁽⁵⁾.

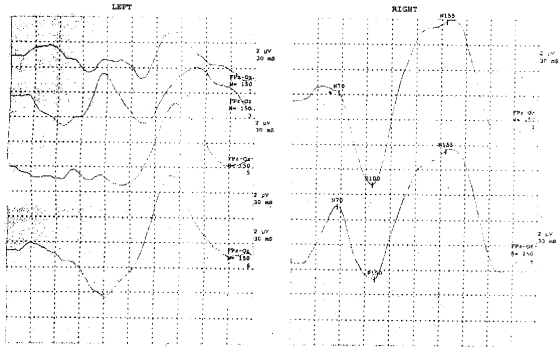
As per ONTT recommendation⁽⁷⁾ the patient was treated with pulse steroid therapy which resulted to a good visual recovery. As methyl prednisolone and dexamethasone show similar efficacy in most conditions⁽⁸⁾ and dexamethasone is cost effective we treated the case with the later. Adequate monitoring is essential during the therapy as pulse therapy is associated with side effects like infections, hypertension, dyselectrolytemia and behavioral effects. Intravenous (IV) pulse steroid is recommended to speed the recovery of visual function, as this is an IV therapy, children are admitted to the hospital⁽⁸⁾.

Children with ON usually have a good prognosis, but a minority⁽⁴⁾ of patients experience persistent visual loss⁽⁴⁾. If only one eye is affected, the visual prognosis may be better than in adults. Obtaining an accurate history from children may be difficult.

Young children may not notice unilateral visual loss and may not report bilateral visual loss until their behaviour indicates visual loss to parents or teachers⁽⁵⁾. Optic neuritis is an uncommon ocular manifestation of viral encephalitis, which should be suspected in patients with meningitis or encephalitis who reside in endemic areas.

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248 PAPIA KHATOON 9 Yrs/Female 0 Cms/0 Kg
Technician: Ref by: Date: 30.08.08
VEP RECORD



Tr	Montage	NTD	P100	N155	P100 - N155	μV
1	PPa-Oa					
2	PPa-Oa					
3	PPa-Oa					
4	PPa-Oa					
5	PPa-Oa					
6	PPa-Oa					
7	PPa-Oa					
8	PPa-Oa					

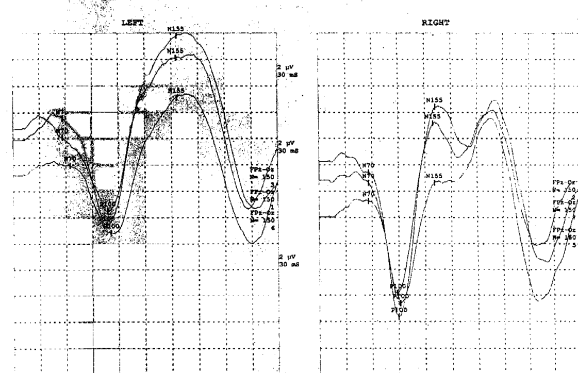
Test Comments

NOTE: THE RESULTS MAY BE CLINICAL X CORRELATED.
RMS ENG SP MARK-II

VEP study shows - Absence of any wave formation in both eyes.
Final Impression - Absence of VEP in both eyes may be due to optic pathway lesion - Optic Neuropathy (ON) - ch. Correlation need.

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274 PAPIA KHATOON 9 Yrs/Female 0 Cms/0 Kg
Technician: Ref by: Date: 03.10.08
VEP RECORD



Tr	Montage	NTD	P100	N155	P100 - N155	μV
1	PPa-Oa	287.7	100.3	186.3		8.16
2	PPa-Oa	56.3	88.6	129.4		8.49
3	PPa-Oa	56.1	107.5	165.6		5.57
4	PPa-Oa					
5	PPa-Oa	56.3	91.9	130.6		7.85
6	PPa-Oa	56.3	90.0	131.9		11.11
7	PPa-Oa					
8	PPa-Oa					

Test Comments

NOTE: THE RESULTS MAY BE CLINICALLY CORRELATED.
RMS ENG SP MARK-II

VEP study is within normal limit
Dr.
3/10

Figure 1: Pattern VEP showing absence of wave formation.

Figure 2: Pattern VEP at one month follow up showing normal wave formation

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