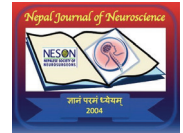


# Scrub typhus Meningoencephalitis : Diagnostic dilemma



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## Abstract

**Introduction:** Neurological involvement in the form of meningitis or meningoencephalitis, although well documented in scrub typhus, has not been extensively studied in the paediatric population. It is seldom considered in the differential diagnosis of meningitis in Indian subcontinent.

**Case Presentation:** We report a case of Scrub typhus meningitis in 13 year old male child. The Cerebrospinal Fluid (CSF) revealed lymphocytic pleocytosis, raised proteins and a normal glucose level.

**Conclusion:** Early diagnosis and prompt institution of doxycycline therapy may lead to early cure of scrub typhus even when features of meningitis supervene. However, Ceftriaxone which is commonly used to treat bacterial meningitis is suboptimal in the treatment of scrub typhus.

**Key words :** Scrub typhus, Meningoencephalitis, CSF

## Introduction

Scrub typhus, which is caused by *Orientia tsutsugamushi*, an obligate intracellular pathogen, is a reemerging infectious disease causing significant global public health concern. Scrub typhus can be associated with varied and protean clinical manifestations ranging from nonspecific fever to fulminant multiorgan dysfunction syndrome.<sup>1</sup> Neurologic manifestations of scrub typhus can range from meningoencephalitis and encephalopathy to isolated cranial nerve palsies, acute disseminated encephalomyelitis, and stroke<sup>1</sup>.

Its commonly presents as fever, headache, inoculation eschar, and lymphadenopathy. In severe forms,

pneumonia, myocarditis, azotemia, shock, gastrointestinal bleed, and meningoencephalitis are known to occur. Although available medical literature mentions many of these complications, central nervous system involvement, in the form of acute encephalitis syndrome, has seldom been highlighted<sup>2</sup>.

## Case presentation

13 year old previously healthy male child admitted in our hospital with complaints of fever on and off since 15 days followed by lower limb weakness (unable to stand and walk), drowsiness and altered sensorium since 1 day. He had 1 episode of generalized tonic clonic convulsion. History of travel from village before onset of fever. On examination child was drowsy, responding to deep painful stimuli. Blood pressure was normal. No rash over body. Bilateral cervical lymphadenopathy present. On systemic examination generalised hypotonia present. Deep tendon reflexes were brisk with extensor plantar reflex. Neck rigidity, Kernig's sign was present. Mild hepatosplenomegaly was present. Initial complete hemogram revealed thrombocytopenia (platelet count: 72,000/cmm), elevated transaminases but hematocrit test along with renal function tests, serum electrolytes, and other liver function tests were normal. CSF routine s/o glucose 33 (corresponding HGT 83), protein 87.7, cells 133 (Poly-15, Lympho-85). CSF culture was no growth. Covid antibody titre reactive but 2D Echo normal. Electroencephalogram was normal. Magnetic Resonance Imaging Brain suggestive of meningoencephalitis. Pan neurotropic virus panel of CSF was negative. CSF CB-NAAT not detected. Epstein Barr Virus VCA Ig M and Chickengunaya IgM negative. Hence Scrub typhus was thought. Scrub typhus IgM was reactive. Child started

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on injection Doxycycline with resultant dramatic clinical improvement within 24 hours and subsequently patient was discharged after 14 days of antibiotics.

## Discussion

Acute encephalitis syndrome (AES) is characterized by rapid onset of febrile illness associated with convulsion, altered sensorium and focal neurological deficit such as aphasia, hemiparesis, involuntary movements, ataxia or cranial nerve palsies. Recent studies have shown scrub typhus as an important cause of AES other than the etiologies like Herpes simplex encephalitis, Japanese Encephalitis, malaria, and dengue.

In this case we faced a diagnostic dilemma due to the elevated CSF proteins with lymphocytic pleocytosis and poor response to conventional antibiotics. Literature mentions that CSF in typhus meningoencephalitis can show a spectrum of changes. It may show leukocytosis, elevated protein, and slightly reduced glucose resembling viral meningoencephalitis, leptospirosis, and in certain instances tuberculous meningitis<sup>3</sup>.

The clinical and laboratory features differentiating scrub typhus meningitis from other usual forms of meningitis have been studied and reported. Scrub meningitis has longer duration of fever prior to presentation than bacterial meningitis. CSF analysis of patients with scrub typhus have significantly less pleocytosis, greater lymphocyte proportion and a lesser degree of protein elevation than in cases of bacterial meningitis. Similarly, scrub typhus can be differentiated from tubercular meningitis by lesser duration of symptoms, lesser CSF pleocytosis and protein and lesser CSF Adenosine deaminase, but these are all relative estimations<sup>4</sup>.

Cerebrospinal fluid examination of our patient showed elevated protein (87.7) and low glucose levels (33), and pleocytosis. The above-mentioned pattern of CSF is consistent with subacute tubercular meningitis like picture, which is therefore, is an important differential of scrub typhus meningoencephalitis. Some studies have reported usefulness of CSF adenosine deaminase for the differentiation but its definite role is not proven. Neurological involvement in scrub typhus is associated with different neuroimaging findings ranging from normal imaging to abnormalities like cerebral edema, features of ischemic changes, small ring enhancing lesions in the corpus callosum, and hyperintensities in periventricular and deep white matter regions of the brain<sup>5</sup>.

## Conclusion

Scrub typhus should be suspected in patients presenting with AES along with thrombocytopenia and elevated transaminases even in uncommon geographical areas, so that treatment can be started early. Clinical picture along with serology and CSF analysis is helpful in diagnosis. Significantly elevated CSF protein levels with lymphocytosis can be observed in Scrub Typhus meningoencephalitis which can be confused with tuberculous meningitis. Rapid and faster normalization of CSF after doxycycline may be a clue to diagnosis. Scrub typhus meningoencephalitis responds well to doxycycline with good outcome but not to ceftriaxone, the commonly used drug to treat bacterial meningitis.

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