

Scrub Typhus Meningismus: A Diagnostic Dilemma

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ABSTRACT

Scrub typhus is an acute, febrile infectious illness caused by *Orientia tsutsugamushi*, an obligate intracellular gram negative bacterium. Serious complications occur in the second week of illness. Absence of eschar indicates a high risk of mortality. An interesting case of meningitis is presented here in a 42-year-old male patient presented with the history of fever and breathlessness for the last seven days and headache, vomiting and disorientation for the last one day. On examination, patient had fever with disorientation and neck rigidity in the initial part of neck flexion in anteroposterior direction only. USG Whole Abdomen revealed hepatosplenomegaly with bilateral mild pleural effusion. Scrub typhus meningismus was diagnosed in the absence of eschar. IgM Scrub typhus antibody was positive by Immunochromatographic method. The importance of the case lies in the fact that since India is endemic for both Tuberculosis (TB) and Scrub typhus; specific tests like IgM antibody and CSF ADA (Adenosine Deaminase) may go a long way in avoiding unnecessary treatment in patients.

Keywords: Meningitis, *Orientia tsutsugamushi*, Scrub typhus IgM antibody

CASE REPORT

A 42-year-old male patient presented with the history of fever and breathlessness for the last seven days and headache, vomiting and disorientation for the last one day. Fever was high grade with chill and rigor with dry cough. There was no history of loose motions, constipation, urinary complaints, rashes, jaundice or bleeding from any site. Skin rashes or eschar was negative. Patient had no head trauma, seizures, convulsions or focal neuro deficit, however, headache was present all over the head and was associated with vomiting several times. Also, history for orthopnoea, Paroxysmal Nocturnal Dyspnoea (PND) and chest pain was not significant.

On examination, patient had fever with disorientation and neck rigidity in the initial part of neck flexion in anteroposterior direction only. Pupils were mid dilated bilaterally with sluggish reaction to light. Both plantars were extensor. Kernig's and Brudzinski's signs were negative and there was no cranial nerve palsy. On chest auscultation, there were bilateral crepitations at base with vesicular breath sounds and first and second heart sounds were audible.

The provisional diagnosis was bacterial meningitis. The differential diagnoses were Tubercular Meningitis, Viral Meningitis and Aseptic Meningitis.

On investigation, Haemoglobin was 10.8 gm/dL, Total Leukocyte Count-4800/mm³ (Neutrophils-90, Lymphocytes-7, Eosinophils-1, Monocytes-2), platelet count was 1.0 lakh/mm³. Malaria, Dengue, Typhoid, *Leptospira* were excluded by MP slide, MP Dual antigen, IgG and IgM Dengue antibody, TyphiDot M, *Leptospira* IgM antibody, respectively. Scrub Typhus IgM antibody was positive by immunochromatographic method.

CSF study done on day one of admission, revealed cell count of 15 cells/mm³, all of which were lymphocytes with normal sugar and protein content was 77 mg/dL (Mildly elevated). There was no coagulum, Cerebrospinal Fluid (CSF) was straw coloured. Cartridge based Nucleic Acid Amplification Technique (CBNAAT) was negative and Adenosine Deaminase (ADA) was normal (<10 U/L). There was no HSV PCR and India Ink Preparation was negative. Mild hyponatremia and hypoxemia was present.

USG Whole Abdomen revealed hepatosplenomegaly with bilateral mild pleural effusion. CT Brain and MRI Brain were normal.

Echocardiography did not reveal any abnormality and urine reports were normal. Chest X-ray was normal. Serology was non-reactive. Scrub typhus meningismus was diagnosed. The [Table/Fig-1] depicts the blood investigations and [Table/Fig-2] depicts the clinical features of the patient. Bilirubin and Alkaline phosphatase were normal.

Day 1	Day 3	Day 5	Day 7
SGOT-210 U/L		150 U/L	30 U/L
SGPT-121 U/L		80 U/L	25 U/L
Albumin-3.2 g/dL		3.2 G/dL	3.5 G/dL
Globulin-2.5 g/dL		2.4 G/dL	2.4 G/dL
CRP-9.6 mg/L		8.0 Mg/L	3.0 Mg/L
Sodium-130 meq/L		135 meq/L	136 meq/L
Urea-57 mg/dL	48 mg/dL		30 mg/dL
Creatinine-1.2 mg/dL	1.1 mg/dL		0.8 mg/dL
FBS-90 mg/dL			
Amylase-67 U/L			
Lipase-100 U/L			

[Table/Fig-1]: Blood investigations on days from admission.

Neurological signs	Non neurological signs
Headache	Pneumonia
Neck rigidity	Hepato-splenomegaly
Vomiting	Pleural effusion
Bilateral mid dilated pupils	Edema

[Table/Fig-2]: Neurological and non-neurological signs of Scrub typhus.

Patient was started with Intravenous Ceftriaxone (2 gm iv BD APST), Linezolid (600 mg iv BD APST), Intravenous Normal saline (iv QDS), PPI (40 mg iv OD) and ondansetron (4 mg iv TDS) and steroids. (Injection Hydrocortisone 100 mg iv TDS). He started improving from fourth day of admission after addition of intravenous Doxycycline (100 mg iv BD APST) from third day of admission. Patient was put on Ryle's tube and Foley's catheter. Fever and vomiting subsided, he was conscious and oriented and started feeling better. Neck was supple, oral feeding was started on fifth day of admission. Catheter was removed on Day 7. Injection Ondansetron was given 4 mg SOS from Day 6. IV fluid was given TDS from Day 8 and was stopped on

Day 10. Hydrocortisone was given 100 mg iv BD from Day 6, then 100 mg iv OD for 2 days. Doxycycline injection was given for 12 days.

DISCUSSION

Scrub typhus is an important cause of fever caused by *Orientia tsutsugamushi* and is acquired during occupational and agricultural exposures [1], as active rice fields act as an important reservoir of transmission [2]. Humans get affected through the bite of an infected chigger, the larval stage of *Leptotrombidium* mites. The bacteria multiply at the inoculation site. Fever is preceded by bacteremia, 3-5 days before fever starts [3].

It spreads to multiple organs via Reticulo-endothelial system and leads to fatal complications [4,5]. Serious complications occur in the second week of illness and comprise of pneumonia, pleural effusion, oedema, hepatosplenomegaly, Acute Respiratory Distress Syndrome (ARDS), Acute Kidney Injury (AKI) and meningitis [6]. When eschar is absent, that indicates a poor prognosis. [7]. Delirium may occur which may be followed by progressive stupor, coma, sustained fever. Focal neurologic deficits and optic neuritis may occur in untreated cases. Stiffness of the neck is noted rarely and the CSF may be entirely normal or show only modest lymphocytic pleocytosis. Rare cases of encephalitis, myelitis and cerebellitis have also been reported [8]. In the study conducted by DM Kim et al., in Korea in 2013, it proved that pneumonia was associated with meningitis and meningoencephalitis in Scrub Typhus [9]. Viswanathan S et al., in 2012 in South India showed that Scrub was associated with meningitis in 25% of cases and eschar in 20% of cases [10]. The study by Takhar RP et al., in Rajasthan showed that approximately 3% of patients had meningitis in Scrub Typhus patients [11].

CONCLUSION(S)

The importance of the case lies in the fact that as India is endemic to Tuberculosis, the diagnosis of Scrub Typhus meningitis by a

simple test and CSF ADA may prevent unnecessarily prolonged treatment.

The case presented here highlighted the importance of clinically detecting Scrub typhus meningism in endemic areas even in the absence of eschar and treating patients properly after excluding the other common possibilities. The dramatic response to Doxycycline also is important in diagnosis which was evident in the patient.

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AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Dec 04, 2019
- Manual Googling: Dec 16, 2019
- iThenticate Software: Feb 11, 2020 (9%)

ETYMOLOGY: Author Origin

Date of Submission: **Dec 03, 2019**
Date of Peer Review: **Dec 30, 2019**
Date of Acceptance: **Jan 30, 2020**
Date of Publishing: **Mar 01, 2020**