

## Scrub typhus meningoencephalitis- An interesting case study

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### ABSTRACT

Scrub typhus is a mite borne acute febrile illness by Gram-negative intracellular organism *Orientia tsutsugamushi*. It commonly presents as fever, headache, inoculation eschar, and lymphadenopathy. In severe forms, pneumonia, myocarditis, azotemia, shock, gastrointestinal bleed, and meningoencephalitis are known to occur [1-2]. Central nervous system involvement is a complication of scrub typhus ranging from meningitis to meningoencephalitis. We report a case of acute meningoencephalitis syndrome, following scrub typhus infection in a 13-year-old child. Patient was treated with injection ceftriaxone, injection dexamethasone, capsule doxycycline, tablet azithromycin and injection levetiracetam. Patient was hospitalized for 13 days and recovered completely.

**Keywords:** Meningoencephalitis, Scrub typhus, Febrile illness.

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## INTRODUCTION

Scrub typhus is an acute febrile infectious illness that is caused by *Orientia* (formerly *Rickettsia*) *Tsutsugamushi*. It is also known as *Tsutsugamushi* disease or *Chigger* borne typhus. It is a zoonotic disease, transmitted by arthropod vector *trombiculid* mite. Humans are accidental hosts in this disease. Scrub typhus is prevalent in many parts of India. There have been outbreaks in areas located in the sub- Himalayan belt, from Jammu to Nagaland. Outbreak occurs more frequently during the rainy season. However, in southern India outbreaks are reported during the cooler months of the year. Scrub typhus is a re-emerging infectious disease in India [3,4,5,6,7,8]. In severe forms, pneumonia, myocarditis, azotemia, shock, gastrointestinal bleeding and meningoencephalitis may occur. Central nervous system (CNS) involvement may be a complication of scrub typhus which ranges from meningitis to frank meningoencephalitis [9,10,11,12]. The name "typhus" itself, is derived from the Greek word "typhos", which means stupor. Other neurological complications include seizure, cranial nerve deficits, vasculitic cerebral infarct, brain hemorrhages, polyneuropathy, sensorineural hearing loss, meningitis or meningoencephalitis. Here we are describing a case of acute meningoencephalitis syndrome (MES), following scrub typhus infection in a 13 year old child . The patient did not have concurrent infection with any other tropical febrile illnesses like malaria, chikungunya, typhoid and dengue fever.

## CASE SUMMARY

A 13-year-old male, resident of Nallasopara (Maharashtra) was admitted in private hospital with complaints of fever without chills and rigors, headache, myalgia for 7 days. Later, after 5 days patient started developing altered sensorium, difficulty in speaking and weakness of all four limbs. He was started on injectable antibiotics and steroids. There was worsening of patient's general condition and he was referred to tertiary care government hospital. During transit, he suddenly developed generalized tonic clonic seizure (GTCS) and so he was immediately admitted in medical intensive care unit at Bharatratna Dr. Babasaheb Ambedkar Municipal and General Hospital, Kandivali (West). On admission he was given

injection Phenytoin, injection ceftriaxone and oxygen support. After stabilization and assessment of the patient, he was started empirically with injection levetiracetam, injection mannitol, injection dexamethasone, injection acyclovir and injection ceftriaxone. On detailed history, patient revealed that he had history of travel to his native place (Ratnagiri, Maharashtra) 2 days prior to onset of symptoms. On examination, patient was febrile with temperature of 101.4°F. Blood pressure of 80/50 mm Hg in supine position in right upper arm, pulse 120/min, SpO<sub>2</sub> 97% on room air. Patient was drowsy but arousable on verbal commands. On general physical examination, eschar was not found. No rash was present. Tongue bite was present.

**CNS examination:** Higher mental functions and cranial nerve examination could not be accessed. Pupils were normally reacting to light. There were no signs of increased intracranial pressure (ICP). Neck rigidity was present. Bilateral plantar reflexes were flexors. There was mild-moderate hepatosplenomegaly on per abdomen examination. Other organ systems did not show any abnormality. Fundus examination of the patient suggested no signs of papilledema and increased intracranial pressure. Non-contrast computed tomography (NCCT) head was normal. Magnetic resonance imaging (MRI) of the brain showed focal non enhancing signal, seen in right thalamus with leptomeningeal enhancement in bilateral occipital region suggestive of meningoencephalitis. Lumbar puncture was done under aseptic precautions and cerebrospinal fluid (CSF) fluid was sent for cytological and biochemical analysis. On gross examination, CSF was drained with normal pressure and was found clear. CSF was found acellular, with proteins 37 mg/dL, sugar 56 mg/dL. Corresponding blood sugar was 103 mg/dL. Gram stain and Ziehl-Neelsen staining of CSF fluid was negative. CSF for viral microorganisms panel was negative for flavivirus, enterovirus, paramyxovirus and herpes virus.

Complete blood count (CBC) showed mild thrombocytopenia hemoglobin [Hb]-12.7, white blood cell [WBC]- 7390, platelet count- 62,000 with mild derangement of liver enzymes with



serum glutamic pyruvic transaminase (SGPT): 117, serum glutamic oxaloacetic transaminase (SGOT): 88. Infectious panel tests for MP QBC (Malarial parasite Quantitative Buffy Coat), Dengue immunoglobulin (IgM/IgG) and NS1 antigen to rule out Dengue and IGM Typhi dot test to rule out Typhoid fever and enzyme-linked immunosorbent assay (ELISA) test for Chikungunya of the patient were negative. Ultrasonography of abdomen revealed moderate hepatosplenomegaly. Chest X-ray of the patient was normal. ELISA test to detect IgM antibodies against *Orientia Tsutsugamushi* antigens for scrub typhus was found positive. Hence the patient was started on capsule doxycycline, tablet azithromycin along with injection ceftriaxone, injection levetiracetam, injection dexamethasone, and symptomatic treatment. By Day 3, patient's sensorium improved and he started to follow verbal commands. He was hospitalized for 13 days and recovered completely. There was no focal neurological deficit.

## DISCUSSION

Scrub typhus is a potentially fatal infection, affecting nearly 1 million people each year <sup>[13]</sup>. Several epidemics of scrub typhus have occurred in India but the literature is still limited. *Orientia Tsutsugamushi*, an obligate intracellular bacterium, is transmitted to humans by the bite of larval mites (chiggers) of *Leptotrombidium deliense*. The incubation period is 6-21 days with an average of 10 days. The larval mites usually feed on wild rats. When human comes in contact with these scrubs, they contract the infection. The basic pathologic changes include focal vasculitis

and perivasculitis of small blood vessels in the involved organs. These occur as a result of multiplication of the organism in the endothelial cells lining the small blood vessels. Mortality rates for scrub typhus range from < 1% to 50% depending on proper and timely antibiotic treatment, status of the individual infected, and the strain of *Orientia Tsutsugamushi* encountered <sup>[14]</sup>.

## Scrub typhus in children

In children, scrub typhus may be mild or severe. Most patients present with fever and regional/generalized lymphadenopathy. <sup>15,16]</sup> A single painless eschar, maculopapular rash, hepatomegaly, splenomegaly, and gastrointestinal symptoms (abdominal pain, vomiting, and diarrhea) may be present. Case fatality rate in untreated patients may be as high as 30%, although deaths in children are infrequent. Acute meningoencephalitis syndrome is characterized by rapid onset of febrile illness associated with convulsions, altered sensorium and focal neurological deficit such as aphasia, hemiparesis, involuntary movements, ataxia or cranial nerve involvement.

## CONCLUSION

Acute meningoencephalitis syndrome should be suspected in all patients with fever, altered sensorium and hepatic involvement. Oral doxycycline or azithromycin should be started as soon as possible for better outcomes. Thus, such unusual presentation of scrub typhus can be easily overlooked, resulting in delay in initiating life-saving treatment.



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