

Short Report

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# Pure cerebellitis: A Case Report on Rare Presentation of Scrub Typhus Fever

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## Article Info

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### Keywords

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## ABSTRACT

Scrub typhus is an infectious rickettsial disease caused by the bacterium *Orientia tsutsugamushi*, transmitted through the bite of chigger mites. This illness can manifest in various ways, ranging from a simple tropical fever to complex multi-organ dysfunction, encompassing acute liver failure, renal failure, acute respiratory distress syndrome, myocarditis, septic cardiomyopathies, secondary hemophagocytic lymphohistiocytosis (HLH), and disseminated intravascular coagulation (DIC) among others. While neurological complications can arise in scrub typhus, the exact frequency remains uncertain. One rarely reported neurological complication associated with this condition is cerebellitis.

In this specific case report, we detail the clinical experience of a 25-year-old woman who presented with fever and substantial cerebellar dysfunction and was diagnosed with scrub typhus based on serological test, specifically an IgM enzyme-linked immunosorbent assay (ELISA) blood test. Notably, her MRI scan and blood investigations revealed no abnormalities, and she responded well to antimicrobial and steroid therapy, ultimately experiencing a full recovery without any complications.

## Introduction

Scrub typhus, a resurging rickettsial disease caused by *Orientia tsutsugamushi*, has expanded its footprint across the Asia-Pacific, including Southeast Asia and India—albeit diagnosis often remains challenging owing to nonspecific febrile presentations and variable detection of eschars<sup>1</sup>. Diagnosis primarily relies on IgM antibody detection via enzyme-linked immunosorbent assay (ELISA), which remains the standard due to its high sensitivity and specificity<sup>2</sup>. Among its myriad neurological complications, which occur in up to 20 percent of cases, focal cerebellar involvement is strikingly rare<sup>3</sup>. While mechanisms underlying neurological manifestations including meningitis, encephalitis, and immune-mediated phenomena—such as direct endothelial invasion, post-infectious vasculitis, and immune-mediated injury—have been increasingly elucidated<sup>4</sup>, isolated cerebellitis remains virtually undocumented. Only two case reports to date describe pure cerebellar involvement: one in a 24-year-old Indian man and another in a 26-year-old woman, both demonstrating acute cerebellar dysfunction without broader encephalopathy<sup>5,6</sup>.

Doxycycline is the first-line treatment, although recent Indian randomized data support combination therapy with doxycycline and azithromycin in severe cases to enhance early resolution of complications<sup>7</sup>.

Epidemiologically, the risk of scrub typhus correlates strongly with environmental and behavioral factors endemic in South Asia, including

proximity to vegetation and scrub habitats, seasonal agricultural exposures, indoor firewood storage, open defecation, and frequent contact with vegetation—all of which elevate chigger bite risk<sup>1,8</sup>. In this context, our case of isolated cerebellitis in scrub typhus not only exemplifies an exceptionally uncommon clinical presentation but also underscores the need for heightened awareness and inclusion of environmental exposure history to reinforce early recognition, prompt diagnosis, and timely intervention.

### Case Presentation

A 25-year-old woman from Chamoli, Uttarakhand, presented with a three-day history of tremors and spontaneous nystagmus. These symptoms were preceded by two weeks of intermittent high-grade fever with chills, rigors, and generalized myalgia. She had initially received symptomatic treatment at a primary health center before being referred to our facility, where she was admitted to the medical intensive care unit. Additionally, she also reported progressive unsteadiness while walking and slurred speech for eight days.

There was no history of vomiting, diarrhea, rash, trauma, altered consciousness, seizures, respiratory difficulty, urinary or fecal incontinence, or meningeal irritation. Her past medical history was unremarkable, with no known neurological illness, and there were no relevant family, occupational, or environmental risk exposures.

On admission, the patient was conscious, alert, and oriented. Her vital signs were stable: afebrile, pulse 78/min, BP 120/78 mmHg, and respiratory rate 18/min. No petechiae, eschar, mucocutaneous bleeding, lymphadenopathy, or any other systemic abnormality.

Neurological examination was significant for bilateral cerebellar dysfunction. Findings included cerebellar dysarthria with scanning speech, pan-directional spontaneous nystagmus, broad-based gait, truncal ataxia, dysmetria, intention tremors, and dysdiadochokinesia. Motor and sensory examinations were unremarkable, cranial nerves were intact and deep tendon reflexes were preserved.

Initial laboratory investigations showed a hemoglobin level of 131 g/L, hematocrit 39.1%, total leukocyte count  $10.53 \times 10^9/L$ , and platelet count  $344 \times 10^9/L$ . Liver and renal function tests, serum electrolytes, and other routine biochemistry and inflammatory markers were within normal limits. Blood and urine cultures were sterile. Infectious disease screening for dengue, malaria, leptospirosis, chikungunya, and brucellosis was negative. However, scrub typhus IgM antibodies were detected via ELISA, confirming the diagnosis.

Neuroimaging was performed to evaluate the etiology

of her cerebellar symptoms and to exclude structural lesions. Initial non-contrast CT (NCCT) head was within normal limits with no evidence of acute hemorrhage, mass effect, or hydrocephalus. Subsequently, a contrast-enhanced MRI of the brain was performed. Multiplanar images were acquired using standard sequences, including T1-weighted, T2-weighted, T2-FLAIR, diffusion-weighted imaging (DWI), and susceptibility-weighted imaging (SWI). The MRI revealed no evidence of demyelination, infarction, hemorrhage, cerebellar or brainstem lesions, or raised intracranial pressure. There were no abnormal contrast-enhancing lesions, and the posterior fossa structures appeared normal.

Although a lumbar puncture was considered, it was deferred as neuroimaging showed no evidence of raised intracranial pressure or structural lesions, and the patient's marked ataxia and involuntary movements posed technical challenges and increased procedural risk. Moreover, in the absence of meningeal signs or altered sensorium, and with a confirmed serological diagnosis of scrub typhus, cerebrospinal fluid analysis was deemed unlikely to provide additional diagnostic value or alter clinical management.

The patient was managed supportively with intravenous fluids, antipyretics, and nutritional supplementation including thiamine (100 mg twice daily). Empiric therapy with doxycycline (100 mg twice daily) and low-dose dexamethasone (8 mg twice daily) was initiated for 14 days. An osmotic diuretic was started initially due to concern for possible raised intracranial pressure suggested by the pan-directional spontaneous nystagmus, but this was discontinued once neuroimaging was normal and scrub typhus was confirmed. Over the hospital stay, the patient showed gradual clinical improvement, with complete resolution of neurological symptoms by discharge.

During her hospital stay, the patient demonstrated progressive clinical improvement, with resolution of dysarthria, gait instability, and nystagmus. By the 14th day of hospitalization, there was significant recovery in speech and coordination, although residual tremors persisted at the time of discharge. The total duration of hospitalization was 14 days.

At a two-week outpatient follow-up, the patient reported complete resolution of unsteadiness and dysarthria. Neurological examination showed no residual nystagmus, dysdiadochokinesia, or upper limb incoordination, indicating full recovery from her acute cerebellar syndrome secondary to scrub typhus.

### Discussion

Acute cerebellitis (AC) is an uncommon neurological syndrome characterized by inflammation of the cerebellum, often presenting with dysarthria, ataxia, tremors, and nystagmus. It is most frequently associated

with viral infections such as herpes simplex virus, Epstein-Barr virus, cytomegalovirus, varicella zoster virus, mumps, and measles. In endemic areas, common tropical infections including dengue, malaria, chikungunya, leptospirosis, and brucellosis must also be considered due to their potential for atypical neurological presentations.

Scrub typhus, caused by *Orientia tsutsugamushi*, is an increasingly recognized etiology of acute undifferentiated febrile illness in Southeast Asia and India. While its neurological complications may include meningoencephalitis, cranial nerve palsies, transverse myelitis, and Guillain-Barré syndrome, focal cerebellar involvement is exceedingly rare. Previous studies, including one by Silpapojakul et al., reported cerebellitis in only 1 of 72 cases of central nervous system involvement. Another study noted cerebellar signs in just 1 out of 29 patients with scrub typhus-related neurological symptoms. To our knowledge, there are no prior reports from India of isolated cerebellitis as the sole manifestation of scrub typhus.

Our patient presented with acute cerebellar syndrome in the absence of other systemic or neurological complications. Comprehensive evaluation excluded alternative infectious etiologies, and scrub typhus was confirmed serologically. Prompt treatment with doxycycline and adjunctive corticosteroids led to near-complete recovery at discharge and full resolution of symptoms at follow-up.

This case highlights the importance of maintaining a high index of suspicion for scrub typhus in patients with acute cerebellar signs, particularly in endemic regions. Early recognition and appropriate antimicrobial therapy are essential to prevent morbidity. The rarity of isolated cerebellitis in scrub typhus makes this case a valuable addition to the growing literature on its atypical neurological presentations.

### Standard Protocol Approvals, Registrations, and Patient Consents

As per institutional guidelines at VCSG Government Institute of Medical Sciences and Research & H.N.B Base Hospital, formal ethical committee approval was not required for this single case report. Written informed

consent for publication was obtained from the patient.

### Author Contributions

**Aditi Mohan:** Collected clinical data, performed literature review, drafted the manuscript, and managed patient follow-up, including vital sign monitoring and clinical assessment.

**Dr. K.S. Butola:** Served as the attending physician, supervised patient management and treatment, and critically reviewed and revised the manuscript for intellectual content.

### Data Availability

All data supporting the findings of this case report are included within the article. Additional details are available from the corresponding author upon reasonable request.

### Conflict of Interest

None

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