

## Scrub Typhus: A Case Report from Eastern Nepal

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### ABSTRACT

Scrub typhus is of the cause of fever among the people more among the farmer working in the rural eastern part of Nepal. It is one of the commonly under diagnosed conditions probably due to a lack of clinical suspicion and lack of diagnostic facilities. The commonest presentation of the disease includes Fever, Headache, Myalgia, Rashes, Vomiting, and Eschar. The condition may also present with gastrointestinal features such as Hepatosplenomegaly, Ocular changes such as conjunctival injection, Acute Kidney Injury (AKI), or neurological findings in the form of meningoencephalitis. Here, we present a report of a case of scrub typhus from a rural part of eastern Nepal. While managing such early appropriate empirical therapy for scrub typhus after a careful clinical assessment prevents complications and saves lives.

**Keywords:** Scrub Typhus; Eschar; Fever

### INTRODUCTION

Scrub typhus is the vector-borne disease caused by a Gram negative intracellular bacilli; *Orientia tsutsugamushi*. It is transmitted by the larva of trombiculid mite. It is one of the differential diagnosis for acute febrile illness in Southeast Asia,<sup>[1]</sup> including Nepal's Eastern and Southern belts, where it emerges as an epidemic during the monsoon and autumn. It is highly prevalent in rural areas because of timely diagnosis and intervention.<sup>[2]</sup> The incidence of Scrub typhus in Nepal is rising; for instance, there were 101 cases of Scrub Typhus reported in 2015, 831 cases in 2016, and 1,271 cases in 2019 reported in Nepal.<sup>[3,4]</sup> Scrub typhus is also one of the differential diagnoses for fever with decrease platelet count and bleeding.<sup>[5]</sup> It can manifest with either nonspecific febrile illness or with the constitutional symptoms (fever, rash, myalgia, and headache) or with multi organ dysfunction, such as the Acute kidney injury, pneumonia, myocarditis, hepatitis, and meningitis.<sup>[6-12]</sup> Most patients with the condition

rapidly improve with appropriate antibiotic therapy however a small percentage of cases experience serious complications.<sup>[5]</sup> We are reporting the issue of scrub typhus from rural eastern Nepal with a brief discussion on the relevant literature.

### **CASE PRESENTATION**

A 50-year-old Nepalese woman presented to the emergency department of PT Birtacity Hospital with a 4-day history of fever (maximum documented temperature (102°F) associated, headache, myalgia and loss of appetite. She denied respiratory distress and other symptoms; however her SpO<sub>2</sub> was 88% on room air. She is farmer by occupation and gave history of travel to hilly area of eastern terai.

On physical examination, pinkish-coloured, non-pruritic eruptions were observed on her abdomen, extremities and trunk (**Figure 1**). An blackish color eschar was observed in the left thigh (**Figure 2**). Laboratory tests revealed the following: Hemoglobin of 9.6 gm/dl Total count of 5,300 with Lymphocyte 43% and platelet count 103 000/ $\mu$ L; aspartate aminotransferase level 79 U/L and alanine aminotransferase level 99 U/L and Alkaline phosphatase of 614 U/L. Serological tests revealed high *Orientia tsutsugamushi* IgM antibody titres ( Scrub typhus Serology positive). She was diagnosed with Scrub typhus and was started on Intravenous 100 mg of doxycycline. After 2 weeks of the treatment, her symptoms resolved and the skin eruptions disappeared. She was discharged without complication.



**Figure 1:** Maculopapular rash over abdomen.



**Figure 2:** Eschar noted in lower extremity.

## DISCUSSION

Scrub typhus is one of the potential health concern in Nepal due to lack of appropriate health care, along with limited diagnostic facility, and due to the epidemiological trend of the disease.<sup>[2]</sup> The common clinical features are fever with myalgia, rashes, and non-specific symptoms like headache, sweating, and vomiting.<sup>[13]</sup> Patients may manifest gastrointestinal (hepatosplenomegaly), respiratory (pneumonia, ARDS), neurological (meningoencephalitis), or ocular (conjunctival injection, subconjunctival hemorrhage) symptoms.<sup>[5]</sup> The clinical features of this condition also resemble to other tropical infections like malaria, enteric fever, dengue, or leptospirosis.<sup>[5]</sup> But one of the characteristic finding i.e eschar is found in about half the patients with proven scrub typhus.<sup>[5]</sup> Previously the presence of eschar was noted in 43.5-87% of the cases from different studies.<sup>[13-15]</sup> It is pathognomonic of scrub typhus<sup>[16]</sup> but is often unreported by patients as it is painless and non-pruritic.<sup>[17]</sup> It is one of the physical examination one need to search to make a differential diagnosis of scrub typhus, so that effective treatment can be initiated as early as possible as delayed diagnosis and treatment for the condition may results in severe complications like Pneumonia, Hepatitis, Meningoencephalitis, Acute Respiratory Distress Syndrome, septic shock, and multisystem organ failure causing death.<sup>[5]</sup> Renal involvement including Acute Kidney Injury is one of the commonest systemic complication of scrub typhus. In one of the study, among 502 patients of scrub typhus diagnosed by ELISA, the majority had stage 1 AKI<sup>[18]</sup> which mostly developed on the fifth to the sixth day of the condition. Further, 18.73% and 3.94% of the patient required Intensive Care Unit (ICU) admission and hemodialysis, respectively.<sup>[18]</sup> In our case, the patient, fortunately, presented during the early stage and recovered well. Delay in diagnosis and the management of the disease would have worsened the prognosis as it is difficult to treat the patient with the complication. Similarly, mortality in the ICU admitted patients of scrub typhus with the complication was found to be in the 20% in a recent study in Nepal.<sup>[19]</sup> Even with the advance laboratory tests, around 94.3% of the cases of Scrub typhus were not diagnosed, according to a surveillance data.<sup>[1]</sup> Result of Weil-Felix test are usually negative during the early stages of the disease<sup>[20]</sup> and only around 50% of patients might have positive tests during the second week of illness.<sup>[1]</sup> Timely diagnosis of the condition and effective antibiotic treatment are usually sufficient to achieve good clinical outcomes.<sup>[21,22]</sup> However, in the resource-limited country like ours, mostly affordable RDTs allow rapid point-of-care testing and diagnosis. Serological tests like indirect immunofluorescence assays (IFAs) though are sensitive are limited because of lack of standardization of the test, variable cutoff titers for endemic regions, and high cost.<sup>[23]</sup> Other diagnostic methods include biopsy of eschar, culture, and polymerase chain reaction (PCR) including Nucleic Acid Amplification Test (NAAT). Hence, early detection and diagnostic accuracy can be improved by combining NAAT and IgM RDTs or Enzyme-Linked Immunosorbent Assays (ELISA).<sup>[24]</sup>

Doxycycline (Drug of Tetracycline group) is the drug of choice, but it is inconsistently used in Nepal. On a review done on 2018, the use of doxycycline, tetracycline, azithromycin, and rifampicin were found to be the effective treatment options with little or no difference among them and with few treatment failures among the drugs.<sup>[21]</sup> Another challenge to treatment is the emergence of resistant strains. It is a serious implication of starting empirical

therapy and is constantly posing a future threat in treatment for scrub typhus. Also, due to the variable occurrence of eschar in the patients in previous studies, its absence does not rule out the disease.<sup>[16]</sup> Similarly, all eschars cannot be attributed to scrub typhus only. It is necessary to differentiate scrub typhus from other diseases such as enteric fever, malaria, dengue, leptospirosis, meningococcal disease, infectious mononucleosis, and HIV which may present with similar clinical features.<sup>[18]</sup> Likewise, co-infection with leptospirosis, dengue, and malaria has also been reported. Hence, a high degree of vigilance is done regarding diagnosis of the condition. Also as correct drug therapy shows the rapid response in the cases of scrub typhus,<sup>[16]</sup> hence it is necessary to incorporate the cheap, yet effective, drugs such as doxycycline in all the treatment guideline of acute febrile illness in patients during the epidemic season in Nepal with similar sign and symptoms.

## CONCLUSIONS

Hence, to conclude with the major problems in dealing with scrub typhus in rural Nepal are availability, sensitivity, cost and significance of laboratory test of scrub typhus. A suspected diagnosis of scrub typhus should be made on the basis of clinical features such as fever with myalgia, headache, vomiting, rashes and specific clinical signs like eschar. Health care providers should always have a high degree of clinical suspicion for Scrub typhus if patient present with fever with such finding, hence conduct a careful physical examination, and remain vigilant for alternate diagnosis like Enteric fever, malaria and dengue in such settings where scrub typhus is one of the common. Hence, in the suspected cases of scrub typhus, incorporation of empirical treatment with appropriate antibiotics i.e Doxycycline while waiting for confirmation and ruling out other possibilities, would timely prevent future complications, disease burden, and death.

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