

## CASE SERIES

# Scrub Typhus Case Series from Tertiary Care Hospital from Central India

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### ABSTRACT:

Scrub typhus is endemic among farmers in the rural southern part of Nepal. It is grossly underdiagnosed due to a lack of clinical suspicion and inadequate testing facilities. The most common clinical features of the disease include fever, rashes, vomiting, myalgia, and eschar. The disease may present with ocular changes such as conjunctival injection, gastrointestinal features such as hepatitis and splenomegaly, acute kidney injury (AKI), or neurological findings in the form of meningoencephalitis. Herein, we present a report of two cases of scrub typhus from a Central India.

**Key words:** Scrub Typhus, Typhoid fever

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### INTRODUCTION

Scrub typhus is an infectious disease caused by the rickettsial bacterium *Orientia tsutsugamushi*. The causative organism displays high levels of antigenic variation. It is a serious public health problem in the Asia-Pacific region including but not limited to the region known as the "tsutsugamushi triangle". One billion people globally covering more than 8 million kilometers from Pakistan in the west, Australia in the south, and Japan in the east are threatened by this infection which can be fatal at times.<sup>1,2</sup>

A systemic review on the burden of scrub typhus in India which is in the "tsutsugamushi triangle" revealed that scrub typhus accounts for at least 25.3% among individuals with acute undifferentiated febrile illness (AUI). Despite being one of the commonest pathogens of the cause of such commonly encountered illness, it remains a neglected disease in terms of research and formulation of health care policies.<sup>3</sup>

Scrub typhus is endemic to a part of the world known as the "tsutsugamushi triangle." This extends from Japan, Taiwan, China, South Korea, Nepal, Northern Pakistan, Papua New Guinea, and the Australian states of Queensland and Northern New South Wales. In India, the presence of scrub typhus has been known for several years. The disease is widely spread all over the country, and was reported in several states - Haryana, Jammu, and Kashmir, Himachal Pradesh, Uttaranchal,

West Bengal, Assam, Maharashtra, Kerala and Tamilnadu. During World War II, there was an outbreak of this disease in Assam and West Bengal, in the 1965 Indo-Pak war and in 1990 and in a unit of an army deployed at the Pakistan border of India. These reports showed a resurgence of this disease in India.<sup>4-7</sup> In the present case series, we have presented data of two cases of Scrub Typhus from Tertiary Care Hospital from Central India.

### CASE 1

A 37 year old male patient presented at medicine OPD with fever with chills since 8 days and shortness of breath since 4 days on physical examination revealed fever 101 degree Fahrenheit blood pressure 130/70 mm Hg, pulse 92, RR 20 /min, Eschar present over left lower abdominal quadrant. On investigation Complete blood count (CBC) revealed hemoglobin (Hb) of 12.5 g/dl, Total leucocyte count (TLC) of 6800/mm, and platelets of 54,000/mm. The urine analysis were normal. Blood urea 32 mg/dl and serum creatinine 1.4 mg/dl were raised. The liver function tests revealed total bilirubin 3.42 direct 1.91 indirect 1.57 and SGOT 154 IU/L SGPT 162 IU/L ALP 194. serum electrolytes sodium 133 mmol/l potassium 4.9 mmol/l. The chest X-ray PA view confirmed bilateral ground glass opacification. Ultrasound (USG) of abdomen revealed hepatosplenomegaly. Widal test was negative.

Hepatitis B virus surface antigen and anti hepatitis C virus, HIV were negative. A diagnosis of scrub typhus complicated with ARDS was made based on the basis of clinical findings, laboratory results, and positive Weil–Felix test and IgM ELISA. Patient treated with doxycycline 100 mg BD and azithromycin 500 mg OD, oxygen therapy for 5 days. On day 7 patient clinically improved with platelet count 1.32 lakh/mm. Patient was discharged on day 8.

#### CASE 2

A 45 year old male patients presented at medicine OPD with history of fever and chills since one week. He also reported dyspnoea for 2 days. On carrying out general physical examination, his blood pressure was found to be 140/80 mm of Hg with pulse rate of 93. CBC examination demonstrated Hb, TLC and platelet count to be 14.2 g/dL, 9080/mm and 12000/mm. Blood urea and serum creatinine levels were found to be 83 mg/L and 1.3 mg/dL respectively. Serum sodium and potassium levels were found to be 137 mmol/L and 3.9 mmol/L respectively. SGOT and SGPT levels were found to be 65.9 U/L and 59.1 U/L respectively. A diagnosis of scrub typhus complicated with ARDS was made with positive Weil–Felix test and IgM ELISA. Patient treated with doxycycline 100 mg BD and azithromycin 500 mg OD, oxygen therapy for 5 days. On day 6 patient clinically improved with platelet count 1.32 lakh/mm. Patient was discharged on day 9.

#### CASE 3

A 19 year old male patient presented at medicine OPD with high grade Fever with chills since 15 days, Shortness of breath since 2 days, Skin Rashes since 2 days. Physical examination revealed blood pressure 90/60 mm Hg, pulse 114/min, sPO<sub>2</sub> - 86% on RA. Pallor, Icterus was present and cervical lymph nodes were palpable. Maculopapular skin rashes were present all over the body. On Systemic Examination, Respiratory System shows bilateral coarse crepts. ABG shows significant Type 1 Respiratory Failure, Metabolic Acidosis. The chest X-ray PA view confirmed bilateral opacification with significant ARDS. On investigation Complete blood count (CBC) revealed hemoglobin (Hb) of 9.2 gm/dl, WBC count was 9.12 k /cumm, platelet count was 13000/cumm. The urea level was 87.2, Creatinine levels were 3.4 and Na levels were 129, K levels were 3.4, TBil was 7.4, DBil was 4, IBil was 3.2, AST was 140, ALT levels were 130, Albumin was 2.4. Scrub Typhus IgM shows Reactive 5.06. Dengue, MPS, Typhoid, HBsAg, HCV, HIV was absent. A diagnosis of scrub typhus complicated with ARDS with Type 1 Respiratory Failure with Metabolic Acidosis was made based on the basis of clinical findings, laboratory results. Patient was treated with supportive treatment, Ventilatory

support along with Tab Doxycycline 100 MG BD along with Platelet transfusion. But patient could not be revived and died within 24 hours.

#### CASE 4

A 45 year old male patient presented at medicine OPD with fever with chills since 4 days and generalised weakness since 4 days. On Examination, patient had Fever of 101°F, BP was 130/70 mm/Hg, pulse rate was 98/ min. Eschar was present over right abdomen upper quadrant. On Investigation, CBC shows Hb levels of 14.3gm/dl, TLC was 13.4K, Platelet count was 18K/cumm. Blood urea was 80, Serum Creatinine was 0.8. Liver function test were performed. Total Bilirubin was 2.1, Direct was 1.6 and Indirect was 0.57. SGOT was 65.9, SGPT was 59.1, and ALP was 210.3. Serum Electrolytes were assessed. Na levels were 137 and K levels were 3.9. Chest X-ray shows bilateral ground glass opacification and USG of abdomen revealed mild hepatosplenomegaly. Widal test, Dengue card, MP card were negative. Hepatitis B virus surface antigen and hepatitis virus, HIV were negative. A diagnosis of Scrub Typhus was made based on clinical findings, Laboratory test of Weil Felix test, OX-2 agglutination was positive. Patient was treated with Tab Doxycycline 100 mg BD and Azithromycin 100 mg OD. On 8<sup>th</sup> day patient's condition was improved with Platelet count to 220K. Patient was discharged on 8<sup>th</sup> day.

#### CASE 5

A 40 year old male patient presented at medicine OPD with history of fever and vomiting since 7 days. On carrying out general physical examination, patient had fever of 102°F, his blood pressure was found to be 110/70 mm of Hg with pulse rate of 108/min. CBC examination demonstrated Hb, TLC and platelet count to be 13g/dL, 7.95k /mm and 28 k/cumm. Blood urea and serum creatinine levels were found to be 48 mg/L and 0.9 mg/dL respectively. Total Bilirubin was 1.7, Direct was 1.2 and Indirect was 0.45. SGOT and SGPT levels were found to be 98.9 U/L and 86.9 U/L respectively, ALP was 159. A diagnosis of scrub typhus complicated with ARDS was made with positive Weil–Felix test and IgMELISA. Patient treated with doxycycline 100 mg BD and azithromycin 500 mg OD, oxygen therapy for 5 days. On day 6 patient clinically improved with platelet count 1.32 lakh/mm. Patient was discharged on day 9. USG whole abdomen was within normal limits. Widal test, Dengue card, MP card were negative. Hepatitis B surface antigen and hepatitis C virus, HIV were negative. A diagnosis of Scrub typhus made based on clinical findings, Laboratory test of Weil Felix test IGM positive. Patient was treated with Tab Doxycycline 100 mg BD. On 7<sup>th</sup> day, patient's condition was improved with platelet count 70K. Patient was discharged on day 9.

**CASE 6**

A 58 year old male patient presented at medicine OPD with high grade fever with chills since 8 days and altered sensorium since 2 days. Patient was presented to us in unconscious state. On Examination, GCS was very critical, BP was 100/70 mm/Hg, pulse rate was 110/min, sPO<sub>2</sub> was 92% on RA. Pallor, Icterus was present and lymph node was not palpable. On CNS Examination, GCS was E2 V1 M5, Bilateral planter flexors, bilateral Pupil was 2.3 mm wide and reactive to light. Neck stiffness was absent and Eschar was present in left axilla. Lab Investigation shows Hb levels of 10gm/dl, WBC was 3000/cumm, Platelet count was 70K/cumm. TBil was 4.5, SGOT was 80, SGPT was 79, Na was 131, K was 4.4, Urea was 84, Creatinine was 2.1 Chest X-ray PA view was within normal limits. USG of abdomen shows mild hepatomegaly. MPS, Typhoid, Dengue, HIV, HbSag, HCV was negative. Scrub Typhus IgM was positive. A diagnosis of Scrub Typhus with Encephalitis with AKI with MODS was made. Treatment was performed with Ventilatory support and Dialysis. Tab Doxycycline 100 mg BD and supportive medications were given but patient was died within 48 hours.

**DISCUSSION**

Scrub typhus, first described in Japan in 1899, caused by *Orientiatsugamushi* (formerly *Rickettsia*), is an acute infectious disease of variable severity that is transmitted to humans by an arthropod vector of the Trombiculidae family. It affects people of all ages including children. Humans are accidental hosts in this zoonotic disease. While scrub typhus is confined geographically to the Asia Pacific region, a billion people are at risk and nearly a million cases are reported every year.<sup>8</sup> Symptoms parity of scrub typhus fever with other febrile illnesses such as dengue, typhoid fever, leptospirosis, and murine typhus, makes it laborious to diagnose. So, it will become very troublesome to assure this infection without laboratory tests or there should be the presence of pathognomonic eschars.<sup>9-11</sup> Presence of eschar in patients aids in the clinical diagnosis of scrub typhus with higher specificity (98.9%), but lack its applicability due to a wide variation in its distribution (7.0–97%) among patients (Paris et al. 2013).<sup>12</sup> Therefore, the diagnosis of scrub typhus demands presumptive as well as definitive tests for accurate detection of disease.

**Table 1: Comparison of method of diagnosis and antibody/marker gene**

Study	Out break	Method of diagnosis	Antibody/ marker gene
Biswal et al; 2018 <sup>9</sup>	8 samples	ELISA Nested PCR	IgM
Sharma et al; 2016 <sup>10</sup>	228 cases	ELISA	IgM
Varghese et al; 2015 <sup>11</sup>	263 cases	ELISA	IgM
Paris et al; 2015 <sup>12</sup>	154 cases	Weil-Felix Test	OX-K

The clinical picture is characterized by sudden onset fever with chills, headache, backache and myalgia, profuse sweating, vomiting and enlarged lymph nodes. In some patients, an eschar may develop at the site of chigger feeding, usually at sites where the skin surfaces meet, such as axilla, groin and inguinal areas.<sup>13,14</sup>

In the present case series, both patient presented at medicine OPD with fever with chills and shortness of breath. A diagnosis of scrub typhus was made based on the basis of clinical findings, laboratory results, and positive Weil–Felix test and IgM ELISA. In a previous case report by Choi, W. Y., authors reported Case of Scrub Typhus Complicated by Adult Respiratory Distress Syndrome and its Successful Management with Extracorporeal Membrane Oxygenation. A 67-year-old woman was diagnosed as having scrub typhus with pneumonitis. On admission, she was started on a combination therapy with levofloxacin and doxycycline. However, the patient developed severe acute respiratory distress syndrome (ARDS) on the 2nd day, and as a result, she underwent extracorporeal membrane oxygenation (ECMO). She was weaned from ECMO on the 10th day, as her respiratory status gradually improved. She was discharged without

sequelae on the 23rd day. The outcome suggested that the use of ECMO should be considered for patients with ARDS induced from scrub typhus.<sup>15</sup>

In a previous case series by Lee CH et al, patients with scrub typhus who complained of gastrointestinal symptoms, exhibited diverse lesions in the stomach, including superficial mucosal hemorrhage, erosions, ulcers, and vascular bleeding. Upper gastrointestinal bleeding associated with scrub typhus was found in 10.3% patients, and active bleeding that requires treatment with endoscopic clipping was found in 3.4%. These complications result from vascular injury by vasculitis and perivasculitis in the capillaries or small arterioles. Moreover, massive intestinal bleeding requiring surgical treatment could also occur.<sup>16-18</sup>

Devasagayam E et al conducted a systematic narrative synthesis to summarize included studies. In the last decade, there were 18,781 confirmed scrub typhus cases reported in 138 hospital-based studies and two community-based studies. IgM ELISA was used in 122 studies to confirm the cases in majority (89%). The proportion of scrub typhus among acute undifferentiated febrile illness (AUI) studies was 25.3%, and community seroprevalence was 34.2%. Ninety studies had data published on multiple organ

involvement out of which 17.4% of cases had multiple organ dysfunction syndromes, 20.4% patients required ICU admission, and 19.1% needed ventilation. The overall case-fatality rate was 6.3%, and the mortality among those with multi-organ dysfunction syndrome was as high as 38.9%.<sup>19</sup>

## CONCLUSION

Numerous fatalities are attributable to scrub typhus, an acute fever infection that is widespread in India and causes high morbidity. The severity of the illness has not been adequately recognised. Rapid treatment and early detection can greatly lower complications and mortality.

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