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# Clinical profile of scrub typhus in children treated in a tertiary care hospital in eastern India



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## ABSTRACT

**Background and objective:** Odisha in the eastern region of India has been witnessing an increased incidence of pediatric scrub typhus. The present study was undertaken to study the clinical profile, laboratory parameters, complications and efficacy to therapy in scrub typhus. **Design:** Prospective observational study. **Material and Methods:** Total 71 children up to 14 years of age who had fever for more than 5 days without an identifiable cause were included in the study. All suspected cases were tested with Weil-Felix test (OX-K  $\geq$  1:80 positive) and IgM antibody (ELISA) against *Orientia tsutsugamushi*. All IgM positive cases were further studied for response to Azithromycin therapy. **Results:** Twenty six children were diagnosed with scrub typhus between July 2015 and December 2015. The age of patients ranged from eleven months to twelve years. Majority of patients (69.2%) were from rural areas. The common symptoms were fever, headache, hepatomegaly, lymphadenopathy and serosal effusions. Eschar was seen only in 30.7% of cases. Leucocytosis was seen in 76.9% of cases and 61.5% of cases had anicteric hepatitis. Commonest complications seen were hepatitis (61.5%) and pneumonia (38.4%). All cases responded well to azithromycin therapy. **Conclusions:** Our result showed that scrub typhus should be suspected in all cases of fever without an identifiable cause irrespective of age. Serosal effusions and anicteric hepatitis must raise the possibility of scrub typhus among clinicians.

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## Introduction

Although mortality rate for malaria has decreased globally, non-malarial infections remain the major cause of mortality

and morbidly in most part of south East Asia. Rickettsial diseases are among the most covert re-emerging infection on the present era. Overall Rickettsial infection is found to be the second most cause of non-malarial febrile illness in South East Asia after dengue [1]. Scrub typhus is

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a reemerging zoonotic acute infectious disease caused by *Orientia tsutsugamushi* which was previously categorized in rickettsia genus. The disease is highly endemic in Tsutsugamushi triangle extending from Afghanistan to China, Korea, the island of the Western Pacific and Indian Ocean and Northern Australia [2]. An estimated one billion people are at risk of scrub typhus and approximately one million cases occur annually [3]. Recent report from various parts of India and neighboring countries suggest that there is resurgence of rickettsial infection in India associated with high morbidity and mortality [4]. Scrub typhus is now the most commonly reported rickettsial infection from Indian subcontinent [5]. Due to its varied clinical manifestations, low index of suspicion and lack of access to specific diagnostic facilities in most areas it become notoriously difficult for diagnosis and timely management. The majority of studies regarding scrub typhus in India and other parts of world are based on adult population with the paucity of studies regarding pediatrics scrub typhus from Indian subcontinent and more so from this part of eastern India.

We conducted a prospective observational study in a tertiary care hospital, Bhubaneswar, Odisha, which is the coastal state located in the eastern part of India. The study is carried out with an objective to determine the prevalence, complex clinical presentation and to analyze the outcome in comparison to results from other part of country reported previously. Moreover to our knowledge this is the first original study on pediatric scrub typhus in eastern India.

## Materials and methods

This prospective observational study was carried out in a tertiary care setup in eastern India from July 2015 to December 2015 with an objective to determine the clinico-demographic and hematological profile of scrub typhus with response to therapy in this part of country after getting the clearance from institution ethical committee.

Total 71 children under 14 years admitted to pediatric ward with acute undifferentiated febrile illness of more than 5 days without an identifiable cause and with one or more presenting features like lymphadenopathy, organomegaly, headache, edema, rash and eschar were enrolled in the study. The detail history, socio-demographic data, clinical findings were documented. Other common conditions which clinically mimic scrub typhus were excluded by doing malaria smear and rapid diagnostic test, dengue antibody, leptospira serology, Widal test with culture of blood and urine, complete blood count, erythrocyte sedimentation rate, chest x-ray, liver function tests, serum electrolytes and BUN. CSF study and echocardiography were done in selected cases only depending on the clinical presentation.

The Weil-Felix test and IgM ELISA were done in all 71 cases. The WF *Proteus agglutination* assay (*Proteus vulgaris*, OX-K strain) was performed on each sample by diluting serum 1:20 to 1:1280. A titer 1:80 or more was considered as a positive result. Detection of IgM antibody in ELISA (in Bios, international inc.) for *O. tsutsugamushi* in their serum sample and optical density (OD) more than 0.5 was considered to be positive result for typhus. All IgM positive cases

were treated with azithromycin (10 mg/kg/day, IV/PO) and response to therapy with fever defervescence time was recorded.

## Results

Among 71 children, 26 were diagnosed as scrub typhus on the basis of positive IgM ELISA and taken as the study group. The median age ranged from 11 months to 12 yrs with mean age of 6.5 ( $\pm$ SD). Majority of patients belong to the age group 1 to 5 years (53.8%) where as below one year accounted for only 7.7% of cases. The male to female ratio was 17:9. Most of the children (69.2%) were from rural areas and least number of cases were from urban areas (3.8%) along with 15.3% from coastal area where as only 11.5% belonged to forest area (Table I).

All the patients presented with fever (100%) and majority among them had fever of 7-14 days (53.8%) duration. Most of the cases had GI symptoms in form of nausea, vomiting (76.9%), 30.7% had neurological manifestations like headache and myalgia where as only 7.6% children presented with rash and clinical jaundice (Table II). Major clinical findings were hepatomegaly (84.6%), lymphadenopathy (57.6%), splenomegaly (34.6%) and serosal effusion (30.6%). Altered sensorium was found in 4 children i.e. in 30.7% cases (Table III). Majority of cases were complicated with anicteric hepatitis (61.5%) followed by pneumonia (38.4%), encephalopathy (11.55%), ARDS (7.6%) and renal impairment (7.6%) as complication.

**Table I – Demographic data**

Characters	n = 26	No of patients	Percentage (%)
Age	<1 yr	2	7.7
	1-5 yr	14	53.8
	5-10 yr	7	26.9
	>10 yr	3	11.5
Sex	Male	17	65.3
	Female	9	34.6
Habitat	Village	18	69.2
	Coastal	4	15.3
	Forest	3	11.5
	Town	1	3.8

**Table II – Clinical features (N = 26)**

Clinical symptoms	No of patients	Percentage (%)
Fever	26	100
<7 days	3	11.5
7-14 days	14	53.8
>15 days	9	34.6
GI symptoms	20	76.9
Nausea/Vomiting	20	76.9
Abdominal pain	12	46.1
Loose motion	4	15.3
Headache/Myalgia	8	30.7
Rash	2	7.6
Jaundice	2	7.6
Decrease urinary output	10	38.4
Breathlessness	10	38.4

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