



Scrub Typhus: Clinical Profile and Complications in Children at A Tertiary Hospital

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ABSTRACT

Background: Scrub typhus is an important cause of acute undifferentiated fever caused by gram negative bacterium *Orientia tsutsugamushi*. The chigger mites of the family Trombiculidae of genus *Leptotrombidium* are responsible for the disease transmission^[1]. This zoonotic disease is grossly neglected and often misdiagnosed in India because of their non specific clinical presentation, limited awareness of disease and lack of diagnostic facilities^[3]. In recent years, scrub typhus has rapidly reemerged to become the major cause of acute febrile illness in many parts of India. Scrub typhus, is now the most commonly reported rickettsial infection from the Indian subcontinent^[3,8-12,17].

Methods: A prospective observational study on children admitted to tertiary care hospital from August 2020 to December 2021 are studied. Scrub typhus was suspected in all children up to 18 years of age who had a fever for more than 5 days without an identifiable infection and one or more of the following clinical features: rash, oedema, hepatosplenomegaly, lymphadenopathy and an eschar^[19].

Results: Thirty one children (19:M, 12:F) were serologically confirmed with scrub typhus during the study period. All 31 patients presented with fever. The duration of fever on presentation ranged from 2 to 15 days. Other common symptoms were vomiting (54%), Headache (64%), cough (35%), abdominal pain (9%), breathlessness (4%), High grade fever (>101F) was recorded in 28 (90%) children.

Conclusions: Scrub fever is considered as a differential in children with febrile illness even in the absence of ESCHAR. Treatment is simple and less expensive and many show good response. Early initiation of treatment and timely recognition of complications is important to ensure favourable outcome.

Keywords: Scrub typhus, Eschar, *Orientia tsutsugamushi*.

I. INTRODUCTION

Scrub typhus is an important cause of acute undifferentiated fever caused by gram negative bacterium *Orientia tsutsugamushi*. The chigger mites of the family Trombiculidae of genus *Leptotrombidium* are responsible for the disease transmission^[1]. This zoonotic disease is grossly neglected and often misdiagnosed in India because of their non specific clinical presentation, limited awareness of disease and lack of diagnostic facilities^[3]. In recent years, scrub typhus has rapidly reemerged to become the major cause of acute febrile illness in many parts of India. Scrub typhus, is now the most commonly reported rickettsial infection from the Indian subcontinent^[3,8-12,17].

Of the 29 states in India, 23 have reported the presence of scrub typhus.^[2-5] and its incidence in children is increasing in present time. The majority of studies regarding rickettsial infections from various parts of the world are based on adult populations^[2-4]. There is a paucity of studies regarding the incidence and clinical profile of scrub typhus in children^[5-12], despite epidemiological mention of children constituting up to half of scrub typhus cases in some regions.

II. METHODS

A prospective observational study on children admitted to tertiary care hospital from August 2020 to December 2021 are studied. Scrub typhus was suspected in all children up to 18 years of age who had a fever for more than 5 days without an identifiable infection and one or more of the following clinical features: rash, oedema, hepatosplenomegaly, lymphadenopathy and an eschar^[19]. Scrub typhus is diagnosed by IgM ELISA test. Regarding age, sex, duration of fever, associated symptoms, vital signs, and the general and systemic examination findings, were recorded. Patients were treated with a 10 days of antibiotics (oral /iv doxycycline or iv azithromycin), course. Complications during the course are noted.



A careful search for eschars was performed in all the patients.

The data collected is entered into an excel sheet and is analysed by SPSS version 2.0 and interpreted using descriptive statistics.

III. RESULTS

Thirty one children (19:M, 12:F) were serologically confirmed with scrub typhus during the study period. The mean age of presentation is

8.5 years with a range of 7 months to 14 years. Two thirds of all children were <12 years of age. 26 (83.8%) cases were observed between the months of September and November. Most of the cases are from rural places like Tiruvuru, Jaggayyapeta, kothagudem and adjoining areas. A history of exposure to domestic animals (cattle, dogs) was found in 23 (74.1%) patients.

Sex:

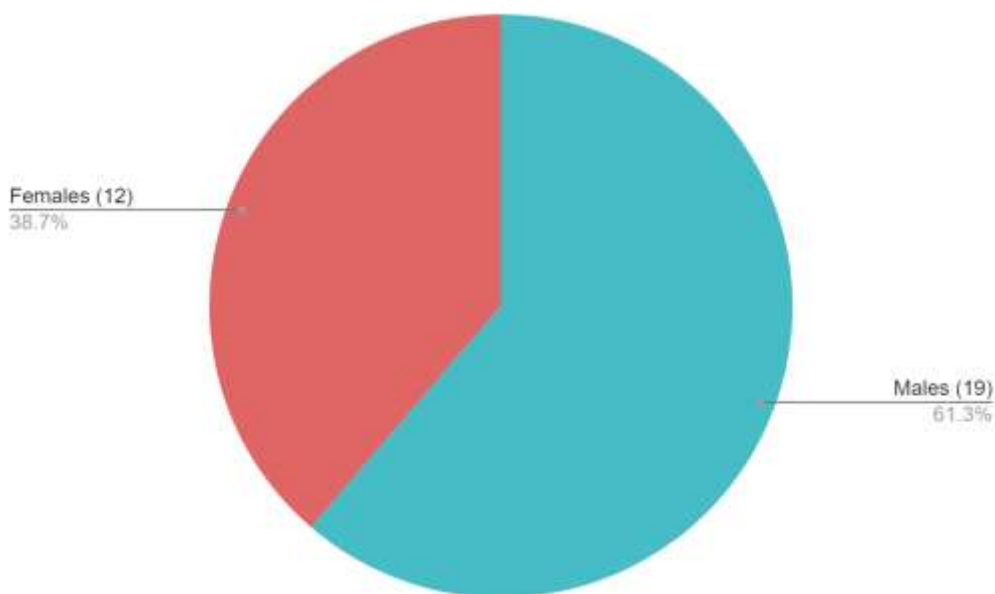


Figure -1

Clinical Profile:

The clinical features at the time of presentation are shown in Table- 1& 2

Table -1

Symptoms	No (%)
Fever	31 (100%)
<7days	12 (38.7%)
>7days	19 (61.2%)
Headache	20 (64%)
Vomitings	17 (54%)
Abdominal pain	9 (30%)
Cough	11 (35%)
Breathlessness	4 (12%)
Bleeding	2 (6.4%)

Table - 2

Signs	No %
Fever >101F	28 (90%)
Hypotension	7 (22%)
Tachypnea	8 (25%)



Eschar	6(19.3%)
Hepatomegaly	18 (58%)
Splenomegaly	13 (41.9%)
Ascites	4(12%)
Edema	5(16.1%)

All 31 patients presented with fever. The duration of fever on presentation ranged from 2 to 15 days .Other common symptoms were vomiting (54%), Headache (64 %),cough (35%), abdominal pain (9%), breathlessness (4%) , High grade fever (>101F) was recorded in 28 (90%) children. Other common signs hepatomegaly, splenomegaly, oedema and hypotension were observed in 58%,

41.9%, 16.1% and 22% of cases, respectively. An eschar was observed in 19.3% of patients. Most common sites of eschar were Groin, axilla and back of the shoulders.

Complications:

Complications observed during the course of the disease are in the table -3.

Table -3

Complications	No (%)
Thrombocytopenia (<50,000)	16 (51%)
Severe anemia (Hb <6 gm%)	2 (6.4%)
Hepatitis	14 (45.1%)
Shock	3(9.6%)
Pleural effusion	4(12.9%)
Pneumonia	3 (9.6%)
ARDS	1 (3.2%)

Anemia (haemoglobin <11.0 g%) was present in 16 (51%), Severe anemia (haemoglobin <6.0 g%) was present in 2(6.4%) children, Thrombocytopenia (platelet count <1,00,000/mm3) in 21 (67.7%) and severe thrombocytopenia (platelet count <50,000/mm3) in 16(51%). and elevated liver enzymes (SGOT, SGPT) in 14(45.1%) children. Three (9.6%) children presented with shock and 1(3.2%) children with ARDS. Doxycycline was used for treatment, children became afebrile within 48 hours of initiating antibiotics which were continued for 10 days.

IV. DISCUSSION

Scrub typhus is an acute febrile illness caused by rickettsia Orientia tsutsugamushi. The disease is transmitted to humans through the bite of an infected chigger, the larval stage of trombiculid mite [6]. The bacteria multiply at the inoculation site with the formation of a papule that ulcerates and becomes necrotic , evolving into an eschar, with regional lymphadenopathy that may progress to generalized lymphadenopathy within few days. Vasculitis is the basic pathogenic mechanism in scrub typhus. It is responsible for skin rash, microvascular leakage, oedema, tissue hypoperfusion and end organ ischemic injury [7].

In this prospective study, we describe the profile of paediatric scrub typhus at a tertiary

hospital of pinnamaneniSiddhartha Institute ofMedicalSciences. There were more male children than female children and the male-to-female ratio was 1.58:1, which is probably due to higher prevalence of exposure to chiggers among boys, who like to play outdoors [8-12]. The mean age at presentation was 8.5 years, which is similar to that reported by other authors [8-12].The majority of cases occurred between the months of September and November, which follow the rainy monsoon season and coincide with the peak growth of vegetations and mite population. Similar observations have been recorded by other authors [3,8,10,11,13]

The clinical manifestations of scrub typhus in children are nonspecific and likely to be misdiagnosed. All the children in the study presented with fever, study similar to observations by other authors [8-10]. The presence of an eschar is a valuable clinical clue in the diagnosis of scrub typhus; however absence does not rule out the disease. Eschar is a black necrotic lesion resembling a cigarette burn, usually found in areas where skin is thin, moist or wrinkled and where the clothing is tight like axilla, genitalia and inguinal area. Eschar was seen in 19.3% children in the present study, In some studies eschar is reported to be in 5080% of cases [3,9,11,12,14]. Headache (64%) is the next common presentation in our study, Vomiting (54%), cough (35%), abdominal pain



(30%) and breathlessness (12%) were the other common symptoms in the present study. A study from south India has reported these symptoms in 49%, 51%, 34%, 13% respectively^[8]

Many other clinical features including fever, hepatomegaly, hypotension, thrombocytopenia can also be caused by dengue fever leading to a diagnostic confusion. The presence of other indicators such as an eschar, splenomegaly, persistence of fever after the shock has supervened and the absence of an increase in haematocrit helps distinguish rickettsial infection from dengue^[8,9,15]. Hepatomegaly and Splenomegaly is 58% and 41.9% of cases, respectively in our study, other authors have reported hepatomegaly in 59% to 98% and splenomegaly in 18% to 88% respectively^[8,9,15]. The presence of splenomegaly is an important sign to distinguish scrub typhus from dengue fever, since splenomegaly is uncommon in the latter.

Thrombocytopenia was the major laboratory finding observed in the present study with 51% of cases, the reported frequency in literature is 22% to 78%^[8,9,11,15]. Thrombocytopenia though a major finding was not associated with an elevated haematocrit, becomes an important clue that helps in differentiating scrub typhus from dengue fever. Scrub typhus is regarded as a life threatening disease in children. Serious complications of scrub typhus usually occur in the second week of illness, which include ARDS, pneumonia severe thrombocytopenia and bleeding.

Hypotension requiring inotropic support (shock) was observed in 9.6% of cases against 45% reported in a previous study^[14]. Pneumonia was observed in 9.6% of cases in the present study, others authors have reported pneumonia in 3% to 21% of cases^[3,9,13,14]. ARDS is reported in 3.2% of cases in the present study, where as ARDS in literature has been reported in 4% to 22% of cases^[8,9,14]. Common complications like Myocarditis and AKI as in few studies^[18], were not observed in this study.

Doxycycline has shown a remarkable clinical response in most of the children as in other studies^[8-13,16,17]. This dramatic response has also been used as a diagnostic test^[3,10-12]. Most (90%) of the patients became afebrile within 48 hr

The present study has some limitations. The study was performed at a tertiary hospital; therefore does not reflect the actual burden of scrub typhus in the community, which may be higher. - IgM ELISA were used for serological diagnosis because the indirect immunofluorescence assay, the gold standard confirmatory test is not yet widely available in India.

V. CONCLUSION:

Scrub fever is considered as a differential in children with febrile illness even in the absence of ESCHAR. Treatment is simple and less expensive and many show good response. Early initiation of treatment and timely recognition of complications is important to ensure favourable outcome.

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