

Research Article

Clinical Profile of Scrub Typhus in Children: A hospital-based study

Akshit Sapehia¹, Sandeep Kumar², Harshita Thakur³

¹Akshit Sapehia, Medical Officer Specialist, Paediatrics, Civil Hospital Shahpur

²Sandeep Kumar, Medical Officer Specialist, Paediatrics, Civil Hospital Amb

³Harshita Thakur, Medical Officer, CHC Sullah, Block Bhawarna, District Kangra

*Corresponding Author

Harshita Thakur

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Abstract: *Introduction:* Scrub typhus is endemic in India due to the Tsutsugamushi Triangle. Increased farming area, animals, lesser education, outdoor cooking, and inadequate indoor sanitary facilities are the key sources of endemicity. The triangle is bounded by northern Australia, the Arabian Peninsula, and Japan. According to reports from South America, the Middle East, and Africa, identical diseases can exist outside the triangle. Unintentional hosts are people with this zoonotic disease. *Methods:* Data from hospital records of children who were admitted with fever to the paediatric ward of Dr. RPGMC, Tanda between January 2021 and December 2022 were collected using retrospective observational study methods. Children between the ages of one month and twelve years, of either gender, who were admitted to the paediatrics department's general ward and paediatric critical care unit met the inclusion criteria for this study (PICU). *Results:* All 50 children developed fever between 3 and 30 days, with a median of 7 days. Extremity edema and face puffiness were found in 38 (76%) and 37 (74%) children, respectively. Cough was prevalent in 35 (70%) children. Vomiting and altered sensorium occurred in 30 (60%) and 29 (58%) youngsters, respectively. Other symptoms included oliguria, GI bleed, convulsions, and diarrhoea. 44 (88%) children had lymphadenopathy and 23 (46%) had eschar, the classic scrub typhus eschar. Axilla, genitalia, and inguinal skin folds had eschar. Popular, petechial, or erythematous rash, icterus, petechiae, and ecchymosis were discovered. *Conclusion:* A child with an acute febrile illness, maculopapular or erythematous rash, hepatosplenomegaly, lymphadenopathy, thrombocytopenia, and capillary leak should be considered for scrub typhus. Eschars in skin folds are important for diagnosis. Patients with clinical suspicion of scrub typhus should start azithromycin or doxycycline immediately without a serological test. Scrub typhus can occur in cities despite its prevalence in rural mite-exposed areas.

Keywords: Scrub typhus, Fever, Edema

INTRODUCTION

India has an endemic case of scrub typhus because of the Tsutsugamushi Triangle. Increased farming area, livestock, lower levels of education, outside cooking, and a lack of adequate indoor sanitary facilities are the main causes of its endemicity. Northern Australia to the south, the Arabian Peninsula to the west, and Japan to the north, form the boundaries of the triangle.¹ According to reports of similar diseases from South America, the Middle East, and Africa,² the triangle is not the only place where they can occur. It is a zoonotic illness, and people are its unintentional hosts.

Scrub typhus, the most frequent rickettsia illness, is spreading across India.³ The most common clinical symptoms in children include fever, headache, nausea, vomiting, stomach pain, shortness of breath, hepatosplenomegaly, generalised edema, maculopapular rash, and lymphadenopathy.⁴ The pathognomonic sign of scrub typhus, which occurs in just 11 to 43% of patients, is an eschar.⁵

Early diagnosis is sometimes difficult because to the nonspecific clinical signs and seasonal characteristic shared with leptospirosis and dengue.⁶ The monsoon and post-monsoon months see a major rise in the mite's activity. Failure to diagnose it quickly can delay treatment and cause the bacteria to spread throughout the body, which can result in the emergence of several complications, including interstitial pneumonia, myocardial infarction, hepatitis, meningoencephalitis, acute respiratory distress syndrome (ARDS), and multiorgan failure. This is due to a variety of nonspecific symptoms, a low index of suspicion, and lack of knowledge.

When left untreated, a median death rate of 6% (0 percent - 70%) has been seen.⁷ Therefore, to reduce morbidity and mortality, a high index of suspicion and early empirical antibiotic therapy is crucial. The present study was aimed to evaluate clinical profile of scrub typhus in children.

METHODS

Data from hospital records of children who were admitted with fever to the paediatric ward of Dr. RPGMC, Tanda between January 2021 and December 2022 were collected using retrospective observational study methods. Children between the ages of one month and twelve years, of either gender, who were admitted to the paediatrics department's general ward and paediatric critical care unit met the inclusion criteria for this study (PICU). The age restriction is due to the local administrative policy for paediatric admissions in the relevant department, the presence of fever lasting five days or longer, positive IgM for tsutsugamushi using the enzyme-linked immunosorbent assay (ELISA), indicating a diagnosis of scrub typhus fever, and informed consent given by the children's parents or caregivers. Children whose parents or other caregivers did not give their agreement for their child to participate in the study were excluded from it.

Data Collection

Data were collected in Department of Pediatrics, Dr. RPGMC Tanda at Kangra

Statistical Analysis

The data were recorded compiled using Microsoft® Excel worksheet (version 2019) and subjected to statistical analysis using SPSS (SPSS 21.0, IBM, Armonk, NY, USA). Categorical data were expressed as frequency, percentages. $P < 0.05$ was statistically significant.

RESULTS

Baseline Characteristics

Baseline characteristics show that the most of the patients was 2-5 years (50%) aged group followed by ≤ 1 (14%) years and 6-12 years (36%). 54% of patients were male and 46% of patients were female. Fever (100%) was the most common presenting symptom followed by Edema (70%), Lymphadenopathy (50%), Loss of appetite (24%), Shortness of breath (10%).

Symptoms

Table 2 shows that all 50 children had fever in a range of 3 d to 30 d with a median of 7 d. Edema of the extremities and facial puffiness were present in 38 (76%) and 37 (74%) children, respectively. Cough was present in 35 (70%) children. Vomiting and altered sensorium were seen in 30 (60%) and 29 (58%) children, respectively. Other symptoms reported were oliguria, GI bleed, seizures, and diarrhea. 44 (88%) children had lymphadenopathy and 23 (46%) children had eschar. The typical eschar of scrub typhus. Eschar was found in the skin folds of axilla, genitalia, and inguinal area, etc. Other clinical findings observed were rash (popular, petechial, or erythematous), icterus, petechiae and ecchymosis.

Anemia

Table 3 shows that anemia was present in 59% of patients while anemia was absent in 42% patients.

Table 1: Baseline Characteristics

	Frequency (n=50)	Percentage (%)
Age (Years)		
≤ 1	7	14%
2-5	25	50%
6-12	18	36%
Gender		
Male	27	54%
Female	23	46%

Table 2: Symptoms

Symptoms	Frequency (n=50)	Percentage (%)
Fever	50	100%
Edema	38	76%
Facial puffiness	37	74%
Cough and Cold	35	70%
Vomiting	30	60%

Altered and Sensorium	29	58%
GI Bleed	22	44%
Seizures	20	40%
Diarrhea	14	28%
Hepatomegaly	8	16%
Splenomegaly	48	96%
Lymphadenopathy	44	88%
Eschar	23	46%
Rash	16	32%
Icterus	11	22%
Petechiae, Echymosis	8	16%

Table 3: Anemia

Anemia	Frequency (n=50)	Percentage (%)
Present	29	58%
Absent	21	42%

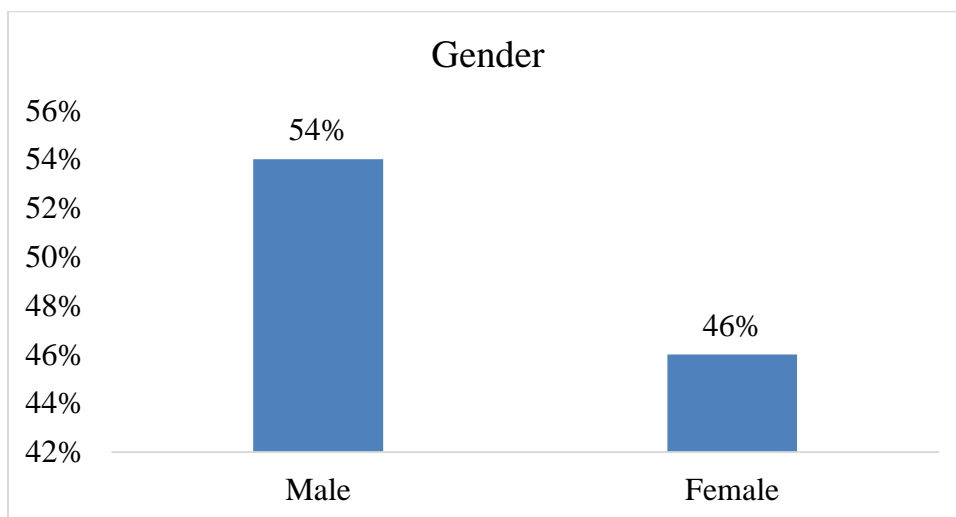


Figure 1: Gender

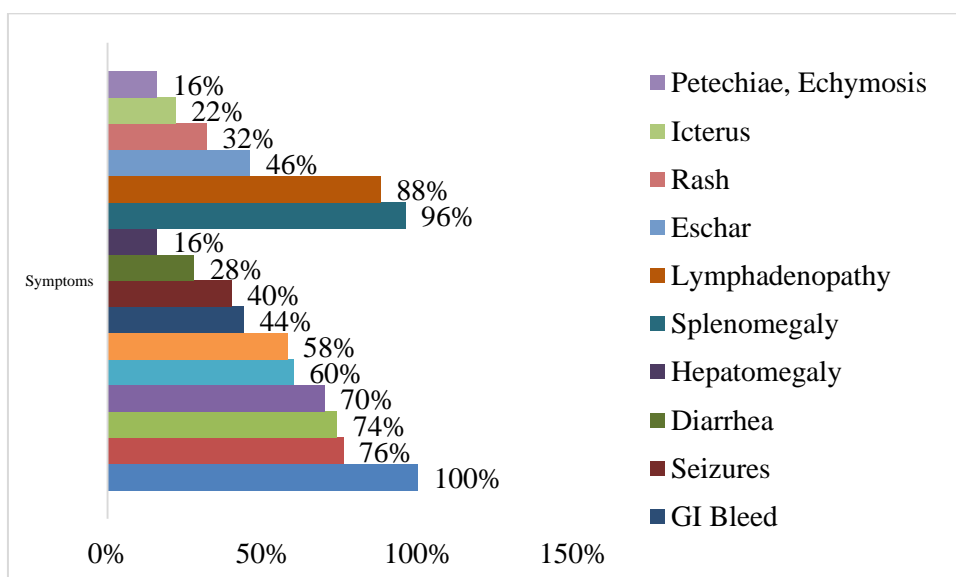


Figure 2: Symptoms

DISCUSSION

Scrub typhus is an acute febrile infectious disease in many parts of the eastern hemisphere. There were few outbreaks reported from India. Outbreaks of Scrub typhus were also reported from South India.^{8,9}

Most¹⁰ of the patients was 2-5 years (50%) aged group followed by ≤ 1 (14%) years and 6-12 years (36%). 54% of patients were male and 46% of patients were female. Fever (100%) was the most common presenting symptom followed by Edema (70%), Lymphadenopathy (50%), Loss of appetite (24%), Shortness of breath (10%). In a study by **Chanta and Chanta**, the mean age was 6.45 years and ranged between 1.25-14 years. 65% of the children were male and 35% of children were female. In a study by **Agarwal et al** the maximum number of cases were seen in the age group of 1 to 5 years with 86 cases (41.1%) and the age wise distribution is given in. Boys and girls constitute 62.7% and 37.3%, respectively, with male: female ratio of 1.68:1.¹¹ In a study by **Huang et al** approximately half the patients were < 5 years old and the mean age (SD) was 6.1 (3.66) years. Patients were more likely to live in rural rather than urban areas. The greatest number of cases was seen in the spring and summer.¹²

All 50 children had fever in a range of 3 d to 30 d with a median of 7 d. Edema of the extremities and facial puffiness were present in 38 (76%) and 37 (74%) children, respectively. Cough was present in 35 (70%) children. Vomiting and altered sensorium were seen in 30 (60%) and 29 (58%) children, respectively. Other symptoms reported were oliguria, GI bleed, seizures, and diarrhea (Table 1). 44 (88%) children had lymphadenopathy and 23 (46%) children had eschar. In a study by **Rathi et al** 161 patients were admitted and met the inclusion criteria, 75 (45.6%) were diagnosed with rickettsial diseases. 52 (69.3%) had spotted fever group and 23 (30.7%) scrub typhus. The mortality rate with rickettsial diseases was 9%.¹³ In a study by **Vivekanandan et al** common symptoms were high grade fever of 7-14 days duration, nausea, vomiting, headache, myalgia, cough and breathlessness. Eschar was seen in 23 cases (46%) and the common sites were axilla, breast and groin. Weil Felix test was positive in 39 cases (78%).¹⁴

CONCLUSION

The diagnosis of scrub typhus must be taken into consideration when a child presents with an acute febrile illness, a maculopapular or erythematous rash, hepatosplenomegaly, lymphadenopathy, thrombocytopenia, and features suggestive of capillary leak. Searching for an eschar, particularly in the hidden areas (skin folds), is very helpful for diagnosis. In the absence of a serological test, patients with a clinical suspicion of scrub typhus should begin empirical treatment right away with azithromycin or doxycycline. Scrub typhus can manifest itself in urban locations, despite typically occurring in rural areas where mite exposure is high.

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