

Scrub Typhus Profile in Paediatrics Age Group Admitted In a Tertiary Care Hospital of Tribal Area in Odisha

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Abstract

Background: Scrub typhus caused by *Orientia tsutsugamushi* is re-emerging as a major cause of acute febrile illness (AFI) in Indian sub-continent especially in children.

Objective: To know the incidence, clinical profile and outcome of scrub typhus in pediatric age group.

Method: The study was conducted in SLN MCH, Koraput in children ≤ 14 years of age admitted to Paediatric ward between January 2019 to January 2020. Total 22 cases were taken on basis of fever with or without presence of eschar. Those cases which were IgM ELISA test positive or had presence of eschar were included in the study. All other cases of fever were excluded by proper clinical examination and laboratory test.

Result: Total 22 children were taken in this study. Most cases occurred between August to November. Male female ratio was 2.7:1. Maximum cases were in the age group of 1 to 5 years. Most common presenting features were fever, vomiting, rash and pain abdomen.

Most common examination findings were presence of eschar, anemia and lymphadenopathy, ELISA IgM test was taken as the diagnostic test and it was reactive in 90.9% cases. We observed few complications during our study i.e meningoencephalitis, ARF, RDS, myocarditis and shock. One subject succumbed due to multi organ dysfunction (MOD).

Keywords: Scrub typhus and Eschar.

Introduction

Scrub typhus is caused by *Orientia tsutsugamushi*, a gram negative bacterium transmitted to humans by the bite of trombiculid mites(1). It is endemic in South East Asia and re-emerging as a major cause of acute febrile illness in Indian sub-continent, especially among children(2).

Presentation is diverse ranging from a mild self-limiting illness to acute respiratory distress syndrome (ARDS), meningoencephalitis, acute kidney injury(AKI), myocarditis leading to heart failure , hepatitis and multi organ dysfunction(MOD). Late presentation, delay in diagnosis and treatment causes

high death rate(11%) in below 10 year children, mainly because of non specificity of signs and symptoms as well as laboratory findings(3). As Odisha is in Eastern Ghats, scrub typhus and acute encephalitis syndrome (AES) outbreaks occur as seasonal variation at specific intervals since 2019.

Most of the cases are associated with single painless eschar with an erythematous rim at the site of chigger bite. Various studies have shown an eschar prevalence of 20-87% among scrub typhus patients (4). In Indian sub-continent epidemics of Scrub typhus has been reported from North, East and South India (5-8). Although the diseases are endemic in our country, it is grossly under diagnosed owing to the non-specific clinical presentation and lack of diagnostic facilities along with low index of suspicion (13).

ELISHA, Dot Blot immunoassay, Weil Felix Test, Micro Immunofluorescence, Immunoperoxidase, Latex agglutination and indirect Haemagglutination are various serological methods available to diagnose rickettsial disease. DNA PCR is the conformatory test available (9-10).

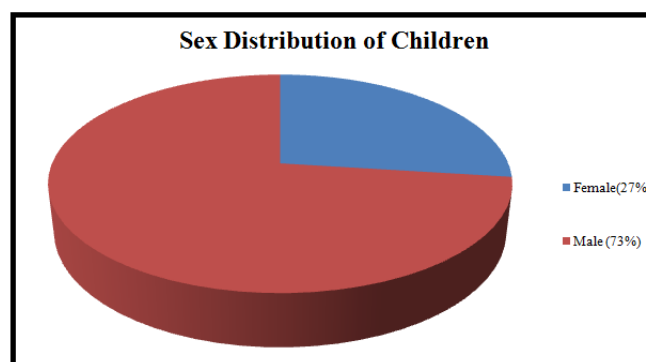
Material Methods

The study was conducted in the Dept. of Paediatrics, SLN MCH, Koraput from January 2019 to January 2020. Total 22 cases were taken into the study on the basis of fever for ≥ 7 days along with or without presence of eschar. Diagnosis of Scrub typhus was done based on test result of IgM ELISA (In Bios International Inc, Seattle, WA). Subjects having optical density of > 0.5 at 450nm were considered positive for Scrub typhus. Other causes of prolonged fever were properly excluded after proper examination and laboratory evaluation. This study was approved by Institutional Ethical Committee.

All Statistical analysis was performed using SPSS Software version 16.0 (SPSS Inc, Chicago. IL), P value of 0.05 or less was considered statistically significant.

Table 1: Age Distribution of Children

Age In Years	Number	Percentage (%)
1-5 Yrs	9	40.9%
6-10 yrs	6	27.3%
11-14 yrs	7	31.8%
Total	22	100%



Graph- 1: Sex Distribution of Children

Table-2: Presenting Complaints

Complaints	Number	Percentage (%)
Fever> 7 Days	19	86%
Fever<7 Days	3	14%
Rash	9	40.9%
Pain Abdomen	7	31.8%
Nausea/Vomiting	10	45.5%
Respiratory Distress	4	18.1%
Convulsion	2	9%
Altered Sensorium	6	27.7%

Table 3: Clinical Examination Finding

Clinical Examination Finding	Number	Percentage (%)
Fever	22	100%
Eschar	13	59%
Hepatomegaly	10	45.4%

Splenomegaly	9	40.9%
Rash	8	36.3%
Lymphadenopathy	12	54.5%
Pallor	13	59%
Icterus	6	27.2%
Oedema	10	45.4%
Meningeal Sign	2	9%

Table 4: Laboratory Findings

Parameters	Number	Percentage (%)
Anaemia	13	59%
Leucocytosis	15	68.1%
Thrombocytopenia	12	54.5%
Deranged LFT	6	27.2%
Deranged RFT	8	36.3%
ELISHA IgM	20	90.9%

Table 5: Complications

Complications	Number	Percentage (%)
Meningo Encephalitis	3	13.6%
Acute Renal Failure	3	13.6%
Myocarditis	1	4.5%
Respiratory Distress Syndrome	3	13.6%
Shock	1	4.5%
Death	1	4.5%

Figure-1: Eschar on Left Leg



Figure 2: Maculopopular Rash of Scrub Typhus



Figure 3: Eschar on Neck



Results

This study included 22 children of which 9 children were in the age group of 1-5 Years i.e. 40.9% (Table-1) and Male: Female Ratio was 2.7:1 (Graph-1).

In our study prolonged fever was the most common presenting complaint present in 100% cases; Vomiting was present in 45.5% and Rashes 40.4 % cases. Other presenting complains were pain abdomen (31.8%), altered sensorium (27.7%), respiratory distress(18.1%) and convulsion (9%) cases (Table-2).

Eschar was present in 13 cases (59%). Other examination findings were Pallor (59%), lymphadenopathy (54.5%), oedema (45.4%), hepatomegaly (45.4%) and splenomegaly (40.9%) cases (Table-3).

In this Study common laboratory findings were leukocytosis in 68.1%, anaemia in 59% and

thrombocytopenia in 54.5% cases, deranged LFT was seen in 27.2 % cases and RFT derangement was observed in 36.3% cases. ELISA IgM was reactive in 90.9% cases(Table-4).

Few children in this study developed complications like meningo encephalitis, acute Renal Failure and respiratory Distress Syndrome in 13.6% cases each. Other complications were myocarditis (4.5%) and shock (4.5). Death occurred in one subject during this study due to multi organ dysfunction (MOD).

Discussion

Acute fever without localizing signs is a common presentation of all communicable neglected tropical diseases (NTD). Scrub typhus a potentially severe chigger borne intracellular bacterial infection and is also an important differential diagnosis of acute febrile NTDs, which is endemic in Asia. In India the proportion of Scrub typhus cases among patients with acute fever is currently unknown even in tertiary setups, because both clinical presentation and laboratory diagnosis of Scrub typhus is challenging. In this study we enrolled acute fever patients hospitalized in our tertiary care hospital between Jan 2019 to January 2020. We found that the presentations of Scrub typhus were generally nonspecific and most cases were missed based on clinical diagnosis alone. We also found that the currently available serological assays were sub optimal and they may underestimate the actual burden of disease.

The infection presents as non-specific febrile illness with rash, lymphadenopathy, gastrointestinal, respiratory or CNS symptoms, which if not diagnosed and treated early can lead to the complications like myocarditis, ARDS, meningoencephalitis, ARF like picture (11-1

In this present study of 22 children we found a M:F ratio of 2.7:1 and maximum cases were between the age group of 1-5 years. Fever is the most common presenting complains in all of the cases (100%). Other symptoms were vomiting (45.5%), rash (40.9%), altered sensorium (27.7%) and respiratory difficulty in 18.1%. On examination eschar was present in 59% cases. Other findings were pallor (59%), hepatomegaly(45.4%), splenomegaly(40.96%), icterus (27.2%), rash(36%).

Our observations can be comparable to earliest studies on paediatrics Scrub typhus. Sirisantha V *et al.* observed common physical signs as fever(100%), lymphadenopathy(83%), hepatomegaly(53%), eschar(68%), rash(30%) and splenomegaly (23%){12}. Jim WT *et al.* reported the clinical manifestations in 39 children with Scrub Typhus as fever (100%), eschar(69%) and lymphadenopathy(64%) {13}. Similar findings were observed by Varghese *et al.* {14}. They found eschar 56% in their study.

In our study few children developed complications like Meningo-encephalitis, acute Renal Failure and Respiratory Distress Syndrome in 13.6% cases each. Other complications were Myocarditis (4.5%) and shock (4.5%). Death occurred in one subject during this study due to multi organ dysfunction (MOD) which amounts to 4.5% appears to be lower than the mortality in previous studies that is Kumar Bhat *et al.* who reported mortality of 7.5%(19) and Palanivel *et al.* showed 11.94% mortality in their study.{15}

The previous study by Palanivel *et al.* {15} reported 49% leucocytosis, 55% anemia, 77% thrombocytopenia, and 64% elevated liver enzyme in their study group. In our study we found leucocytosis in 68.1%, anaemia in 59% and thrombocytopenia in

54.5% cases, deranged LFT was seen in 27.2 % cases and RFT derangement was observed in 36.3% cases.

In a study by Prakash et al. a sensitivity of 87% was observed for IgM ELISHA whereas in our study we observed 90.9% sensitivity which is at par with their observation.

Scrub typhus generally responds well to antibiotics. We treated our patients with Azithromycin (below 8 years) and Doxycycline for more than 8 years age group. All responded well and were afebrile within 48 hours. Mahajan et al. used Azithromycin and Doxycycline in their study groups. {9}

Conclusion

Scrub typhus is now one of the common causes for prolonged fever in paediatric practice. With this study we conclude that any child who presented with long duration fever always look for eschar which is a clue to the diagnosis of Scrub typhus. Though clinical features and lab findings are overlapping and non conclusive but still with a good clinical examination, history taking and serological testing we can pick most of the cases. Early diagnosis and appropriate antibiotic treatment can cause dramatic improvement and prevent life threatening complications.

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