

**PROPORTION OF SCRUB TYPHUS AMONG THE PAEDIATRIC POPULATION: A CROSS-SECTIONAL STUDY IN A TERTIARY CARE HOSPITAL OF TRIPURA**

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ABSTRACT

Background: Scrub typhus is a mite borne Rickettsial disease caused by the *Orientia tsutsugamushi*. It is an acute febrile illness (AFI) with a high fatality rate. Scrub typhus is underdiagnosed in India due to its non-specific clinical presentation, limited awareness, and low index of suspicion among clinicians and lack of diagnostic facilities. **Materials and Methods:** A descriptive cross-sectional study was undertaken in a tertiary care hospital of Tripura for a period of one year. The study population comprised of 75 paediatric patients attending a tertiary care hospital of Tripura with AFI. Blood was collected and serum sample was tested for Scrub typhus IgM ELISA. **Results:** 75 patients were included in the study. Out of 75 patients, 14 (18.66%) showed sero-positivity towards Scrub typhus. 47 (62.67%) were male children and 28 (37.33%) were female children. (52%) patients were from rural area and 36 (48%) were from urban area. 25 (33.33%) patients were from tribal population and 50 (66.66%) were from non-tribal population. All patients had fever followed by vomiting, headache, myalgia and cough and pain abdomen. Only 3 (4%) patients had rash and 1 (1.33%) had eschar. Most of the cases occurred in the month of July. **Conclusion:** Scrub typhus is one of the differential diagnoses that need to be considered in a child with fever. Early identification and treatment is crucial in preventing complications. In this study, 18.66% of AFI patients were positive for scrub typhus. Scrub typhus should be included in the differential diagnosis of AFI in children.

KEYWORDS : *Orientia tsutsugamushi*, Scrub typhus, AFI.**INTRODUCTION**

Scrub typhus is a mite borne Rickettsial disease caused by the *Orientia tsutsugamushi*. It was once widely prevalent in the Tsutsugamushi triangle in the East Pacific region.³ Over the last 5 years, there are several outbreaks of scrub typhus all over India.⁴ According to the World Health Organization, Scrub typhus is one of the most under-diagnosed and under-reported febrile illnesses requiring hospitalization.⁵ Scrub typhus accounts for up to 23% of all febrile episodes, with an estimated 1 million cases occurring annually, in endemic areas.⁵ Due to the nonspecific clinical symptoms and seasonal profile shared with other infectious disease, early diagnosis is frequently challenging.⁶ The clinical spectrum of scrub typhus varies from mild to moderate severity. Acute fever is the most common manifestation later accompanied by headache, myalgia, and cough.⁶ Eschar is a characteristic skin lesion usually observed in most of the scrub typhus patients. The activity of the mite increases significantly in the monsoon and post-monsoon months. Due to a variety of nonspecific symptoms, low index of suspicion, and lack of knowledge, failure to diagnose it promptly can delay treatment and result in the spread of the bacteria throughout the body, which can lead to the emergence of several complications.⁷ Severe complications include encephalitis, interstitial pneumonia, Acute Respiratory Distress Syndrome (ARDS), circulatory collapse with hemorrhagic features. Mortality may be as high as 35 to 60% if diagnosis and appropriate therapy is delayed.³ Hence, to reduce the morbidity and mortality, a high index of suspicion and early empirical antibiotic therapy is crucial.

Aim and Objective

The aim and objective of this study is to estimate the sero-prevalence of scrub typhus in paediatric patients attending a tertiary care hospital of Tripura.

MATERIALS AND METHODS

A descriptive cross-sectional study was undertaken in the Department of Microbiology in collaboration with Department of Paediatrics in a tertiary care hospital of Tripura for a period of one year after taking clearance from Institutional Ethics Committee. The study population were children of 1 month to 18 years AFI patients admitted in the paediatrics ward of a tertiary care hospital. After taking informed consent from parents or guardians, relevant information such as age, gender, duration of illness, address, ethnicity, symptoms etc were

collected and entered in a predesigned structured questionnaire. Blood was collected after proper disinfection and serum was separated. Serological diagnosis was done by performing Scrub typhus IgM ELISA using the following test protocol:

- Serum was diluted with sample dilution buffer for Scrub typhus in the ratio of 1:100 and was mixed well.
- 100µl of 1:100 diluted serum was added to the microwell plate with positive and negative control to respective wells as per protocol.
- The plate was covered on the well opening surface and incubated at 37°C for 30 minutes.
- After incubation, plate was washed 6 times with wash buffer using an automatic plate washer.
- 100µl of ready to use Enzyme HRP conjugate for Scrub typhus was added to each well.
- The plate was covered on the well opening surface and incubated at 37°C for 30 minutes.
- After incubation, plate was washed 6 times with wash buffer using an automatic plate washer.
- 150µl of EnWash was added to each well and the plate was incubated at room temperature for 5 minutes without any cover on the plate.
- After incubation, plate was washed 6 times with wash buffer using an automatic plate washer.
- 100µl of Liquid TMB substrate was added and the plate was incubated at room temperature in dark for 10 minutes.
- 50µl of stop solution was added to stop the reaction and incubated at room temperature for 1 minute.
- The optical density was read at 450nm with a microtitre plate reader.

RESULT

75 patients were included in the study. Out of 75 patients, 14 (18.66%) showed sero-positivity towards Scrub typhus. 47 (62.67%) patients were boys and 28 (37.33%) were girls which is depicted in figure number 1. Highest number of cases were found in 1 to 5 years of age (43%). (52%) patients were from rural area and 36 (48%) were from urban area figure number 2. 25 (33.33%) patients were from tribal population and 50 (66.67%) were from non-tribal population figure number 3. All patients had fever followed by vomiting, headache, myalgia and cough and pain abdomen. Only 3 (4%) patients had rash and 1 (1.33%) had eschar. Figure number 4 shows the clinical manifestations of Scrub typhus. Most of the cases occurred in the month of July.

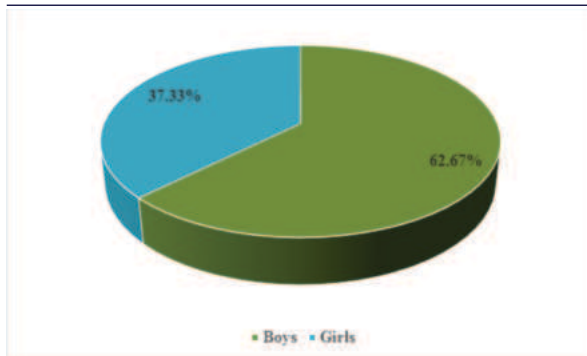


Figure Number 1: Gender Distribution.

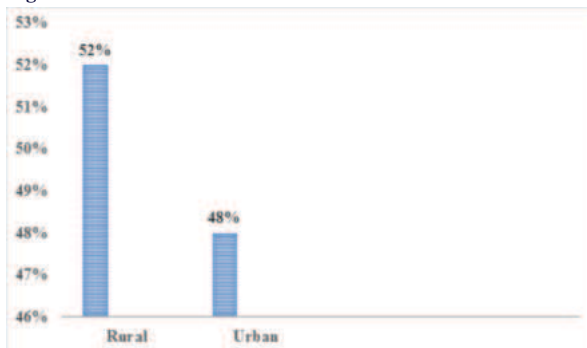


Figure Number 2: Area Wise Distribution.

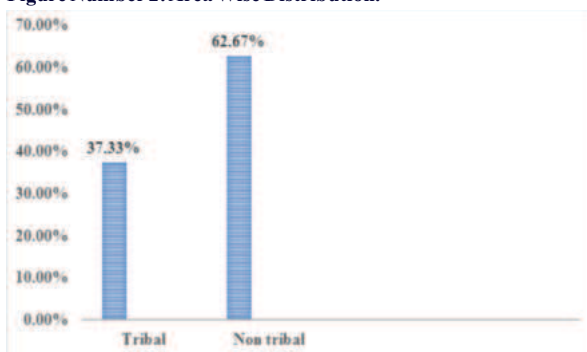


Figure Number 3: Ethnicity Wise Distribution

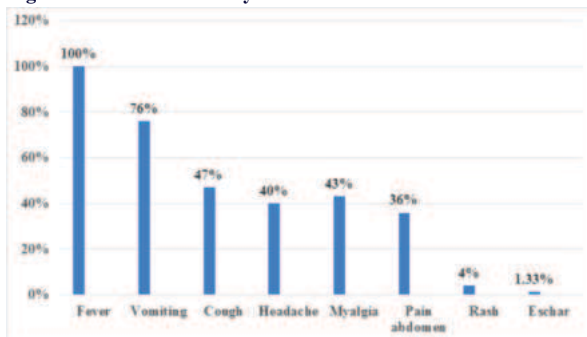


Figure Number 4: Clinical Manifestations Of Scrub Typhus

DISCUSSION

Scrub typhus is among the most commonly overlooked and emerging AFI. Scrub typhus in children has a wide range of clinical manifestations and a typical seasonal variation similar to other tropical diseases such as enteric fever, malaria, leptospirosis, and dengue. This study included 75 patients, of either gender, ranging from 1 month to 18 years of age. Out of 75 patients 62.67% were males and 37.33% were females. This study found that boys outnumbered girls which is similar to a study conducted by Kumar Jana J et al.⁸ Highest number of cases were found in 1 to 5 years of age which is similar to a study conducted in 2022.⁹ This study showed fever as the most common clinical manifestation followed by vomiting, cough, myalgia and headache which is consistent with some other studies.^{8,9} This study also found that there was a sharp rise of cases in the month of July. Similar

findings was also reported by a study which found sharp rise from April to July, peaking in August, and then a sharp fall.⁸

This study also found that 39 (52%) patients were from rural area and 36 (48%) were from urban area which indicates the disease is more prevalent in rural area which is consistent with a study conducted in 2021.⁴

CONCLUSION

Scrub typhus is a reemerging zoonosis, which presents as acute febrile illness. It has a wide range of clinical manifestations, which makes it difficult for the paediatricians to distinguish it from other infectious diseases with similar clinical manifestations and seasonal variations. Scrub typhus is not uncommon in paediatric population. It is one of the differential diagnoses that need to be considered in a child with fever.² Even in the absence of eschar, scrub typhus should be suspected in any febrile child. Strong clinical suspicion and early identification and treatment is crucial in preventing complications and decreasing the morbidity and mortality. The present study found the disease to be more prevalent in the male gender and the age group of one to five years. Fever was the most common clinical manifestation. Due to the high risk of dangerous complications and prompt response to doxycycline, early diagnosis and prompt initiation of treatment is very important to reduce the morbidity and mortality. Monitoring disease trends and deploying public health interventions targeting vector control in the endemic areas is also urgently needed to reduce the incidence of Scrub typhus.

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