



CLINICO EPIDEMIOLOGICAL SPECTRUM OF SCRUB TYPHUS IN A TERTIARY CARE CENTRE OF TRIPURA

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ABSTRACT

Introduction: Scrub typhus is caused by *Orientia tsutsugamushi*. It is an infectious disease of variable severity. Scrub typhus is grossly under diagnosed due to its nonspecific clinical manifestations, limited awareness and low index of suspicion. **Materials and Methods:** This study was a observational cross sectional study conducted in a tertiary care centre of Tripura for a period of one year. 200 patients were included in study. Results: 60 patients were found to be scrub typhus positive. Majority of the patients were males and most of them were in the age group of 41-50 years followed by 21-30 years. Besides fever, myalgia and headache were the common presenting symptoms. Scrub typhus was seen most commonly in farmers followed by day labourers and unemployed individuals. Most of the cases occurred in the month of June and July. **Conclusion:** Scrub typhus is an acute febrile illness with the characteristic of high grade fever, headache, myalgia with or without rashes. Although the disease is endemic in our country it is grossly under diagnosed owing to the non specific clinical presentation and lack of its awareness. So high index of suspicion should be there while dealing with patients of AFI as early diagnosis and prompt initiation of antimicrobial therapy may help prevent complications and reduce morbidity and mortality.

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

INTRODUCTION:

Scrub typhus is a vector borne rickettsial infection causing acute febrile illness (AFI). The re-emergence of Scrub typhus in the Asia-Pacific region represents a serious public health threat.¹ Scrub typhus is a severe infectious disease caused by *Orientia tsutsugamushi*. It poses a significant public health concern, especially within the "tsutsugamushi triangle."² The term scrub means the type of vegetation that harbors the vector and typhus means fever with stupor or smoke in Greek.³ *Orientia tsutsugamushi* is an obligate intracellular organism which grows freely in the cytoplasm of infected cells since it lacks vacuolar membrane. It has 5 major serotypes: Boryon, Gilliam, Karp, Kato, and Kawazaki.²

Scrub typhus affects about one billion people worldwide, and there are thought to be one million new cases yearly. Incubation period of scrub typhus ranges between 10 and 12 days. Following bite of infected *Leptotrombidium* mite, patients often exhibit nonspecific flu-like symptoms. Additionally, patients may develop an eschar at the bite site. The presence of an eschar is a distinctive feature of scrub typhus which occurs at the site where the chigger is fed.⁴ Scrub typhus can manifest either as nonspecific AFI or with constitutional symptoms such as fever, rash, myalgia, and headache or with organ dysfunction. Mortality of scrub typhus in untreated patients range from 0% to 30% and tends to vary with age and degree of infection.^{5,6} Acute respiratory distress syndrome (ARDS), myocarditis, acute renal damage, meningoencephalitis, disseminated intravascular coagulation, multiple organ dysfunction syndrome (MODS) are the serious complications of scrub typhus, which has high morbidity and mortality.^{7,8} Clinical features of these diseases are non-specific & so overlapping that it is almost impossible to achieve differential diagnosis because of limited diagnostic tools & thus many preventable deaths occur because of delayed or lack of diagnosis. In endemic areas where rapid, sensitive, and affordable diagnostic tools for scrub typhus are typically unavailable, clinicians often initiate empirical treatment based on suspicion. However, this approach can lead to misdiagnosis and subsequent mismanagement of the condition in the affected patients.⁹ Serological methods are the mainstay for diagnosing scrub typhus. Hence, early diagnosis of scrub typhus is very

important for early initiation of treatment with specific antibiotic which in turn can prevent the occurrence or reduce the severity of complications and death.

Aim and Objective: To study the clinical spectrum of scrub typhus in a tertiary care centre.

MATERIALS AND METHODS:

A hospital based cross-sectional study was undertaken at AGMC & GBPH for a period of one year. After taking informed consent, a pre-designed questionnaire was used to obtain data which included personal information such as name, age, sex, address, clinical profile, profession and socio-demographic profile. A total of 200 patients with AFI were included in the study. Blood was collected after proper disinfection and serum was separated. Serological diagnosis was done by performing 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.
- 100 μ l 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.
- 100 μ l 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.
- 150 μ l 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.
- 100 μ l of Liquid TMB substrate was added and the plate was incubated at room temperature in dark for 10 minutes.
- 50 μ l 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.

RESULTS:

Out of 200 patients, 114 were males and 86 were females. 60 (30%) were found to be positive for IgM Scrub typhus. Most of the cases belong to age group of 41-50 years (27%) followed by 21-30 years (26%). Figure number 1, 2 and 3 shows gender wise distribution, age group and percentage of scrub typhus respectively. Most of the patients in the study were farmers (22%) by occupation followed by day labourers (19%) and unemployed individuals (18%) which is depicted in Figure number 4. The cases were seen mainly in the month of June and July. The common symptoms found were fever (100%) followed by myalgia (76%), headache (59%), vomiting (44%) abdominal pain and rash (1%) which is depicted in figure number 5. Rash is an uncommon finding mostly maculopapular found in limbs.

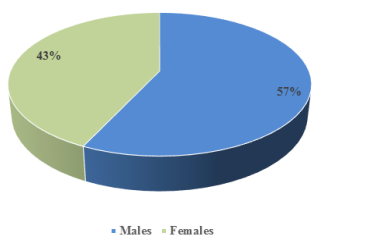


Figure no 1: Genderwise distribution

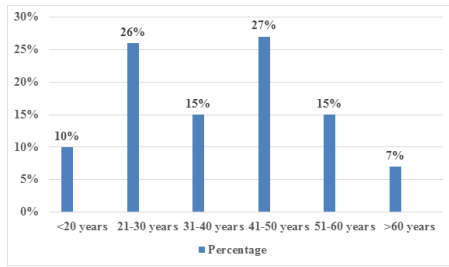


Figure no 2: Age group distribution

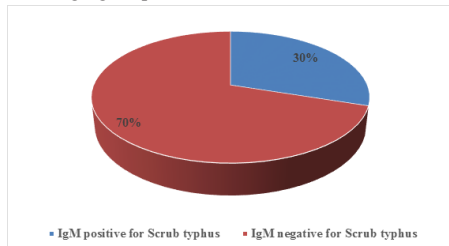


Figure no 3: Percentage of scrub typhus

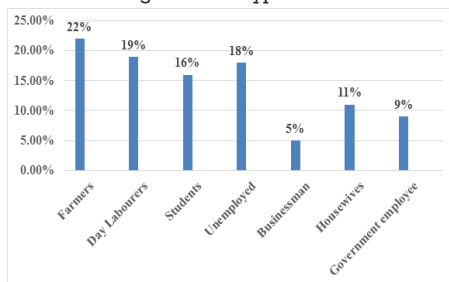


Figure no 4: Occupation of patients

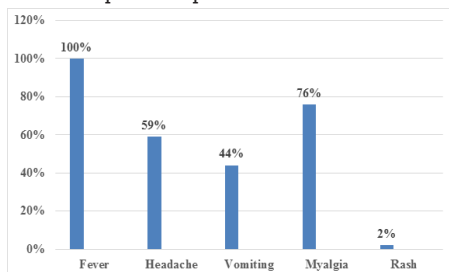


Figure no 5: Clinical manifestations

DISCUSSION:

Scrub typhus is a mite borne acute infectious disease caused by *Orientia tsutsugamushi*. Mites are both the vectors and reservoirs. Humans are accidental hosts. It affects people of all ages. The mortality of scrub typhus in untreated patients range from 0% to 30%. It is generally seen in people whose occupational or recreational activities bring them into contact with ecotypes favorable with vector chiggers.¹⁰ In our study, 60 patients showed seropositivity to Scrub typhus which is similar to a study conducted in 2015.³ Majority of the patients were males (57%) which is consistent with other studies.^{11,12} A male preponderance was also seen in a study conducted by Gurung S et al.¹³ Most of the patients in this study were in the age group of 41- 50 years followed by 21-30 whereas a study conducted in 2015 revealed majority of cases in age group of 21-30 years.¹¹ Most of the patients in this study were farmers by occupation which is also consistent with a study conducted in Uttarakhand.¹⁴ This study also revealed that most common symptoms were fever, myalgia, headache which is also similar to a study conducted in 2018.¹¹ Pattnaik et al also found similar result of fever in 100% cases.¹⁵

CONCLUSION:

Scrub typhus is an emerging disease of clinical importance and is increasingly noticed in India. Scrub typhus is also an important differential diagnosis of AFI and clinical features overlaps with other infectious diseases such as malaria, typhoid with or without organ dysfunction. However, it is grossly underdiagnosed due to low index of suspicion and due to nonspecific clinical manifestation and also due to lack of diagnostic procedures in most of the clinical settings. Eschar, which is the most diagnostic feature, is not detected in all cases. Patients presenting with fever, myalgia, headache, and rash should be considered to exclude scrub typhus. Early suspicion of the disease, establishment of an early diagnosis and early prompt initiation of antibiotic therapy leads to better outcome and prevents complication which in turns leads to substantial reduction in the mortality.

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