

Scrub Typhus in a Tertiary Care Hospital

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Abstract

Introduction: Scrub typhus is an important cause of acute febrile illness in South and East Asia and the Pacific. The causative agent is distinct from but related to Rickettsia species, i.e. Orientia tsutsugamushi. O. tsutsugamushi is transmitted via bite of a larval stage (Chigger) of a trombiculid mite (Leptotrombidium), which serves as both vector and reservoir.

Materials and Methods: This retrospective study was carried out on all serologically confirmed 93 cases of scrub typhus, admitted in a tertiary care teaching hospital during a one year period from January 2018 to December 2018. All serologically confirmed (anti O. tsutsugamushi IgM antibody positive) scrub typhus cases admitted in the hospital during the study period were included in the study. Commercially available ELISA kit (Inbios International Inc. Seattle, USA), which utilizes recombinant 56kDa antigen of O. tsutsugamushi was used for detecting anti O. tsutsugamushi IgM antibodies. An O. D value of the sample more than the cut-off (as per kit insert) was considered as positive for IgM antibodies. Data of all the 93 patients who were confirmed positive for scrub typhus during the study period was obtained from hospital information system and the medical records department. The medical records were analyzed for demographic details which included age and sex of the patients.

Results: A total of 93 patients were serologically diagnosed to have scrub typhus during the study period of three years. Among the 123 patients, 56(60.21%) were males and 37(39.78%) were females. Maximum cases of 29 (31.18%) were seen in the age group of 21-30 years. There were five cases (5.37%) of deaths due to scrub typhus infection and complications.

Conclusion: Knowledge and awareness about the disease makes the diagnosis simple and fast, which in turn facilitates early appropriate antibiotic and supportive therapy, which helps in the recovery of the patient without acquiring complications.

Key Words: Scrub typhus, ELISA, vector, reservoir

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I. Introduction

Scrub typhus is an important cause of acute febrile illness in South and East Asia and the Pacific. The causative agent is distinct from but related to Rickettsia species, i.e. Orientia tsutsugamushi. O. tsutsugamushi is transmitted via bite of a larval stage (Chigger) of a trombiculid mite (Leptotrombidium), which serves as both vector and reservoir.¹ Rickettsial infections are re-emerging and are prevalent throughout the world. In India they are reported from Maharashtra, Tamilnadu, Karnataka, Kerala, Jammu and Kashmir, Uttaranchal, Himachal Pradesh, Rajasthan, Assam and West Bengal.² Scrub typhus has been increasingly reported from almost all parts of the country in the recent years.

In recent years, scrub typhus has rapidly reemerged to become the major cause of AFI in many parts of India, especially during the monsoon and postmonsoon seasons. Of the 29 states in India, 23 have reported the presence of scrub typhus. The clinical presentation of scrub typhus ranges from subclinical disease to multiorgan failure and death. The disease usually presents with fever, diffuse lymphadenopathy, myalgia, rash, jaundice, thrombocytopenia, capillary leak syndrome, hepatomegaly, and splenomegaly. The pathognomonic feature of scrub typhus is the necrotic eschar at the bite site. The disease can progress to severe complications like acute respiratory distress syndrome (ARDS), hepatitis, acute kidney injury, myocarditis leading to heart failure, and meningoenzephalitis in different proportions of the patients. A late presentation, delay in diagnosis and treatment, and varying levels of antibiotic resistance exhibited by the organism are factors responsible for high mortality.

With the changing epidemiology of scrub typhus, it is now among the commonest causes of AFI in India. It is important to get familiar with the clinical and diagnostic laboratory features of scrub typhus, so as to

differentiate it from other etiologies of AFI. An early diagnosis and institution of specific treatment will reduce morbidity and mortality from this infectious disease.

II. Materials And Methods

This retrospective study was carried out on all serologically confirmed 93 cases of scrub typhus, admitted in a tertiary care teaching hospital during a one year period from January 2018 to December 2018 at TRIHMS, Naharlagun, Arunachal Pradesh. All serologically confirmed (anti *O. tsutsugamushi* IgM antibody positive) scrub typhus cases admitted in the hospital during the study period were included in the study.

Commercially available ELISA kit (Inbios International Inc. Seattle, USA), which utilizes recombinant 56kDa antigen of *O. tsutsugamushi* was used for detecting anti *O. tsutsugamushi* IgM antibodies. An O. D value of the sample more than the cut-off (as per kit insert) was considered as positive for IgM antibodies.

Data of all the 93 patients who were confirmed positive for scrub typhus during the study period was obtained from hospital information system and the medical records department. The medical records were analyzed for demographic details which included age and sex of the patients. The sex wise distribution of patients with scrub typhus was calculated and expressed in percentages. Patients were grouped into age groups of 1-14 years (paediatric group), 15 to 20 years, 21 to 30 years, 31 to 40 years, 41 to 50 years, 51 to 60 years, 61 to 70 years and 71 to 80 years, and the percentage of people in each age group who were positive for scrub typhus was calculated and expressed in percentages.

Data regarding clinical signs, symptoms and complication if any were also analyzed. The clinical presentations were grouped into signs and symptoms like fever, eschar, rigor, vomiting, cough, chills, headache, skin rash, abdominal pain, seizure, myalgia, arthralgia, oliguria, hepatomegaly, splenomegaly, lymphadenopathy, thrombocytopenia and complications like hepatic dysfunction, renal failure, pleural effusion, acute respiratory distress syndrome (ARDS), multiple organ dysfunction syndrome (MODS), meningitis and meningoencephalitis. Co - infections and mortality if any were also documented. The number of patient exhibiting these signs, symptoms and complications were calculated. All the data were expressed in numbers and/ or percentages.

III. Results

A total of 93 patients were serologically diagnosed to have scrub typhus during the study period of three years. Among the 93 patients, 56(60.21%) were males and 37 (39.78%) were females. Figure 1 shows the sex wise distribution of patients with scrub typhus. Numbers of males were more than the female patients.

Table 1: Gender distribution

S.No	Gender	N (%)
1	Male	56 (60.21%)
2	Female	37 (39.78%)

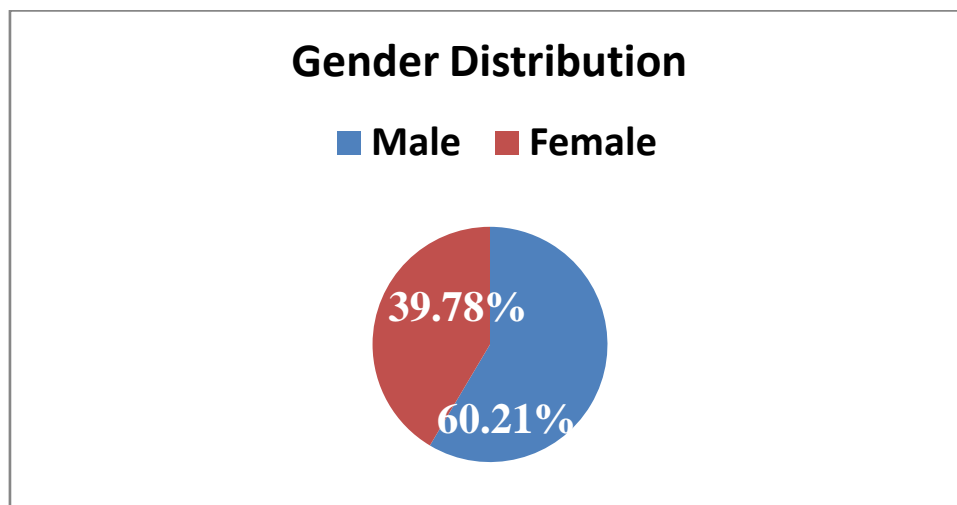


Figure 1: Gender Distribution of patients with scrub typhus

Table 2: Age wise distribution of patients with scrub typhus

S.No	Age Group	N (Percentage)
1	1-14 years	4 (4.3%)
2	15-20 years	9 (9.67%)
3	21-30 years	29 (31.18%)
4	31-40 years	16 (17.2%)
5	41-50 years	14 (15.05%)
6	51-60 years	13 (13.97%)
7	61-70 years	6 (6.45%)
8	71-80 years	2 (2.15%)

Table 2 shows age wise distribution of patients with scrub typhus. Among all the positive cases, 4 (4.3%) of them were paediatric cases. Maximum cases of 29 (31.18%) were seen in the age group of 21-30 years.

Table 3: Clinical features of the patients diagnosed with scrub typhus

S.No	Clinical Features	Numbers	Percentage
1	ALTERED SENSORIUM	9	9.67
2	Breathlessness	38	40.86
3	Rashes	27	29.03
4	Cough	24	25.80
7	Diarrhea	4	4.30
10	Jaundice	10	10.75
11	Pedal edema	3	3.22
15	Generalised weakness and myalgia	10	10.75
16	Hepatomegaly	20	21.50
17	Splenomegaly	14	15.05
18	High grade fever with chills and rigor	93	100
19	Pallor	27	29.03
20	Hypotension	12	12.90

Table 3 shows the clinical features of the patients diagnosed with scrub typhus. Symptoms like cough were found in 25.8 % of the patients, skin rash in 29.03 %, breathlessness in 40.86 %, diarrhoea in 4.3 %, jaundice in 10.75%, myalgia in 10.75% and altered sensorium in 9.67 % of the patients. Clinical signs like pedal edema (3.22%), hepatomegaly(21.5%), splenomegaly(15.05%), hypotension(12.9%) and pallor (29.03%) were seen.

Table 4 shows the laboratory parameters of the scrub typhus patients. Thrombocytopenia was seen in 43(46.23%) patients. Anemia was found in 41(44.08%) patients.

Table 4: Laboratory parameters of 93 scrub typhus patients

Laboratory parameters	No. of patients	Percentage
Thrombocytopenia (< 1.0 × 10 ⁹ /μL)	43	46.23
Hyperbilirubinemia (> 2.5 mg/dL)	10	10.752
Anemia (< 11 g/dL)	41	44.08
SGOT/SGPT (≥ 2 times normal)	20	21.505
Hypoalbuminemia (< 3 g/dL)	22	23.65

Table 5: Complications of scrub typhus

S.No	Complications	Number	Percentage
1	Hepatic dysfunction	10	10.75
2	acute renal failure	3	3.22
3	ARDS	3	3.22
4	Lower Respiratory Infection	23	24.73
5	cerebrovascular hemorrhage	1	1.075
6	MODS	5	5.37
7	Meningoencephalitis	1	1.075

8	Pleural effusion	2	2.15
9	Mortality (deaths)	5	5.37

Table 5 shows the various complications seen in the scrub typhus positive patients. Some of the scrub typhus positive patients developed complications. The most common complication found in the patients with scrub typhus was acute lower respiratory infection (24.73%). There were five cases (5.37%) of deaths due to scrub typhus infection. Co-infections with other etiological agents like malaria and typhoid were found in 17.1% of patients.

IV. Discussion

The incidence of scrub typhus has been increasing in India. The improved laboratory diagnostic methods like IgM scrub ELISA and PCR and the awareness about the disease, has led to improved diagnosis and reporting.⁷ This is evident from the fact that a total of 93 positive cases of scrub typhus have been reported in this present study, in a one year period, whereas in a study by Vivekanandan et al.⁶ it was only 50 cases which were reported positive during a two year period. This can be in part attributed to the switch over from non specific test like the Weil-Felix test to more specific and sensitive scrub typhus IgM ELISA assay.

In the present study, the percentage of male patients were higher (60.21%), than the females (39.78%) and this trend has also been reported in some of the earlier studies.^{5,8} However Mahajan et al also reported more number of male patients in their study.³

Patients with scrub typhus have fever, headache and myalgia as the most common clinical presentations.⁶ Patients can also present with other nonspecific symptoms, which often leads to a dilemma in diagnosis.⁶

In this study, majority of the patients presented with fever (100%) which was the most common symptom, followed by chills, rigor and myalgia. Non specific symptoms associated with the respiratory tract like cough (25.8%) and symptoms of the gastro intestinal tract like diarrhea (4.3%) were also seen in patients. In our study, the case fatality rate was 5.37% which was lower than 13.6% report of Sharma et al.¹¹

V. Conclusion

Knowledge and awareness about the disease makes the diagnosis simple and fast, which in turn facilitates early appropriate antibiotic and supportive therapy, which helps in the recovery of the patient without acquiring complications.

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