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### RESEARCH ARTICLE

#### CLINICAL CHARACTERISTICS, MANAGEMENT PRACTICES AND IN-HOSPITAL OUTCOMES OF SCRUB TYPHUS PATIENTS IN A TERTIARY CARE CENTER IN THE NORTH EASTERN STATE, TRIPURA

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#### Abstract

**Background-** With the changing epidemiology, scrub typhus is now among the commonest causes of AFI in India and a high suspicion should be maintained, and an early diagnosis and prompt management is warranted to prevent complications.

**Objective -** Clinical characteristics, management practices and in-hospital outcomes of scrub typhus patients.

**Methods-** a Cross-sectional retrospective study was conducted among 110 scrub typhus patients attending Agartala Government Medical College and GB Pant Hospital, a tertiary care centre of Tripura in last one year period. Their clinical profile, laboratory studies and management has been recorded and data has been evaluated with SPSS 21.0 for windows with p- value <0.05.

**Results-** the commonest presenting symptoms of scrub typhus are high-grade fever with chills, headache and it most commonly effects farmers. Most commonly effected age group was 40-50 years of age. Most of the patients were from West Tripura followed by Khowai Tripura and least patients were from North Tripura. Predominately it occurred in September, October and November i.e. in post monsoon period. The pathognomonic eschar was present in 43% patients and rarest presentation was paraparesis (0.9%). Lymphadenopathy (9%), neck rigidity (6%), hepatomegaly (10%), splenomegaly (4%), acute respiratory distress syndrome was seen in 14% patients. Hepatic involvement was the most common complication seen in our study (42%). Anemia was present in 25% and thrombocytopenia was present in 22% patients. Subside of fever to doxycycline injection seen in 73% on day1 and 84% on day2. 19% Patient required icu admission. 9% developed ARDS and 6% required ET tube intubation and mechanical ventilation. 6% developed hypotension requiring inotropic support. 4% developed severe thrombocytopenia(<10,000) required platelet transfusion. 11% developed acute kidney injury requiring haemodialysis. Survival rate were 93% and mortality 7%. In conclusion, scrub typhus became the leading infectious cause of acute

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febrile illness in North eastern state, Tripura. A high suspicion should be maintained, and an early diagnosis and prompt management is warranted to prevent mortality and morbidity of patients.

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### **Introduction:-**

Acute febrile illness is one of the most common presenting complaint in clinics of north eastern states. Usually the outbreaks occur in the rainy and post-rainy seasons in India. Like malaria, dengue, typhoid scrub typhus is also responsible for such outbreaks. Scrub typhus, an infective vasculitic-perivasculitic disease, is caused by *O. tsutsugamushi*, a gram negative obligate intracellular bacteria.<sup>1</sup> The disease is a zoonosis and is transmitted to humans through scrub vegetation by the bite of trombiculid chigger mites.<sup>2</sup> In recent years, it has rapidly emerged to become the major cause of Acute Febrile Illness in many parts of India.<sup>3</sup> It occurs during monsoon and postmonsoon seasons.<sup>4</sup> To my knowledge, no such study has been done in north-eastern state. This study will enable us to get familiar with clinical profile and laboratory parameters of scrub typhus as high suspicion and an early diagnosis and prompt management is warranted to prevent mortality and morbidity from this infectious disease.

### **Materials And Methods:-**

A cross sectional retrospective observational study done in the department of medicine of Agartala Government Medical College and GB Pant Hospital during last one year from December 2020 to November 2021 among 110 scrub typhus patients with inclusion criteria of patients above 12years of age with sero positive scrub typhus. Patients who has co infection with other organisms has been excluded from our study.

A detail history was collected and thorough physical examination was carried out and all patients were managed according to Surviving Sepsis Campaign Guidelines. The patients with bilateral chest infiltration on chest x-ray, a  $PaO_2/FiO_2 < 300$  in absence of heart failure were defined as ARDS<sup>5</sup>. Features of two or more system involvement in an acutely ill patients labelled as MODS<sup>6</sup>. Laboratory tests carried out were complete hemogram, renal function tests, liver function tests, serum electrolytes, chest x rays.

Diagnostic modality used to diagnose scrub typhus in our patients is **IgM ELISA**.

The descriptive statistics including frequency, mean, median, inter quartile range and standard deviation were calculated for the demographic data and laboratory parameters. Categorical variables were presented as percentage and continuous variables were presented as mean/median along with 95% confidence interval. For all tests P value 0.05 or less was considered as statistically significant. All statistical analysis were performed using SPSS 21.0 for windows.

### **Results:-**

A total of 110 adult patients (51 females and 59 males) with median age of 44 years with range of 40-50 years were studied and most of them were farmer (43%). Most of the patients were found during post monsoon period i.e. September(21%), October(20%), November(23%) of 2021. Most of the patient came from West Tripura followed by Khowai Tripura and least patients were from North Tripura.

## Scrub typhus map of Tripura



Most cases presented during the month of September(20.9%, n=23), October(20%, n=22) and November(22.7%, n=25) i.e. in postmonsoon periods.

Of the entire group 43% were farmer, 20% homemaker, 18% students and others 19%. Among them most common presentation was fever associated with headache(79%, n=87) followed by myalgia(51% n=56). The pathognomonic eschar was present in 43% patients and rarest presentation was paraparesis (0.9%). Lymphadenopathy (9%), neck rigidity (6%), hepatomegaly (10%), splenomegaly (4%), acute respiratory distress syndrome was seen in 14% patients. Among them 76(69%) patients had intermittent type of fever and 32(29%) patients had continuous type of fever, 2 (1.8%) patients had remittent type of fever.

	Number	percentage (%)
Fever	110	100%
Headache	87	79%
Myalgia	56	51%
Malaise	47	43%
<b>eschar</b>	<b>47</b>	<b>43%</b>
Polyarthralgia	46	42%
Shortness of breath	18	16%
rash	18	16%
Diarrhea	14	13%
restlessness	10	9%
jaundice	4	4%

paraperesis	1	0.9%
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**Table no 1:-** clinical presentation of scrub typhus patients (n=110).

In this study population 19(17%) patients found to have diabetes and 23(20.9%) patients were hypertensive.

According to the laboratory investigation most common laboratory finding was altered hepatic function 46(42%)patients. Anemia was present in 25% and thrombocytopenia was present in 22% patients. Acute kidney injury was the commonest complication (22%, n=20) followed by multiorgan dysfunction syndrome (10%, n=11) and acute respiratory distress syndrome (9%, n=10). Among these 10(9%) ARDS patients 6(6%) required ET tube intubation and mechanical ventilation. 7(6%) developed hypotension requiring inotropic support. 5(4%) developed severe thrombocytopenia(<10,000) required platelet transfusion. 12(11%) developed acute kidney injury requiring hemodialysis. Mortality rate was 7%(n=8). While evaluating the chest X ray findings of scrub typhus positive patients we got 12 (n=12, 11%) patients having ground glass opacities, 9 (n=9, 8.1%)patients having consolidation, 3 (n=3, 2.7%) patients having hilar lymphadenopathy, 2(n=2, 1.8%) patients having massive pleural effusion and rest of the patients were having normal chest X ray findings. The case fatality rate in patients with MODS were 44% and without MODS were 2% (P <0.001). In univariate analysis ARDS requiring mechanical ventilation (relative risk =3.7,95% P<0.001, hypotension requiring inotropic support (6%, P<0.001), acute kidney injury requiring hemodialysis (11%,n=12, p<0.001), altered sensorium at presentation (9%, n=10, P<0.001)and MODS (10%, n=11, P<0.001) were inversely associated with survival. Survival was significantly higher in patients who presented with fever of less than 10 days duration.

### Discussion:-

In this study, the commonest presenting symptoms are **high-grade fever with chills, headache** And it most commonly effected farmers. Which is similar to study done by Emily Devasagayam et al.<sup>6</sup> **Hepatic involvement** in the most common complication seen in our study **46 (42%)** where as hematological abnormality (thrombocytopenia) is most common complication seen in a study done by navneet Sharma et al.<sup>7</sup> **Acute kidney injury** was noted in **22(20%)** of our scrub typhus patients, which is higher than study done by Raghav Grover et al.<sup>8</sup> **Subside of fever to doxycycline therapy in 48 hours** seen in **92 (82%)** which is slightly low compared to study done by Ilamaran Virappan et al (92%).<sup>9</sup> The **case fatality rate** was **8(7%)** which is less than study done by Shital Adhikari et al (20%).<sup>10</sup>

### Conclusion:-

With the changing epidemiology, scrub typhus is now among the commonest causes of AFI in India. A high suspicion should be maintained, and an early diagnosis and prompt management is warranted to prevent complications. Early presentation of disease with duration of fever < 10 days has better prognosis when compared with a fever duration of > 10 days. Multiorgan failure, respiratory dysfunction, and shock are the important life-threatening complications that lead to higher case fatality rates. An increasing awareness about the disease presentation, clinical features, and laboratory findings will help in reducing the mortality from this infectious disease.

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