

CLINICAL AND PARACLINICAL PROFILE OF SCRUB TYPHUS PATIENTS AT A TERTIARY CARE HOSPITAL IN SOUTH RAJASTHAN, INDIA

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Abstract

Scrub typhus is one among the common causes of Acute Undifferentiated Febrile Illness(AUFI) in Asia especially from India.

Objective - The present study aims to describe the clinical features, lab diagnosis, complications and outcome in scrub typhus from Southern Rajasthan, India.

Method -This present prospective, observational, hospital-based study was conducted in the Department of Microbiology of AIMS &RC, Rajsamand, located in Southern Rajasthan, from January 2021 to Dec 2021. Scrub typhus was diagnosed in the microbiology laboratory by carrying out SD Bioline, one step scrub typhus for detection of IgM antibody.

Result -A total of 500 patients suspected of AUFI were included in study. Out of which 88 patients were diagnosed to have scrub typhus by rapid card method detecting IgM antibody. Fever (100%) was the most common symptom and the duration of illness at the time of detection was less than 1 week in 70% cases. The most predominant sign noted in our study was icterus in 41% cases followed by hepatosplenomegaly. Elevated transaminase level was detected in 75% cases followed by increased serum urea/creatinine level and thrombocytopenia in 50% and 39% cases respectively. Acute hepatitis was found in majority of patients ie in 75% cases followed by acute kidney injury in 49% cases. The overall mortality rate was 16%.

Conclusion -Hence we conclude that scrub typhus is an important differential diagnosis in patients with fever, icterus, elevated serum transaminase and patients with acute hepatitis and multiorgan dysfunction.

A high index of suspicion, prompt diagnosis and early treatment can prevent complications which in turn will help in reducing mortality.

Keywords – AUFI, scrub typhus, multiorgan dysfunction, Rapid card test.

Introduction

Scrub typhus, a mite borne acute infectious disease caused by *Orientia tsutsugamushi* [1]. It is the most prevalent rickettsial disease in India and also reemerged as a major cause of high morbidity and mortality among acute undifferentiated febrile illness (AUFI) patients [2]. Scrub typhus commonly present with headache, breathlessness, fever, rash, nausea, vomiting, cough, haemoptysis, headache and generalized weakness. 30-50% of AUFI patients with scrub typhus require hospitalization due to multi-organ dysfunction with pulmonary, neurological, renal, cardiac or hepatic complications leading to high case fatality rates[3,4].

The WHO has described scrub typhus as one of the most under diagnosed and under reported febrile illness requiring hospitalization[5]. In India also along with Southern Rajasthan, it is an underreported disease and can easily be missed in early course due to resemblance with other prevalent infections in the region (Malaria, Dengue etc.). Early diagnosis of scrub typhus will help in better outcome of patients. Keeping the above point in mind, this study was planned with the aim to know the clinical and laboratory profile of patients with scrub typhus which will in turn help the physicians to diagnose and manage these patients in a better way.

Material and method

This present prospective, observational, hospital-based study was conducted in the Department of Microbiology of AIMS & RC, Rajsamand, located in Southern Rajasthan, from January 2021 to Dec 2021. Ethical clearance was obtained from Institutional ethical committee.

The patients were enrolled in the study who fulfilled the following inclusion and exclusion criteria –

Inclusion criteria

1. Patients who were tested positive for IgM antibodies for *O. tsutsugamushi*.

Exclusion criteria

1. Patients who presented with other causes of fever like pneumonia, malaria, pleural effusion, dengue, Leptospirosis, viral diseases, urinary tract infections, Typhoid fever,
2. Patients who were tested negative for IgM antibodies for *O. tsutsugamushi*.

All demographic data, detailed clinical history, physical examination, reports of standard set of investigation and final outcome was obtained from the case file. Scrub typhus was diagnosed in the microbiology laboratory by carrying out SD Bioline, one step scrub typhus for detection of IgM antibody. Statistical analysis was done by the Graph Pad prism statistical software.

Result

During the study period a total of 500 samples were processed in Microbiology lab received from various clinical departments of Ananta Institute of Medical Sciences and Research center, Rajsamand. Out of which 88 samples were reactive to IgM Ab by SD Bioline Rapid card test. 88 (100%) patients had high grade, continuous fever and mean duration of illness of fever was 6.7 ± 2 days. Other related symptoms were headache in 50 (57%) patients, nausea and vomiting in 43(50%), jaundice and abdominal discomfort in 36(41%) patients each, loss of appetite in 19(22%) and only 14(16%) patients complained of breathlessness.

Most common clinical sign was icterus in 36 (41%) patients followed by splenomegaly in 14(38%), hepatomegaly in 12 (33%), pallor in 10 (11%) and eschar in 4 (5%) patients. Most predominant laboratory finding was elevated transaminase in 66 (75%) patients while increased serum urea/creatinine in 44 (50%), elevated bilirubin(>2mg/dl) in 40 (46%), leukocytosis (WBC count >11,000 /mm³) in 29(33%), anemia (haemoglobin <10gm/dl) in 17 (19%) patients.

Most common complication observed were acute hepatitis in 66 (75%) patients followed by acute renal failure in 43(49%) patients, multiorgan dysfunction(MODS) in 21(44%), pleural effusion in 14(16%), acute respiratory distress syndrome (ARDS) and metabolic acidosis in 12(14%) patients each, ascites, septic encephalopathy and septic shock in 7(8%) patients each and least common complication noted was pulmonary odema only in 5(6%) patients. Despite the best efforts, 14 patients expired. The overall mortality was 16% and most of these patients had complications like hepatic failure, renal failure, MODS and ARDS.

TABLE 1 - CLINICAL PROFILE OF ENROLLED SCRUB TYPUS PATIENTS

Characteristic	No of cases	%
1. Duration of Illness (at the detection of illness)		
a) < 7 days	62	70
b) 8-14 days	21	24
c) >14 days	5	6
Mean duration of illness \pm SD (days)	6.7 \pm 2	
2. Symptoms		
a) Fever	88	100
b) Breathlessness	14	16
c) Nausea/vomiting	43	50
d) Headache	50	57
e) Jaundice	36	41
f) Loss of Appetite	19	22
g) Abdominal discomfort	36	41
3. Signs		
a) Pallor	10	11
b) Icterus	36	41
c) Shock/Hypotension	3	8
d) Hepatomegaly	12	33
e) Splenomegaly	14	38
f) Eschar	4	5

TABLE 2 - LABORATORY INVESTIGATION OF SCRUB TYPHUS PATIENTS

Characteristics	No of cases	%
Total leucocyte count		
<4000	14	16
4000-11000	45	51
>11000	29	33
Haemoglobin(<10gm/dl)	17	19
Platelet count(<1.0×10 ⁶ /cumm)	34	39
Elevated transaminase	66	75
Elevated bilirubin(>2mg/dl)	40	46
Increased serum urea /creatinine	44	50

TABLE 3- COMPLICATIONS OF SCRUB TYPHUS IN OUR STUDY

Characteristics	No of cases	%
Hepatic dysfunction	66	75
Renal dysfunction	43	49
Septic shock	7	8
Acute respiratory distress syndrome	12	14
Pleural effusion	14	16
Multi organ dysfunction syndrome	21	44
Pulmonary odema	5	6
Septic encephalopathy	7	8
Metabolic acidosis	12	14
Ascitis	7	8

Discussion

Scrub typhus is fast growing, potentially fatal and most neglected rickettsial disease emerging in India [2]. It is one of the common cause of acute respiratory distress syndrome which inturn is responsible for increase in duration of admission in ICUs[6]. Though sporadic outbreaks of scrub typhus have been reported from various parts of India but it is the tip of iceberg as it still remains underdiagnosed and underreported hence causing high morbidity and mortality [3,4].

In our study, fever was the most common symptomreported in all 88 (100%) patients, similar finding was also reported by Sudhir K Verma et al [7] and Rajendra Prasad Takhar et al[8]. Majority of the patients presented with fever of less than one week duration and mean duration of illness was of 6.7 ± 2 days. This is similar study conducted by Zhang M et al [9] with mean duration of illness of 6.6 days, where as a study conducted by Lakshmi et al [10] showed that more patients presented with fever of 7-14 days of illness, with mean duration of illness of 9.6 ± 2 days.

In the present study, other symptoms were headache (57%), nausea/vomiting (50%),jaundice(41%), abdominal discomfort (41%). Sudhir K Verma et al [7] also found similar results with 2nd most common symptom as headache (70%) followed by nausea and vomiting (59.6%), altered sensorium (48%) and jaundice (28.8%). Similarly, Raman Sharma et al [11] reported headache (81.6%) followed by cough and breathlessness (58.4%), nausea/vomiting (46.5%). However, in a study conducted by Jay Prakash et al[12] reported loss of appetite, vomiting /nausea in 21.24% patients each and jaundice in 6.22% patients.

In the present study eschar, a characteristic feature of scrub typhus is found in only 5% cases. Sivarayan et al [13], Uday W. Narlawar et al[14] and Pathania et al [15] reported eschar in 2.3%, 1.8% and 11.1% respectively, whereas Sudhir K Verma et al [7] and Jayprakash V et al[12] also reported eschar in 21.2% and 28.1%patients. The low rate of detection of eschar in Indian studies might be due to dark complexion of patients. On examination icterus was the most common sign noticed in 36 (41%) patients. A study conducted by Verma et al[7]and Kedareshwar P.S et al[16] both reported icterus as the most predominant sign in 28.8% and 53.3% cases respectively. Whereas a study conducted by Raman Sharma et al [11] most common clinical sign was hepatosplenomegaly reported in 50.4% patients.

Among laboratory investigations, most patients had elevated serum transaminase in 75% patients, followed by increased serum urea/creatinine level in 50% patients, elevated bilirubin in 46% patients, thrombocytopenia (platelet count $<1,00,000/\text{cumm}$) in 39% patients and leukocytosis in 33% patients.

This is similar to study conducted by Lakshmi RMMV et al [10], in which elevated transaminase and increased serum creatinine level was noted in 82.7% and 20.6% respectively.

As noted, that scrub typhus is one of the causes for multiorgan dysfunction. In our study most common complication was acute hepatitis in 75% cases. This is similar to the study conducted by Verma et al[7], Pathania et al[15] and Narvencar et al[17]. The second most common complication noted was acute renal failure in 49% cases followed by MODS in 44% cases but ARDS was only noted in 14% cases. A study conducted by Pathania et al[15], Griffith et al[18] and Verma et al[17] in which acute renal failure was the second most common complicated seen in 12%, 22% and 58% cases respectively. ARDS was also noted in 7.7% cases in a study conducted by Verma et al [7].

The mortality rate in our study was 16%. Out of 14 patients who expired most of them had the complications like acute hepatic dysfunction, acute renal failure, multiorgan dysfunction and ARDS. The overall mortality rate in our study was much lower than the studies conducted by Rajender Prasad et al (21%) [8] and Pandey et al (30%) [19]. Similar studies conducted by Mahajan et al[20] and Kumar et al [21] reported a mortality rate of 14.2% and 17.2% respectively. Lower mortality rate in our study may be primarily due to early presentation, increased awareness, early diagnosis and treatment of cases by physicians.

Conclusion

Scrub typhus must be considered as an important differential diagnosis in patients with fever, icterus, elevated transaminases, and thrombocytopenia. Scrub typhus patients with systemic complications like acute hepatitis, acute kidney injury and MODS are associated with high morbidity and mortality. Hence, we conclude that high index of suspicion in patients with AUFI, early diagnosis by immune chromatographic tests and prompt treatment can significantly reduce complications thereby decreasing both morbidity and mortality.

Authors contribution

All the authors collected data, reviewed and drafted the manuscript and all have approved the final version of this in the end.

Conflicts of interests

None.

Authors funding

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