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Original Research Article

Demographic variables and clinical profile of scrub typhus patients: experience from a tertiary care center in Udaipur, Rajasthan

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ABSTRACT

Background: Scrub typhus is an acute febrile bacterial zoonoses, caused by Orientia tsutsugamushi and is associated with a range of complications, including sepsis, Acute respiratory distress syndrome (ARDS), pre-renal azotemia and Multiorgan dysfunction syndrome (MODS). The objective of this study was to study the demographic variables and clinical profile of the patients diagnosed with scrub typhus. admitted in a tertiary care hospital in Udaipur, Rajasthan.
Methods: It was a longitudinal, observational study, conducted in a tertiary care centre in Udaipur, Rajasthan from January 2020-June 2021. All patients, diagnosed (positive for antibody IgM) with scrub typhus in the hospital during the study period were included in the study. Information about the patients was collected using a pre-tested questionnaire and clinical examination, after taking the informed consent from the study participants.
Results: Mean age of the patients was 36.4±19 years. Majority (69.4%) of the patients were from rural area and fever was the most common (83.9%) symptom experienced. Eschar was found in only 1.6% of patients. About 87.1% of the patients had complications, with MODS, being the most common affecting about 34% of the total patients. The patients from rural areas were found to have significantly higher odds (OR=1.61) of having complications as compared to urban area patients (CI=1.09-4.3).
Conclusions: This article draws attention to the fact that scrub typhus is quite on rise and most of the cases are associated with complications. There is a need to develop effective strategies and interventions to stop this rampant rise of the cases in India.

Keywords: Clinical, Scrub typhus, India, Rajasthan

INTRODUCTION

Scrub typhus has been one of the most covert emerging and re-emerging Rickettsial infections with increasing trend in incidences of the disease worldwide including India. The tropical febrile vector borne disease also known 'Tsutsugamushi disease' is caused by the organism Orientia tsutsugamushi, a gram negative obligate intracellular slow growing bacterium. The Scrub typhus infection is transmitted by bite of larva of mites known as chiggers. The mite acts both as reservoir and vector to efficiently transmit its off springs through transovarian transmission. The disease is also transmitted from larval stage of mites to rats, where man is an accidental host.[1]

Scrub typhus is an acute febrile illness varying from mild and self-limiting to fatal. Onset is by fever, headache, myalgia, cough and gastrointestinal symptoms. A typical eschar is found in more than 50% cases. There is regional lymphadenopathy and a maculopapular rash on 4th to 6th day of illness in some. Severe cases are characterized by encephalitis and interstitial pneumonia due to vascular injury with a Case fatality rate of 7%.[1] In India, the disease is included in the list of Infectious diseases under surveillance (IDSP), still there is underestimation of its prevalence and hazard.[2] As an emerging infectious disease, scrub typhus has a trend of wide and fast spread in the past two decades. There is a study on a recent outbreak of scrub typhus recorded during the cooler months in patients admitted to a hospital in Southern India with acute febrile

illness associated with diverse signs and symptoms.[3] Deaths caused by delay in diagnosis and treatment can occur in scrub typhus patients. It is important to study the various demographic and other associated variables, to devise strategies for early diagnosis and guiding subsequent management. In the past, scrub typhus was believed to be a benign infection. However, there has been change in the epidemiological pattern of the distribution of the disease and it is no longer confined to the sub-Himalayan states. This longitudinal observational study was an attempt to explore the demographic features, clinical profile and associated complications in the patients infected with scrub typhus.

METHODS

It was a longitudinal, observational study, conducted between January 2020-June 2021 in a tertiary care centre in Udaipur, Rajasthan. All patients, diagnosed with scrub typhus in the hospital during the study period, willing to participate in the study, were included in the study. The diagnosed cases of scrub typhus were the confirmed positive cases for antibody IgM, by Standard Q card method (SD biosensor), admitted in the hospital. Detailed history of the patient was taken using a pre-designed and pre-tested questionnaire, after taking the informed consent from the study participants. Questionnaire included the questions about the housing, occupation, area of residence etc. Clinical history about the presence of symptoms like fever, breathlessness, vomiting etc was also taken. It was followed by the clinical examination and a careful search for the presence of eschar. The information about the occurrence of complications among the patients was collected: which organ was involved or Multiorgan dysfunction syndrome (MODS). MODS is defined as dysfunction of two or more organ systems. Prior approval from Institutional Ethics Committee (IEC) was obtained before commencing the study. An informed and written consent was taken from every participant before being included in the study.

RESULTS

A total of 62 patients, admitted in the hospital from January 2020 to June 2021 consented to participate in the study. Mean age was 36.4±19 (SD) years. Out of the total patients, 30 (48.4%) were males and 32 (51.6%) were females. Table 1 shows the demographic variables of the study participants. Majority (69.4%) belonged to rural area and had pukka house (83.9%). About 82.3% had sanitary toilet in their houses and 62.9% revealed that there were mice in their households. About 9.7% study participants had history of travel in past 14 days.

Table 2 shows the clinical profile of study participants. Fever was the most common (83.9%) symptom, followed by vomiting (29%), breathlessness (21%), abdominal pain (16%), headache (9.7%) and altered sensorium (8.1%). Out of the total patients, eschar was found in only one patient (1.6%).

Table 3 shows the various complications in study participants diagnosed with scrub typhus. Complications involving one or more organs were found in majority of patients (87.1%). The most common complication was MODS, found in about one third of the patients. The other complications were related to gastrointestinal (11.2%), respiratory (9.6%), neurological and renal (8.1%) and cardiac system (6.5%).

Table 4 shows the association of occurrence of complications with various variables, using regression analysis. The patients from rural area had significantly higher odds of having the complications as compared to urban area patients, with odds ratio of 1.61 (95% CI 1.09-4.3).

Table 1: Demographic variables of the patients hospitalized with scrub typhus (N=62).

Variables		Number	Percentage (%)
Gender	Male	30	48.4
	Female	32	51.6
Area of residence	Urban	19	30.6
	Rural	43	69.4
Housing	Kutcha house	10	16.1
	Pukka house	52	83.9
Presence of sanitary toilet	Yes	51	82.3
	No	11	17.7
Presence of mice	Yes	39	62.9
	No	23	37.1
History of recent travel (in last 14 days)	Yes	6	9.7
	No	56	90.3

Table 2: Clinical profile of the patients hospitalized with scrub typhus (N=62).

Clinical features*	Number	Percentage (%)
Fever	52	83.9

Continued.

Clinical features*	Number	Percentage (%)
Vomiting	18	29
Breathlessness	13	21
Abdominal pain	10	16
Headache	6	9.7
Altered sensorium	5	8.1
Anorexia	3	4.8
Seizure	3	4.8
Diarrhoea	1	1.6
Rash	1	1.6
Eschar	1	1.6

Note: *-not mutually exclusive

Table 3: Complications among the patients hospitalized with scrub typhus (N=62).

Complications	Number	Percentage (%)
Respiratory	6	9.6
Gastrointestinal	7	11.2
Cardiac	4	6.5
Neurological	5	8.1
Renal	5	8.1
Multiple organ dysfunction syndrome (MODS)	21	33.9
Others	6	9.7
No complications	8	12.9

Table 4: Multivariate logistic regression analysis of the factors associated with the occurrence of complications among patients of scrub typhus.

Variables	OR	95% CI	P value
Gender	2.46	0.37-16	0.35
Residence	1.61	1.09-4.3	0.03
Occupation	0.67	0.034-13.1	0.79
Mice	5.2	0.65-14.8	0.82
Travel history	0.41	0.16-11.9	0.72

DISCUSSION

Scrub typhus is zoonoses, caused by Orientia tsutsugamushi and transmitted to humans by the bite of the larva of the trombiculid mite.[1] These mites are usually found in areas like forest clearings, bushy regions and river banks, especially during the rainy season when these mites lay eggs. The most common symptoms are fever and myalgia, which often mimics complicated malaria disease and also its quick response to doxycycline, has led to the underestimation of the burden of disease despite its widespread presence.[4] Also, patients frequently suffer from complications, which can be life threatening and delay in diagnosis or failure of correct diagnosis can lead to significant mortality.[5-8] Also, there has been a recent rise in its prevalence of scrub typhus in the world, including India.[9]

Our study described the demographic characteristics and clinical profile of scrub typhus patients admitted in a tertiary care hospital in Udaipur, Rajasthan. The mean age of the patients was 36 years. The females constituted about 52% of all cases. Most of the patients belonged to the rural area. These findings are comparable to the results revealed in study done by Pathaniav et al in Uttarakhand state of India.[10] Pathania et al conducted a retrospective observational study in 2015 in a tertiary care centre in Garhwal, Uttarakhand. The case records of 54 confirmed patients of scrub typhus admitted between January 2014 to December 2014, were analysed to study demographic characteristics, clinical features, complications and outcomes. Results showed that mean age of patients was 30.80±12.3 years. Females were more affected as compared to males. Majority of the patients belonged to 20 to 40 years age group. Maximum cases belonged to rural areas.[10] Gautam et al also studied the epidemiological factors associated with the scrub typhus fever in Central Nepal and did the multivariate regression analysis, according to which rural residential location was identified as a significant risk factor to be associated with the scrub typhus infection (OR=0.431 and confidence interval: 0.260-0.715).[11] In our study, fever was the most common presenting symptom among the patients. This finding is similar to the results of the study done by Oberoi et al which revealed that predominant feature among the patients was persistent high-grade fever. Presence of eschar was a relatively rare feature in our study subjects, being found in only 1.6% patients. Oberoi et al also

observed that eschar was not present in all the cases.[12] In our study majority (87.1%) of the patients had complications involving either single organ system or MODS. Out of all the patients who had some complication, the most common was MODS, present in about 39% cases followed by complications involving gastrointestinal (13%), respiratory (11.1%), neurological and renal (both-9.3%) and cardiac (7.4%). The prevalence of complications in our study is similar to that found in other studies. Jain et al conducted an observational study in a northern state of India, and reported that about 89.7% of the scrub typhus patients had complications.[13] The most common complication was found to be acute respiratory dysfunction syndrome (72%). The second most common complication was sepsis with multiple organ dysfunction syndrome (62%), followed by acute kidney injury (56.4%), shock (20.5%), meningitis (15.3%) and disseminated intravascular coagulation (13%). In our study we also applied multivariate regression analysis to assess factors associated with the occurrence of complications among the patients. The only variable which was significantly associated with higher odds of having complications was being a resident of from rural area. This could be attributed to the fact that in India, rural people do not have easy access to good quality care at the earliest, which could probably be the reason for rural patients having higher risk of complications.

CONCLUSION

Mean age of the patients was 36.4±19 years. About 52% were females and majority (69.4%) belonged to rural area. Fever was the most common (83.9%) symptom, followed by vomiting (29%), breathlessness (21%), abdominal pain (16%), headache (9.7%) and altered sensorium (8.1%). Out of the total patients, eschar was found in only 1.6% of patients. Most (87.1%) of the patients had complications involving one or more organs. The most common complication was multiple organ dysfunction syndrome (MODS), found in about one third of the patients. The other complications were related to gastrointestinal (11.2%), respiratory (9.6%), neurological and renal (8.1%) and cardiac system (6.5%).

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