

ORIGINAL ARTICLE

Clinical Manifestations and Complications of Scrub Typhus: A Hospital-based Study from North Andhra

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Abstract

Aims and Objectives: To describe the diversity of clinical manifestations, laboratory findings and outcome of scrub typhus in hospitalised patients of Tirumala Hospital, Vizianagaram during 2014-2015.

Material and Methods: All the cases of acute febrile illness diagnosed as scrub typhus were analysed. Diagnosis was based on clinical and serological data.

Observations and Results: A total of 60 patients were studied. All of them presented with fever; the other major symptoms were headache, cough, dyspnoea and myalgia. On examination, Eschar was seen in 10 cases and common sites was trunk and axilla. Patients had hepatosplenomegaly, lymphadenopathy and eschar. On investigation elevated SGOT, SGPT with normal or elevated bilirubin levels were the most common findings. Other laboratory findings were thrombocytopenia and deranged renal function tests. Other complications were MODS, ARDS, hypotension and meningoencephalitis. There was a dramatic response to doxycycline in nearly all the patients.

Conclusion: Scrub typhus though prevalent is under-reported in our country. It should be considered as an important differential diagnosis in a febrile patient with thrombocytopenia, deranged liver or renal functions. Early diagnosis and appropriate treatment is rewarding and prevents morbidity and mortality.

Introduction

Scrub typhus is a Rickettsial infection caused by *Orientia tsutsugamushi* transmitted through bite of chiggers (larval stage of trombiculid mite). In India, epidemics of scrub typhus have been reported from Pondicherry, Goa, and Andhra Pradesh in South India, Uttarakhand, and Southeastern states in North India. Although the disease is endemic in our country, it grossly remains underdiagnosed owing to the nonspecific clinical presentation, lack of access to the specific diagnostic facility, and low index of suspicion by the clinician. It is a common observation that when the diseases of acute febrile illness such as malaria, typhoid, leptospirosis and fever due to localized causes were excluded, a good percentage of cases among the patients with acute febrile illness were ultimately diagnosed to have scrub typhus. Complication associated with scrub typhus is not

uncommon and sometimes proved to be fatal. Common complications associated with scrub typhus are acute kidney injury, hepatitis, acute respiratory distress syndrome (ARDS), meningoencephalitis, myocarditis, and septic shock. Though effective treatment in the form of doxycycline and azithromycin is available a large number of patients develop complication with high mortality mostly because of delay in the diagnosis and late initiation of specific treatment. The public health importance of this disease is underestimated because of difficulties with clinical diagnosis and lack of laboratory methods in many areas.

Scrub typhus, though endemic in India; yet is under reported. During the months of November to April of 2014-2015, we encountered a spurt in

cases of fever with serology negative for dengue, malaria parasite. On further evaluation, Scrub typhus serology emerged positive in all these patients. Keeping this clinical scenario in mind effort has been made to conduct an observational prospective study on scrub typhus among the adult patients admitted in the department of general medicine and critical care in our hospital.

Aims and Objectives

The aim is to study the different clinical manifestation and complications associated with scrub typhus.

Material and Methods

All patients admitted with acute febrile illness in our hospital were evaluated. Patients were included in the study group whose scrub typhus IgM serology was positive. Detailed history and clinical examination were followed with a meticulous search for the presence of eschar. Basic laboratory evaluation included complete blood count, peripheral blood smear, blood sugar, liver and renal function tests, and chest Xray. Special investigations such as rapid antigen test for malaria parasite, dengue serology (IgM and IgG), Widal test, blood culture, polymerase chain reaction for H1N1, and serology for leptospirosis were done to exclude alternative diagnosis and concurrent infections. Other tests such as cerebrospinal fluid analysis, magnetic resonance imaging brain were performed as indicated.

For the diagnosis of scrub typhus, serological test was performed by Weil-Felix test (PROGEN, Tulip Diagnostics (P) Ltd.) and lateral flow format immunochromatographic test for the detection of *O. tsutsugamushi*, IgM,

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Table 1: Symptomatology

Symptoms	n	Percentage
Fever	60	100.00%
Headache	42	70.00%
Chills	17	28.33%
Vomitings	13	21.67%
SOB	9	15.00%
Eschar	6	10%
Abdominal pain	5	8.33%
Myalgia	4	6.67%
LRTI	3	5.00%
Ptosis	3	5.00%
Slurring of speech	3	5.00%
Vertigo	3	5.00%
Altered sensorium	2	3.33%
Incoherent speech	2	3.33%
Arthralgia	1	1.67%
Chest pain	1	1.67%
Cough	1	1.67%
Facial puffiness	1	1.67%
GTCS	1	1.67%

IgG, and Ig antibodies (SD Bioline Tsutsugamushi, Standard Diagnostic, Inc., Korea), which has good sensitivity.

Results and Observation

Total 60 patients were diagnosed to have scrub typhus in the present study. Most of the patients were reported from the month of January to March although the cases were reported throughout the year. As shown in female patients 35(58.3%) are more than male patients 25(41.7%) that include one pregnant women.

Majority of the patients were belong to age group 11-30 years (41%) and 31-50 years (31%) were younger than 11 yrs. and 10% more than 50yrs. Patients with acute febrile illness were only included in the present study. As shown in (Table 1), the most common presentation was fever (100%) with headache (70%). Other common sign and symptoms (Table 2) on presentation include lymphadenopathy, cough, dyspnea, eschar, altered sensorium, jaundice, hepatomegaly, splenomegaly and oliguria. Distribution of lymphadenopathy was painful in most of the instances mostly in inguinal region. Eschars found were mostly of subcentimeter in size having firm adherent black scab with red margin. Eschars were mostly found in trunk almost all patients and is single (Figure 1). Uncommon presentations in the present study include hemoptysis, epistaxis, rash, and neck rigidity. Others include seizure and cholangitis

Table 2: Signs and complications

Signs and complications	n	Percentage
Thrombocytopenia	20	33.33%
Jaundice	8	13.33%
Hypotension	7	11.67%
ARF	6	10.00%
Effusion	6	10.00%
Anemia	5	8.33%
Consolidation	5	8.33%
Hepatomegaly	5	8.33%
Splenomegaly	5	8.33%
Hemodialysis	4	6.67%
DM	3	5.00%
Dyselctro	3	5.00%
Hypertension	3	5.00%
UTI	3	5.00%
Meningoencephalitis	2	3.33%
AF	1	1.67%
Bronchospasm	1	1.67%
Cholelithiasis	1	1.67%
Enteric fever	1	1.67%
Meningitis	1	1.67%
Pancytopenia	1	1.67%
PRIMI	1	1.67%
Metabolic acidosis	1	1.67%
Oligohydramnios	1	1.67%

with cholecystitis in 1 (1.67%) and 1 (1.67%) patient, respectively. Investigation report has been shown in (Table 3). Hemoglobin <11 g/dl was present in 28 (46.6%), leucocytosis in 26 (43.3%), leukopenia in 15 (25%), and platelet count <150,000/cumm in 20 (33.33%) number of patients. Deranged liver function were present in 15(20%) and deranged renal function in 7 (11.66%) of patients respectively associated complications found were hepatitis and acute renal failure others include pancreatitis, ARDS, MODS, and meningoencephalitis as shown in Table 2. Two patients expired with a mortality rate of 3.33% in the present study.

Discussion

Scrub typhus is a wellknown miteborne disease. In Andhra Pradesh, it is less studied though it has onandoff outbreaks. In the present study, most of the cases were seen between January and March although cases were reported in other months also. Most of the cases in the present study were involved in outdoor activity, particularly agriculture activities or collecting firewood from the agency.

Patients usually present with fever, headache, malaise, suffused face, lymphadenopathy, and eschar. It is so characteristic for scrub typhus that in the present study, doxycycline was

**Fig. 1: Eschar in axilla**

started empirically. In our study, the most common presentation was an acute febrile illness with headache (70%), which is dull aching in character although some other studies reported headache^[1-16] in only 14.3% of cases. Lymphadenopathy, usually painful, is a common finding in scrub typhus reported in 13–18% of patients; in the present study, lymphadenopathy was present in 6% of cases. Cervical lymphadenopathy (22.03%) is most common. Although rash was reported in many studies as a common finding, but in our study only one patient (1.69%) had rash on presentation. A necrotic eschar which is considered most useful diagnostic clues for scrub typhus was present in 6 (10%) cases of our study population although it was reported as high as 86.3% in some studies while some studies from India reported of eschar in as less as 5.56% of patients. In the present study, the most common site for eschar was trunk. Hepatomegaly was present in 8.3% of cases and splenomegaly in 8.3% of patients though hepatosplenomegaly was reported to be a very common finding, especially in children.

In contrast to other case series, elevated serum glutamicoxaloacetic transaminase (8.3%) and serum glutamic pyruvic transaminase (8.3%) was present in less number of cases. Raised bilirubin was present in 15 (25%) and raised serum creatinine in 7 (11.6%) of patients. Leukocytosis was noted in 43.33% patients, but leukocytopenia was also present in 25% of patients. Platelet count of <150,000/cumm was present in 33% cases. MODS and meningoencephalitis are the common complications associated with scrub typhus as is the ARDS with high mortality rate. In our study, MODS was present in 8.3%, meningoencephalitis in 3.3%, and ARDS in 6.6% patients although other studies reported meningoencephalitis as a more common complication (26%) and ARDS as

Table 3: Lab paramaters

Investigations	n	Percentage
HB <11	28	46.66%
HB >11	32	53.33%
Leucocytes		
< 4000	15	25%
4000-11000	19	31.66%
> 11000	26	43.33%
Platelets		
< 50000	4	6.66%
< 100000	11	18.33%
< 150000	5	8.33%
SGOT	5	8.33%
SGPT	5	8.33%
ALK	6	10
Serum creatinine > 1.0	7	11.66%
SBT > 1	15	25%
Elevated ESR	6	10%
Lymphopenia	6	10%
Lymphocytosis	16	26.66%
Polymorphocytosis	10	16.66%
Neutropenia	9	15%
Erythropenia <3.8	12	20%

(11.1%). Pancreatitis and disseminated intravascular coagulopathy (DIC) are uncommon complications with few case reports; however, in the present study, no case of pancreatitis or DIC was reported. The case fatality rate for untreated classic cases is 7% but would probably be lower if all mild cases were included; however, as the present study is hospital based which includes only admitted patients, mortality is expected little higher (8.47%). Of those who had expired, 4 out of 5 patients had MODS and one patient was having acute renal failure. Three (5.08%) patients had associated pregnancy in the present study, of which one had spontaneous abortion, a common finding in other

Table 4: Duration of stay

< 5 days	41
6-10 days	14
> 10 days	5

studies also. All cases were treated with doxycycline except those who were pregnant with an excellent result. Almost all patients show significant clinical improvement within 1–2 days of starting of doxycycline. Those who do not show improvement with doxycycline were treated with azithromycin and rifampicin (Tables 4 and 5).

Conclusion

The study shows a wide variety of clinical manifestations and complications of scrub typhus, a wellknown mite-borne disease in India. Due to the varied presentation and high mortality due to complications, a high index of suspicion is required. The study highlights the clustering of cases during September to November. The study also shows the response of treatment with doxycycline.

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