

A Study of Clinical presentation, Laboratory findings and Outcome among patients of Scrub typhus in General Hospital Thiruvananthapuram

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ABSTRACT

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Objectives: To study the clinical presentation, laboratory findings and outcome in scrub typhus patients.

Methods: We did a hospital based observational study in patients with acute febrile illness diagnosed as scrub typhus. Diagnosis was made by ELISA based IgM serology.

Observations and Results: A total of 80 patients were studied, males (57.5%) more than females (42.5%). Clustering of cases noted in December, January and February. Commonest symptom was fever followed by headache, myalgia and cough. Important laboratory findings were elevated liver enzymes, thrombocytopenia. Complications were rare which included ARDS, MODS, and AKI.

Conclusion: Scrub typhus is prevalent in Thiruvananthapuram District. It should be thought of as differential diagnosis in acute febrile illness. Early diagnosis and treatment with appropriate antibiotic prevents morbidity and mortality.

Keywords: Clinical presentation, Laboratory findings, Outcome, Scrub Typhus

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INTRODUCTION

Scrub typhus is an acute febrile illness caused by *Orientia tsusugamushi*.^{1,2} This is an intracellular Gram negative coccobacillus from the family of Rickettsiaceae. It is transmitted by the bite of infected larvae of trombiculid mite (Chiggers). Though scrub typhus is of self limiting nature delay in diagnosis and late initiation of appropriate treatment may result in complications and mortality.³ Common complications encountered are hepatitis, myocarditis, meningoencephalitis, ARDS, sepsis, AKI. It can effectively be treated with doxycycline or azithromycin. It is important to have a high degree of suspicion to differentiate scrub typhus from other main causes of acute febrile illnesses like dengue fever, leptospirosis, malaria, H1N1.

Scrub typhus is prevalent in Pakistan, India, Nepal, Japan, China, Korea, Indonesia, Philippines, Northern Australia, Pacific islands. In India scrub typhus epidemics were reported from Pondicherry, Goa, North eastern states, Western Himalayas. Recently we

saw a resurgence of cases of scrub typhus in our institution, many of them posing diagnostic difficulties. This prompted us to conduct an observational study of scrub typhus.

Aims and objectives

To study the various clinical presentations, laboratory findings, and outcome of scrub typhus patients.

MATERIALS AND METHODS

We did a hospital based observational study in patients admitted in medical wards and MICU of the General Hospital Thiruvananthapuram which is a tertiary care hospital under the Health Services Department of Kerala State. Most of our patients were referred from periphery. The study period was 1 year from June 2014.

Inclusion criteria

Patients with acute febrile illness admitted in medical wards and MICU who are scrub typhus IgM positive

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were considered for the study.

Exclusion criteria

Patients with chronic kidney disease, chronic liver disease and immunocompromised patients were excluded from the study. Patients with acute febrile illness who were IgM positive for other illnesses like dengue, malaria, and leptospirosis were excluded from the study.

Study procedure

After getting permission from Superintendent and ethical committee, we studied all cases of scrub typhus admitted in medical wards and MICU from June 2014—May 2015. Data was collected using a case report form, which contains clinical profile, laboratory features, complications and outcome of patients.

All patients were subjected to detailed clinical examination including meticulous search for eschar. They were subjected to investigations complete blood count, urine routine examination, liver function tests, renal function tests, blood sugar, chest x ray and ECG. We did USG abdomen wherever indicated.

Nowadays Weil Felix test is not used for the diagnosis of scrub typhus as it is less specific and sensitive. Immunofluorescence assay (I F A) is considered as gold standard for diagnosis of scrub typhus. However we did ELISA for IgM antibodies to scrub typhus for the diagnosis. IgM ELISA has 94% sensitivity and 91% specificity, is easy to perform and is widely available.^{2,7,12}

Serological test was done in State Public health laboratory. The test is a qualitative ELISA for the detection of IgM antibodies to *O.tsusugamushi* in serum using The Scrub Typhus Detect IgM ELISA system.^{4,12}

Data management and Analysis

Data was coded and entered in MS Excel and analyzed using SPSS version 16.0 software. Frequency and mean calculated based on the type of variable.

RESULTS

In the study conducted in the Medicine department of General Hospital Thiruvananthapuram following observations were made. Of the total 80 cases studied, 57.5% were males and 42.5% were females. Mean age of the patient was 40.64 with maximum age 85 and minimum age 14. 9% of the patients were below 20 years, 39% between 20—39, 44% between 40—59, 9% were above 60 years. Majority of patients belong to

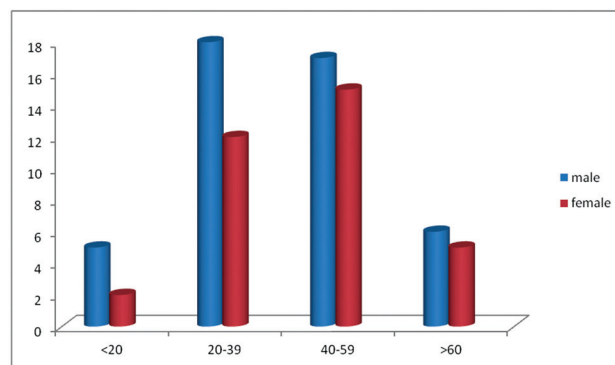


Figure 1. Age group and gender distribution of study sample

20-39 and 40-59 age groups (Figure 1).

In the less than 20 age group, there were 5 males and 2 females. 20-39 age group there were 18 males and 12 females, and in 40-59 age group there were 17 males and 15 females and in above 60 age group six males and 5 females.

Cases were reported throughout the year, with increase in number of cases from second half of December, January and February. Definite peaking in January (21 cases) (Figure 2).

Out of 80 cases 30 were from Thiruvananthapuram

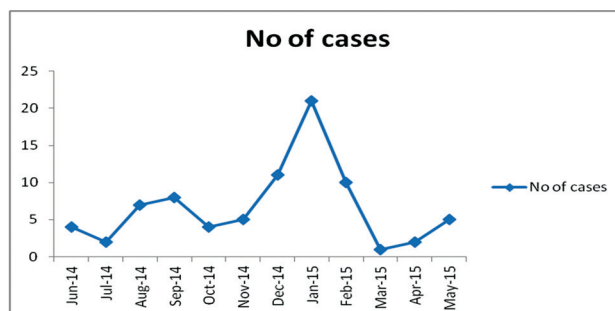


Figure 2. Showing distribution of cases throughout the year

corporation area others from Panchayat areas. Of the 48 cases were from Panchayat areas 15 cases were from coastal area. One patient each was from Kanyakumari District and Kollam District.

Fever was the commonest symptom. All patients had fever, followed by headache, myalgia, cough, abdominal pain, vomiting, dyspnoea. 36.2% had myalgia, 37.5% had cough, 12.5% dyspnoea, 11.2% vomiting, 12.5% had eschar, one had rash (Table 1).

Of the 80 patients 22 were having co morbid conditions like T2 Diabetes mellitus, Hypertension, COPD and CAD.

Thrombocytopenia was seen in 64.9% of patients. Mean platelet count was 138000. Minimum platelet

Symptoms	Frequency	%
Fever	80	100
Cough	30	37.5
Headache	29	36.2
Body pain	29	36.2
Abdominal pain	14	17.5
Hepatomegaly	12	15.0
Lymphadenopathy	12	15.0
Dyspnoea	10	12.5
Eschar	10	12.5
Vomiting	9	11.2
Hepatosplenomegaly	8	10.0
Rash	1	1.2

count was 45000. Platelet count between 50000—100000 was seen in 37.5% of patients, 33.3% of them were males, 39.4% were females. Platelet count between 100000—150000 was seen in 26.2% and 35% had platelet count above 150000. Of them 28.9% were males, 24.2% females. (Table 2) 26.2% of patients had leucocytosis and 11% had leucopenia. 36.2% had neutrophilia, 23.8% had lymphocytosis.

Investigations	Number (%)
Leucocytosis	21 (26.2%)
Leucopenia	11 (13.8%)
Thrombocytopenia(pl. count <150000)	21 (26.2%)
Thrombocytopenia (pl. count <100000)	30(37.5%)
SGOT >50	56 (70%)
SGPT >50	58 (72.5%)
Hyperbilirubinemia	15 (18.8%)
S. Creatinine (>1.5)	4 (5%)

Another important finding was elevated liver enzymes. 70% of patients had increased SGOT 72.5% had increased SGPT. 18.8% had hyperbilirubinemia. Maximum S. Bilirubin was 5.5 g%. 12.5% of patients had eschar, 11.1% males and 12.1% females (Figure 3 and 4). All of them had single eschar. One patient had rash.

One patient developed MODS, improved with peritoneal dialysis. Two patients developed ARDS one male, one female, of them one required invasive mechanical

Outcome	N (%)
AKI	4 (5%)
ARDS	1 (1.2%)
MODS	1 (1s.2%)
Death	1 (1.2%)



Figure 3. Maturing Eschar seen in a case of Scrub Typhus



Figure 4. Early Escha seen in a case of Scrub Typhus

ventilation (Table 3).

AKI was present in 4 (5%) of patients. One patient who died had uncontrolled diabetes and sepsis.

Mean hospital stay was 7.31+_{2.87} with minimum 3 days and maximum 24 days. 61.2% of the study subjects had less than 7 days of hospital stay. 37.5% had 7-14 days hospital stay and 1.2% had more than 14 days stay.

DISCUSSION

Sporadic cases of Scrub typhus were reported from Kerala, in previous years. But two years back we noticed an increase in number of cases of scrub typhus in our institution. Many of these had difficulty in diagnosis and few of them developed complications as well. In this scenario we decided to have an observational study of scrub typhus cases admitted in our hospital. To our knowledge this study is the first of its kind from Kerala.

Of 80 cases studied there was a slight male predominance with 57.5%. 30 Cases were from Thiruvananthapuram corporation area, 48 cases from panchayat areas. Of these 48 cases, 15 cases were from coastal areas. Though these areas are not rural in the strict sense, people in this area have more outdoor activities and increased chance of exposure to chigger bites. Though it was believed that scrub typhus is a rural

disease it was well reported from towns and cities. This could be due to the vegetation around residential areas creating "mite islands".¹²

Though cases were reported throughout the year an increase in number of cases were noted towards the end of December, January and February. There is a definite peaking in mid January. This pattern is different from other Indian studies where clustering of cases was seen from September to November. That is the post monsoon season.^{5,7} The difference in pattern seen in our study could be due to the extended rainfall we received in the past two years.

Fever was the commonest symptom, present in all patients. Fever was of high grade continuous nature, followed by headache, myalgia, cough, abdominal pain vomiting, cough and dyspnoea.

Eschar which is the most characteristic feature of scrub typhus is seen at the site of attachment chiggers. It is a black swab surrounded by reddish areola It is neither painful nor pruritic that may be the reason in some cases patients do not notice this. So doctors need to look for this important finding if there is suspicion of scrub typhus. In our study eschar was seen in 12.5% of cases which is consistent with the study done in Hyderabad. Another study from North East⁶ showed 28.81% and a study from Western Himalayas⁸ showed 44%. But in studies from Pondicherry⁹ it was 46%, Rajasthan it was 17.6%, South Vietnam 46%, Taiwan 60%. In our study all the eschar were single, commonest site being inguinal region followed by axillary, mammary area, abdomen. Associated regional lymphadenopathy was present in all cases. It is observed that many studies from South East Asia including India and other endemic areas revealed eschar and rash in less number of cases. In our study rash was present in only one case.^{7,8,9,10,11} Though headache was an important symptom seen in 36.2% of patients, none of them had clinical features of meningoencephalitis so CSF study was not done in any of the cases.

Deranged liver function was the commonest biochemical abnormality noted in our study. Elevated SGOT was present among 70 % of the study subjects and SGPT among 72.5%. This is similar to the studies conducted in South India and North east India.⁶ Hyperbilirubinaemia was present in 18.8%.

Thrombocytopenia was the next important finding, 65% had thrombocytopenia. Two different Indian studies showed thrombocytopenia of 32.2% and 85.6%.

T.Doxycycline was given in most (73) of the cases, rest of them received T. Azithromycin as

Doxycycline was not tolerated. Compared to other Indian and South East Asian studies complications and mortality were less.

Acute kidney injury was present in 4 patients (5%). ARDS was present in two patients out of which one needed invasive mechanical ventilation. MODS in one patient, recovered with peritoneal dialysis.

The only death was in a patient with uncontrolled diabetes mellitus and sepsis.

Reasons for less number of complications and death could be due to the habit of seeking medical attention early in the course of illness among the people of Kerala. Many of them go to hospital even with one day of fever whereas in many other Indian studies patients go to hospital after 6-7 days of fever. Another reason was that doxycycline was started early from PHCs and other peripheral institutions so that complications were less. Early referral of patients was done making the management of complications more effective. Improved healthcare system of Kerala and higher literacy especially regarding health matters does have a role.

Limitations

As we do not admit antenatal cases in our hospital, they could not be included in the study.

CONCLUSIONS

Scrub typhus should be considered as an important differential diagnosis in febrile illness,

even though eschar is not present. Empirical anti rickettsial treatment with safe and widely available drugs doxycycline and azithromycin is very effective. Appropriate treatment and timely referral help in reducing complications and mortality.

END NOTE

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Conflict of Interest: None declared

Editor's Remarks: Scrub typhus should be a differential diagnosis in many cases of fever in this age of travel and migration in search of jobs. The detailed analysis of the cases provides details to the interested reader.

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