



A STUDY ON DEMOGRAPHIC, CLINICAL PROFILE AND OUTCOME OF SCRUB TYPHUS: A HOSPITAL BASED STUDY

General Medicine

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ABSTRACT

Background: Scrub typhus, a zoonotic disease caused by the bacterium *Orientia tsutsugamushi*, has become endemic in many parts of India. The aim of the study is to analyse the demographic, clinical profile and outcome of scrub typhus. **Material and methods:** The present prospective study was conducted in 100 patients that reported to our tertiary care center during the study period. Scrub typhus was diagnosed with IgM ELISA. We observed the symptoms, signs, laboratory findings, risk factors for death from the time of admission till discharge/death. **Results:** There are more males as compared to females. A high-grade fever occurred in 90%, breathlessness in 40%, jaundice in 34%, abdominal pain in 25%, renal failure in 10%, diarrhea in 10%, rashes in 9%, and seizures in 7%. Common laboratory abnormalities at presentation were a deranged hepatic function in 60%, anemia in 52%, leukopenia in 16% and thrombocytopenia in 88% of the patients. A hepatorenal syndrome was seen in 36% and multiple organ dysfunction syndrome (MODS) in 21% patients. The overall case fatality rate was 14%. Survival was significantly higher in patients that presented with a duration of fever < 10 days compared with those that presented ≥ 12 days ($P < 0.05$) after onset. **Conclusion:** In conclusion, scrub typhus has become a leading infectious disease in north India and an important cause of infectious fever. An increasing awareness of this disease coupled with prompt management will go a long way in reducing both morbidity and mortality from this disease.

KEYWORDS

scrub typhus, acute undifferentiated fever, *Orientia tsutsugamushi*, eschar, epidemic, acute respiratory distress syndrome

Introduction

More than a billion people live in the "tsutsugamushi triangle," where scrub typhus is a common acute fever sickness¹. This region includes large portions of south and southeast Asia, the Asian Pacific Rim, and northern Australia. *Orientia tsutsugamushi*, formerly placed in the *Rickettsia* genus, is the obligate intracellular Gram-negative bacterium responsible for this infection². Scrub typhus was a key contributor to epidemics and heavy casualties in the border areas of India and Burma during World War II³. As a result of a poor presentation and a low index of suspicion among clinicians, the disease is severely underdiagnosed in low and middle income countries (LMICs)⁴.

Complications from scrub typhus include pneumonia, low blood counts, and potentially acute respiratory distress syndrome¹³. Other neuropsychiatric and delirium-related symptoms may occur as a result. However, this seemingly insignificant illness has been linked to cases of multi-organ failure and even death¹⁴.

MATERIALS AND METHODS

Type of Study:

A hospital based CROSS-SECTIONAL STUDY

Period of Study:

January 2021 to AUGUST 2022

Place of Study:

Department of General Medicine, Mahatma Gandhi Medical College & Hospital, Jaipur

Selection Of Patients:

500 patients with Scrub Typhus presenting to the Department of Medicine was considered for the study. Patients that fulfill the inclusion criteria were taken up for the study.

Inclusion Criteria:

1. Age >18 years
2. Positive serology for scrub typhus.

Exclusion Criteria:

1. Patients with history of alcohol intake >40 ml/day.
2. Patients with Alcoholic Liver Disease.
3. Patients with Chronic Liver Disease.
4. Patients with Viral Hepatitis.
5. Patients with Ischemic hepatitis
6. Patients with infectious mononucleosis.

INVESTIGATIONS:

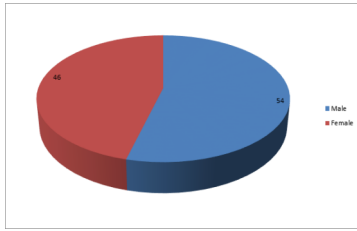
All the patients that are enrolled for the study were subjected to

1. Scrub typhus
2. Total Bilirubin
3. Direct Bilirubin
4. SGOT
5. SGPT
6. Alkaline Phosphatase
7. Complete Blood Count

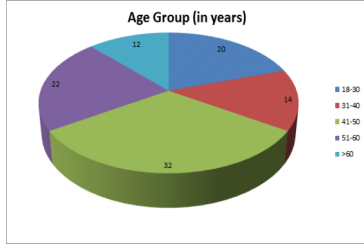
Results

The research work was carried out in the Department of Medicine among 500 patients reported with Scrub Typhus. The aim of the study was to document the demographic, clinical profile and outcome of scrub typhus. Out of 500 subjects, 54% were males and 46% were females (table 1, graph

In this study, maximum subjects were from 41-50 years (32%) followed by 51-60 years (22%) and 18-30 years (20%). Minimum subjects were from >60 years (12%) followed by 31-40 years (14%) as shown in graph 2.

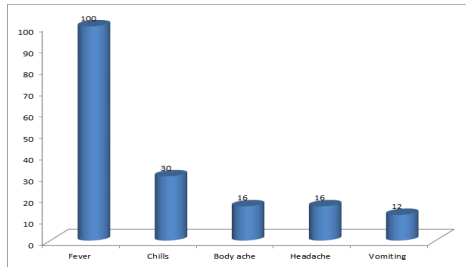


Graph 1: Gender distribution among the study subject



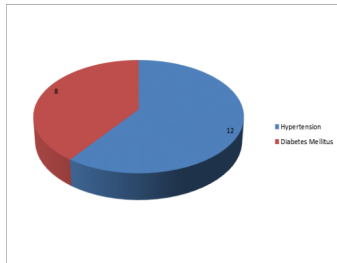
Graph 2: Age distribution among the study subjects

Fever, chills, body ache, headache and vomiting was reported among 100%, 30%, 16%, 16% and 12% of the subjects respectively (table 3, graph 3).



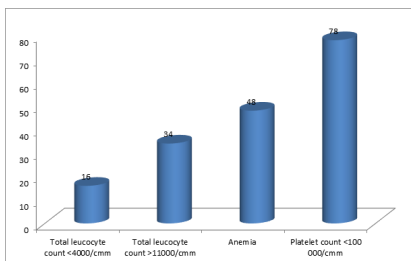
Graph 3: Complaints among the study subjects

Co-morbidities viz. hypertension and diabetes mellitus was reported in 12% and 8% of the subjects respectively (table 4, graph 4).



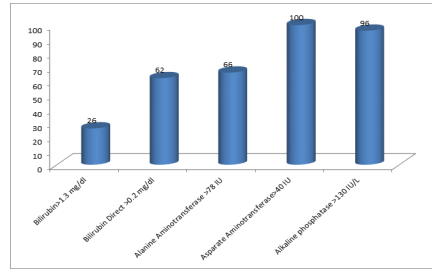
Graph 4: Co-morbidities among the study subjects

Total leucocyte count <4000/cmm, leucocyte count >11000/cmm, anemia and platelet count <100000/cmm was found in 16%, 34%, 48% and 78% of the subjects respectively (table 5, graph 5).



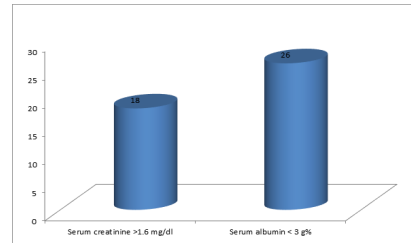
Graph 5: CBC profile among the study subjects

LFT profile viz. Bilirubin>1.3 mg/dl, Bilirubin Direct >0.2 mg/dl, Alanine Aminotransferase >78 IU, Asparate Aminotransferase>40 IU and Alkaline phosphatase >130 IU/L was found in 16%, 34%, 48%, 100% and 96% of the subjects respectively (table 6, graph 6).



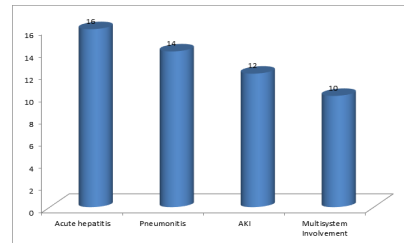
Graph 6: LFT profile among the study subjects

Serum creatinine >1.6 mg/dl and serum albumin < 3 g% was revealed in 18% and 26% of the subjects respectively (table 7, graph 7).



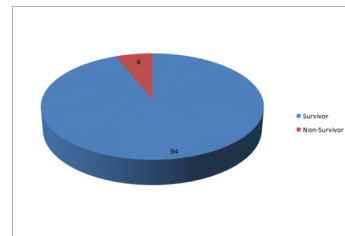
Graph 7: KFT profile among the study subjects

Complications viz. acute hepatitis, pneumonitis, AKI and multisystem involvement was shown in 16%, 14%, 12% and 10% of the subjects respectively (table 8, graph 8).



Graph 8: Complications among the study subjects

Mortality was revealed in 6% of the subjects (table 9, graph 9).



Graph 9: Mortality among the study subjects

*: statistically significant

DISCUSSION

After screening around 485 patients with the suspicion of scrub typhus, 50 (10.30%) patients were proved serology positive via the IgG/IgM test and were selected for the study.

Age

In this study, maximum subjects were from 41-50 years (32%) followed by 51-60 years (22%) and 18-30 years (20%).

Gender

In the present study, among the 50 patients, 54% were males and 46% were females. Hence there was slightly more male as compared to females.

In the present study, the male to female ratio is almost 1:1,

Co-morbidities

It was also found that Hypertension was present in 12% of patients and 8% patient had Type-II diabetes myelitis. And most those patients were elderly.

In this study serum creatinine levels were also studied as a marker for poor outcome and to look for multiorgan involvement, among the patients, serum creatinine level of >1.6 mg/dl was found in 18% of patients but did not exceed 3mg/dl in any patient. Similarly serum albumin value of <3.0 g/dl was seen in 26% of patients but was not <2 g/dl in any patient.

Complications

Among the patients in this study major complications seen were acute hepatitis seen in 16% of patients, pneumonitis seen in 14% of patients, acute kidney injury in 12% of patients and out of the total 10% patients had multi system involvement.

Summary

- Present study was a single centre, prospective, observational, cross sectional study over the period of 2 years. Total 50 patients were recruited in this study. The mean age of the patients was 44.8 + 13.5 years. Among the total 50 patients, 54% were males and 46% were females.
- In the study group, (100%) of the patients had fever, with only (30%) patients presenting with chills, after that (16%) had myalgia, (16%) had headache, followed by cough in (14%) of patients and lastly vomiting was present in (12%) of patients.
- Duration of symptoms ranges were divided into two groups where, patients presenting with <7 days of symptoms were(), and >7 days were ().
- Clinical history also revealed that, among these patients there was also a history of hypertension in (12%) and history of Type-II diabetes myelitis in (8%). The mean (SBP) of patients was 117.2 + 19.2 mmHg and the mean (DBP) of patients was 80.45+ 16.45 mmHg among the total recruited patients.
- On clinical examination of the 50 recruited patients, edema was present in () of patients, pallor was present in () of patients, icterus was seen in () of patients, lymphadenopathy was present in () of patients, Hepatomegaly in () of patients and splenomegaly in () of patients. And even after thorough searching for eschar, it could only be found in (25%) of patients, hence its absence cannot rule out scrub typhus.
- Pathological findings of the patient revealed Hb was (), TLC was (), Platelet counts were ()
- Biochemical findings of the patients revealed Total bilirubin value of (), Direct bilirubin was (), AST values were (), ALT was (), and ALP was found to be (). Creatinine was (), and Albumin was ().
- Complications of the disease among the study patients were Hypoalbuminemia in () of patients, thrombocytopenia was seen in () of patients, hepatitis in (), acute kidney injury in () of patients, pneumonitis in () of patients and MODS in () of patients.
- An overall case mortality seen in our study was 6%.
- Presence of thrombocytopenia (platelet count <1,00,000 cells/mm³), raised transaminases (AST, ALP, ALT), and raised serum creatinine is associated with MODS and mortality (p-value <0.05)

Conclusion

Present study is a prospective, observational, and cross sectional study conducted over a duration of 1 year. Total 500 patients with clinical and investigational evidence of scrub typhus were analysed in this study, and their laboratory findings were compared for profile and assessing severity of the disease.

Patients present with fever, and other symptoms (chills, cough, headache, myalgia, vomiting), which can be difficult to differentiate from other febrile illnesses (dengue, pneumonia, malaria). Presence of Eschar should prompt the diagnosis of scrub typhus, but its absence should not be used to rule out scrub typhus. Middle aged patients working in agriculture and horticulture are more exposed to this disease.

Our findings show a link between scrub typhus and transaminases. And involvement of multiple organs, raised transaminases, thrombocytopenia, and raised serum creatinine have been linked with MODS, poorer outcomes and mortality.

It is suggested to keep scrub typhus a possibility in cases presenting with

acute fever, and other symptoms, with raised transaminases, and a IgG/IgM testing for scrub typhus should be done for early detection and treatment to reduce morbidity, hospital stay, and mortality.

REFERENCE:

- 1) Kelly DJ, Fuerst PA, Ching WM, Richards AL. Scrub typhus: the geographic distribution of phenotypic and genotypic variants of *Orientia tsutsugamushi*. *Clin Infect Dis* 2009; 48: S203–30.
- 2) Tamura A, Ohashi N, Urakami H, Miyayama S. Classification of Rickettsia tsutsugamushi in a new genus, *Orientia* gen. nov., as *Orientia tsutsugamushi* comb. nov. *Int J Syst Bacteriol* 1995; 45: 589–91.
- 3) Sayen JJ, Pond HS, Forrester JS, Wood FC. Scrub typhus in Assam and Burma: clinical study of 616 cases. *Medicine (Baltimore)* 1946; 25: 155–214.
- 4) Mahajan SK, Rolain J-M, Sankhyani N, Kaushal RK, Raoult D. Pediatric scrub typhus in Indian Himalayas. *Indian J Pediatr*. 2008; 75(9): 947–9.
- 5) Dodake N, Jain AP, Bhagat M. Clinical Profile of Adult Patients Suffering from Scrub Typhus in Kasturba Hospital Wardha, Central India: A Study of 125 Patients. *Archives of Clinical Microbiology*. 2020; 11(1): 1–4.
- 6) Parola P, Paddock CD, Raoult D. Tick borne rickettsioses around the world: emerging diseases challenging old concepts. *Clin Microbiol Rev*. 2005; 18(4): 719–56.
- 7) Sharma A, Mahajan S, Gupta ML, Kanga A, Sharma V. Investigation of an outbreak of scrub typhus in Himalayan region of India. *Jpn J Infect Dis*. 2005; 58(4): 208–10.
- 8) Mathai E, Rolain JM, Verghese GM, et al. Outbreak of scrub typhus in southern India during cooler months. *Ann NY Acad Sci* 2003; 990: 359–64.
- 9) Vivekanandan M, Mani A, Priya YS, Singh AP, Jayakumar S, Purty S. Outbreak of scrub typhus in Pondicherry. *J Assoc Physicians India* 2010; 58: 24–8.
- 10) Kim DM, Won KJ, Park CY, et al. Distribution of eschars on the body of scrub typhus patients: a prospective study. *Am J Trop Med Hyg* 2007; 76: 806–9.