



OUTBREAK OF SCRUB TYPHUS IN MEWAR REGION

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ABSTRACT

Scrub typhus is a zoonotic disease caused by *Orientia tsutsugamushi*, an obligate intracellular gram-negative bacterium. It is transmitted via the larval stage of trombiculid mites (chigger, a primary reservoir)¹. It is prevalent across southern and eastern India including Rajasthan. This study reports the outbreak of scrub typhus in Mewar region of Rajasthan in 2019. **Methods:** 50 scrub typhus patients were studied at Geetanjali Medical College and Hospital, Udaipur, Rajasthan. Scrub typhus was diagnosed by enzyme linked immunoassay for scrub typhus along with routine blood tests, and ultrasonography of abdomen. **Results:** In our study, fever was the most common symptom seen in all patients (100%), followed by breathlessness (80%) and the most common sign is jaundice (76.6%). Two thirds of the patients had multi-system involvement. 4 deaths occurred in the study. **Conclusion:** Our study denotes the emergence of scrub typhus in Mewar region presenting as acute febrile illness with or without eschar. It should be considered as a differential diagnosis with high index of suspicion for acute febrile illness in patients from this region, as early diagnosis and intervention may reduce mortality.

KEYWORDS : Scrub typhus, Mewar.

INTRODUCTION:

Orientia tsutsugamushi belongs to the Rickettsiae group of obligately intracellular, gram-negative coccobacilli and short bacilli. *O. tsutsugamushi* differs substantially from Rickettsia species both genetically and in cell wall composition (i.e., it lacks lipopolysaccharide). It persists by transovarial transmission in trombiculid mites¹. Chiggers (only stage to transmit disease) inoculate organisms into the skin.

Scrub typhus is an endemic and a re-emerging disease in eastern and southern Asia. In high-risk areas the prevalence could be >3% of the population. Immunity is not long lasting and the organism exhibits remarkable antigenic diversity². Approximately one million cases are reported annually³.

The illness could be self-limiting to fatal. Incubation period is 6-21 days (average 10-12 days). Onset is characterized by fever, headache, myalgia, associated with cough, nausea, diarrhea and vomiting. The peculiar eschar at the bite site, lymphadenopathy and maculopapular rash may or may not be seen⁴. It is considered a differential diagnosis in patients with acute febrile illness which is associated with hepatic dysfunction, thrombocytopenia, renal impairment, altered sensorium, pneumonitis or ARDS⁵. Other gastro-intestinal manifestations reported include acute acalculous cholecystitis, duodenal ulcer perforation, peritonitis and gastric ulceration and pancreatitis⁶. The mortality rate for untreated patients is 7-30% which can be prevented by early recognition of this treatable disease⁷.

AIMS AND OBJECTIVES

1. To identify scrub typhus as an important aetiological agent of acute febrile illness in Mewar region.
2. To describe the clinical features, manifestations and complication in patients diagnosed with scrub typhus.
3. To know about its atypical clinical presentations.

METHODS:

This study was conducted from June 2019 to November 2019 in the Department of Medicine in Geetanjali Medical College

and Hospital, Udaipur. Study included 50 adult patients admitted with signs and symptoms suggestive of scrub typhus. Detailed clinical history and clinical examination was recorded. Scrub typhus was diagnosed by enzyme linked immunoassay for scrub typhus. All patients were investigated with complete blood count with peripheral smear, liver and renal function tests, urine analysis, MP-QBC, Dengue serology, blood culture, chest x-ray and Ultrasonography. Pregnant females and patient having other co-infections like malaria, dengue, enteric fever, UTI and septicemia were excluded.

RESULTS:

Table 1.0 – Sign and symptoms at presentation

SYMPTOMS	Number of patients (n=30)	SIGNS	Number of patients (n=30)
FEVER < 7 DAYS	9 (30%)	JAUNDICE	23 (76.6%)
FEVER 7-14 DAYS	14 (46.6%)	LYMPHADENOPATHY	19 (63.3%)
FEVER > 14 DAYS	7 (23.3%)	HEPATOSPLENOMEGALY	21 (70%)
COUGH	12 (40%)	ALTERED MENTAL STATUS	4 (13.3%)
BREATHLESNESS	24 (80%)	ATAXIA	2 (6.6%)
SEVERE HEADACHE	20 (66.6%)	ESCHAR	0
		NECK RIGIDITY	4 (13.3%)

Fever was present in all patients. Breathlessness was the second most common symptom (80%), followed by headache (66%) and cough (40%). The most common sign was jaundice (76.6%). Lymphadenopathy, hepatosplenomegaly, neck rigidity and ataxia were seen in 63.3%, 70%, 13.3% of patients respectively. Eschar was not found in any patient.

Table 2.0 Lab parameters at presentation

Investigation	Number of patients (n=30)	Investigation	Number of patients(n=30)

TLC <4000 4000-11000 >11000	15 (50%) 10 (33.3%)	SGOT, SGPT (>40 IU/L)	22 (73.3%)
	5 (16.6%)	Alkaline Phosphatase (>130 IU/L)	6 (20%)
		Bilirubin (>1.3mg%)	23 (76.6%)
Platelet <1.5 LAC /CMM <1.0 LAC/CMM	9 (30%) 21 (70%)	Creatinine (>1.4 mg%)	19(63.3%)
Hypocalcaemia	16 (53.3%)	Albumin (<3.0 gm%)	21 (70%)
ELISA POSITIVE	30	Chest X-RAY INFILTRATES	26(86.6%)
		CSF - lymphocytic pleocytosis, normal sugar level, mildly elevated protein and raised ADA levels.	

Out of 50 patients, 30 were found to be positive for scrub typhus by ELISA. Thrombocytopenia was present in all patients. Leukopenia was observed in 50%, while leucocytosis was seen in 16.6% of patients. Hypocalcaemia was noted in 53% of patients. Liver function was deranged in 76% of patients. 63% patients developed acute kidney injury out of which 5 patients required haemodialysis. Albumin was decreased in 70% of patients. CSF was done in patients with altered mental status which was found to have lymphocytic pleocytosis, elevated sugar, protein and ADA.

Table 3.0 Complications of scrub typhus

Complications	Number of patients (n=30)
Pulmonary infiltration	24 (80%)
Shock	14 (46.6%)
Renal impairment > 1.5MG/dl	19 (63.3%)
Myocarditis	4(13.3%)
Haemoptysis	2(6.6%)
Meningitis	4 (13.3%)
Polyserositis	2 (6.6%)
ARF (required haemodialysis)	5 (16.6%)
DIC	5 (16.6%)

Diffuse pulmonary infiltrates were present in 80% of patients. Acute kidney injury was the second most common complication. Shock was observed in ~47% of patients. Other complications including myocarditis, meningitis, hemoptysis, polyserositis, disseminated intravascular coagulation were also observed. **Discussion:** There have been reports of outbreaks of scrub typhus from various parts of the country⁸. In our study out of the 50 suspected cases 30 cases were serologically positive. Patient's presented with acute febrile illness with non-specific sign and symptoms. The most common symptom was fever (100%), followed by breathlessness (80%). Most common sign was jaundice (76.6%). Eschar, the pathognomic sign of scrub typhus was not seen in any patient in our study. Its absence does not rule out scrub typhus.

Scrub typhus was diagnosed by ELISA test for IgM antibody against *O.tsutsugamushi*. Current serological tests are indirect immunofluorescence, indirect immunoperoxidase and ELISA. Rapid immunochromatography and dipsticks are also available⁹.

Amongst the other lab parameters hepatic dysfunction was most commonly observed in our study. Diffuse infiltrates were seen in Chest x-ray in the lower zone in 80% of patients. 33.3% of patients required invasive ventilator support. Renal impairment was the second most common complication observed. 4 patients died in the study. Complication were seen in two thirds of our patients.

Chrispal A. et. al. conducted a study of 398 patients with acute febrile illness, 189 were scrub typhus positive. The chief symptoms were headache, vomiting and myalgia. Eschar was present in 45.5% patients. Hepatic dysfunction was seen in 95.2% of patients. 13.8% presented with shock. ARDS (29.7%), renal failure (29.7%) and altered sensorium (24.4%) was seen in respective proportions¹⁰. Vargese conducted a retrospective study of 623 patients with scrub typhus, where fever, headache, nausea, vomiting, shortness of breath and eschar formation were the presenting symptoms. Acute kidney injury, glomerulonephritis, meningoencephalitis, myocarditis, pericarditis, ARDS and acute acalculous cholecystitis were atypical complications of scrub typhus¹¹.

CONCLUSION:

Scrub typhus is common in the Mewar region of rajasthan and should be considered as an important differential of acute febrile illness. It can present as pneumonitis, meningo-encephalitis and acute hepatitis, and should be considered as a differential diagnosis in the patients with acute febrile illness. Delayed treatment may lead to complications and high mortality rate (7-30%)⁷. Empirical treatment with doxycycline is recommended in cases of strong suspicion.

REFERENCES:-

1. Traub R, Wisseman CL Jr. The ecology of chigger-borne rickettsiosis (scrub typhus). *J Med Entomol* 1974;11: 237-303
2. Kasper, D. L. Fauci, A. S., Hauser, S. L. Longo, D. L., Jameson, J. L., & Loscalzo, J. (2018). *Harrison's principles of internal medicine (20th edition)*. New York: McGraw Hill Education.
3. Wu KM, Wu ZW, Peng GQ, et al. Radiologic pulmonary Findings, clinical manifestations and serious complications in scrub typhus. Experiences from a teaching hospital in Eastern Taiwan. *Int J Gerontol* 2009; 3:197-264.
4. Narendra Rathi, Akanshka Rathi. Rickettsial Infections: Indian perspective, *Indian pediatr* 2010; 47: 157 - 164.
5. M.Vivekanandan, A. Mani, Y.S. Priya, AJ Singh, S Jayakumar, S. Purty. Outbreak of Scrub Typhus in Pondicherry, *JAPI* Jan 2010;58: 24 - 28
6. Pathak Praharsh, Mistry abhishek. Pancreatic involvement in scrub typhus. *GJRA* Feb 2020;2:53-54.
7. Mahajan SK, Bakshi D. Acute reversible hearing loss in scrub typhus. *J Assoc Physicians India* 2007; 55: 512-14.
8. Mahajan SK, Kashyap R, Kanga A, Sharma V, Prasher BS, Pal LS. Relevance of Weil-Felix test in diagnosis of scrub typhus in India. *J Assoc Physicians India* 2006; 54: 619-21
9. Gurung S, Pradhan J, Bhutia P Y. Outbreak of scrub typhus in the North East Himalayan region-Sikkim: an emerging threat. *Indian J Med Microbiol* 2013; 31:72-4.)
10. Chrispal, A. Scrub typhus: an unrecognized threat in South India - clinical profile and predictors of mortality. *Tropical Doctor*. 2010;44(3)
11. Varghese GM, Trowbridge P, Janardhanan J, et al. Clinical profile and improving mortality trend of scrub typhus in South India. *Int J Infect Dis* 2014; 23:39-43.