

Case Series

Scrub Typhus — A Case Series from Tertiary Care Hospital of Rural Bengal

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Scrub Typhus is an endemic zoonotic disease caused by rickettsial bacteria, *Orientia tsutsugamushi*. It is a major public health problem in many parts of India. It is often under diagnosed and under reported due to lack of awareness among the clinicians and testing facilities. Fever is the usual presenting symptom. Other signs and symptoms are headache, myalgia, cough, hepatosplenomegaly, abdominal pain and lymphadenopathy. Although eschar is the single most pathognomonic feature of scrub Typhus, it is present in 43.5-87% of cases. Due to a lack of awareness among clinicians and diagnostic facility in rural areas, fatal complications such as Acute Respiratory Distress Syndrome (ARDS), meningoencephalitis, pneumonitis, acute kidney injury and myocarditis may occur in patients who are not treated early. Here we are presenting a case series of ten cases of scrub Typhus patients admitted in tertiary care hospital of rural parts of West Bengal. Initially one of them had acute kidney injury and another patient developed jaundice, but all recovered completely within a few weeks. All patients responded to Doxycycline (200 mg/day for 7 days). Death is attributable to delayed presentation, delayed diagnosis, and drug resistance. Timely commencement of empirical antibiotic therapy, after careful clinical assessment in limited diagnostic facility setup may prevent the morbidity and the mortality. The clinicians should be aware of this serious but easily curable diseases.

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Key words : Scrub Typhus, Case series, Rural Bengal.

Scrub Typhus is a mite-transmitted, acute febrile illness caused by bacterium *Orientia tsutsugamushi*. It was a military disease that caused thousands of cases during Second World War. The original name of Scrub Typhus was “tsutsugamushi diseases” (by Hashimoto in 1810). It is highly prevalent in rural areas where there is difficulty in timely diagnose and treatment. It was estimated that about one billion people was at risk of this disease and annual incidence was one million¹. *The World Health Organization (WHO) described Scrub Typhus as one of the most under diagnosed and under reported febrile illness and strongly emphasized surveillance owing to its relatively high case fatality rate (up to 30 % in untreated patients)*². Scrub Typhus is prevalent in many parts of India especially in east, south and Himalayan region³. Scrub Typhus outbreak

Editor's Comment :

- Scrub Typhus should be suspected in all cases of fever specially FUO, because it has a wide range of manifestations.
- Mortality is high if there is delay in initiation of treatment but outcome is excellent if treated early.

was reported for the first time in West Bengal from Darjeeling district in 2004⁴. It is more prevalent in the northern part of West Bengal mainly Alipurduar, Jalpaiguri, Cooch behar and Darjeeling, as the areas are heavily forested and rich in wildlife biodiversity⁵. The disease is associated with agricultural or occupational exposures like exposure to Piles of wood, Domestic animals, Rodents and Rice fields.

The main pathology is focal or disseminated vasculitis due to endothelial dysfunction and perivascular infiltration of leukocytes.

After an incubation period of 6 to 21 days (usually, 10-12 days), the patients present with fever with Chill, Headache, Myalgia, Cough and Gastrointestinal symptoms⁶. The severity of presentation varies widely, depending on the susceptibility of the host, the virulence of the organism or both. *Complications such as Pneumonia, Acute Respiratory Distress Syndrome (ARDS), Myocarditis, Meningoencephalitis, Encephalitis, Hepatitis, DIC, Haemophagocytic Syndrome, Acute Kidney Injury (AKI), Acute Pancreatitis, Transient Adrenal Insufficiency and Sub-Acute Painful Thyroiditis are not uncommon in*

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untreated patients. The presence of characteristic eschar (blistered ulcer covered with black crust and surrounded by reddish erythema) at the bite site was considered to be pathognomonic of Scrub Typhus⁷.

Diagnosis of Scrub Typhus is clinically difficult; hence laboratory tests play an important role. A high index of suspicion for Scrub Typhus is necessary in febrile patients not responding to conventional antibiotics. The response to antibiotics in Scrub Typhus is excellent.

Although Scrub Typhus is endemic in our country, it is under diagnosed because of the non-specific symptomatology, lack of access to diagnostic facilities in rural areas and low index of suspicion by the physicians.

We are reporting a case series of ten cases of Scrub Typhus patients admitted in Tertiary Care Hospital of Rural Parts of west Bengal.

Presentation of the Cases :

Total ten patients admitted in inpatient Department of General Medicine, Deben Mahata Government Medical College, Purulia, West Bengal during July, 2022 to September, 2022. Median age of the patients was 21.5 years. Majority of them were engaged in cultivation (six patients were farmer and four were student). Co-morbidity (diabetes) was present only in two patients. Fever was the most common symptoms. Headache and myalgia was also common. Three patients had tachycardia but Blood Pressure was normal in all. Jaundice was present in one patient. One patient was anaemic. Necrotic eschar was noted only in one patient (Fig 1). Although five patients complain of cough, abnormal auscultatory finding was present in one patient only (Table 1). Examination cardiovascular and Central Nervous System was unremarkable.



Fig 1 — Eschar at the nape of neck of Case 8

Complete Hemogram revealed Leukocytosis in two patients and one had Anaemia (Table 2). Platelet count was within normal limit in all. Urine R/E and M/E did not reveal any abnormality. Renal Function Test (Urea/Creatinine – 60/1.8 mg/dl) was impaired in one patient. Liver Function Test (LFT) was reported normal except one (Bilirubin/Direct – 3/1.8 mg/dl, AST/ALT – 424/458 IU/L, ALP 206IU/L and Protein/Albumin 6.5/4 gm/dl). Chest X-ray PA view showed no obvious abnormality (Fig 2).

All patients were tested positive for Scrub Typhus IgM ELISA and negative for RTPCR for COVID-19 in nasopharyngeal swab. Rapid diagnostic test for malarial parasite was negative. Serology for Dengue, Hepatitis B surface antigen (HBsAg), Hepatitis C virus and Human Immunodeficiency Virus (HIV) were also negative. Leptospira was negative for Case No 6.

Every one responded well to 7 days course with Doxycycline (200mg/day). Average duration of hospital stay was 4.9 days with a range from 4 to 6 days. On follow-up visit after two weeks, everybody

Table 1 — Clinical parameters of the cases

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
Age	14	16	60	43	45	25	14	35	14	18
Gender	M	M	M	M	M	M	M	M	M	M
Occupation	S	F	S	F	F	F	S	F	F	S
Duration of stay(day)	5	5	6	5	4	4	4	6	5	5
Co-morbidity	Nil	Nil	Nil	Nil	DM	DM	Nil	Nil	Nil	Nil
Chief complaint	Fever, cough	Fever, headache	Fever, cough	Fever, cough	Fever, cough	Fever, jaundice	Fever, bodyache	Fever, cough	Fever, headache	Fever, bodyache
Vitals										
Spo2	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%
Temperature	101F	101.5F	100F	98.5F	101.5 F	99.4F	102F	100F	100.5F	101F
Blood Pressure	118/78	122/82	94/60	122/80	128/90	120/78	120/80	130/78	118/78	124/80
Pulse	92	90	104	88	98	82	96	78	84	88
General Physical examination	-	-	-	A	-	J	-	-	-	-
Eschar	-	-	-	-	-	-	-	Present	-	-
Systemic Examination	-	-	Rhonchi B/L lungs	-	-	-	-	-	-	-

M- Male/F- female. S – Student/ F – Farmer. A – Anaemia. J – Jaundice

		Table 2 — Biochemical parameters and outcome of the cases									
		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
Laboratory parameters	TLC (/cumm)	8000	6700	13500	9200	4600	6600	7600	11500	5700	6800
	Urea(mg/dl)	45	34	60	35	37	43	44	26	36	32
	Creatinine (mg/dl)	1.0	0.8	1.8	1.2	0.7	0.6	0.6	0.5	0.7	0.7
	LFT	N	N	N	N	N	A	N	N	N	N
	CXR	N	N	N	N	N	N	N	N	N	N
	ELISA	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
Treatment and outcome	Treatment	D+S	D+S	D+S	D+S	D+S	D+S	D+S	D+S	D+S	D+S
	Outcome	R	R	R	R	R	R	R	R	R	R

TLC – Total leukocyte count. CXR- Chest X-ray PA View. ELISA- ELISA for Scrub Typhus. N – Normal. A – Altered. R – Recovered. D – Doxycycline. S - Supportive

were symptomatically better. Abnormal RFT in Case No 3 normalized in two weeks and LFT in Case No. 6 became normal in next four weeks.

DISCUSSION

Scrub Typhus is a rickettsial disease, widespread and prevalent in different parts of India especially in east, south and Himalayan region². Scrub Typhus is a potential health concern in India due to poor health care, limited diagnostic facility, and the epidemiological trend of the disease. Humans are the accidental hosts. The disease is transmitted by the bite of larval stage of infected trombiculid mites⁸. The disease is more common in rainy season. Working in vegetable fields, hilly areas, and harvesting poses the highest risk. The causative organism is bacteria of the family Rickettsiaceae, that are obligate intracellular, Gram negative, non-flagellate pleomorphic coccobacilli. The clinical presentations range from sub-clinical disease to organ failure. Common clinical features are fever with chills, rashes, headaches, myalgia, regional lymphadenopathy. Necrotic Escher at the bite site are most pathognomonic of the disease. But different studies reported the presence of eschar in 43.5-87% of the cases⁹⁻¹¹. Eschar is usually present on Caucasian and East Asian patients but is seen less frequently on South Asians, especially those who are dark skinned. It was unreported by our patients because of painless and nonpruritic nature of the lesion and complexion of the patients.

The disease usually runs a benign course but complication like, Hepatitis, Pneumonia, AKI, ARDS, Meningoencephalitis, Myocarditis, Conjunctival Injection, Subconjunctival Hemorrhage, Sepsis and Multiorgan failure are not uncommon. In a study of 502 Scrub Typhus patient, majority had stage 1 AKI and 3.94% of them required dialysis¹². In our study one patient had AKI, due to early diagnosis and treatment, the patient recovered completely. Delay in the diagnosis for laboratory conformation may lead

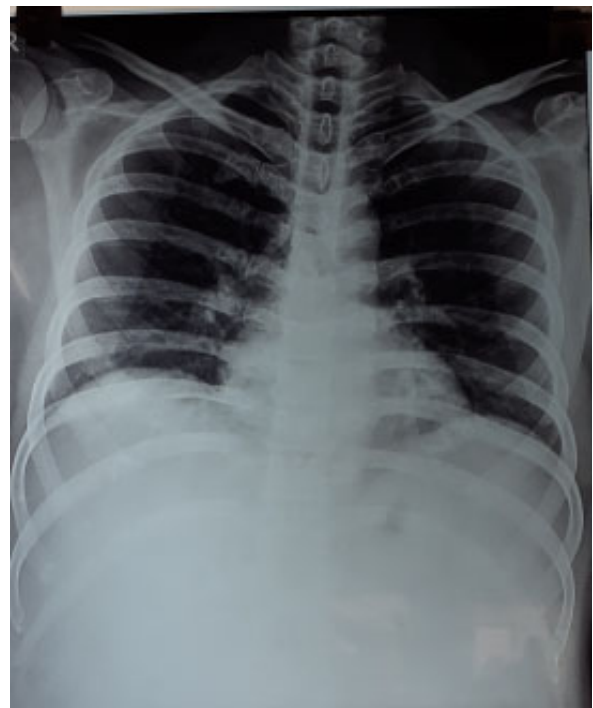


Fig 2 — Normal Chest X-ray PA view of Case 3

to unfavourable outcome. Griffith M, *et al* reported 116 Scrub Typhus patient admitted in Critical Care Unit, 87.9% required ventilatory support and hospital mortality was 24%.

High degree of vigilance is required to look for alternative or overlapping possibilities. Malaria, Leptospira, Dengue, Meningococcal diseases, Typhoid, HIV and infectious mononucleosis may mimic and share many clinical features. The macular rash of dengue is finer. Malaria can be excluded by peripheral smear. Leptospirosis, typhoid and meningococcal disease can be diagnosed by culture of blood, CSF or bone marrow. Leptospirosis, infectious mononucleosis and HIV can be diagnosed by serology.

Serological test, widely used in India for diagnosis of Scrub Typhus was the Weil Felix (WF) test as it was easily available, highly specific but lacks

sensitivity¹³. Indirect Immuno-fluorescence Assay (IFA) is the gold standard test for diagnosis of Scrub Typhus. Although it is highly sensitive but its use is limited because of the cost and availability. IgM enzyme linked immuno-sorbent assay is commonly used. Different study showed that compared to IFA, IgM ELISA was quite satisfactory in diagnosing Scrub Typhus¹⁴. *In view of the disadvantages of IFA and WF tests, IgM ELISA is currently preferred method.* A rapid immuno-chromatographic assay using recombinant major outer membrane protein (r56) to detect IgM, IgG and IgA antibodies was shown to be reliable and suitable in developing countries but is expensive.

Doxycycline is the drug of choice. Azithromycin, rifampicin and tetracycline were found effective treatment options with more or less no difference¹⁵. Azithromycin is used in children below eight years, doxycycline resistant strains and pregnant women¹⁶. But empirical use of antibiotics in suspected Scrub Typhus may lead to emergence of resistant strains. As appropriate anti-biotic therapy shows rapid response in Scrub Typhus, cheap and effective drug such as doxycycline should be treatment protocol of acute febrile illness in patients during the endemic season.

High clinical suspicion is required as there is limited accesses to rapid test and low sensitivity of other test. During the outbreak of Scrub Typhus in north India in 2009, the patients were treated with empirical Doxycycline with 100% success rate¹⁷. Morbidity and mortality can be reduced by early initiation of appropriate antibiotics¹⁸.

A high degree of clinical suspicion and familiarity with the various manifestations of Scrub Typhus allow early diagnosis and timely commencement of appropriate antibiotics therapy may reduce the morbidity and mortality.

CONCLUSIONS

- (1) Scrub Typhus is endemic in different parts of India and all physician should be aware of the disease.
- (2) Delayed presentation, availability and cost of laboratory testing of Scrub Typhus are major problems in the rural areas of India.
- (3) Physician should have a high degree of clinical suspicion and remain vigilant for alternate diagnosis in an area where Scrub Typhus is prevalent.
- (4) In suspected cases of Scrub Typhus, empirical appropriate antibiotic treatment while waiting for confirmation and ruling out other possibilities, can prevent complications and death.

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