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Case Series on Scrub Typhus From a Tertiary Care Hospital in Central India

[1]Dr. Manish Patil, Associate Professor, Department Of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur (CG), India

[2]Dr. R L Khare, Professor, Department Of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur (CG), India

[3]Dr. Prachi Dubey, Associate Professor, Department Of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur (CG), India

[4]Dr. Khanda Shahbaz Yasin, Post-Graduate Resident, Department of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur (CG), India

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Corresponding Author: Dr. Khanda Shahbaz Yasin, Post-Graduate Resident, Department of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur (CG), India

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Abstract

Introduction

Scrub typhus is caused by Orientia tsutsugamushi, an obligate intracellular gram negative bacteria and transmitted to humans through the bite of larval forms of trombiculide mites. Scrub typhus has been considered to be a re-emerging condition, but there is scanty of reporting from Chhattisgarh state.

Methodology

In the month of October 2021, 17 suspected cases of scrub typhus were screened using rapid immuno-chromatographic qualitative assay, and six patients were diagnosed to be scrub typhus positive. This study describes the clinical profile, laboratory findings and treatment outcome of these six scrub typhus positive patients.

Results

Among the 6 reported cases, 5 patients were from rural areas of Raipur division and 1 patient was from tribal area of surguja division. There was a mortality of 2 patients. Comparing the data of survivors and non survivors, the average day of presentation from

onset of symptoms among non-survivors was 13.5 days and among survivors it was 7 days. Both the non-survivors had developed MODS and 1 had presented as meningo-encephalitis. It was also noted that 5 out of these 6 cases were referred from peripheral or private hospitals and were misdiagnosed initially.

Conclusion

Considering the re-emergence of scrub typhus, patients presenting with fever associated with renal impairment or elevated hepatic enzymes, with or without eschar must be screened for scrub typhus.

Keywords

Scrub Typhus, Re-emergence, Rapid Immuno-chromatography.

Intoduction

Scrub typhus is the most common rickettsial disease prevalent in India.[1,2] It is caused by Orientia tsutsugamushi, an obligate intracellular gram negative bacteria and transmitted to humans through the bite of larval forms of trombiculide mites.[3] Humans are accidental dead end hosts in this zoonotic disease.[4] Scrub typhus may be considered an occupational disease among the rural and tribal residents, working in farmlands.[5]

The spike in the cases of acute febrile illness during monsoon and post-monsoon season is experienced in India. Viral infections, malaria, dengue, typhoid, leptospirosis and scrub typhus are mostly responsible for such outbreaks.[1] The presence of an "eschar" supports the diagnosis of scrub typhus, however, eschar positivity in India and other Asian populations is very low.[6,7] Diagnosis, therefore, depends on clinical suspicion, and mainstay in scrub-typhus diagnostics remains serology. The diagnosis of scrub typhus, is very low in the routine clinical practice and also no statistical data is available from central India. The non-availability or costly diagnostic modalities as well as low suspicion index among clinical practitioners has been a barrier in diagnosis of this otherwise treatable mishap.

This case-series provides a glimpse of the severity of this disease and evaluates clinical presentation, laboratory findings and treatment outcomes of scrub typhus in a tertiary care setting.

Methodology

In the month of October 2021, there were total 59 admissions in the female ward of Unit-2, Department Of Medicine, Pt. Jawaharlal Nehru Memorial Medical College & Hospital, Raipur. Out of these 59 admissions, 17 patients were considered to be suspected cases of scrub typhus and screened using rapid immuno-chromatographic qualitative assay with STANDARD Q tsutsugamushi IgM/ IgG rapid Kit. From these, six patients were diagnosed to be scrub typhus positive. Suspected case of scrub typhus was defined as per ICMR guidelines as, acute undifferentiated febrile illness of 5 days or more with or without eschar and fever of less than 5 days, if eschar is present.[8] This study describes the clinical profile, laboratory findings and treatment outcome of these six scrub typhus positive patients.

For the diagnosis of associated complication and for the ease of comparison same standard definitions were used as of other studies on scrub typhus.[9]

Acute kidney injury: Confirmed biochemically with rise in serum creatinine of more than 1.6 mg/dl or clinically with urine output less than 400 ml/24 hrs and failing to improve after adequate rehydration.

Acute respiratory distress syndrome (ARDS): Bilateral alveolar or interstitial infiltrates on chest

radiograph and PaO2/FiO2 less than or equal to 200mmHg.

Hepatitis: Confirmed biochemically with rise in serum glutamic oxaloacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT) of more than three times the upper normal limit and/or elevation of serum total bilirubin >3 times the upper normal limit.
Meningitis: Patients presenting in altered sensorium with clinical signs of meningeal irritation like neck rigidity & positive Kernig sign.

Multiple-organ dysfunction syndrome (MODS): Dysfunction of more than one organ, requiring intervention to maintain homoeostasis.

Results

All the patients were females and presented in month of October 2021, as study population was limited to such extent. The youngest patient was 16 years old while the oldest was aged 60 years. Among these, 5 patients were from rural areas of Raipur division and 1 patient was from tribal area of surguja division. District wise, 2 were from Raipur, 1 from Rajnandgaon, 1 from Gariyaband, 1 from Mahasamund and 1 from Balrampur. The duration of illness ranged from 6 to 15 days from the onset of symptoms to hospitalization, with an average of 9.2 days. Fever and myalgia were the chief presenting complaint in all the cases. Three patients had co-existing dry cough and headache. One patient also presented with hematuria, and 2 patients were in altered sensorium on the day of presentation. Clinically appreciable icterus was seen in 1 patient and the same patient was a known case of sickle cell disease. Hepatosplenomegaly and lymphadenopathy was not seen in any patient of this study. The pathognomic feature of eschar was seen in only two patients, in right leg and right forearm respectively.

Thrombocytopenia (<150,000/mm^3) was present in 5 cases and hypoalbuminemia (< 3.5 g/dl) in all 6 patients. Serum urea and creatinine was elevated in 3 cases. One patient had hematuria and 3 patients had proteinuria. Hypotension was present in 3 cases requiring inotropic support and laboratory evidence of hepatic dysfunction was present in all cases. Considering the complications, 3 patients presented with meningo-encephalitis and multiple organ dysfunction syndrome (MODS). There was mortality of 2 patients within 12 hours and 18 hours of admission respectively. The average hospital stay of survivors was 6 days after admission of which, 1 patient needed ICU care. Comparing the data of survivors and non-survivors, the average day of presentation from onset of symptoms among non-survivors was 13.5 days and among survivors it was 7 days. Both the non-survivors had developed MODS and 1 had presented as meningo-encephalitis. It was also noted that 5 out of these 6 cases were referred from peripheral or private hospitals and were misdiagnosed initially. All the patients were treated with doxycycline in the dose of 100 mg twice daily for 10 days with supportive care

Discussion

Incidence of scrub typhus had dropped off, after world war II.[10] However, frequent outbreaks were witnessed in different parts of India recently, which can be considered as re-emergence.[7] A report that detailed the re-emergence of scrub typhus in South India estimated its prevalence to be around 5%. However, that same report also found that scrub typhus accounted for up to 50% of all hospital admission for undifferentiated fever in that area during the cooler seasons.[11] Scrub Typhus has been clearly reported from several states in India including Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Bihar, West

Bengal, Meghalaya, Rajasthan, Maharashtra, Karnataka, Tamil Nadu and Kerala. In some regions it accounts for up to 50% of undifferentiated fever presenting to hospital.[8] But, there are scanty reports of scrub typhus from Chhattisgarh state. The overall mortality varies from 7% to 9%, second only to malaria among infectious diseases.[4] Mortality rates in untreated patients can vary significantly with rates as high as 70%.[12] Even when appropriate antibiotic therapy is given, in-hospital mortality was found to be 9% in South India.[13]

The late presentation at tertiary care hospital and lack of availability of diagnostic modalities at primary health care centers results in higher mortality of this treatable disease.

Conclusion

Considering the re-emergence of scrub typhus, patients presenting with fever associated with renal impairment or elevated hepatic enzymes, with or without eschar must be screened for scrub typhus. Availability of diagnostic modalities even at peripheral hospitals must be considered. Scrub typhus must be actively reported by clinicians to understand the real statistics. An early diagnosis and timely antibiotic therapy may prevent the complications and mortality. Rapid Immuno-chromatographic kits can provide point of care diagnostic assistance in resource poor set-ups.

Table 1: Tabulation of cases

Case	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age	60 years	60 years	16 years	50 years	32 years	32 years
Address	Kesari, Balrampur	Janjgira, Raipur	Pithora, Mahasamund	Hardowa Rajnandgaon	Arang Raipur	Gadaghat, Gariyaband
Date of Admission	4/10/21	19/10/21	19/10/21	19/10/21	20/10/21	26/10/21
Day of Presentation	15th day	12th day	8th day	7th day	6th day	7th day
Eschar	Right leg	Right forearm	Absent	Absent	Absent	Absent
Hemoglobin	8.5 g/dl	7 g/dl	12 g/dl	10 g/dl	10.3 g/dl	7.9 g/dl
Platelet (per microliter)	69,000	16,000	13,000	40,000	55,000	269,000
Total Leukocyte count	12.38	13.57	4.73	11.76	16.2	23.17
Total Bilurubin	2.57	0.5	0.2	1.1	3.3	6.3
SGOT(IU/L)	890	1500	207	105	202	91
SGPT(IU/L)	1190	1900	490	530	94	30
Serum Creatinine (mg/dl)	5.9	2.8	0.5	0.6	1.8	0.3
Serum Albumin	2.8	2.8	3.1	3	2.7	3.1
Complications and comorbiditities	MODS with Meningoencephalopathy with Thrombocytopenia	MODS with thrombocytopenia with hematuria	Hepatitis and Thrombocytopenia	Hepatitis and Thrombocytopenia	MODS with Meningoencephalopathy with Thrombocytopenia	K/C/O sickle cell disease with hemolytic crisis
Outcome	Death	Death	Improved	Improved	Improved	Improved

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