

**Clinical Profile of Rickettsial Infections: A Case Study from Central Kerala**

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Abstract

Introduction: Rickettsial infections are reemerging in different parts of our state. Cases reported from mid Kerala are very few. The aim of the present study is to review the demographic patterns, clinical manifestations, treatment outcomes and complications of Rickettsial infections presented to a tertiary care Centre in central Kerala.

Materials and methods: A Retrospective analysis was done among patients diagnosed with Rickettsial infection for a period of one year in a tertiary care center from mid Kerala. Diagnosis of Rickettsial infection was made on basis of positive Weil Felix test with titre more than 1:160 and positive clinical response to Doxycycline. We analyzed the demographic profile, clinical features, response to treatment and complications of the infection.

Results: Sixteen patients were diagnosed to have Rickettsial infection based on positive Weil Felix test out of which 87.5% were from rural area and 12.5% were from suburban area. A post monsoon surge of infection was noted. Predominant symptom noted was fever associated

with myalgia, arthralgia and abdominal symptoms. Typical eschar of scrub typhus was seen only in one patient. Hepatitis and acute kidney injury were the predominant complications noted.

Conclusion: Because of the wide variation in its clinical presentation all cases of acute febrile illness not responding to treatment or presenting with thrombocytopenia, renal failure and hepatitis should be investigated for the possibility of rickettsial infection. An empirical therapy with doxycycline can be given in cases of high index of suspicion.

Keywords: Weil Felix, Eschar, Doxycycline

Introduction

Rickettsial infections are re-emerging in different parts of India. In India, it's prevalent in many parts and has been reported in the east, south and the Himalayas. But the disease may go under diagnosed due to the non-specific clinical presentation, low index of clinical suspicion and lack of access to diagnostic facilities[1]. The greatest challenge to clinician is the difficulty in diagnosing these infections early in their clinical course when antibiotic

therapy is most effective[2]. An extensive study on tick-borne rickettsial infections in Pune district of Maharashtra revealed that Indian tick typhus exists as zoonosis [3].

In Kerala although many cases have been reported from northern and southern parts, cases reported from central Kerala are only few. The aim of the present study is to analyze the demographic patterns, clinical manifestations, complications and treatment outcomes of adult scrub typhus in a tertiary care setting in central Kerala.

Study design and methodology

A Retrospective observational analysis was done in 16 patients diagnosed with rickettsial infection from December 2014 to December 2013 in a tertiary care center at central Kerala. The Diagnosis of rickettsial infection was made on basis of positive Weil Felix test with titers >1:160 and a positive clinical response to doxycycline. Inclusion criteria included all diagnosed cases of rickettsial infections admitted to the hospital. Exclusion criteria included patients with positive dengue serology, leptospirosis, and positive blood or urine cultures. We analyzed the Demographic profile, Clinical presentations, laboratory investigations, response to treatment and Complications in these patients.

Results

Among the sixteen patients eight were males and eight were females. All the sixteen patients were from central - Kerala. Fourteen among them hailed from rural area while the remaining two were from sub-urban areas. Most of the cases occurred between July to December. The mean age was 47.5 yrs. The duration of illness before hospitalization ranged from 5-12 days with an average of 6.5 days. Only two patients had underlying co morbidities of diabetes and hypertension. Diagnosis of rickettsial infection was made on the basis of positive Weil-Felix test with titers >1:160. IgM rickettsial antibody test specific for

Scrub typhus was done only in 8 patients out of which 5 of them had a positive result.(Table-1)

The predominant clinical symptom was fever followed by myalgia, abdominal discomfort and arthralgia. Rash was observed in two of them which was generalized non-pruritic and erythematous. The typical eschar described in scrub typhus was observed only in one of the patients which were seen near the inguinal region. Icterus and hepatosplenomegaly were the predominant clinical finding observed in 31.25 % of patients. 18.75% of them had clinical evidence of myocarditis and 12.5% of them had expiratory wheeze and crackles at the time of presentation (Table-2) 4 of these patients were admitted to intensive care unit and remaining 12 patients were admitted to wards. One of them expired due to multiorgan damage, and another one was referred to a different center due to persistent thrombocytopenia. Both these patients did not receive doxycycline as the diagnosis was made retrospectively. Rest of the 14 patients had an excellent response to doxycycline. Defervescence was observed within two days of initiating doxycycline. Hepatitis was the predominant complication observed among 62.5% of individuals followed by acute kidney injury in 50% of cases. Hypotension and myocarditis were seen in 18.75% of cases. Acute respiratory distress syndrome (*ARDS*) and pancreatitis observed in 12.25% of cases. (Table-3)

Laboratory investigations revealed normal leukocyte count in 75% of the cases, with leucopenia and leukocytosis manifesting in 12.25% each. Thrombocytopenia was a predominant lab finding in 62.5% patients. Elevation of AST, ALT and serum bilirubin was observed in 37.5% of cases followed by raised serum creatinine kinase in 31.5%. Hypoalbuminemia was observed in 25% of cases. (Table-4).

Discussion

Rickettsia are small, non-flagellate, gram negative pleomorphic cocco-bacilli adapted to obligate intracellular parasitism and transmitted by arthropod vectors. Arthropods maintain the infection naturally by transovarian transmission and humans are the accidental hosts. Invertebrates, including humans, they infect vascular endothelium and reticulo-endothelial cells [4]. Disease manifestations may vary from self-limiting illness to very fatal conditions. Rickettsial infections form one of the differential diagnoses in patients with hemorrhagic fever especially if associated with jaundice and renal failure [5]. The disease is widespread, extending from Australia to Japan and from India to the Pacific.

There were case reports on the outbreak of Scrub typhus from northern and southern parts of Kerala but cases from central Kerala were not documented so far. All our sixteen cases were from central Kerala, two being from sub-urban areas. In our study, most of the cases occurred between July to December. [6,7,8,9,10] A similar pattern of post monsoon surge in rickettsial infections was noted in other studies as well. Scrub typhus was confirmed only in 5 patients who had rickettsial infection. Thus the study shows the presence of other rickettsial species causing infections in mid Kerala. The disease presents as acute febrile illness with nonspecific symptoms. [1] In our study the most common presentation was fever with myalgia and arthralgia. Next predominant symptom observed was gastrointestinal in the form of nausea, vomiting and abdominal pain. Similar symptoms were noticed in some other studies as well [11]. Many reports have highlighted the importance of rash and eschar for diagnosing rickettsial infections. Rash typically described in rickettsial infection was noticed only in 2 of our cases and eschar, the most specific sign described for scrub typhus [12] was found in only one patient. Lymphadenopathy is a

common symptom described in typhus fevers [13, 14] but we could not find in our cases. As Rickettsial infections form differential diagnosis for other febrile illness like dengue and leptospirosis, presence of gastro intestinal symptoms may be clue to differentiate them from others. Similar to many other case series [11], our patients had thrombocytopenia and elevation of transaminases without evidence for other multiorgan dysfunction. Acute kidney injury was noted in many cases. Diagnosis of rickettsial infection should be based on clinical suspicion and serological tests. The gold standard serological tests for the diagnosis are immunofluorescence antibody test or indirect immunoperoxidase assay [15]. The test commonly used in our country is Weil Felix test owing to its cost and availability [7, 8, 9, 16, 17]. This test has high specificity but lack sensitivity according to some studies [18, 19]. We used Weil Felix test for diagnosis of Rickettsial infection. IgM for Scrub typhus was done only in eight (50%) patients and five among them were diagnosed as scrub typhus. Complications of infection usually set in during the end of first week or early in the second week [20]. Hepatitis was the predominant complication observed among individuals followed by acute kidney injury. Myocarditis, ARDS and Pancreatitis were also observed in few cases. Patients who received Doxycycline, clinical response was observed within 48hrs. Two of those patients did not receive Doxycycline or macrolides as the diagnosis was made retrospectively. One of them presented in the second week of illness with multiorgan dysfunction and succumbed to disease. (Mortality rate = 6.25%). Another patient had fever with persistent thrombocytopenia, hence took discharge and lost follow up.

Conclusion

To conclude, though not many cases of rickettsial infections were reported from mid Kerala, we could find

few cases especially in the post monsoon seasons. We had few scrub typhus cases as well. Rickettsial Infections should be considered as a differential diagnosis of acute febrile illness presenting with myalgia, arthralgia and GI symptoms, with organ dysfunctions such as acute kidney injury, ARDS and hepatitis. Though a typical eschar is described for scrub typhus in many cases, its absence does not rule out the disease. Delay in diagnosis and initiation of treatment may lead to complications and increase the mortality. As Clinical response to doxycycline occurs within forty eight hours of initiation therapy, empirical therapy may be considered in cases with of high index of suspicion.

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Table-1: Diagnosis of Rickettsial infections

Titers	%
OX 19(>1:160)	12.5
OX 2(>1:160)	37.5
OX K(>1:160)	50
IgM Rickettsial antibody for Scrub typhus	31.25

Table-2 : Clinical presentation of Rickettsial infections.

Symptoms	No: s (%)
Fever <7 Days	8 (50)
Fever 7-14 Days	6(37.5)
Fever >14 Days	2(12.5)
Myalgia	10(62.5)
Nausea/Vomiting	9(56.25)
Arthralgia	8(50)
Cough	6(37.5)
Abdominal pain	6(37.5)
Oliguria	4(25)
Headache	4(25)
Diarrhoea	3(18.75)
Jaundice	2(12.5)
Rash	2(12.5)
Dyspnea	2(12.5)
Altered sensorium	1(6.25)

Table-3: Complications of Rickettsial infection

Complication	(%)
Hypotension	18.75
ARDS	12.5
Renal Failure	50
Hepatitis	62.5
Hemorrhagic Manifestations	0
Pancreatitis	12.5
Myocarditis	18.75
Meningitis	0
Multi Organ Dysfunction	43.75
Death	6.25

Table-4: Laboratory parameters in Rickettsial infection.

Laboratory Parameters	(%)
Leukocytosis(>11000/ μ l)	12.5
Leucopenia (<4000 / μ l)	12.5
Thrombocytopenia (< 1 lakhs/ μ l)	62.5
Raised serum creatinine (>1.4mg/dl)	50
Raised serum bilirubin(>3mg/dl)	37.25
Raised AST/ALT (> 80 IU/l)	37.5
Creatinine phosphokinase	31.25
Serum albumin	25
Serum amylase	12.5