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# A RETROSPECTIVE STUDY OF CLINICO- LABORATORY PROFILE OF RICKETTSIAL DISEASE IN PAEDIATRIC AGE GROUP IN KOLAR

Pediatrics

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## ABSTRACT

**Background :** Rickettsial infections are re-emerging in the Indian subcontinent. Due to their diagnostic dilemma the onset of treatment is delayed especially in children. There is a need for understanding clinic epidemiological profile which will facilitate early diagnosis and management.

**Objectives:** To describe the epidemiology, clinical and laboratory profile of spotted fever among children in a tertiary care hospital in Kolar.

**Methodology:** Children aged <18yrs hospitalized with clinically-diagnosed rickettsial fever were reviewed retrospectively.

**Results:** Among 196 children hospitalized between January 2013-December 2017, median age was five years, and 57.6% were male children. Mean duration of fever was 9.7 days. Rash was present in 92.7% (182/196) of children, involving palms and soles. Severe complications were seen in 22.7% (purpura fulminans,4.5%; meningitis and meningoencephalitis, 6.1%; septic shock, 4.5%; acute respiratory distress syndrome, 1.0%:pneumonia, 6.1%; gastrointestinal bleed, 0.5%). Positive Weil-Felix test results were seen in 80.2% of cases. Patients were treated with doxycycline and more than half showed defervescence within 36 hours.

**Conclusions:** This analysis from southern India shows that the burden of rickettsial infection among children in India is high, with a substantially high complication rate. Thus, indicating the need for increasing awareness for early diagnosis and management of these infections.

## KEYWORDS

Children, Rickettsial disease , spotted fever

### Introduction

Rickettsial diseases a re- emerging infections, are under-diagnosed due to low index of suspicion among clinicians, and lack of diagnostic facilities in the country. As the disease poses a challenge to diagnosis in its early clinical course, late presentations of the cases to hospitals are a well known phenomenon of these diseases (1,2,3). As a consequence of delayed identification of these diseases complications such as ARDS, meningoencephalitis and organ failures which have a higher risk of mortality are increasingly being reported from many parts of India (1,4). These reports of Rickettsial diseases outbreaks may be an indication of a continual transmission of the disease in India. Many of the rickettsial disease outbreaks reported in the last decade are from the northern regions of India (5-11). There are a few rickettsial outbreaks reported in the southern India over the last decade and serological evidence is also demonstrated (4,12,13). Rickettsial fevers are classically divided into the typhus group and spotted fever group (SFG). Most of the rickettsial outbreaks, reported in the literature in India pertain to Scrub typhus. We present clinic-laboratory profile of rickettsial disease of spotted fever group among children in Kolar during 2013 to 2017.

### Material and methods

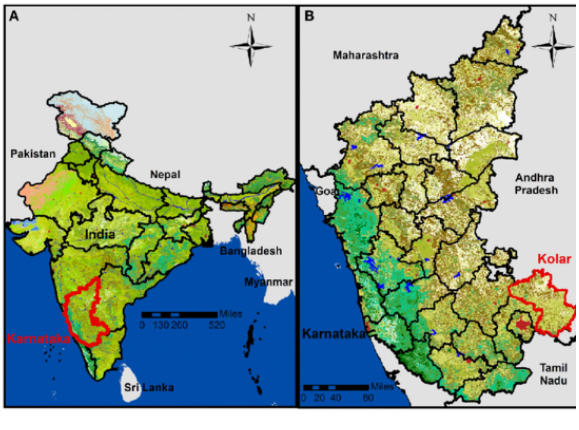



**Fig 1: Map of India with Kolar district**

Paediatric cases admitted to a rural based medical college hospital at Kolar in Karnataka from January 2013 to December 2017 were considered for this hospital based retrospective case study. Ethical clearance was obtained from the institution ethical board. All children presenting with fever and rashes on the body especially involving the palms and soles and headache were included in the study. The clinical information such as duration of fever and rashes, other symptoms like headache, pain abdomen, drowsiness, convulsions, cough, breathlessness, vomiting and diarrhea were recorded. The information related to the management of the patient's illness prior to admission were noted. Clinical examination findings recorded were type of skin rashes, level of sensorium and presence of meningeal signs, hepatosplenomegaly and evidence of pneumonia. All admitted patients had undergone laboratory investigations of complete blood count, Weil Felix test for rickettsial disease and chest x-ray. Additional investigations such as CSF analysis, liver function test, blood culture, smear for malarial parasites, Widal test, serology for leptospirosis, serology for dengue fever and ultrasonogram of the abdomen were done on the basis of clinical indications.

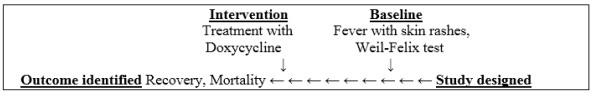



Fig 2: Study design

### Results

Total of 196 cases were included for the study during this 5 years period. The duration of presence of fever before admission to the hospital ranged from 5 to 15 days with mean duration was 9.7 days. Median age of presentation was 5 years. 113 were male children. Eighty six(43.7%) of the cases were earlier being treated as viral exanthematous fevers by the doctors before being admitted to the referral hospital. Some of the patients apparently had not received medical treatment and instead were taken by the caretakers to goddesses temples to offer prayers and perform traditional rituals for cure. These patients were brought to the hospital because their condition did not improve or had deteriorated. Around 130(66.7%) of these patients were referred by the treating doctors to a referral center and 65 (33.3%) of them had taken their own decisions to approach the hospital for consultation and management.

Of these196 patient's admitted with fever and maculopapular skin rashes, a petechial type was observed in 57 (29.2%) cases. Rashes were also observed on the palms and soles in 182 (92.7%) of them. Oedema of the dorsum of the hands and feet was seen in 143 (73.2%) of the cases. Peripheral gangrene of the toes or fingers was recorded in three patients (1.5%) and purpura fulminans noted in nine patients. Of the 12(6.1%) patients who had evidences of neurological involvement,

seven had altered sensorium, three had hemiplegia, six had seizures and two of them had meningeal signs. Twelve patient's had pneumonia based on the chest x-ray findings and two had ARDS. Nine cases presented with shock and one with gastrointestinal bleed. Inoculation eschar was not evident in any of these patients.

**Table 1: Clinical features and laboratory results of patients with spotted fever**

| Characteristics | Values |
|---|---|
| Sex<br>Male<br>Female | N (%)<br>113<br>83 |
| Age (range) | 4 months – 18 years |
| Petechial skin rashes, n (%) | 57(29.2) |
| Hepatosplenomegaly, n (%) | 162(82.9) |
| Neurological involvement, n (%) | 12 (6.1%) |
| Pneumonia, n (%) | 12 (6.1%) |
| Hb, (gms %)<br>Range<br>Mean | 5.6–12.4<br>8.2 |
| Total leucocyte count<br>< 5000/mm3<br>> 11000 /mm3 | N (%)<br>17 (8.5% )<br>109 (56.1%) |
| Platelets<br>< 1.5 lakhs/mm3<br>> 1.5 lakhs/mm3 | N (%)<br>67(34.1)<br>98(50.2) |
| Weil-Felix test titres<br>1:80 (convalescent sera)<br>1:160<br>1:320<br>1:640<br>1:1280 | N (%)<br>81 (41.5)<br>26 (13.3)<br>43(22.0)<br>02(01.0)<br>02 (01.0) |

Weil-Felix test was positive in 157 (80.2%) of the patient's. Among them 100(51.5%) showed a rising titre of 1:80 and above in the convalescent sera. Raised protein levels and pleocytosis were found in the CSF samples of 08 (75%) out of the 12 patient's who had clinical neurological features.

Based on the clinical suspicion of rickettsial disease all of these patients were treated with oral Doxycycline, 2.2 mg/kg/dose given in two doses per day for 5 to 7 days. Patient's presenting with fever, skin rashes and clinical neurological symptoms and signs, received the drug for 10 days. All patient's responded to the treatment clinically. Defervescence was observed in 114(58.3%) of the cases within 36 hours. None of the treated patient's had neurological symptoms or signs at the time of discharge. Twenty six of the doctors who had referred these patients could be contacted and the feed back about the disease condition diagnosed and treated was given. Information was given to them about the existence of rickettsial disease in the region and to consider it as a differential diagnosis for patient's presenting with fever, skin rashes and headache. Also, the care takers of the patient's admitted to the hospital were educated about the disease and its common symptoms. They were informed about the importance of seeking early treatment from the health facilities to control the outbreak of such diseases.

Most of the children (70.7%) clinically diagnosed to have a rickettsial disease of spotted fever group presented to the referral hospital in the rural district after being referred as the symptoms did not subside. None of these cases were suspected to be having a ricketssial disease by the referring physicians. Weil-Felix test was positive in 80.2% of the cases and was helpful in strengthening the clinical suspicion of rickettsial disease in these children during this period. Although 27.8% of these cases initially presented with neurological complications none of them had residual neurological clinical signs and symptoms at the time of their discharge from the hospital. There was no mortality among these cases.

Rickettsioses generally are described among the difficult to diagnose disease conditions. Most of the symptomatic rickettsial diseases are known to present as moderate illness, but some of the spotted fevers and typhus fevers may be fatal in 20%–35% of untreated cases. Hence prompt treatment is very much essential. The presentation of the cases described here mimicked many of the common diseases routinely seen in children. Many conditions were considered under the differential diagnosis in these patients including measles in young children, and dengue, typhoid, malaria, meningococcemia and leptospirosis among all. CSF analysis including a smear and culture was performed among all the cases presenting with neurological signs and symptoms to rule out TB and meningococcemia (14,16).

Though rash is considered as an important feature of rickettsial disease, it may not be a seen in all the patients in early stages. Rashes described in typhus group of rickettsial diseases usually are known to spare the palms and soles (15). Presentation of patients predominantly with rashes and the involvement of palms and soles in some of them made a diagnosis of spotted fever group of rickettsial diseases more likely. Though Weil-Felix test is less sensitive as a diagnostic tool for rickettsial diseases, the raise in the agglutination titer is considered in the context of clinical presentation of the cases (16).

The defervescence observed in more than 50% of the patients within 36 hours after initiating doxycycline therapy made the diagnostic suspicion of rickettsial diseases stronger in these cases. As it is a characteristic feature of rickettsial diseases to respond to doxycycline quickly, failure to defervescence in 48 hours is also considered as an indication to review the diagnosis (15,17). Thrombocytopenia in 34% and a normal to low leucocyte count in 44 % of these cases were also considered as clues for early diagnosis of rickettsial diseases. The other presentations that were compatible with the clinical diagnosis of rickettsial diseases in these cases were occurrence of neurological signs and symptoms suggestive of meningoencephalitis in 6.1% of the patients (15).

This retrospective study was done to study the spotted fever group type of rickettsial diseases that has rarely been reported in this region of India. Serological evidence exists of the continued occurrence of human rickettsiosis in southern India (13). In this study existing data of group of cases presenting with fever and skin rashes during 2013-2017, that had been recorded for clinical management were used. Since this case series is uncontrolled it may have be subjected to selection bias. There is a need for prospective study which is superior to be planned for further documentation of the varied clinical profile of rickettsiosses in children (17,18).

Based on the findings of the clinical study of spotted fevers, we propose that rickettsial diseases are prevalent in Kolar and surrounding regions. Practitioners of medicine including paediatric and adult groups need to be sensitized about the occurrence of rickettsial diseases. Hence, continuing medical education for the medical practitioners on rickettsial diseases is required in this region to develop a clinical awareness and also to propagate the use of diagnostic methods to better the diagnosis of rickettsial diseases so as to prevent their undue morbidity and mortality.

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