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Clinical profile of tick bite fever cases in tertiary care hospital in Rural Bangalore

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ABSTRACT

Background: Rickettsial fever is a major health concern in different district of Karnataka with serious complications including mortality and morbidity if diagnosed late. The objective of present study was to study the Tick bite fever and its outcome in children

Methods: Observational study was conducted on all the laboratory confirmed cases of Rickettsial fever in children admitted to Sapthagiri Institute of Medical Sciences And Research Centre, Bangalore, Karnataka, from October 2018- December 2019.

Results: of the 213 cases suspected to have Tick born infections admitted to hospital 208 (97.6%) were positive for Rickettsial fever and 5(2.4%) were positive for Rocky Mountain spotted fever. Of the children positive for Rickettsial fever, majority belonged to 3-6 year age group 30% (63/205), followed by 11-14 years 26 % (54/205) and among gender, males were more commonly affected. Majority of the children presented with fever 93 %(153/213) followed by skin rash 84%(179/213). The common complication was cardiac (carditis) and CNS complications (altered sensorium and encephalitis).

Conclusion: This study concludes male children in the age group of 3-6 years are more affected; common symptoms observed were fever, skin rash, decreased appetite and myalgia. The complications seen were shock, myocarditis, meningitis/encephalitis, and renal failure.

Keywords: Tick bite fever, Rickettsial fever, Rocky Mountain fever, complications.

Introduction

Ticks are hematophagous arthropods belonging to the class arachnids. Ticks are among the most competent and versatile vectors of pathogens and are second to mosquitoes as vectors of a number of human pathogen[1]. The losses due to ticks and tick borne diseases and cost of controlling them in India is estimated to be US$498.7 million/annum[2]. The outbreaks of KFD

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(Kyasanur forest disease) in Karnataka, India, despite ongoing vaccinations and the 2011 Crimean-Congo hemorrhagic fever (CCHF) outbreak in Gujarat, India underlines the importance of monitoring the vector activities and checking human interference in natural habitat of ticks and their wild hosts[3]. Rickettsial fever is a re-emerging disease of South East Asian countries[4,5]. Rickettsial fever is endemic in north Karnataka, Tamil Nadu, Andhra Pradesh[6,7,8,9]. In Karnataka Rickettsial fever is reported from both rural and urban areas[10,11,12].

The clinical manifestations are protean like fever, headache, rashes, gastrointestinal symptoms and respiratory symptoms[6,13,14]. Difficulty in diagnosis is due to variations in the antigenicity of infecting strains[12,15,16]. Orienta species makes up Scrub Typhus group[17.] Rickettsial diseases are Zoonoses where human beings are accidentally involved in a chain of transmission between chiggers and animals' endemic habitats, like rice fields, deserts and river banks. These ecological patches which attract the natural host of mites[18].

The children commonly present with fever, calf muscle pain, and gastrointestinal symptoms. The classic triad is fever, rashes and unremitting headache. Rash is discrete, after several days rash becomes like petechie, ecchymosis or necrosis[11]. Classical eschar is seen in few cases in the hidden areas of body[19]**.**

Methods:

This is a hospital based observational study carried out at the General hospital, Sapthagiri Institute Of Medical Sciences And Research Centre, Bangalore, Karnataka, India, on all laboratory confirmed cases of children with Tick fever, admitted over a period of one year, from October 2018 to December 2019. All the admitted patients were enrolled on a structural protocol which included symptoms, signs, diagnosis, complications, relevant investigations, treatment, duration of stay and outcome. Relevant data was entered in a proforma and analyzed. The diagnosis was based on clinical and lab diagnosis (Weil Felix) for tick fever and, for Rickettsial fever was based on Rathi (**Rathi** Goodman Aghai (RGA) Clinical **scoring** system) scoring system.

Inclusion criteria :

- Children age group 0-18 years
- Admitted with symptoms suggestive of Rickettsial fever based on RATHI **(Rathi Goodman Aghai (RGA) Clinical scoring system)** criteria.
- IgM scrub typhus antibody positive cases by Elisa technique and Weil Felix test

Exclusion criteria:

- Children with dengue, Malaria
- Children whose Lab tests were positive for other infections.
- Children with congenital anomalies and other deformities
- Children with similar history of disease
- Children on treatment for other infections or diseases

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Table 1 - Age wise distribution

Age in Years	Males	Females	Total
1-2 years	6	4	10(4.7%)
3-6 years	46	19	65(30.5%)
7-10 years	28	12	40(18.8%)
11- 14 years	33	22	55(25.8%)
14-18 years	30	13	43(20.2%)

Table 2 Rathi criteria (**Rathi** Goodman Aghai (RGA) Clinical **scoring** system)

Clinical criteria	Score	Lab criteria	Score
Rural	1	Hb<9 g/dl	1
Pets	1	Platelets	1
Tick Exposure	2	CRP>50 g/dl	2
Tick Bite	3	Serum Albumin<3+ g/dl	1
Non Exudative conjunctivitis	2	Urine Albumin 2+	1
Maculopapular rash	1	SGOT >100 mg/dl	2
Purpura	2	Sodium <130 mEq/l	2
Palpable purpura/necrotic rash	3		
Rash appear in 48-96 hrs after fever	2		
Pedal edema	2		
Rash on palms and soles	3		
Hepatomegaly	2		
Lymphadenopathy	1		
Total	25	Total	10

Table 3 Classification based on signs and symptoms

Signs, Symptoms and Complications	Numbers (n=213)	Percentage
Fever	200	93
Reduced Appetite	150	70
Skin Rash	179	84
Myalgia	90	42
Altered Sensorium	2	0.9
Breathlessness	5	2
Bleeding tendency	7	3
Joint Pain	50	23
Splenomagaly	40	18
Ascites	6	2

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Results

A total of 213 cases of tick born infections were admitted to the General hospital, SIMS & RC, Bangalore, Karnataka, India from December 2018 - November 2019 were statistically analyzed, out of which 208(97.6%) were positive for Rickettsial fever and 5(2.4%) were positive for Rocky mountain spotted fever and other tick born infections were not found. Of the positive cases of Rickettsial fever, based on the age, majority were in the age group of 3-6years 30 %(63/205), followed by 11-14 years 26 % (54/205), among gender males 68 %(140/205) and females were 32% (65/205). Based on the symptoms the most common symptoms noticed were fever 93%(200/213) followed by skin rash 84% (179/213) and reduced appetite 70 %(150/213), myalgia 42%(90/213) the least common symptoms noticed were altered sensorium 0.9%(2/213) breathlessness 2%(5/213) and bleeding tendencies 3%(7/213).

Discussion

This study describes tick fever in children admitted to General hospital, Sapthagiri Institute Of Medical Science And Research Centre, Bangalore, Karnataka, India. Among the children who presented with tick fever the most common presentation were more of Rickettsial fever compared to other tick born infections(Eg: Rocky mountain spotted fever). Rocky mountain fever was not specific to particular age group. It was seen in different age groups and sex and it was comparatively more in males than females as compared to study by Mastan Singh et all [20]

Number of case positivity for Rocky Mountain spotted fever was also less compared to Rickettsial fever which was similarly seen in our study [20]. Rickettsial fever positivity was seen more in our study. Among the positive cases males were 67.2% (143/213) was more compared to female 32.8%(70/213) children which was similar compared to A Ramyashree et all [21]. Children of age group 3-6 years were noticed to be more affected compared to other studies[21]. In our study skin rashes were seen in 84 % of the children as compared to a study done by Somashekar HR et all[11]. In certain conditions where cases were referred from other places children who were not diagnosed early developed complications like altered sensorium(encephalitis), carditis and ascites. Altered sensorium was observed in 0.9 % of the children as compared to other study[11] where they had 18 % which showed severity was less in this region. Fever (93%), rash (84%), myalgia (42%) were the early symptoms presented by the children in our study which was similar compared to other study[22], where as late manifestations in our study were joint pain (23%), splenomegaly (18%), bleeding tendency (3%), ascites (2%), breathlessness(carditis) (2%) and altered sensorium (encephalitis)(0.9%) as compared to similar study[22]. This study tells us that Rickettsial fever is more common and to be suspected at any age group with history of fever with rash in order to prevent the CNS and cardiac complications.

Conclusion:

This study concludes male children in the age group of 3-6years were more affected. The common symptoms observed were fever, decreased appetite, skin rash and myalgia. The common complications were bleeding tendencies, carditis and encephalitis. All cases did not have eschar. Early suspicion in endemic areas prevents morbidity and mortality as

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presentation of Rickettsial infection is nonspecific, like viral illness. This study also tells us that Rickettsial fever should be suspected early if not the children might end up with systemic complications which may involve brain causing encephalitis presenting as altered sensorium, involving Gastrointestinal system causing splenomegaly, ascites and involving cardiac system presenting as breathlessness. Hence Rickettsial fever should be suspected early and treated early in cases of children presenting with fever and rash.

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