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Original Research Article

Scrub Typhus – A re-emerging illness in a tertiary care center in southern Odisha

Sunil Kumar Agarwalla[1], Tapan Kumar Biswas[2], Shantanu Kumar Meher[3], Subhranshu Sekhar Dhal[3]
[1]Associate Professor, Dept. of Paediatrics, M.K.C.G Medical College, Brahmapur, Odisha 760004
[2]Junior Resident, Department of Paediatrics, M.K.C.G Medical College, Brahmapur, Odisha 760004
[3]Junior Resident, Dept. of Paediatrics, M.K.C.G Medical College, Brahmapur, Odisha 760004

***Corresponding author**
Tapan Kumar Biswas
Email: biswas.tapan433@gmail.com

Abstract: Scrub typhus is an acute febrile illness and now one of the important causes of fever of unknown origin (FUO) in paediatric age group. It generally presented with fever along with nonspecific symptoms without any obvious clinical findings. Often you may get eschar which is due to bite of the mite give a strong support for diagnosis but its absence does not rule out scrub typhus. Sometimes it may be complicated with multi organ dysfunction leading to increased morbidity and mortality. To know the incidence, clinical profile and outcome of the scrub typhus in paediatric age group. The study was conducted in the department of paediatrics, M.K.C.G medical college, from September 2015 to August 2016. Total 44 cases were taken in the basis of fever along with presence of eschar. Weil Felix test positive or negative and scrub typhus IgM positive cases were taken. Other causes of prolonged fever were excluded after proper examination and laboratory evaluation. In the present study total 44 children were taken among them 1-5 years age group were most prevalent and male: female ratio was 1.3:1. Fever was the most presenting complaints (100%), other symptoms were vomiting (43.2%), rashes (38.2%), abdominal pain (31.8%), respiratory difficulty (15.9%) and convulsion (9.1%). On examination eschar was present 61.4%, pallor 59.1%, generalised lymphadenopathy 52.3%, hepatomegaly 47.2% and splenomegaly 43%. Bronchopneumonia was the most common (15.9%) followed by meningoencephalitis (13.6%). Other complications were acute renal failure (11.4%), multi organ dysfunction (9.1%), shock (6.8%) and myocarditis (4.5%). Scrub typhus is now a common febrile illness among children.Any child with prolonged fever without any focus always keep scrub typhus in your mind and look for eschar which may clinch your diagnosis. Prompt diagnosis and treatment will definitely reduce morbidity and mortality in children.
Keywords: Scrub typhus, organ dysfunction, Bronchopneumonia, eschar

INTRODUCTION

Rickettesial disease (typhus and spotted fever group, scrub typhus and Q fever) may pose a serious public health problem when they are underdiagnosed [1]. Scrub typhus is one of the most common and also very prevalent in India. The causative organism, *Orientia tsutsugamushi*, a Gram-negative bacterium, is transmitted to humans by the bite of the larval stage of the trombiculid mites [2].

It presents as either a nonspecific febrile illness with constitutional symptoms such as fever, rash, myalgia and headache or with organ dysfunctions involving organs such as kidney (acute renal failure), liver (hepatitis), lungs (acute respiratory distress syndrome), central nervous system (meningitis), or with circulatory collapse with haemorrhagic features [2,3].

Most of the cases it is associated with a single painless eschar with an erythematous rim at the site of chigger bite. Various studies have shown an eschar prevalence of 20-87% among Scrub typhus patients [4].

In India, epidemics of scrub typhus have been reported from north, east and south India [5-12].

Although the disease is endemic in our country, it is grossly underdiagnosed owing to the non-specific clinical presentation, lack of access to the specific diagnostic facilities in most areas, and low index of suspicion by the clinicians [13].

Micro immunofluorescence, immunoperoxidase, latex agglutination, indirect hemagglutination, ELISA, Dot blot immunoassay, and Weil Felix test are the various serological methods available for the diagnosis of rickettesial diseases.
DNA PCR can be conformatory [14,15].

MATERIALS AND METHODS

The study was conducted in the department of paediatrics, M.K.C.G medical college, from September 2015 to August 2016. Total 44 cases were taken in the basis of fever along with presence of eschar. Weil Felix test positive or negative and scrub typhus IgM positive cases were taken. Other causes of prolonged fever were excluded after proper examination and laboratory evaluation.

RESULTS

In the present study total 44 children were taken among them 1-5 years age group were most prevalent (Table-1) and male: female ratio was 1.3:1(graph-1).

In our study fever was the most presenting complaints (100%), other symptoms were vomiting (43.2%), rashes (38.2%), abdominal pain (31.8%), respiratory difficulty (15.9%) and convulsion (9.1%).(Table-2) On examination eschar was present 61.4% (**Fig**1,2,3,4,5,6,7), pallor 59.1%, generalised lymphadenopathy 52.3%, hepatomegaly 47.2% and splenomegaly 43%.(Table-3)

In the study some children developed some complications. Bronchopneumonia was the most common (15.9%) followed by meningoencephalitis (13.6%) (**Fig** 8). Other complications were acute renal failure (11.4%), multi organ dysfunction (9.1%), shock (6.8%) and myocarditis (4.5%). (Table -5) In our study only one child died due to complications.

In our study 65.9% children having leucocytosis, anaemia 59.1%, thrombocytopenia 56.8%, elevated liver enzyme 29.5% and impaired renal function test 34.1%. In the present study weil-felix test were positive in 70.5% cases at a titre of 1:80 and more and IgM ELISA were reactive in 84.1% cases. (Table-4)

Fig-1: Eschar over popliteal fossa

Fig-2: Eschar over left arm

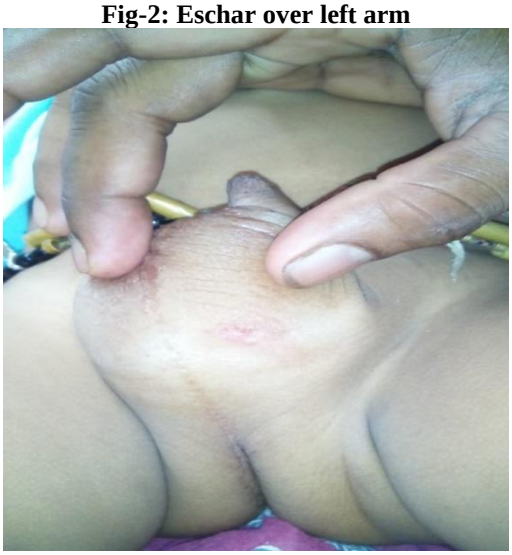


Fig-4: Eschar over scrotum

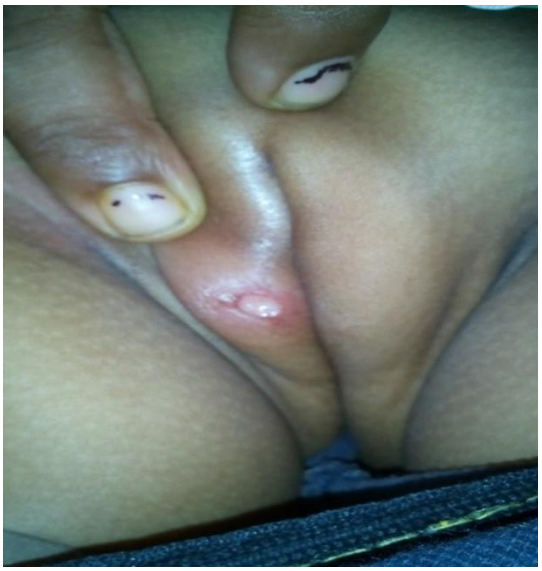


Fig-3: Eschar over labia majora

Fig-5: Eschar over eyelid

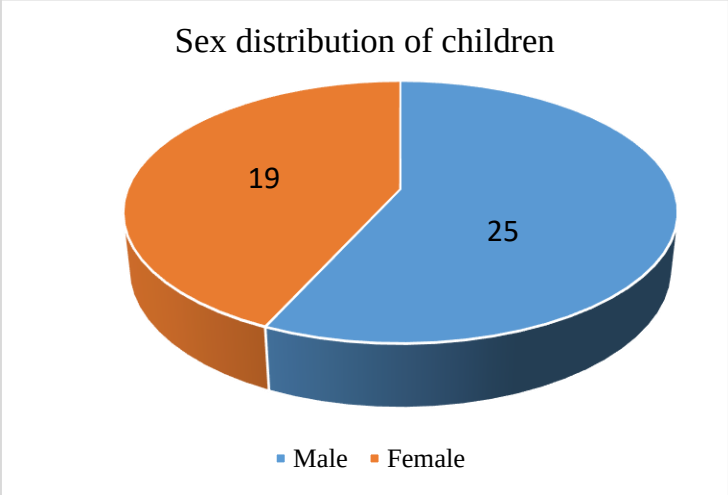
Fig-6: Eschar over axilla

Fig-7: Eschar behind ear

Fig-8: Eschar over left inguinal region with encephalopathy

Table-1: Age distribution of the children

Age in years	No	%
1-5	19	43.2
6-10	12	27.3
11-14	13	29.5
Total	44	100



Graph- 1: Sex distribution of children

Table-2: presenting complaints

Complaints	No	%
Fever>7 days	39	88.6
Fever< 7 days	5	11.4
Rash	17	38.6
Abdominal pain	14	31.8
Vomiting	19	43.2
Respiratory difficulty	7	15.9
Convulsion	4	9.1
Altered sensorium	12	27.3

Table-3: Clinical examination findings

findings	No	%
fever	44	100
Eschar	27	61.4
Hepatomegaly	21	47.7
splenomegaly	19	43
Rash	17	38.6
Lymphadenopathy	23	52.3
Pallor	26	59.1
Icterus	13	29.5
Oedema	21	47.7
Meningeal sign	5	11.4

Table-4: Laboratory findings

Parameters	No	%
Weil Felix	31	70.5
Elisa Ig M	37	84.1
Anaemia	26	59.1
Leucocytosis	29	65.9
Thrombocytopenia	25	56.8
Hepatopathy	13	29.5
Nephropathy	15	34.1

Table-5: Complications

Complication	No	%
meningoencephalitis	6	13.6
Acute renal failure	5	11.4
Myocarditis	2	4.5
Bronchopneumonia	7	15.9
Multi organ dysfunction	4	9.1
Shock	3	6.8
Death	1	2.3

DISCUSSION

Scrub typhus being the re-emerging zoonosis is increasingly recognised in India. The diagnosis of scrub typhus is generally made by the history and clinical presentation. The vast variability and common clinical manifestations of the disease which is similar to

other febrile illnesses makes the clinical diagnosis a challenge. Kulkarni *et al*. reported indoor admissions as high as 12% [16].

The total burden of the disease however may be grossly under reported as most of the studies are hospital based. Also the serological tests, other than Weil Felix, are not freely available in most of the endemic areas. The infection presents as a nonspecific febrile illness with rash, lymphadenopathy, gastrointestinal, respiratory or central nervous symptoms, which if not diagnosed and treated early can lead to complications like myocarditis, pneumonia, meningoencephalitis, gastrointestinal bleeding, acute renal failure, ARDS like picture [17,18].

In the present study out of total 44 children, most prevalent age group was 1 to 5 years (43.2%) with male and female ratio of 1.3:1. Similar results were observed in a study carried out by Kumar Bhat7 et al. in which the male-to-female ratio was 1.44:1 [19].

In our study fever was the most presenting complaints (100%), other symptoms were vomiting (43.2%), rashes (38.2%), abdominal pain (31,8%), respiratory difficulty (15.9%) and convulsion (9.1%). On examination eschar was present 61.4%, pallor 59.1%, generalised lymphadenopathy 52.3%, hepatomegaly 47.2% and splenomegaly 43%. Our observation can be comparable to the earlier studies on paediatric scrub typhus patients. Sirisantha V *et al*. observed common physical signs as fever (100%), lymphadenopathy (93%), hepatomegaly (73%), eschar (68%), conjunctival hyperaemia (33%), maculopapular rash (30%) and splenomegaly (23%) [18].

Jim WT *et al*. reported the clinical manifestations in 39 children with scrub typhus as fever (100%), cough (72%), anorexia (72%) eschar (69%) and lymphadenopathy (64%) [20].

Similar findings were observed by Varghese *et al*. [21]. They found eschar 56% in their study.

In the study some children had some complications. Bronchopneumonia was the most common (15.9%) followed by meningoencephalitis (13.6%). Other complications were acute renal failure (11.4%), multiorgan dysfuction (9.1%), shock (6.8%) and myocarditis (4.5%). In our study only one child died, mortality rate was 2.3% which is lower than the previous studies. Kumar Bhat *et al*. [19] also reported that mortality rate was 7.5% in their study. However, Palanivel *et al*. [22] showed 11.94% in their study.

In our study 65.9% children having leucocytosis, anaemia 59.1%, thrombocytopenia 56.8%, elevated liver enzyme 29.5% and impaired renal function test 34.1%. These findings can be comparable with the previous studies.

The previous study by Palanivel *et al.* [22] reported 49% leucocytosis, 55% anemia, 77% thrombocytopenia, and 64% elevated liver enzyme in their study group.

Digra *et al*. [23] reported renal functions were deranged 4.7% of their patients. The most widely performed laboratory test in India is Weil-Felix test which has low sensitivity and specificity. The test shows false negative results in the early stage of disease as the agglutinating antibodies can be detected only in the second week of illness [24]. The IgM ELISA with good sensitivity and specificity, ease to perform, swift results and also suitable for testing large number of specimens may be considered as good replacement for Weil-Felix test and IFA test in diagnosis of scrub typhus.

In a study by Prakash *et al.*, sensitivity of 44% and 87% were observed with Weil-Felix test and IgM ELISA respectively [25].

Weil Felix has a poor sensitivity but still serves as a useful and cheap test for laboratory diagnosis of rickettsial diseases.

Prakash *et al*. evaluated two specific serological tests, Dot enzyme immunoassay (EIA) and IgM ELISA and the Weil Felix test and found a sensitivity of 100%, 86.5% and 43.5% respectively [25].

Issac *et al*. [15] have demonstrated that the sensitivity of Weil Felix was 30% at a break point titre of 1:80, but the specificity and positive predictive value were 100%.

In the present study weil-felix test were positive in 70.5% cases at a titre of 1:80 and more and IgM ELISA were reactive in 84.1% cases.

Scrub typhus generally well respond to antibotics. We started azithromycin in less than 8 years of age and doxycycline more than 8 yrs of age. Results were same in both the conditions. Child was afebrile after 48 hrs of starting antiboitics. Mahajan *et al*. [9] used azithromycin and doxycycline in their study groups.

CONCLUSIONS

Scrub typhus is now one of the common cause for prolonged fever more than 7 days in pediatric practice. Any chilld presented with long duration fever always look for eschar which may be a clue for diagnosis of scrub typhus.Though there is no available good serological test for diagnosis but weil felix/IgM scrub typhus are good investigation tool for scrub typhus. Early diagnosis and appropiate antiboitic treatment can cause dramatic improvement other wise it may lead to severe complications which are lifethreatening.

Ethical approval: The study was approved by the Institutional Ethics Committee

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