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Scrub Typhus in Children at a Tertiary Care Center: Clinical Profile and Complications

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Abstract: ***Background: To study the clinical profile and complications of childhood scrub typhus. Materials and Methods: The present study was a prospective hospital based study conducted in tertiary care hospital at Great Eastern Medical School and Hospital, Ragolu, Srikakulam, from April 2021 to September 2021 with 52 children. Results: Out of 52 children 65.3 % were males and 34.6% were females. All children presented with fever. Other common symptoms abdominal distension and pain (69%), Myalgia (38%) Vomitings (20%) decreasedurine output (7.6%). Eschar was found in 77% cases. Other common signs ascites (73%), fever more than 101°F (69%) Pain abdomen (61%). Thrombocytopenia, anaemia, pleural effusionwere the most common complications observed in these children. Other common complications were hepatitis, Cardiac dysfunction, ARDS, meningoencephalitis, AKI, myocarditis.90% children became afebrile within 48 hours of appropriate antibiotic. Overall mortality rate was 7.6 %. Cause of death were ARDS, myocarditis, PAH. Conclusion: Clinicians should keep a high suspicion for scrub typhus in any febrile child having hepatosplenomegaly, thrombocytopenia and features suggestive of capillary leak. Emperical therapy with doxycycline or azithromycin should be started as delay would result in life threatening complications.***

Keywords: Scrub typhus, Mite, Eschar, ARDS, Meningoencephalitis

1. Introduction

Scrub Typhus is anacute febrile illness in rural asia [(1).] It is caused by Orientia Tsusugamushi an obligate intracellular gram negative cocco bacilli belonging to ricketesia family [(2, 3).] It is a zoonotic disease that is transmitted to human through the bite of an infected chigger, the larval stage of trombiculid mite [(4).] Bacteria multiply at the inoculation site with the formation of papule that ulcerates and becomes necrotic, evolving into a eschar. When bacteria invades endothelial cells it produces disseminated vasculitis and perivascular inflammatory leisons. Vasculitus leads to significant microvascular leakage, edema, tissue hypoperfusion and ensuing end organ ischemic injury [(4, 5).] Scrub typhus and other rickettsia infections are under diagnosed in india because of their non-specific symptoms and low index of suspicion among clinicians, and lack of awareness about the disease and diagnostic facilities [(6).] If it is not diagnosed in time and treated it can lead to grave complications with MODS and even death [(3).]

Aim of the Study

To determine the clinical features and therapeutic outcome of children presenting with scrub typhus at our institution.

2. Materials and Methods

A hospital based study was conducted on children attending to our hospital and was conducted from April 2021 to September 2021.

3. Study Design

A prospective observational hospital based study.

4. Sample Size

Study conducted of 52 cases evaluated with the help of pre-designed proforma and including history and clinical examination.

Data Collection

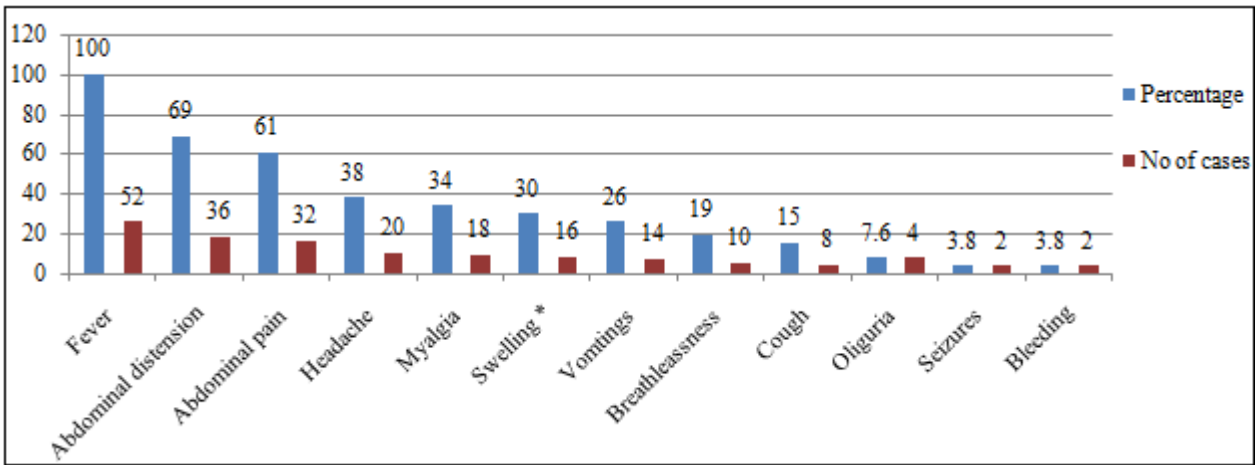
After obtaining consent from the parent, information was taken as per pre-designed proforma, enclosed, recorded on the clinical forms. Scrub typhus was suspected in all children up to 14 years of age who had a fever for more than 5 days without an identifiable infection and one or more of clinical features such as Petechial rash, Eschar, Edema, Hepatosplenomegaly, Respiratory distress. Serological diagnosis was made by a rapid immunochromatographic assay (SD Bioline Tsutsugamushi test from Standard Diagnostics). A favorable clinical response to antibiotics (defervescence within 48 Hrs) was considered additional evidence of the disease. Patients were treated with a 7-day course of antibiotics (doxycycline 4 mg/kg/day BD). Clinical data, including history of fever, associated symptoms, vital signs, and the general and systemic examination findings, were noted. A careful search for eschar was performed in all patients. Complete blood counts, chest X-rays, tests for renal and liver function, urinalysis and serum electrolyte estimation were performed at presentation for all cases and were repeated if necessary. Common infectious conditions that could clinically mimic scrub typhus were ruled out by performing the following tests: peripheral smear and rapid antigen test for malaria, Widal

test, Dengue (NS1 antigen and IgM antibody) test, urine and blood cultures. Cardiac evaluation in selected cases with suspected myocaritis and cerebrospinal fluid (CSF) analysis was done for meningoencephalitis. Data has been entered into Microsoft office Spreadsheet and analyzed.

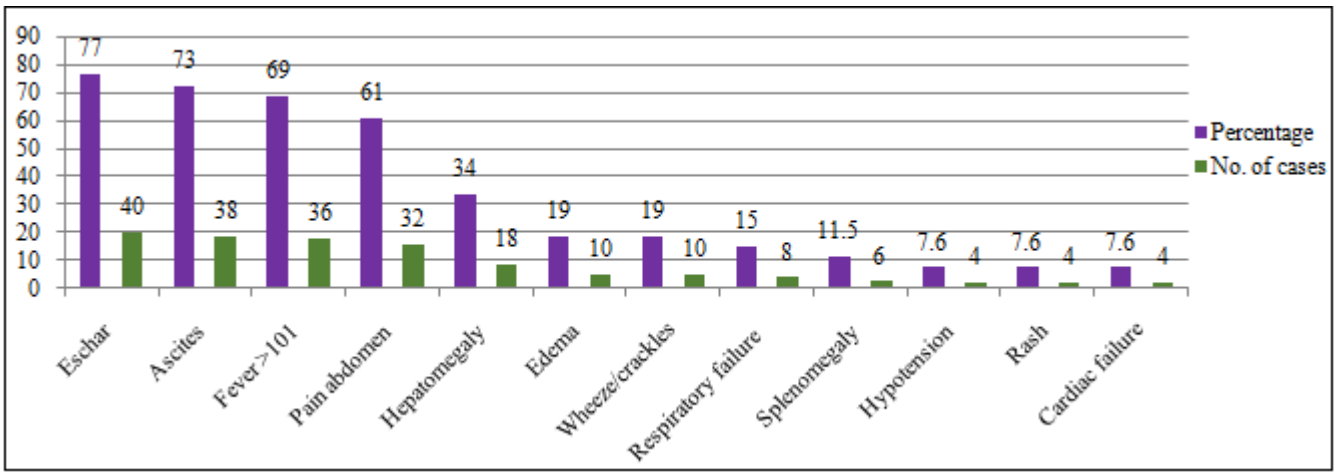
5. Results

52 children (34 Males 18 Female) cases were diagnosed with scrub typhus during the study period with a male to female ratio of 1.8: 1. All cases serologically confirmed. Fever found in all children (100%), abdominal distension (69%) abdominalpain (61%), headache (38%), myalgia (34%), swelling mostly facial swelling (30%), vomtings (26%), breathlessness (19%), cough (15%), oliguria (7.6%), seizures (3.8%), bleeding (3.8%). Most Common sign was Eschar and observedin (77%) and other signs were ascites (73%), fever>101F (69%), pain abdomen, (61%), hepatomegaly (34%), edema (19%), wheeze, (19%), respiratory failure (15%), splenomegaly, (11.5%) hypotension (7.6%), cardiac failure (7.6%).

Symptoms of Scrub Typhus

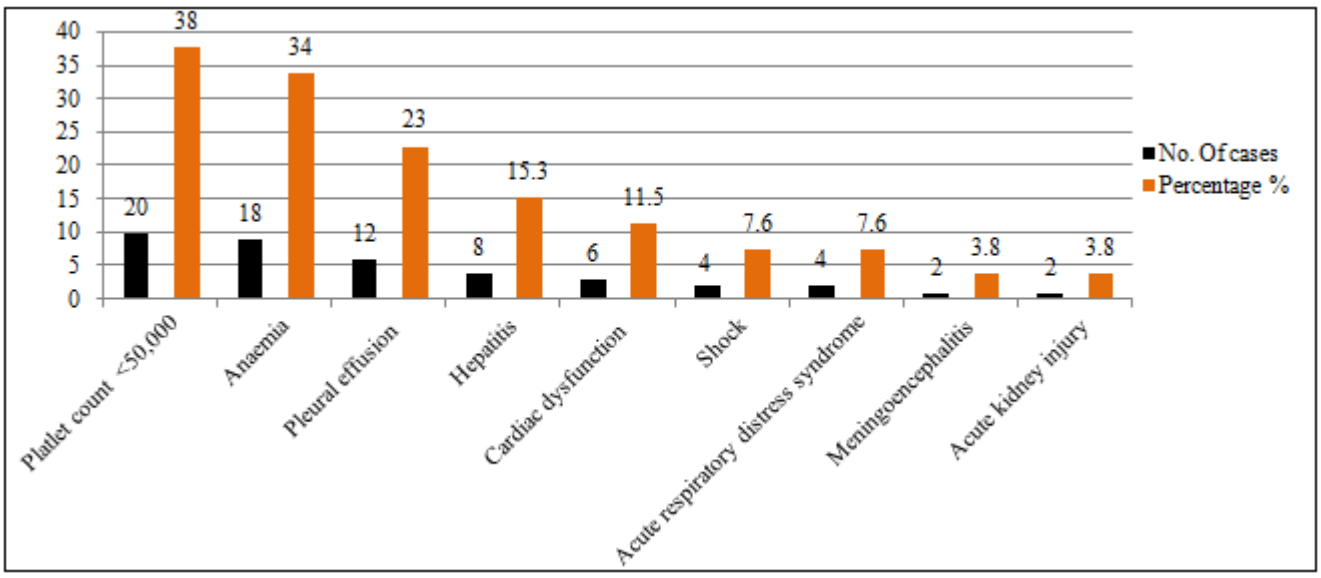


Signs of Scrub Typhus



The duration of fever on presentation ranged from 2 to 14 days with a median of 8 days. Anaemia (hemoglobin <11gm%) is seen in 18 cases (34%) thrombocytopenia (platelet <1, 00, 000/mm^3) is seen in 20 (38%) pleural effusion in (23%) and elevated liver enzymes (SGOT, SGPT) in8 (15.3%) cardiac dysfunction (11.5%) children. Meningoencephalitis was the complication seen in 2 child (3.8%).4 (7.6%) children presented with shock (7.6%), ARDS (7.6%) children with respiratory failure needed assisted ventilation. Other complications encountered in the present study were pneumonia, myocardial dysfunction and severe PAH, acute kidney injury (AKI), hepatitis, acute respiratory distress syndrome.

Complications of scrub typhus seen in the present study



In children less than 5 yrs intravenous azithromycin 10mg/kg/day was given for 5 days. Children more than 5 yrs of age was treated with injection doxycycline 5mg/kg/day in two divided doses. Children became afebrile with 48 hours of treatment.4 Children died with mortality rate of 7.6%. These children presented with ARDS and PAH and myocarditis.

6. Discussion

Males affected more in number compared to females with the ratio 1.8: 1 in the present study which is also observed in the study done by Kumar et. al in north india which is probably due to higher prevalence of exposure to chiggers among boys, who like to play outdoors [7, 8]. Zainab et. al reported majority of the cases occurred between the months of Septemberand November which is similar to the present study as 61% cases are observed in that period. [9]Fever was documented in all children in the present study similar to observations by studies of Kumar et. al and Zainabet al. [9, 10]The presence of an eschar is a valuable clinical clue in the diagnosis of scrub typhus; however absence does not rule out the disease. Eschar was detected between 20 to 80% in various studies but it is 77% in the present study similar to Somasekhar et. al and Kumar et al. [10]Puffiness of face and pedal edema were observed in 52% and 39% respectively in the present study. Scrub typhus is regarded as a life threatening disease in children. Serious complications of scrub typhus usually occur in the second week of illness, which include ARDS, pneumonia, AKI, myocarditis, severe thrombocytopenia and bleeding. Out of complications SanjeevKumar et al [11]reported 19% and 14% developed cardiac dysfunction and meningoencephalitis respectively during the couse of illness but in the present study it is seen in 11.5 % and ARDS seen in 7.6% cases and Meningoencephalitis is seen in 1 child (3.8%). Analysis of laboratory parameters revealed a major proportion of children had anemia (38%) which may be contributed by underlying nutritional deficiency and thrombocytopenia (34%). Leucocytosis was seen in 23% cases similar to other studies Zainab et. al, [9] dyselectrolytemia such as hyponatremia was seen in 36% cases. Many clinical features including fever, hepatomegaly, edema, hypotension, thrombocytopenia, and hepatitis can also be caused by dengue infection, which results in diagnostic confusion. The presence of other indicators such as an eschar, tender splenomegaly, persistence of fever after the shock has supervened and the absence of an increase in hematocrit helps distinguish rickettsial infection from other hemorrhagic fevers, such as dengue. Most of the patients in this study demonstrated a remarkable clinical response to doxycycline as in other studies. Most (90%) of the patients became afebrile within 48 hrs (median 22hrs). Mortality rate in the present study was 7.5% which is less than 15%, as reported by other authors.

7. Conclusion

When a child presents with acute febrile illness, maculopapular rash, hepatosplenomegaly, thrombocytopenia and features suggestive of capillary leak, diagnosis of scrub typhus must be suspected and an eschar, if found is very useful for diagnosis. Clinical suspicion of scrub typhus warrants immediate empirical therapy with doxycycline or azithromycin pending serological confirmation, as delay in treatment would result in life threatening complications.

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