

Case Study

A CASE STUDY ON SCRUB TYPHUS

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Received: 01 Aug 2023, Revised and Accepted: 02 Sep 2023

ABSTRACT

Scrub typhus is a mite-borne typhus caused by *Orientia tsutsugamushi* and it is characterized by acute febrile illness, rash, eschar and an incubation period ranging from 6 to 21 d. It affects various organs such as lungs, heart, spleen, liver, and kidney. We report a case on 5 y old male child was admitted with complaints of fever and vomiting. Based on a general examination, the patient had eschar on the scrotum. Diagnosis was made based on clinical features, and the serology IgM for scrub typhus was positive. He was treated with doxycycline. To prevent complications, the patient needs effective management, early administration of antibiotics and preventive measures to control vector bite.

Keywords: Scrub typhus, Eschar, Thrombocytopenia, IgM ELISA

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DOI: <https://dx.doi.org/10.22159/ijpps.2023v15i10.49102>. Journal homepage: <https://innovareacademics.in/journals/index.php/ijpps>.

INTRODUCTION

Scrub typhus is a zoonosis caused by *Orientia tsutsugamushi*, an intracellular gram-negative bacteria. It is an acute febrile illness categorized into differentiated fever and undifferentiated fever. Differentiated fever is mainly caused by an infection such as a respiratory and urinary tract infection. Undifferentiated fever shows quite non-specific signs and symptoms [1]. Scrub typhus is a disease endemic in many countries, such as Japan, Taiwan, China, South Korea, Australia, Nepal, Pakistan, and India [2]. The clinical features are characterized by sudden onset fever associated with myalgia and headache, profuse sweating, vomiting, rash, eschar, and enlarged lymph nodes. Six to twenty-one days is the incubation period for symptoms. An eschar develops at the mite bite site. In males, eschar is usually seen in the axilla, groin and genitalia. In females, it is usually seen in the abdomen and chest [3]. Scrub typhus complication includes pneumonia, myocarditis, meningoencephalitis, acute kidney injury, gastrointestinal bleeding, acute pancreatitis, hepatitis [2]. The differential diagnosis for scrub typhus is malaria. Arbo virus infection includes dengue, leptospirosis, meningococcal disease, typhoid, infectious mononucleosis and HIV [4]. The diagnosis is based on clinical

findings such as the identification of eschar and a rash on the skin. The laboratory diagnosis includes leucocytosis, thrombocytopenia, raised CRP and ESR, hyponatremia, hypoalbuminemia, elevated transaminase. Serology findings include indirect immunofluorescent antibody assay (IFA), indirect immunoperoxidase assay, Weil-felix and IgM ELISA [5]. The mainstay treatment for scrub typhus was antibiotics.

Case presentation

A 5-year-old male child was admitted with complaints of fever (high grade with intermittent nature) for 6 d, abdominal pain over umbilical region for 2 d, vomiting for 2 d. On general examination, the child was febrile, conscious, oriented, periorbital edema and had eschar on scrotum. On Systemic examination, CVS-S1S2, RS-BAE+(Bilateral Air Entry), CNS-Tone, power, speech were normal. The vitals were given in table 1. The patient clinical laboratory investigation shown in table 2. The serological detection of IgM was positive. The USG abdomen shows a spleen size of 10-3.5 cm and confirms mild splenomegaly. The pharmacological treatment includes Inj cefotaxime 500 mg TDS, C Doxycycline 100 mg BD, Inj Ranitidine 0.6cc IV BD, Inj Ondansetron 1.5 mg sos and Inj pantoprazole 15 mg stat. He recovered without any complication and was discharged.

Table 1: Vitals

Parameter	Observed value
Temperature	102 degree Fahrenheit
Heart rate	114 beats/min
Respiratory rate	26 cycles/min

Table 2: Laboratory investigation

Test	Observed value	Normal range
Haemoglobin	9.3	12-14 g/dl
Total count	9700	4000-11000 cells/cubic mm
Red blood cell	3.44	4.3-5.9 million/mm
Platelet	8.9	1.5-4.5 lakhs/cubic mm
SGOT	156	5-40 IU/l
SGPT	221	7-56 IU/l
ALP	172	44-147 IU/l
Albumin	3.4	3.4-5.4g/dl
Total Protein	5.0	6.0-8.3 g/dl
sodium	126	135-145mEq/l

SGOT: Serum glutamate oxaloacetate transaminase, SGPT: Serum glutamate pyruvate transaminase and ALP: Alkaline phosphatase.

DISCUSSION

According to the WHO, scrub typhus is probably one of the most underdiagnosed and underreported febrile illnesses requiring hospitalization in the region [6]. In our case, the patient presented with symptoms of acute febrile illness vomiting, and was diagnosed with undifferentiated febrile illness. Laboratory investigation was interpreted and showed thrombocytopenia (increased platelet level) and elevated liver enzymes. The USG abdomen shows mild splenomegaly. Finally, a positive serology IgM was found, which confirms the diagnosis of scrub typhus. In India, IgM ELISA is a frequently used serological diagnosis that has high sensitivity specificity, and is easier to perform with a large number of specimens without the requirement of fluorescent microscopes. It could potentially replace the weil-felix and IFA tests in scrub typhus diagnosis [7]. IgM ELISA is a method for detecting IgM antibodies against 56-k DA antigen a gene of *Orientia tsutsugamushi*, the major immunodominant protein on bacteria outer membrane, using a recombinant antigen [8]. The serum samples were diluted to 1:1000, and the results were read with a microplate at 450 nm [9]. Untreated patient increase their complication risk. The future diagnosis approach for scrub typhus are biosensor and immunosensor. Biosensors are devices that detect and measure various biological processes using a sensing bioreceptor, transducer, and detector with digital output [10]. Biosensor used for the detection of scrub typhus due to higher specificity and sensitivity and immunosensors are an alternative to DNA sensor [11]. This study shows multiorgan involvement, including tubulointerstitial nephritis (TIN) with acute renal failure, interstitial pneumonia with respiratory distress syndrome, liver function impairment and upper gastrointestinal bleeding [12]. The pharmacological treatment for scrub typhus is Doxycyclin 200 mg OD for seven days. The alternative drugs, such as chloramphenicol 500 mg QID, Rifampicin 900 mg/day for week and macrolides (Azithromycin 10 mg/kg/day for 5 d), are the best choice treatment for doxycyclin resistance [4]. The preventive measures were vector control, preventing vector bites, prompt removal of attached ticks and pre-exposure chemoprophylaxis. There is no vaccine to prevent scrub typhus [13]. Campaigns are essential for public health education about the spread of scrub typhus [14].

CONCLUSION

Scrub typhus is a prevalent rural disease, and so healthcare providers need extensive knowledge to diagnose scrub typhus and be aware of undifferentiated febrile illness to differentiate the diagnosis. Pharmacist play an important role in educating patient about the medication, lifestyle modification and regular follow-up. Early detection, empirical treatment and prevention reduce patient morbidity and mortality.

ACKNOWLEDGEMENT

We would like to express our thanks to hospital authorities for providing us to access the patient's medical records.

FUNDING

Nil

AUTHORS CONTRIBUTIONS

The contribution from each author are equal.

CONFLICT OF INTERESTS

The authors declared no conflict of interests.

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