

Scrub Typhus In A Tertiary Care Hospital In Chengalpattu District

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Abstract

Introduction: *Orientia tsutsugamushi* is the bacterium that causes scrub typhus. By being bitten by a larval trombiculid mite(chigger), it is transmitted. The incubation period is 10-14 days. Fever, headache, body aches, and sometimes rashes are the most common symptoms. The hallmark is the characteristic eschar lesion-scab at the site of chigger bite and regional lymphadenopathy. The severity of the illness varies from person to person ranging from fever to multi-organ involvement. Scrub typhus is diagnosed in the laboratory using serological tests such as ELISA IgM and Immunofluorescence IgM and molecular test -real-time PCR. Though the organism can be isolated using egg and cell culture is confined to the referral or research laboratories having biosafety level 3 facilities. The disease is managed with doxycycline or chloramphenicol and the organism does not respond to penicillins.

Aim: To elaborate a case report of scrub typhus in a 41-year-old female patient in our tertiary care hospital.

Materials and Methods: laboratory work up of a single patient with clinical suspicion of scrub typhus was carried out using TruNat, Molbio for detection of *Orientia tsutsugamushi*. All other differential diagnosis of fever including Dengue, were also evaluated to confirm the diagnosis

Conclusion: Considering scrub typhus as differential diagnosis of fever is suggested

Keywords

Scrub typhus, Rickettsial disease, *Orientia tsutsugamushi*, Eschar, Chigger bite.

Imprint

R. Vasuki, U. Arunkumar. Scrub Typhus In A Tertiary Care Hospital In Chengalpattu District. *Cardiometry*; Issue No. 26; February 448 | *Cardiometry* | Issue 26. February 2023

2023; p. 448-450; DOI: 10.18137/cardiometry.2023.26.448450; Available from: <http://www.cardiometry.net/issues/no26-february-2023/scrub-typhus-tertiary-care>

Introduction:

Scrub typhus, a rickettsia disease caused by *Orientia tsutsugamushi* causes acute febrile illness. It is transmitted through the bite of a trombiculid mite^[1]. Incubation period ranges from 10-14 days. Fever associated with headache, body aches, and sometimes rashes are the most common symptoms. In some cases, vesicular lesions are seen due to the feeding of the chigger (larval mite) that gradually progress to eschar. -central crust which is black in color surrounded by an erythema associated with regional lymphadenopathy. The eschar lesion evolves in the following manner: a) A vesicle is observed in the early stages surrounded by an erythematous border. b) Then the lesion progresses with a black coloured crust appearance at the centre surrounded by erythema. c) The classic eschar lesion forms 6–8 days after the onset, and the scales covering the crust gradually thicken. d) The crust gradually contracts, and the surrounding scales thin out and vanish, leaving just a scar-like, whitish macule (indicating fibrosis). e) In the edematous area, the lesion cures with reddish-brown hyperpigmentation^[2].

The severity of the illness varies from person to person ranging from febrile flu-like illness to multi-organ involvement. The presence of eschar is strongly suggestive of scrub typhus and the diagnosis is confirmed in the laboratory using serological tests that detect IgM antibodies indicating current illness, The test use ELISA, Immunofluorescence and Rapid immune chromatography principles.

Case History:

A 41-Year-old female patient, presented with complaints of fever (4 days), headache, myalgia, abdomen pain & vomiting for 3 days. The fever was intermittent, and the vomiting was nonprojectile and not blood-stained. There was no history of cough with expectoration. She further gave the history of noting a black-colored lesion in the right inframammary region. There was no history of antimicrobial intake prior to admission.

Regarding epidemiology history, she was a housewife and not involved in any agricultural activity. She

had not travelled to any malaria-endemic areas like Rameswaram, Chennai, or coastal region of Tamilnadu, or other parts of India.

Clinical Examination:

At the time of admission on 1 November 2022, she had the following clinical signs on general examination: Temperature was 101°F; conjunctival pallor present vitals were normal.

On local examination, she had an ulcerative lesion with a central black scab and peripheral hyperpigmentation on the right mammary region. (figure: 1)*. There was no generalized lymphadenopathy. On abdominal examination generalized tenderness was present but no organomegaly.



Figure 1: eschar*

On 6 November 2022 patient had a right eye conjunctival injection and it was diagnosed as anterior uveitis

The following were the laboratory findings:

Haemoglobin -9.7 gm /L; Platelet count was -75000 lakhs/mm³; ALT (75U/L) and AST (167U/L) were elevated and ALP (97 IU/L) was normal; serum bilirubin

– 0.8 mg/dL; Serum albumin – 3.1 gm/dL; No significant abnormalities detected on ultrasonography of abdomen and pelvis; Chest x-ray was normal.

Microbiological investigations: Dengue NS1 antigen & IgM were negative

Scrub typhus real-time PCR (TrueNat, Molbio): Orientia tsutsugamushi DNA was detected 2.4x 10² copies /ml **

Diagnosis:

Presumptive clinical diagnosis of Scrub typhus on eschar lesion was confirmed. The patient has managed with doxycycline for 7 days. The patient started showing clinical improvement from the next day onwards and the fever subsided. She was discharged after 7 days of admission.

Discussion:

The rickettsia are intracellular parasites that live freely in cytoplasm of host cells which were released when infected host cell membrane are destroyed. [3] In South and East Asia, northern part of Australia, many island of the Indian Ocean, and western Pacific, scrub typhus is endemic & re-emerging. Scrub typhus is typically characterised by eschar at the mite feeding site, fever, and lymphadenopathy. [4]

The clinical presentation of the patient is dependent on the host factors and virulence of the strain. Macrophages and the endothelial cells are the target cells. Dissemination to multiple organs is through the endothelial cells via macrophages and lymphocytes. In majority of cases it involves the liver and spleen. The bacteria subsequently enters the circulation, causing perivascularitis and focal or systemic vasculitis in numerous organs, which causes serious complications. They include meningoencephalitis, interstitial pneumonitis, acute respiratory distress syndrome, acute Renal Failure, acute Liver Failure, myocarditis, pericarditis. [5]

With the advancement of technologies, laboratory diagnosis of scrub typhus is easily available in various formats like ELISA, Immunofluorescence and Rapid immune chromatography principles & PCR. Culture has specificity of 100 %. The warning sign of laboratory-acquired infection is very high, making a laboratory vulnerable. This can be cultivated in embryonated eggs or tissue culture. Conventional and quantitative real time PCR techniques have been established to identify *O. tsutsugamushi* in blood, eschar, and CSF samples. [6].

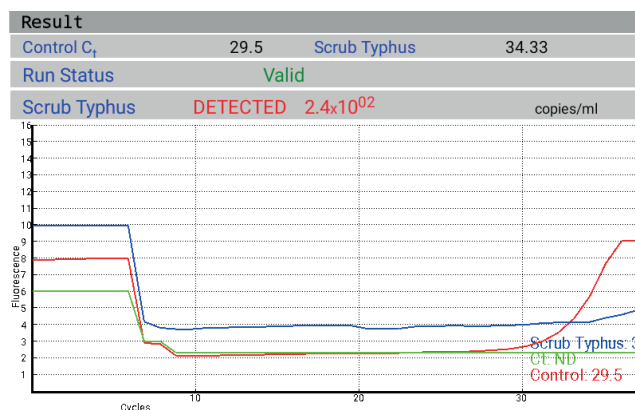


Figure 2: Molecular detection of scrub typhus. **

Conclusion:

Considering scrub typhus as differential diagnosis of fever is suggested. Detailed clinical history, epidemiology and local and systemic examination of patient, evaluation of patient based on laboratory test procedure is recommended as we see a raising trend on the number of scrub typhus cases at present scenario since it poses a threat on human and may even warrant the life of patient if not identified and treated earlier as it has impact on multiple organ involvement.

Acknowledgement

The authors are grateful to the Department of microbiology for constant guidance.

Ethical Consent

Patients who participated in the study provided informed consent.

Funding

The study was carried out with no outside funding.

Conflict Of Interest

The authors mentioned above declare that they have no conflict of interest.

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