



## Scrub Typhus: A Rare Cause of Recurrent Arrhythmias in Febrile Adults

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### Abstract

Scrub Typhus is prevalent in our country, especially in the rural parts among the farmers. Scrub Typhus is grossly under-diagnosed due to lack of clinical suspicion and improper diagnostic facilities. The most common clinical features of the disease include fever, rashes, vomiting, myalgia, and eschar. Conjunctival congestion, gastrointestinal features such as hepatitis and splenomegaly, acute kidney injury (AKI), or neurological findings in the form of meningoencephalitis are the most common clinical features of this disease. We present here a case report of a young 30-year-old female with Scrub Typhus who was presented to ER in arrhythmia and shock.

**Keywords:** scrub typhus, myocarditis, shock, mods, arrhythmias

### Introduction

Scrub Typhus is an acute febrile illness caused by *Orientia tsutsugamushi* (rickettsiat *tsutsugamushi*). The disease has a nonspecific clinical presentation, and due to lack of awareness, low index of suspicion, Scrub Typhus is grossly under-diagnosed in our country. *O. tsutsugamushi* is an intracellular Gram-negative coccobacillus[1]. There are several serotypes of *O. tsutsugamushi*, and infections with one serotype gives only temporary cross immunity to another. Scrub Typhus is a zoonotic disease transmitted by the larval mites (chiggers) of the *Leptotrombidium deliense* group. These larval mites usually feed on the wild rats. The infection is usually acquired through agricultural or recreational activities in the woods or mountainous areas. The infection appears clinically as a nonspecific febrile illness often accompanied by headache, myalgia, nausea,

vomiting, diarrhoea, cough, or breathlessness. The pathognomonic clinical sign of Scrub Typhus is “eschar” (40–50%) which is not seen in all the patients. It is usually seen in the areas like groin, gluteal folds, breast folds, and external genitalia and may go unnoticed in dark-skinned people. The lesion is missed mostly, as it is painless and does not itch, and the bite may be in a location that is onerous to notice[2]. Severity of this disease may vary from subclinical illness to severe illness with multiple organ failure, which can sometimes be stringent enough to be life threatening and sometimes lead to death.

### Case Report:

30 year female with no known comorbidities presented with the fever with chills, myalgia since 7 days for which she was taking treatment from a local hospital. From last two days she developed severe abdomen pain associated with multiple episodes of vomiting and loose stools. She was referred to our center for further management. On arrival to ER she was conscious oriented to time, place and person, general examinations were within normal limits her vitals were BP was 120/80mm Hg, HR 180/min RR was 30/min. 12 lead ECG was taken which showed SVT which was reverted back to sinus rhythm with one dose of Injection Adenosine. She was shifted to MICU for further management. On arrival to MICU, she was conscious, oriented, severely dehydrated, rapid thready pulse hypotension, cold clammy extremities. PCOUS showed kissing IVC with A profile. She was treated with IV fluids and blood investigations send, showed mild thrombocytopenia deranged RFT, LFT lactate 7, CRP 689 and PCT 77, hypokalemia, hypocalcemia hypomagnesiumemia. She developed hypotension with BP 80/60 and was started on inotropes, antibiotics and her electrolytes were corrected simultaneously. On the same day of admission, she had an episode polymorphic VT which was reverted to sinus rhythm by delivering shock 200J. Later she developed AF and was started on amiodarone infusions. In view of endemic areas for tropical fever, her tropical fever work up was also send and in which Scrub Typhus IgM was found to be positive and she was initiated on doxycycline. In view of persisting hypotension vasopressin along with norepinephrine was added to keep MAP 65 mmHg. USG abdomen and pelvis and ECHO was within normal limits. She was continuously being hemodynamically monitored in ICU with a strict hourly urine output charting. On the 3rd day of admission, she had developed acute onset of breathing difficulty associated with cough and pink frothy sputum a diagnosis of Acute pulmonary Oedema was made, was managed with NIV support and diuretic infusion. Repeat ECHO done which showed HF with EF 35% and a diagnosis of Myocarditis was made.

### Discussion:

On the subsequent days of her admission, our patient's condition improved considerably. Her inotropic supports came down; serial X rays were improving, and echo showed improvement in

EF from 35% to 75%. The patient was slowly weaned off from NIV and started taking oral diet. By the 6th day of her admission, she had completely recovered and was stable enough to be shifted to the ward before getting discharged. Scrub Typhus is known to involve the cardiovascular system leading to a pericardial effusion [myocarditis [myocardial infarction [and findings in ECG like ischemic changes, arrhythmia, and QT prolongation were found in the patients with Scrub Typhus [In this case, the patient presented with acute onset fever, and she was evaluated in terms of acute febrile illness. Lab tests suggested acute renal injury and acute liver injury with IgM Scrub came out to positive[3]. The patient was started on doxycycline therapy. The patient's condition deteriorated during her initial hospital stay and she developed abnormal rhythm which was cardioverted and was started on antiarrhythmic. Studies previously conducted in Scrub Typhus patients revealed new onset atrial fibrillation in 1% of the Scrub Typhus patients with, 87.2% of this 1% patients aged more than 65 years [Scrub Typhus patients have also reported ECG alterations like ST segment elevation, AV block, PR segment depression, and T wave inversions [The involvement of blood vessels leads to vasculitis, which may further lead to target organ damage. Similarly, it leads to inflammatory changes in the myocardium, leading to structural and functional damage responsible for the ECG changes like atrial fibrillation or other narrow and wide complex arrhythmia seen in Scrub Typhus patients[11]. Cardiovascular involvement with myocarditis and ECG changes has also been reported in other tropical infections like dengue, which is attributed to macrophage activation, immune mediated cardiomyocyte damage, direct invasion of cardiomyocytes, and electrolyte alterations[18]. Doxycycline is the antibiotic of choice, and in resistant cases of Scrub Typhus rifampicin and azithromycin are used.

Early antibiotic use leads to a decrease in mortality (from 6% to 1.4%) and complications[12]. In Scrub Typhus patient who develops atrial fibrillation, along with doxycycline cardioversion is done in hemodynamically unstable patients, while in hemodynamically stable patients, ratecontrolling agents like calcium channel blockers, beta blockers are used Early detection and management of the

presence of any such arrhythmias is vital and can influence the prognosis of the patients. Recently, several reports of Scrub Typhus from various parts of India have been published[1-5]. Most cases of Scrub Typhus were diagnosed during the rainy months of June to November. This is correlated with the months with a higher number of field rats infected with *O. tsutsugamushi* and the months with more mites attached to rodents. Most of the time Scrub Typhus gets treated by the physician without even knowing the diagnosis as it responds to commonly used antibiotics like doxycycline and azithromycin. Micro immunofluorescence is considered the test of choice. Latex agglutination, indirect hemagglutination, immunoperoxidase assay, ELISA, and polymerase chain reaction are other tests available. The Weil Felix test using the Proteus OXK strain is a commercially available serodiagnostic test and is in use for many years. A minimum positive titer is 1:80 or a fourfold rise over previous levels is significant. Several studies have shown that the Weil Felix test has a high specificity. It was found that at a cut off value of 1:320, OXK had a specificity of 97% but it was less sensitive[9]. Early treatment shows better outcomes and faster resolution than delayed treatment. Tetracycline 500 mg, qid, or doxycycline 200 mg, od, for 7 days is the treatment of choice. Chloramphenicol 500 mg, qid is an alternative. Rifampicin, 900 mg per day for a week, has been found effective in patients who respond poorly to conventional therapy. Azithromycin has been proven to be more effective than doxycycline in doxycycline susceptible and doxycycline resistant strains causing Scrub Typhus [Rapid defervescence after antibiotics is so characteristic that it is used as a diagnostic test for Scrub Typhus

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### Conclusion

Scrub Typhus infection can lead to inflammation of the myocardium, cascading to new onset atrial fibrillation and other narrow and wide complex arrhythmia, leading to an increase in mortality and morbidity. Such patients require perpetual monitoring of cardiac status and precise treatment with either rate control or rhythm control agents depending upon the patient's clinical condition. In addition, early suspicion of the disease and use of appropriate antibiotics can decrease the mortality and complications in these patients.

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