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Tropical Twists: Navigating the Confluence of Scrub Typhus and Acute Liver Failure - A Compelling Case Report

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Abstract

Scrub typhus is a mite borne zoonosis, caused by Orientia tsutsugamushi, a gram-negative intracellular organism. This infection usually presents in high prevalence in the rural areas of East Asia and Western pacific islands. It usually presents with fever, chill, myalgia, headache, skin rashes, having pathognomonic and skin lesion i.e. eschar in ~10% cases in Indian subcontinent. It can present with life-threatening complications on occasional. Here we report a case of 50 yr old male with fever for 20 days, complicated with acute liver failure.

Keywords: Scrub Typhus, Liver failure.

Introduction

Scrub typhus is a sudden-onset feverish illness caused by the bacterium Orientia tsutsugamushi, transmitted to humans through the bite of a trombiculid mite. The incubation period typically spans 6 to 21 days. Infected individuals commonly exhibit symptoms such as fever, chills, headache, muscle pain, skin rashes, the presence of an eschar (a characteristic skin lesion), and swollen lymph nodes. Failure to promptly diagnose and treat scrub typhus may result in severe complications such as acute respiratory distress syndrome, myocarditis, acute kidney injury, liver dysfunction, meningoencephalitis, and rhabdomyolysis, with these complications becoming more prominent in the second week of untreated infection. Mortality rates can vary widely, ranging from 0% to 70% in untreated patients.

Case Report

A 50-year-old male resident of Chennai, India, presented with a 20-day history of intermittent low-grade fever, chills, and rigors, accompanied by loose stools (3 episodes) for the past day. The fever responded temporarily to medication, and the patient had no other significant symptoms such as headache, chest pain, palpitations, respiratory issues, gastrointestinal discomfort, or urinary problems. The individual, a long-term alcoholic with no other health conditions, exhibited mild dehydration and pallor upon physical examination. Eschar was present. Laboratory results revealed anemia (hemoglobin 9g%), significant thrombocytopenia

(platelet count 74,000/cu.mm), and leukocytosis (12,400/micro liter). Liver function tests indicated hyperbilirubinemia, elevated aspartate and alanine aminotransferase, while renal function and electrolyte levels were within normal range. The patient tested positive for SCRUB IgM (16.37) in enzyme-linked immunosorbent assay, confirming scrub typhus. Despite negative results for various infections, including HIV, hepatitis, and malaria, and negative serology for leptospirosis and dengue, the patient was diagnosed with acute liver failure.

Treatment initially focused on managing acute liver failure symptoms and fever. The patient received intravenous doxycycline (100 mg BD) for 14 days upon confirmation of scrub typhus. Gradual improvement occurred, with normalization of liver enzymes upon discharge. The patient was advised to rest, avoid strenuous activities, and gradually increase exercise during recovery.

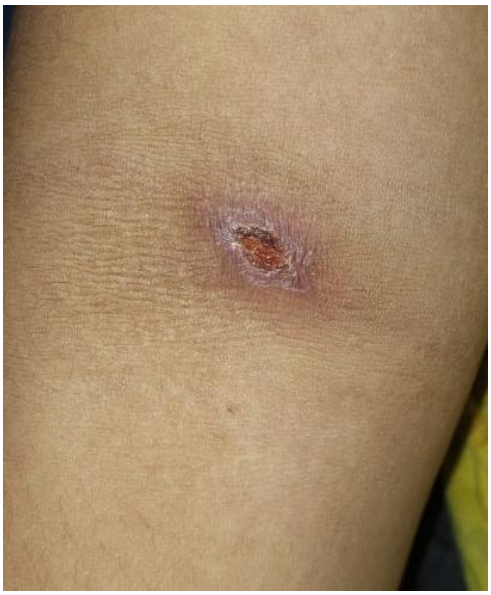

Fig.1: Eschar on the right arm

Discussion

Scrub typhus, caused by the bacterium Orientia tsutsugamushi and transmitted through the bite of trombiculid mites, often presents in patients after a 6–8-day incubation period. Individuals may exhibit either an uncomplicated febrile illness or progress to mono- or multi-organ dysfunction, with the liver being a frequently affected organ. The manifestation in the liver is characterized by elevated transaminases and bilirubin levels, which, while generally non-specific, may indicate mild focal inflammation due to vasculitis of intrahepatic sinusoidal endothelium and cytopathic liver damage. Studies have noted specific histopathological changes in the liver associated with scrub typhus. Bi- or triple nucleated changes, fat deposition in swollen hepatocytes, small lymphocyte aggregation in sinusoids, granulomatous changes, and the presence of rod-shaped organisms within hepatocytes and sinusoids are observed in some cases. These changes reflect the invasive nature of Orientia tsutsugamushi, which evades the immune system and multiplies within phagocytes. Upon release from phagocytes, the organisms proliferate on the endothelium of small blood vessels, triggering the release of cytokines. The ensuing inflammatory response disrupts endothelial integrity, leading to fluid leakage, platelet aggregation, and proliferation of polymorphs and monocytes. This process causes focal occlusive endarteritis, resulting in micro infarcts. Multiple organs are affected, including the skeletal muscles, skin, lungs, kidneys, brain, and cardiac muscles. The severity of the infection can vary, with some cases progressing to fatal outcomes. Giventhe potential complications associated with scrub typhus, timely and appropriate treatment is crucial. Intravenous doxycycline, administered at 100 mg twice daily for duration of 14 days, has proven to be effective in managing the infection. Additionally, other antibiotics like azithromycin have demonstrated efficacy in the treatment of scrub typhus. Liver failure in the context of scrub typhus underscores the systemic impact of the infection. The liver, a vital organ for metabolism

and detoxification, becomes a target for the inflammatory and infectious processes. Elevated transaminases and bilirubin levels signal the liver's involvement, reflecting the disruption caused by the pathogen. Understanding the intricate pathophysiology of scrub typhus, especially its impact on the liver, enhances the ability to diagnose and manage the condition effectively. Awareness of the potential histopathological changes in the liver aids in confirming the diagnosis, allowing for prompt initiation of appropriate antibiotic therapy. As with any infectious disease, prevention, early detection, and timely intervention are essential in minimizing the risk of complications and improving patient outcomes.

Conclusion

Scrub typhus has emerged as a common etiology of acute febrile illness. It is under recognized infection, which may present with serious complications like acute liver failure. Leukemoid reaction may be seen in scrub typhus like other triggering infections. In patients with acute febrile illness with acute liver failure scrub typhus should be ruled out in all cases. Timely diagnosis of disease and therapy with doxycycline/or azithromycin leads to excellent prognosis.

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