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Case Report

An interesting case of scrub typhus meningoencephalitis

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ABSTRACT

Rickettsial diseases are a re-emerging group of illnesses that are known to show a good response to treatment if diagnosed in time. Here we report a case of Scrub Typhus-related Meningoencephalitis in a young gentleman and the importance of high clinical suspicion with early empirical treatment in patients with consistent epidemiological context.

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1. Introduction

An acute febrile illness, Scrub Typhus, is a vector-borne disease caused by *Orientia tsutsugamushi* (tsutsuga being a Japanese term for illness, mushi meaning insect/ creature)¹ which is transmitted via the bite of trombiculid mite. The disease is endemic to South-East Asia and is prevalent in India, although definite statistics are not available mostly due to a lack of awareness and high index of suspicion on the clinician's part, high cost, and unavailability of diagnostic test kits.²

2. Case History

27 years old gentleman, hailing from West Bengal, with recent travel to Mumbai, presented to us with fever, holo cranial headache, and vomiting for 2-3 days. The patient was conscious and oriented to present but soon progressed to a state of disorientation, altered mental status, and aggressive behavior by the next morning. Along with neurological deterioration, the patient also developed hematuria with deranged serum creatinine values, transaminitis, and a drop in platelets from 2.5 lakhs/mm³ to

1 lakhs/mm³ A Cerebrospinal Fluid (CSF) study was done. While awaiting results patient was started on empirical treatment with injection of dexamethasone, ceftriaxone, and vancomycin considering bacterial meningitis as the etiology. To our surprise, the CSF (Cerebro Spinal Fluid) picture turned out to be sterile with only 4 (White Cell Counts) WBCs, normal proteins (40grams/Litre), and borderline low sugars 52mmol/litre(126mmol/litre), with a workup for tuberculosis being negative. The patient did not respond to our empirical treatment. Magnetic Resonance Imaging (MRI) of the brain was done suggestive of leptomeningeal enhancement and meningoencephalitis like picture. Although physical examination did not reveal the presence of any rashes, considering rickettsial infection as the etiology in the presence of fever with multi-organ involvement, scrub typhus IgM (Immunoglobulin-M) and PCR(Polymerase Chain Reaction) for rickettsia were sent, and both reverted positive results. The patient was started on doxycycline and started exhibiting rapid improvement in neurological symptoms with down-trending biochemical values. The patient was stabilized and discharged on tenth day of treatment.

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3. Discussion

Rickettsia belongs to a genus of non-motile, gram-negative, non-spore-forming obligate intracellular bacteria that is highly pleomorphic and cocco-bacilli in form.³ The prevalence of scrub typhus is higher in East Asian countries like China, Japan, South and North Korea, India, and Pakistan. More common during the Rainy Season, as rainy and humid conditions favor the vector growth that's why it is more common during this period of year with many outbreaks reported in above countries in last few decades more on the eastern coast of India.^{4,5}

It is a diverse group of species, mainly divided into 3 – typhus, spotted fever, and scrub typhus. Among them, scrub typhus caused by *Orientia tsutsugamushi* is found to be most notorious for neurological manifestations. Scrub typhus mostly presents as fever, headache, myalgias, and a pathognomic eschar.⁵ In an Indian setting, with dark-colored skin, the presence of eschar is difficult to elicit, and its incidence varies from 10%-92%.⁶ In the absence of eschar, the diagnosis of scrub typhus is difficult. The bacteria tends to stay and infect the endothelial cells of small and medium vessels and hence has a propensity to involve highly vascular organs (lung, liver, brain, kidney). The disease has been linked closely with agricultural occupation or with populations in close contact with scrub vegetation in their day-to-day activities and has been reported in most states of India.⁷ CNS(Central Nervous System) manifestations may include meningitis, encephalitis, cranial nerve deficits, and cerebellitis. Low platelets and infection-related DIC (disseminated intravascular coagulation) may lead to haemorrhages. In a country like India, tubercular meningitis is a close differential owing to a lymphocytic picture on lumbar puncture examination. Apart from neurological involvement, the disease may involve other organ systems leading to myocarditis, (Acute Respiratory Distress Syndrome) ARDS, liver dysfunction, gastrointestinal bleeding manifestations, and renal injury.⁸

In the case we report, the patient presented with a short history of fever for 3-4 days, low platelet count, transaminitis, and deranged serum creatinine values alongside neurological manifestations. Our close differentials were Dengue fever-associated encephalitis, Leptospirosis, and Malaria. The aseptic meningitis-like picture on cerebrospinal fluid examination with multi-organ involvement, a recent history of travel, and negative serology for other infectious causes gave us a clue to look for rickettsial etiology. A peripheral blood PCR (Polymerase Chain Reaction) for rickettsia and Scrub Typhus IgM(Immunoglobulin-M) were tested positive. Rapid response to Doxycycline confirmed the diagnosis clinically.

4. Conclusion

Scrub typhus meningoencephalitis (STME) should be considered as a differential diagnosis in patients hailing

from endemic areas with neurological manifestations, CSF (Cerebro Spinal Fluid) picture resembling tubercular meningitis, or aseptic meningitis like picture with multiorgan dysfunction. The disease carries a high index of morbidity and mortality if remains undiagnosed but is easily treatable when compared to rest forms of CNS (Central Nervous System) infections. With high clinical suspicion, early diagnosis and effective treatment there can be complete resolution of multi organ dysfunction in patients with Scrub Typhus infection.

5. Conflicts of interest

None.

6. Source of Funding

None.

7. Human Ethics

Written informed consent was obtained from the next of their kin for publication of case report.

8. Acknowledgements

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