

## Case Report

# A Rare Concurrent Infection with Scrub Typhus, Dengue, Malaria, and Typhoid in a Tertiary Care Hospital of Southern Rajasthan

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### ABSTRACT

Mixed infections are not uncommon in tropical areas, especially during the rainy and post-rainy season due to the predisposition of vector-borne diseases in endemic areas. Due to overlapping symptoms, it is difficult to come to a diagnosis and thus increasing the time taken to start the required empiric treatment.

**Keywords:** Concurrent infection, dengue, malaria, scrub typhus, typhoid.

### INTRODUCTION

Tropical infections like dengue, malaria, typhoid, and scrub typhus are very common in the South Asian region including the Indian subcontinent.<sup>1</sup> Malaria is a potentially life-threatening parasitic disease caused by infection with *Plasmodium* transmitted by an infective female *Anopheles* mosquito. Dengue is an arboviral illness in humans transmitted by mosquitoes of the genus *Aedes* and is a major concern in tropical and subtropical areas. Scrub typhus is an acute febrile illness caused by *Orientia tsutsugamushi*. Typhoid fever is a common disease in travellers returning from tropical destinations caused by *Salmonella enterica* serotypes and *paratyphi* A, B, and C. These infections being vector-borne diseases and caused by different vectors can be the reason for simultaneous infection in the same breeding period of the vectors in post-monsoon season or early winters, especially in areas with high endemicity.<sup>2</sup> Diagnosis of concurrent infections becomes difficult for a physician leading to delay in the institution of appropriate treatment.<sup>3</sup> We hereby report a rare case of a patient having mixed infection with dengue, malaria (*falciparum* and *vivax*), scrub typhus, and typhoid fever.

### CASE REPORT

A 46-year-old female farmer was referred to our outpatient department with complaints of fever with chills, myalgia, generalized weakness, loss of appetite, and nausea for five days. There was a significant decrease in platelet count (29,000/microL) and the patient was diagnosed outside with positive Dengue NS1 antigen and Widal test along with a positive Typhoid IgM test which was done by immunodastichromatographic card test. For managing these, she was given an injection of Ceftriaxone and fluid therapy<sup>4</sup> but, in view of prolonged fever with tertian spikes and mild splenomegaly clinically, MP QBC and Slide test was done which was positive for *Plasmodium vivax* as well as *Plasmodium falciparum*. On examination, the patient was febrile and had pallor and mild splenomegaly. She was drowsy tachypnoeic with a respiratory rate of 33 per minute and BP 84/56 mm of Hg. Her hemoglobin was 6.7 g/dl, total leukocyte count 2500/mm<sup>3</sup>, and total bilirubin was 1.35 mg/dL. Her electrolyte levels also revealed hyponatremia (Na<sup>+</sup> 124 mmol/L). She was started on injection Artesunate.<sup>5</sup> Even after Artesunate, the patient continued to have persistent fever and headache. She also gave a history of living with in-house animals including two buffaloes and two goats for which a test for scrub typhus was done and an immunodastichromatographic card test<sup>6</sup> was sent which also came to be positive. Lab investigations revealed a low platelet count for which RDP was transfused. X-ray chest showed blunting of bilateral costophrenic angles suggestive of mild pleural effusion. On ultrasonography, mild ascites with a spleen size of 15.5 cm was noted. The patient was given Doxycycline along with Azithromycin and Artesunate was continued.<sup>7</sup> Radical treatment with Primaquine was also given after ruling out G6PD deficiency. Supportive airway management, fluid therapy, blood transfusion, a high salt diet, and probiotics were given. After 4 days, the patient became afebrile and showed improvement. A diagnosis of concurrent infection

of dengue, malaria (*vivax* and *falciparum*), scrub typhus, enteric fever with multiorgan dysfunction and severe anemia was made.

## DISCUSSION

In endemic areas, dengue and malaria are often encountered by physicians in their day-to-day practice, especially during post-monsoons and early winters.<sup>7</sup> Though dengue is nowadays seen throughout the year unlike earlier when outbreaks were seen twice a year in developing countries.<sup>8</sup> The evolvability of this virus is constant as a result of mutations in its genetic material and environmental pressures. Malaria has been a deep-rooted concern for the endemic areas in developing countries. These infections are common in rural areas where hygiene and proper sanitation are yet to achieve the desired benchmark. Mixed infections, though are less commonly reported in the literature, but since they are caused by different vectors, therefore, can be present in an individual living in endemic areas with poor environmental conditions.<sup>9</sup> Our index patient did not respond well to antimalarial therapy and was later diagnosed with scrub typhus, also, abdominal discomfort and altered bowel habits raised suspicion of enteric fever which was found positive. Thrombocytopenia in mixed infections is observed to be more and the nadir presents early as compared to dengue alone. The mortality rate was higher as seen in various studies in patients with mixed infection compared to single infection.<sup>10</sup>

**Limitations:** No gold standard tests were performed. Card tests have been done for dengue and scrub typhus (with ELISA being the superlative tests) and no blood cultures were sent for typhoid.

## CONCLUSION

A patient with acute febrile illness not responding to appropriate therapy within 48 hours must be investigated for concurrent infection with other tropical infectious diseases, including scrub typhus. These infections have almost similar overlapping clinical manifestations and the same season of presentation. Co-infection with dengue and malaria has been reported in the literature, but four concurrent infections with scrub typhus, dengue, and

malaria (*falciparum* and *vivax*) in a patient is a very rare occurrence.

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