

Case Report

Dengue and Scrub Typhus Coinfection: Navigating Diagnostic and Therapeutic Challenges in a Child

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ABSTRACT

Coinfection with Dengue fever and Scrub Typhus presents significant diagnostic and therapeutic challenges, particularly in pediatric cases. We report a 6-year-old girl with fever, headache, maculopapular rash, and a vesicular lesion on the knee that progressed to a black eschar. She developed generalized edema, oral bleeding, decreased urine output, and renal dysfunction. Laboratory tests revealed anemia, leukocytosis, thrombocytopenia, elevated serum urea and creatinine, hypoalbuminemia, and hyponatremia. The Weil-Felix test was positive for OXK titer 1:320, and Dengue IgM antibodies were detected, complicating the diagnosis. Treatment with doxycycline, azithromycin, and local care for the eschar led to clinical improvement. This case highlights the importance of considering coinfection in febrile illnesses and emphasizes the need for accurate and timely diagnosis for effective management.

Keywords: Coinfection, Dengue, Fever, Rickettsial Infection, Scrub typhus, Thrombocytopenia, Weil-Felix test

INTRODUCTION

Coinfection with Dengue fever and Scrub Typhus presents a significant diagnostic and management challenge due to the overlap in clinical presentations and the complexity of symptoms. Dengue fever, caused by the Dengue virus transmitted by *Aedes* mosquitoes, is characterized by high fever, rash, and bleeding tendencies. Meanwhile, Scrub Typhus, a rickettsial infection caused by *Orientia tsutsugamushi* and transmitted by chigger mites, is increasingly recognized as a major cause of acute febrile illness, particularly in South and Southeast Asia. This infection is marked by fever, headache, myalgia, and a distinctive necrotic eschar at the site of the mite bite. Both diseases can lead to severe complications such as multi-organ dysfunction and renal impairment if not promptly diagnosed and treated.¹

This case report describes a 6-year-old girl who exhibited symptoms of both Dengue fever and Scrub Typhus, including a maculopapular rash, a progressively worsening eschar, and systemic signs such as edema and renal dysfunction. Diagnostic evaluation revealed a positive

Weil-Felix test for rickettsial disease and Dengue IgM antibodies, confirming the dual infection. The child received targeted antibiotics, supportive care, and surgical treatment for the eschar. This case underscores the critical need for early recognition and multidisciplinary management of concurrent rickettsial and viral infections in pediatric patients.

CASE HISTORY

A 6-year-old female child was admitted to the pediatric department with complaints of fever, headache, and rashes over the abdomen and lower limbs for five days. Additionally, the child developed a single vesicular lesion over the left knee joint ten days ago, which progressed to a black, dry eschar five days before. Over the past two days, she also experienced generalized edema, bleeding from the oral cavity, and decreased urine output.

On admission in general physical examination, the child appeared toxic with altered sensorium. Vital signs revealed a heart rate of 128 beats per minute, respiratory rate of 26 breaths per minute, temperature of 101°F, and blood

pressure of 110/78 mmHg (90-95th percentile systolic and 95th percentile diastolic). Physical examination showed pale conjunctiva, generalized edema, bleeding from the oral cavity, a maculopapular rash over the abdomen and limbs, and an eschar measuring 6 cm x 4 cm over the left knee. Hepatosplenomegaly was noted, with the liver palpable 4 cm and the spleen 6 cm below the costal margin in the midclavicular line. (Figures 1 and 2).



Figure-1: Sick look, edema & bleeding from oral cavity



Figure-2: 6 cm x 4 cm eschar over extensor aspect of left knee

Laboratory tests revealed hemoglobin at 9.3 g/dL indicating mild anemia, white blood cell count at 45,780/cumm suggestive of leukocytosis, and platelet count at 35,000/cumm consistent with thrombocytopenia. Serum urea and creatinine levels were elevated at 141 mg/dL and 2.1 mg/dL, respectively, indicating renal dysfunction. C-reactive protein was significantly raised at 390.2 µg/mL, while the erythrocyte sedimentation rate was 20 mm/hr.

Liver function tests showed SGPT at 45 U/L, SGOT at 38 U/L, serum alkaline phosphatase at 162 U/L, total serum bilirubin at 0.5 mg/dL, and serum albumin at 2.2 g/dL suggest hypoalbuminemia. Coagulation profile indicated a prothrombin time of 15.5 seconds, activated Partial Thromboplastin time (aPTT) of 30.9 seconds, and INR of 1.01. Electrolyte levels revealed serum sodium at 109 mEq/L (hyponatremia) and serum potassium at 3.2 mEq/L. Dengue IgM antibodies test was positive. The Weil-Felix test was also positive with an OXK titer of 1:320. Based on the clinical features and investigations, a diagnosis of dengue and scrub Typhus Coinfection was made. Intravenous fluids and antibiotics were started. Doxycycline (4.4 mg/kg/day BD for 10 days) and azithromycin (10 mg/kg/day for 5 days) were given. Hyponatremia was treated with 3% normal saline. Symptomatic treatment, including paracetamol, antiemetics, and supplements, was provided. Surgical consultation for the eschar recommended glycerin and magnesium sulfate dressings with limb elevation.

After 2 hours blood pressure was within normal range 94/62. On admission urine output was 0.6 ml/kg/hour. Patient was catheterized & on next day urine output was 2.8 ml/kg/hr. On second day investigations were repeated, hemoglobin was 7.6 gm/dl, white blood cells count 30770/cumm, platelet counts 52000/cumm, serum urea 93 mg/dl and serum creatinine 1.1 mg/dl levels, C-reactive protein was 152 µg/ml, serum sodium 131 mEq/liter. Serum potassium 3.6 mEq/liter. On the sixth day of admission, an ulcer developed at the site of the eschar, measuring 6 cm x 6 cm with well-defined irregular margins with sloping edges and necrotic slough on the floor (Figure-3). Debridement was performed to excised dead tissue (Figure-4). Regular dressings were done with Oxum spray (super-oxidized solution) and betadine ointment.

Repeat investigations on 6th day of admission showed improvement. Hemoglobin was 7.9 gm/dl, white blood cells count 22150/cumm, platelet counts 135000/cumm, serum urea 26 mg/dl and serum creatinine 0.8 mg/dl levels, C-reactive protein was 73 µg/ml, serum sodium 134 mEq/liter. Serum potassium 3.6 mEq/liter. The patient was discharged after 15 days, when she was stable, accepting oral feeds, and the ulcer showed signs of healing. At follow-up, complete healing of the ulcer was noted (Figure-5).

DISCUSSION

Rickettsial diseases, which are endemic in several regions worldwide, are often challenging to diagnose due to their nonspecific clinical presentations. This case highlights a complex clinical presentation of dengue and scrub typhus co-infection in a 6-year-old child. The overlapping symptoms and complications associated with these vector-borne diseases underscore the diagnostic and therapeutic challenges in such cases, particularly in endemic regions.



Figure-3: Ulcer on extensor aspect of knee



Figure-4: Debridement on extensor aspect of knee



Figure-5: Healed ulcer on extensor aspect of left knee

Rickettsial diseases, particularly scrub typhus and spotted fever group (SFG) rickettsioses, often present with fever, rash, and eschar, a feature characteristic of the disease in this patient. Eschars are necrotic lesions that arise at the site of tick bites and are an important clue in diagnosing rickettsial infections, although they may not be present in all cases.^{2,3} The presence of an eschar along with a positive OXK titer on the Weil-Felix test strongly indicated a rickettsial infection in this child. According to Kelly et al., eschar formation is a classic feature of scrub typhus serving as a significant diagnostic clue, especially when febrile children present with a rash. In contrast, dengue typically lacks this feature but is marked by a more prominent hemorrhagic tendency, which was observed in this patient with bleeding from the oral cavity.⁴

The Weil-Felix test, though limited in sensitivity and specificity, remains a commonly used diagnostic tool in resource-limited settings. In this case, the positive OXK titer was indicative of a rickettsial infection, guiding the clinical management.⁵

Hyponatremia, a common finding, is associated with the release of antidiuretic hormone triggered by the systemic inflammatory response.⁶ Pathak et al. reported that hyponatremia was observed in 48.7% of the cases.⁷ In this patient, hyponatremia was corrected with 3% saline, which helped improve the patient's condition. Thrombocytopenia and leukocytosis indicate the severity of the infection and reflects an intense inflammatory response.⁸ The marked elevation of C-reactive protein and other inflammatory markers (ESR and liver enzymes) further corroborated the severity of the infection.

The treatment regimen for rickettsial infections typically includes doxycycline, which is the drug of choice.⁹ In this case, doxycycline was administered along with azithromycin, covering both bacterial co-infections and rickettsial disease. The gradual improvement in laboratory parameters, including hemoglobin, white blood cell count, and renal function, reflects the effectiveness of the treatment.

The eschar in this patient evolved into an ulcer, which is not uncommon, especially if the lesion is large or if there is secondary infection. Timely surgical debridement followed by appropriate wound care was critical for managing this complication. The use of Oxum spray and betadine dressings promoted wound healing, leading to the successful recovery noted at discharge.¹⁰

Dengue co-infection was detected in this patient, a finding that raises the concern of overlapping symptoms, such as fever, thrombocytopenia, and rash, which can complicate the diagnosis. However, the presence of an eschar and positive Weil-Felix test remained key to diagnosing rickettsial disease. Such co-infections are increasingly

reported in endemic regions, emphasizing the need for careful clinical assessment in febrile patients presenting with atypical signs.^{11,12}

This case illustrates the importance of early recognition and treatment of rickettsial infections, which can be fatal if left untreated. The recovery of the patient, despite the presence of severe complications such as acute kidney injury and significant thrombocytopenia, highlights the efficacy of prompt antibiotic therapy combined with supportive care. However, the presence of an eschar and response to doxycycline provided clarity in this case.

CONCLUSIONS

This case highlights the critical importance of early recognition of rickettsial infections, especially in pediatric patients from endemic areas. The co-infection with dengue, characterized by overlapping symptoms such as fever, thrombocytopenia, and rash, can complicate the diagnostic process. However, prompt diagnosis and timely initiation of appropriate antibiotic therapy are essential to reducing morbidity and mortality. The development of severe complications, such as acute kidney injury and necrotic ulcers, in our case underscores the critical need for early intervention and comprehensive supportive care.

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