



# Dengue Shock Complicated with Scrub Typhus in a Child: A Case Report

Bipesh Kumar Shah<sup>1</sup>, Shova Shrestha<sup>2</sup>, Sumit Dhamala<sup>3</sup>

<sup>1</sup> Lecturer, Department of Paediatrics, B.P. Koirala Institute of Health Sciences, Dharan, Sunsari, Nepal.

<sup>2</sup> Lecturer, Department of Pediatrics, Patan Academy of Health Sciences, Lalitpur, Nepal.

<sup>3</sup> Medical Student, MBBS, B.P. Koirala Institute of Health Sciences, Dharan, Sunsari, Nepal.

## Article History

Received on - 2023 Nov 19

Accepted on - 2024 Jan 28

## Keywords:

Dengue; infection; scrub typhus

## Online Access



DOI: <https://doi.org/10.60086/jnps563>

## Abstract

Dengue and scrub typhus mixed infection is not commonly reported in the paediatric age group. Here, we report a case of a female child from the eastern part of Nepal who presented with abdominal pain, fever, respiratory distress and shock. The overlapping clinical features and laboratory findings complicate the diagnosis of polymicrobial infection, thus delaying treatment, and bringing up complications. Thus, our case emphasizes that a high index of clinical suspicion, vigilant physical examination, and appropriate laboratory tests should be employed for the early diagnosis and prompt treatment of coexisting infection, considering the local endemicity of both the diseases.

## Introduction

Dengue is a viral infection (Flaviviridae family) transmitted by the vector mosquitoes *Aedes aegypti* and *Aedes albopictus*. This is characterized by an initial febrile phase from two to seven days, critical phase for 24 - 48 hours characterized by plasma leakage and recovery phase of 48 - 72 hours.<sup>1</sup> Scrub typhus is a rickettsial infection caused by the obligate intracellular gram-negative coccobacillus *Orientia tsutsugamushi*. It is transmitted to humans through the bite of the larval stage (chigger) of trombiculid mite. Scrub typhus is characterized by an eschar at the site of mite feeding and regional lymphadenopathy, followed by pyrexia, myalgia, headache and gastrointestinal symptoms.<sup>2</sup> The immunopathological mechanisms target the endothelium in both diseases, resulting in a spectrum of manifestations because of vasculitis (third spacing) and increased capillary permeability.<sup>3</sup> Both illnesses show similar clinical and laboratory pictures.<sup>4</sup> However, concomitant illnesses are not commonplace, because of their spread by separate vectors with their differing behaviors. We are reporting a case of scrub typhus and concomitant dengue fever in the same child at the same time.

## Case Report

A five-year-old female presented to the emergency department with a fever for nine days which was continuous, measuring up to 102°F without chills, and rigor. It was associated with sudden-onset, colicky, non-radiating abdominal pain which she developed three days before the onset of the fever. There were no other localizing signs and no recent travel or pet exposure history.

On examination, the patient was febrile with pulse rate of 130 beats per minute, regular but feeble, a respiratory rate of 50 breaths per minute, blood pressure < 5<sup>th</sup> centile, and bilateral pitting pedal edema. A black necrotic eschar was present on her right buttock. The liver was palpable four cm below the right costal margin with no neurological signs or coagulopathy.

## Correspondence

Bipesh Kumar Shah,  
Lecturer,  
Department of Paediatrics,  
B.P. Koirala Institute of Health Sciences,  
Dharan,  
Sunsari, Nepal.  
Email: shahbipeshkumar@gmail.com



In view of shock, norepinephrine infusion was started at 0.1 mcg / kg / min, which was gradually tapered over 24 hours. Blood and urine samples sent for culture were sterile; supplemental oxygen was administered via a face mask; and she was admitted to PICU (Paediatric Intensive Care Unit).

Laboratory parameters revealed anaemia (Hemoglobin 8.6 g/dl, hematocrit 25.7%), total leukocyte count 16,720 cells / mm<sup>3</sup>, normal platelet count (1.85 lacs / mm<sup>3</sup>), hypoalbuminemia (2.7 g / dl), mild transaminitis (Alanine transaminase 63 U / L, aspartate transaminase 95 U / L, and alkaline phosphatase 154 U / L). The metabolic parameters (Serum Na 135.7 mEq / L, K 4.7 mEq / L, urea nitrogen 24 mg / dl, creatinine 0.42 mg / dl) were unremarkable. Chest x-ray showed no infiltrates or opacity and no collection was noted on ultrasonography of the abdomen. Dengue IgM was positive while NS1 (Nonstructural protein1) antigen and IgG were both negative. Similarly, scrub typhus IgM and IgG were positive. Peripheral smear and rapid antigen test for malarial parasites were negative. The patient was managed with seven days of intravenous doxycycline 4.4 mg / kg / day and judicious fluid support. The patient was afebrile after 72 hours of admission, hemodynamic support was tapered after 24 hours, and oral feeds were tolerated thereafter. The intravenous fluids were stopped after the fourth day and the patient was discharged a week after hospitalization with normalization of vital parameters. The child is under regular follow up and doing fine so far.

## Discussion

This case depicts the coinfection of dengue and scrub typhus in a child with prolonged fever, shock, transaminitis, hypoalbuminemia and normal platelet count which was managed with intravenous fluids, doxycycline and inotrope. Acute undifferentiated febrile illness (AUFI) is defined as a fever of < 2 weeks with no localizing symptoms and signs of dengue fever and scrub typhus are common etiological agents in tropical regions.<sup>5</sup> The index case illustrates the importance of early recognition of co-infection in unremitting fever and those with features of shock to prevent complications and mortality. There was difficulty in commenting on which infection occurred earlier in our case.

Nepal reports several outbreaks of both dengue and scrub typhus from time to time. We reported this case in the monsoon season of Nepal, which is the favorable season for vector growth in both diseases. Thus, the concurrence of both diseases is not as rare pertaining to their local endemicity in Nepal. Subedi et al<sup>6</sup> and Sapkota et al<sup>7</sup> reported similar mixed infections in adults from different parts of Nepal. However, a paediatric case report of dengue-scrub typhus dual infection has not been reported from Nepal to the best of our knowledge. In contrast to an observational study by Ahmad et al, where clinical presentation was milder and the requirement

of ventilation, and dialysis were lesser in co-infection group compared to the mono-infection, our case had a stormy course requiring hemodynamic support.<sup>8</sup>

Jose et al described the chances of scrub typhus in a dengue serology-positive child as significant when the symptoms are atypical or protracted.<sup>4</sup> The index case had findings similar to study by Basheer et al, in which patients suffering from both dengue and scrub typhus have tachycardia, hypotension, elevated liver enzymes, hypoalbuminemia, and ultimately have prolonged hospitalization as compared to isolated infections.<sup>9</sup> Venkatesh et al reported all patients required mechanical ventilation and renal replacement in the case series of dengue-scrub typhus coinfection.<sup>10</sup> The overlapping clinical and laboratory features necessitate workup for all the differential diagnoses of tropical infection.

## Conclusion

This severity of clinical presentation should alert the paediatrician to work up for other causative agents with similar pathophysiology if therapeutic response is not obtained as desired. Thus, it is important to look for features suggesting polymicrobial infection and place low thresholds for serological tests, taking local endemicity into account if tropical fever is unremitting or if there are features of severe dengue.

## References

1. Simmons CP, Farrar JJ, van Vinh Chau N, Wills B. Dengue. *N Engl J Med*. 2012 Apr 12;366(15):1423-32. DOI: [10.1056/NEJMra1110265](https://doi.org/10.1056/NEJMra1110265) PMID: 22494122
2. Walker DH. Scrub Typhus - Scientific Neglect, Ever-Widening Impact. *N Engl J Med*. 2016 Sep 8;375(10):913-5. DOI: [10.1056/NEJMp1608499](https://doi.org/10.1056/NEJMp1608499) PMID: 27602663
3. Gulati S, Maheshwari A. Atypical manifestations of dengue. *Trop Med Int Health*. 2007 Sep;12(9):1087-95. DOI: [10.1111/j.1365-3156.2007.01891.x](https://doi.org/10.1111/j.1365-3156.2007.01891.x) PMID: 17875019
4. Jose P, Rajan N, Kommu PK, Krishnan L. Dengue and scrub typhus co-infection in children: Experience of a teaching hospital in an endemic area. *Indian J Public Health*. 2022;66(3):292. DOI: [10.4103/ijph.ijph\\_2052\\_21](https://doi.org/10.4103/ijph.ijph_2052_21) PMID: 36149107

5. Subramanyam V, Kaeley N, Kumar M, Pandey S, Bhardwaj B, Reddy K. Acute undifferentiated febrile illness: Protocol in the emergency department. *J Fam Med Prim Care*. 2020;9(5):2232.  
DOI: [10.4103/jfmpc.jfmpc\\_214\\_19](https://doi.org/10.4103/jfmpc.jfmpc_214_19)  
PMID: 32754479 PMCID: PMC7380766
6. Subedi P, Ghimire M, Shrestha K, Ghimire K, Adhikari S, Tiwari B. Dengue and scrub typhus co-infection causing septic shock. *Oxf Med Case Rep*. 2021 Nov 1;2021(11-12):omab115.  
DOI: [10.1093/omcr/omab115](https://doi.org/10.1093/omcr/omab115)  
PMID: 34909204 PMCID: PMC8665681
7. Sapkota S, Bhandari S, Sapkota S, Hamal R. Dengue and Scrub Typhus Coinfection in a Patient Presenting with Febrile Illness. *Case Rep Infect Dis*. 2017;2017:1-3.  
DOI: [10.1155/2017/6214083](https://doi.org/10.1155/2017/6214083)  
PMID: 28386493 PMCID: PMC5366795
8. Ahmad S, Dhar M, Mittal G, Bhat NK, Shirazi N, Kalra V, et al. A comparative hospital-based observational study of mono- and co-infections of malaria, dengue virus and scrub typhus causing acute undifferentiated fever. *Eur J Clin Microbiol Infect Dis*. 2016 Apr;35(4):705-11.  
DOI: [10.1007/s10096-016-2590-3](https://doi.org/10.1007/s10096-016-2590-3)  
PMID: 26851948
9. Basheer A, Iqbal N, Mookkappan S, Anitha P, Nair S, Kanungo R, et al. Clinical and laboratory characteristics of dengue-orienti tsutsugamushi co-infection from a tertiary care center in south India. *Mediterr J Hematol Infect Dis*. 2016 Jun 16;8:2016028.  
DOI: [10.4084/mjhid.2016.028](https://doi.org/10.4084/mjhid.2016.028)  
PMID: 27413521 PMCID: PMC4928539
10. Venkatesgowda P, Prakash Y, Rao S, Harde Y. Scrub typhus in false-positive dengue patients. *Ann Trop Med Public Health*. 2015;8(2):34.  
DOI: [10.4103/1755-6783.157279](https://doi.org/10.4103/1755-6783.157279)