Annals of Clinical Case Reports

Case Report
Published: 13 May, 2024

Dengue and Scrub Typhus Co-Infection: Delayed Detection of Scrub Typhus: A Case Report

Abhinav JC, Raju A, Neha S, Monika C, Jenith C and Sagar Bahadur CK*

NAIHS, Kathmandu, Nepal

Abstract

Infections caused by Dengue and Scrub typhus have been a serious public concern in South Asia. Since the clinical features of dengue and scrub typhus are similar, persistent symptoms may occur despite proper management of dengue, as scrub typhus may go undetected. During the seasonal increase in dengue cases, concurrent infections are also reported, although they are not very common. The delay in diagnosis of concurrent scrub typhus infection leads to delay in the institution of appropriate treatment.

Keywords: Dengue; Scrub typhus; Co-infection

Introduction

In tropical and subtropical regions, such as the Indian Subcontinent and Nepal, scrub typhus and dengue are common infectious diseases. Both share similar clinical, epidemiological, and laboratory features, including high fever, rashes, thrombocytopenia, and most probably hepatic dysfunction [1,2]. Nepal is located in the endemic region known as the Tsutsugamushi triangle, where scrub typhus, caused by the bacterium Orientia tsutsugamushi, is prevalent [1]. In Nepal, there is a significant seroprevalence of 19.31% among Acute Undifferentiated Febrile Illness (AUFI) cases, with a notable incidence of multiple organ dysfunction and a case fatality rate of 2.56% [1].

Dengue, a mosquito-borne viral disease transmitted by Aedes mosquitoes, was reported for the first time in Nepal in 2004, following the return of a traveler from India. Subsequently, isolated cases have been reported annually, with notable outbreaks in the years 2010, 2013, 2016, 2018, 2019, and 2022 [2,3]. Following the destructive earthquake in 2015, dengue has become one of the country's fastest-growing public health concerns [2]. While initially confined to the southern plains of Nepal, it has recently extended its reach to encompass temperate and subtropical climatic zones in hilly regions [4]. Uncontrolled population growth, global warming, ineffective vector control, and increased undiagnosed cases due to insufficient public health infrastructures are promoting the surge of Dengue [2].

Although the co-infection of Dengue and Scrub typhus is a rare condition due to the necessity of different vectors for disease transmission, the spike in dengue cases in the monsoon and post-monsoon seasons with the coexistence of endemic scrub typhus infection creates a potential diagnostic dilemma and affects effective management [4,5]. Here, we present a case of a 13-year-old female from Gorkha district of Nepal who presented with an acute febrile illness and was later diagnosed with the co-infection of Dengue and Scrub typhus.

Case Presentation

A 12-year-old girl from Gorkha complained of a 10-day fever that was high-grade, gradually increasing, up to 104°F, continuous, without diurnal variation, and accompanied by chills, generalized myalgia, headache, and sweating, but not rigor or aggravating or relieving factors. Additionally, she reported experiencing acute vomiting for five days, with three-four episodes each day. The episodes typically started after intake of food, approximately 30 ml in each episode, containing ingested food particles, non-bilious, non-blood stained, non-projectile and usually followed by pain in the abdomen. For the above complaints, she was taken to the clinic where a series of investigations were performed. The IgM antibody for the dengue virus tested positive and her hemoglobin was 11.4 gm/dl. She was referred to Gorkha Hospital where investigations were repeated which revealed anemia (Hb=8.3 gm/dl) with low platelet count and her Scrub typhus serology tested negative. She was treated with tablet cefixime, tablet hyoscine, and tablet pantoprazole. However, her symptoms did not subside for which she visited Shree Birendra Hospital.

OPEN ACCESS

Correspondence:
Neha Shah, NAIHS, Sanobharyang, Kathmandu, Nepal, Tel: 9863899751;

Received Date: *18 Apr 2024*
Accepted Date: *07 May 2024*
Published Date: *13 May 2024*

Citation:
Abhinav JC, Raju A, Neha S, Monika C, Jenith C, Sagar Bahadur CK. Dengue and Scrub Typhus Co-Infection: Delayed Detection of Scrub Typhus: A Case Report. Ann Clin Case Rep. 2024; 9: 2622.

ISSN: 2474-1655.

At the time of presentation, she was ill-looking, but oriented to time, place, and person. Her BP was 90/60 mmHg, pulse was 90 beats per minutes, Spo_2 was 99% on room air and temperature was 100.9°F. On general physical examination she was pale. Other systemic examinations revealed no abnormalities. Series of laboratory investigations were done which revealed persistent anemia. Her tropical panels were sent to the National Public Health Laboratory, Teku. IgM/IgG antibody for dengue was positive. Her LFTs and RFTs were on normal ranges. Her optimal malaria test was negative. Serology was non-reactive for HIV, HBsAg and HCV. Her Widal agglutination test for salmonella typhi and para typhi were negative.

Ultrasonography of the abdomen and pelvis showed minimal free fluid in the pelvis. With these findings, the patient was admitted and treated with Injection paracetamol, Injection pantoprazole, Injection ondansetron, tablet albendazole stat along with IV fluids and electrolyte supplements. Her scrub typhus test was obtained on the 2nd day of admission from the national public health laboratory, Teku which was positive. Subsequent reports revealed negative results for the Leptospira IgM/IgG antibody test, the Brucella antibody test, and the Kala Azar antibody test (k39). Then she was treated with injection ceftriaxone and tablet azithromycin. On the 3rd day of admission, she became afebrile and her hematological parameters were also improved. Her medication continued. With her symptoms improving she was discharged on the 8th day of admission.

Discussion

Acute Undifferentiated Febrile Illness (AUFI) is often seen in tropical countries, especially during the monsoon and post-monsoon seasons. Common causes of AUFI in the South Asian region comprise malaria, enteric fever, dengue fever, leptospirosis, Hantavirus and Japanese encephalitis [6]. In a resource-poor country like Nepal, timely diagnosis and effective management of such cases is a challenge, which leads to significant morbidity and mortality. As a healthcare worker in the area with limited access to laboratory diagnosis, utilizing local epidemiological data of AUFI can offer valuable insights for making preliminary diagnoses and implementing suitable therapeutic interventions [6].

The incubation period of Dengue is 3 to 10 days, whereas the incubation period of scrub typhus ranges from 6 to 21 days [7]. Dengue is a viral illness transmitted by the bite of female Aedes mosquitoes, while Scrub typhus is a rickettsial disease spread by the bite of an infected larva of a *Leptotrombidium* mite, commonly known as a chigger [1,2]. Due to the overlapping clinical signs and symptoms and laboratory parameters, the mixed infection, commonly the scrub typhus infection goes undiagnosed. Diagnosing and effectively managing Scrub typhus infection is crucial due to its association with various complications, including multiorgan dysfunction (with 24%) followed by central nervous involvement (with 14%) [8]. The main techniques for detecting Scrub typhus include Polymerase Chain Reaction (PCR) and serological tests such as Enzyme-Linked Immunosorbent Assay (ELISA) with a high degree of accuracy. However, these methods can be costly, demand specialized skills, and rely on advanced laboratory facilities [8]. Due to their widespread availability, affordability, and ease of use, the NS1 antigen or combined NS1/IgM rapid diagnostic tests are highly suitable for early dengue diagnosis in resource-constrained countries [5,8].

The unique clinical presentation of the Scrub typhus infection is the formation of an eschar, which is seen in 80% of cases and has high diagnostic value [9]. However, in our case, an eschar did not form, making the suspicion of Scrub typhus less likely. Although the dengue test was positive and the patient was under management, her condition worsened over the following days. Therefore, considering the probability of a co-infection, we sent her tropical panels to the National Public Health Laboratory, which confirmed the presence of Scrub typhus and dengue co-infection. In the literature, several cases of coinfection are shown to be associated with complications but our case was managed on an ambulatory basis and was recovered uneventfully.

References

1. Lamichhane P, Pokhrel KM, Alghalyini B, Zaidi ARZ, Alshehery MZ, Khanal K, et al. Epidemiology, clinical characteristics, diagnosis, and complications of scrub typhus infection in Nepal: A systematic review. Ann Med Surg (Lond). 2023;85(10):5022-30.
2. Gupta BP, Lamsal M, Chaulagain S, Rauniyar R, Malla R, Shrestha S, et al. Emergence of dengue in Nepal. Virusdisease. 2018;29(2):129-33.
3. Pandey BD, Pandey K, Dumre SP, Morita K, Costello A. Struggling with a new dengue epidemic in Nepal. Lancet Infect Dis. 2023;23(1):16-17.
4. Subedi P, Ghimire M, Shrestha K, Ghimire K, Adhikari S, Tiwari B. Dengue and scrub typhus co-infection causing septic shock. Oxf Med Case Reports. 2021;2021(11):omab115.
5. Chandra A, Hati A, Ray AK, Chakraborty U, Karmakar PS, Dasgupta S. Dengue and scrub typhus coinfection: A diagnostic dilemma. Oman Med J. 2023 ;38(3):e513.
6. Wangdi K, Kasturiaratchi K, Nery SV, Lau CL, Gray DJ, Clements ACA. Diversity of infectious aetiologies of acute undifferentiated febrile illnesses in South and Southeast Asia: A systematic review. BMC Infect Dis. 2019;19(1):577.
7. Rajapakse S, Rodrigo C, Fernando D. Scrub typhus: Pathophysiology, clinical manifestations and prognosis. Asian Pac J Trop Med. 2012;5(4):261-4.
8. Tran HTD, Schindler C, Pham TTT, Vien MQ, Do HM, Ngo QT, et al. Simple clinical and laboratory predictors to improve empirical treatment strategies in areas of high scrub typhus and dengue endemicity, central Vietnam. PLoS Negl Trop Dis. 2022;16(5):e0010281.
9. Akaike T, Ishizuka K, Tominaga N, Motohashi I. Scrub typhus: the clinical significance of the eschar. BMJ Case Rep. 2023;16(5):e255404.