

## CONTEMPORANEOUS INFECTION OF DENGUE AND TYPHOID IN CRITICAL CLINICAL CONDITIONS: A PEDIATRIC CASE REPORT

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### ABSTRACT

In south-east Asian countries, infectious diseases are major threat and cause of morbidity and mortality. Concurrent infection with more than one infectious agents make patient's life more critical and challenging task for physician for diagnosis and therapeutic issues. In this case report, we present a case of dual infection of typhoid and dengue fever in fourteen year old child and explain the critical issue observed during treatment.

**Keywords:** Dengue fever, typhoid, NS1 antigen, Widal test and concurrent infection.

### INTRODUCTION

Among south-east Asian countries, India is a one of the country which is most sensitive for the various viral diseases. In 2010, it has been estimated 96 million apparent dengue infections worldwide and interestingly, 33 million dengue positive cases reported from India alone<sup>1</sup>. As per reference to World Health Organization fact sheet published in 2017, Dengue is a one of the most prevalence in the center of India, which have more impact on human health and a major cause for the mortality. In 2015, it has been observed that more than 15,000 dengue cases were reported from the India<sup>2</sup>.

Dengue virus is a causative agent of dengue hemorrhagic fever which is transmitted within humans through female *Aedes* mosquitoes<sup>3</sup>. Inappropriate treatment or misdiagnosis of dengue could be fatal for patient. However, concurrent infection with other pathogenic agents could be more critical to diagnose and make physician in dilemma to treatment process when symptoms are overlapping with other diseases. In this article, we have highlighted the

concurrent infection of *Salmonella typhi* in dengue patient.

### Case Report

A fourteen-year-old male child presented to the pediatric emergency with complaints of high grade fever for four days, associated with headache, nausea, abdominal pain, and two to three episode of vomiting. Three days prior to admission in hospital, the child was noticed to have swelling his face and abdominal part of the body. However, child did not observe any rashes on the body or internal bleeding. During the examination, the patient's body temperature was 104<sup>0</sup>F and not associated with chills, rigors, and sweating. The child heart beat and blood pressure were normal.

On the basis of typical presentation of fever with clinical parameters of capillary leak and petechial spot on the body of patient. It was recommended for a diagnosis of dengue fever as well as for complete blood cell count. Pathological diagnostic report suggest patient was NS1 antigen positive and blood cells counts

were abnormal compared to standard pathological parameters (standard range (SR) values for unisex gender and for all age groups). Pathological output revealed that total leukocyte count (TLC), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and platelet count was 2800 cells/cu.mm (SR values; 4,000-11,000 cells/cu.mm), 42.4% (SR values; 36-42%), 82.2 (SR values 80-96 fL/red cell), 28.1 (SR values; 27-33pgm/cell) and  $1.59 \times 10^5$ /cu.mm (SR values  $1.50 - 4.00 \times 10^5$ /cu.mm), respectively. Based on initial observation and confirmation of dengue fever, patient was started on an intravenous infusion of ringer lactate at 5ml/kg per hour. Regular observation revealed that after supply of intravenous fluid, reduced trend of hematocrit level and normal urine output were observed. The intravenous infusion rate was gradually decreased and finally stopped by the third day of hospital admission. Interestingly, after the infusion based therapy improved the patient platelet count. However, patient was still suffering with fever. Patient with persisting fever indicated parallel infection of other pathogen. In view of co-infection, child's blood sample was sent for serology considering the possibility of scrub typhus (Rickettsial illness) and typhoid fever. Weil Felix and Widal test were performed for Rickettsial and *Salmonella typhi* infection, respectively. Serological observation suggest that blood sample of patient was Weil Felix test negative and Widal test positive. After confirmation of Widal test positive, patient was immediately started on ceftriaxone intravenous therapy, and it has been observed reduced body temperature with passing time. After all treatment, patient was discharged from hospital and recommended to use ceftriaxone for seven days more.

## DISCUSSION

Typhoid fever is endemic in India, mainly predominant in urban areas. Most prevalence of typhoid fever were observed in the age group from 5 to 15 years and incidence of typhoid fever approximate 220 per 100,000 every year<sup>4</sup>. Indian subcontinent weather is diverse and provide suitable environment for various infectious and vector borne disease. In vector borne disease, dengue is a one of the reputed viral disease which causes epidemic and sporadic cases year-round. However, highest frequency is observed in post-monsoon (humid) season, mainly August to November<sup>5</sup>. Dual pathogenic infection can be prove to be a diagnostic challenge to the physician, especially during dengue outbreaks.

Incidence of co-infections of malaria, chikungunya and other disease with dengue have been observed from tropical countries. Nevertheless, co-infections of dengue and typhoid have been reported in few adult patients<sup>6</sup>, but very few reports in pediatric patients to date. In this report patient was primarily observed by the physician and recommended for NS1 antigen and also for IgM antibody for dengue to verify the dengue infection. Initial presentation of high grade fever with clinical and radiological evidence and a fall in hematocrit of with intravenous fluids, was compatible with the diagnosis of dengue. After initial confirmation with dengue positive and treatment strategies performed by physician, patients improve the platelet count, but still persisted the fever. It provoked physician to evaluate the patient for other co-infections. So, patient recommended for the Widal and other pathological test. Observation suggest that patient was also positive for Widal test.

Dual pathogenic infection are more critical for the health of young patient, and risk factor of two independent pathogen (Typhoid and Dengue) have not been well characterized in Pediatrics patient. As per our knowledge, the confection of bacterial and viral pathogens are not fully elaborated and required more attention of researchers, both medical and non-medical. With increasing concurrent infection in patient with dengue, it would be worthy to understand the physiological and pathological impact of co-infection with dengue.

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## Conflicts of Interest Statement

The authors declare no conflict of interests.

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