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Case Report

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A Case of Enterococcus Faecalis Infective Endocarditis Following Dengue Haemorrhagic Fever

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ABSTRACT

Dengue fever is a leading health problem in Vietnam. Clinical presentation can vary from a simple flu like illness to hemorrhagic fever with shock. Most people who develop dengue fever recover completely within 1 weeks. Apart from the complications such as haemorrhage and dengue shock syndrome, concurrent bacteraemia inpatients with dengue fever is a very rare complication. We report a patient initially diagnosed with dengue haemorrhagic fever, who subsequently developed Enterococcus faecalis infective endocarditis.

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Introduction

Dengue represents the commonest arboviral disease transmitted globally, transmitted to humans by an arthropod vector (Aedes aegypti). Dengue virus, an RNA + sense virus, member of the flavivirus group in the family Flaviviridae, presents four antigenically distinct virus serotypes, DEN-1, DEN-2, DEN-3, and DEN–4 [1]. The clinical manifestations of dengue range from a mild flu-like syndrome to a serious hemorrhagic fever usually associated with shock. The spread of dengue fever disease worldwide allowed the observation of a correspondingly higher number of patients with atypical clinical presentations [1]. According to some authors, many of these unusual presentations of dengue might be linked to concurrent infections, caused by fungi, protozoa,or bacteria [2-4]. Enterococcus faecalis is a gram-positive, gamma-hemolytic streptococcus that grows in chains. Clinical presentations of E. faecalis infection include urinary tract infection, bacteremia, meningitis, and endocarditis [5]. Enterococcus faecalis is the third leading cause of infective endocarditis, accounting for 5% to 15% of all cases [6]. The genitourinary (GU) tract is the traditional source of infection in patients with infective endocarditis caused by E. faecalis, occurring mainly in men of advanced age [6]. However, E. faecalis is also part of the natural gut flora and has the potential, albeit rare, to translocate from the gastrointestinal (GI) tract to the heart and cause infective endocarditis. Numerous patients with enterococcal bacteremia have concurrent infective endocarditis; population-based studies have shown that up to 25% of patients with community-acquired E. faecalis bacteremia have infective endocarditis [7]. Furthermore, because infective endocarditis has a high mortality rate, it is imperative to perform a bedside screening test with close to 100% sensitivity to rule out infective endocarditis. We report herein the case of a patient initially diagnosed with classical dengue fever, who subsequently developed infective endocarditis caused by Enterococcus faecalis.

Case Report

A 20-year-old female, a healthy student, presented on October 26, 2022 with acute fever, headache, myalgia, arthralgia, prostration, and maculopapular rash. She had a presumptive diagnosis of classic dengue fever, and recovered completely in a few days with antipyretics and analgesics. Three weeks later (November 21), the patient presented a new episode of mild grade fever (38°C), accompanied by dry cough, exercice intolerance, orthodyspnea, paroxysmal nocturnal dyspnea which became worse on the following day. The patient was admitted to the hospital (December 13). On examination she was alert, a little tired and mild febrile. Her pulse rate was 120/minute and regular. Blood pressure was 130/70 mmHg. Examination of cardiovascular system there were a loud pansystolic murmur at apical radiating to left armpit and the ECG with sinus tachycardia. Respiratory system and abdomen were normal. Her chest ragiograph showed increase pulmonary circulation. Laboratory exams were obtained, the results of which were as follows: Red blood cell 3.58M/µL, hematocrit 32.3%, leukocyte count 7.700/mm3 and platelets 289.000 mm3; C-reactive protein 2.75 mmol/L; aspartate aminotransferase (AST) 23 U/L, alanine aminotransferase (ALT) 22 U/L, and creatinine 57.8 µmol/L; Sodium 138 mmol/L, Potasium 4.07 mmol/L; NT-proBNP 1089.2 pg/ml. Blood culture showed a growth of Enterococcus faecalis. A 2D Echocardiogram revealed severe mitral valve regurgitation (VC=7mm, ERO=0.57cm2) and 8x5 mm vegetation attached to the anterior mitral valve leaftlet (Figure 1) severe tricuspid valve reguritation, pulmonary hypertension PAPs 60mmHg, LVEF 69%. Treatment for infective endocarditis was started according to the antibiotic sensitivity with intravenous Ampicillin 12 g four times a day for 42 days and intravenous gentamycin 120mg a day for a period of 14 days. Progress was monitored with ESR and CRP levels periodically. After 3 weeks of antibiotic treatment, the patient was surgery to remove vegetation and mitral valve, tricuspid valve repair (January 6,

2023). Subsequently the patient was discharged on January 27, 2023 and without events.

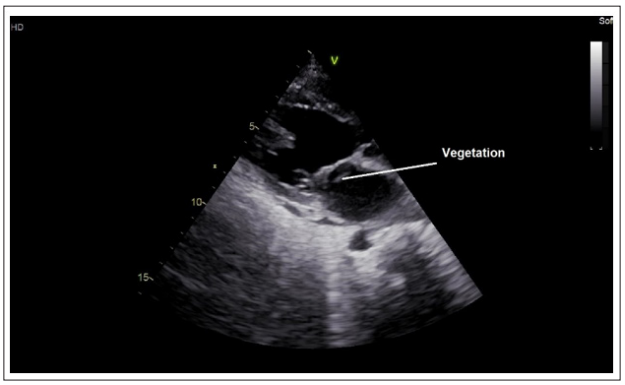

Figure 1: Vegetation on Anterior Mitral Valve Leaflet

Discussion

Some micro-organisms have been identified as occurring simultaneously with dengue virus infection. Among them, one can mention Escherichia coli, Salmonella sp., Streptococcus pneumoniae, Mycobacterium tuberculosis, Mycoplasma pneumoniae, Shigella sonnei, Klebsiella pneumonia, Klebisella ozaenae, Enterococcus faecalis, Moraxella lacunata, Staphylococcus aureus, Rosemonas sp., Haemophilus influenza, Candida tropicalis, and herpes viruses [2]. One of the mechanisms proposed to explain these co-infections would involve lesion of the digestive epithelial barrier, possibly through endothelial damage or intestinal hemorrhage, rendering it possible for pathogens found there to enter the circulation. Actually, there seems to be a predominance of intestinal flora micro-organisms in such cases [8]. Additionally, physiopathological changes of the vascular and hemostatic system observed in some organs or systems may predispose to complicating infections. Finally, the occurrence of bacterial infection superimposed on the dengue virus infection might occur as a mere temporal coincidence or, more likely, have the ways paved by a supposed immunosuppression caused by the virus [9].

This patient with dengue haemorrhagic fever was subsequently complicated by Enterococcus faecalis infection with endocarditis. Several cases of Enterococcus faecalis infection has been reported following dengue fever, however this is the first case of this rare complication of dengue haemorrhagic fever to be reported in Vietnam. Several mechanisms have been proposed regarding increased susceptibility to secondary infections following dengue fever. Antibodies directed against dengue virus cross reacting with endothelial cells in association with nitric oxide causes endothelial cell apoptosis and disruption of the endothelial barrier [10]. When this type of damage occurs in the endocardium, bacteraemia that could lodge in these damaged endocardium and cause endocarditis [11]. In our patient increased susceptibility to endocarditis may also be due to the previous rheumatic heart valve disease but the patient did not know. Apoptosis of polymorphonuclear leukocytes and their subsequent removal from circulation is probably responsible for neutropenia [12]. Decreased in vitro proliferative response of peripheral blood mononuclear cells (PBMC) to mitogens and to several antigens during acute dengue infection has been well documented [12]. Further it is also known that plasma levels of IL-10 which is a known immunosuppressant are increased in patients with Dengue fever [12].

Conclusion

This case illustrates the need to be aware of the possibility of secondary bacterial infection as a cause for recurrence of fever following initial dengue haemorrhagic fever. Clinicians should be very vigilant to unusual manifestations of dengue fever, which may signalize a concomitant infection by other microorganisms, mainly bacteria.

Conflict of Interest

None

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