

Case Report

Dengue Fever induced Myocarditis

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Abstract

Dengue is an arthropod-borne viral illness, mostly asymptomatic, but may present with a wide variety of clinical manifestations, from mild febrile illness to severe and fatal disease. Cardiac involvement is a significant yet under-reported one because of lack of awareness. We report a case of myocarditis in Dengue Fever with an intention to create awareness among the physicians.

Key Words : Dengue fever, atypical manifestations of dengue, acute myocarditis in dengue.

Introduction:

Dengue fever is caused by a *Flavivirus* with four distinct serotypes that is transmitted by *Aedes* mosquito.¹ A wide spectrum of presentations are observed in dengue fever ranging from uncomplicated, self-limiting febrile illness to a more severe disease associated with plasma leakage, thrombocytopenia, hemorrhage and/or shock.² Although most symptomatic dengue infections follow an uncomplicated course, complications and unusual manifestations are increasingly being reported due to rising disease burden. Unusual manifestations of dengue infection affect various organ systems including gastrointestinal, hepatic, neurological, pulmonary, renal and cardiovascular systems.

Case presentation:

A 58-year-old, diabetic and hypertensive woman got admitted in the intensive care unit (ICU) after being transferred from a local hospital with the complaints of respiratory distress and compressive central chest pain for six hours. She had a history of fever with acute watery diarrhea and multiple episodes of vomiting for last five days. Her highest recorded temperature was 102°F, and it was associated with severe headache and generalized bodyache. The patient initially presented as a case of Dengue Hemorrhagic Fever with acute gastroenteritis in a local hospital and treated accordingly. But after few hours of admission (on day six of fever) she developed chest pain

which was central, severe and compressive in nature, along with respiratory distress. So she was transferred to our hospital on emergency basis and was admitted in the ICU.

On admission, the patient was severely dyspnoeic with tachycardia. An electrocardiogram (ECG) showed sinus tachycardia with T wave inversion in V1 through V6. Chest X-ray revealed an enlarged cardiac silhouette and pulmonary oedema (Fig.1). FBC suggested thrombocytopenia. Dengue virus-specific immunoglobulin M (IgM) and immunoglobulin G (IgG) antibodies were both positive. Serotyping was not possible as the facility is not available in Bangladesh. The initial Cardiac enzymes were within normal limits. Liver function study showed ALT 108 U/L and AST 216 U/L.

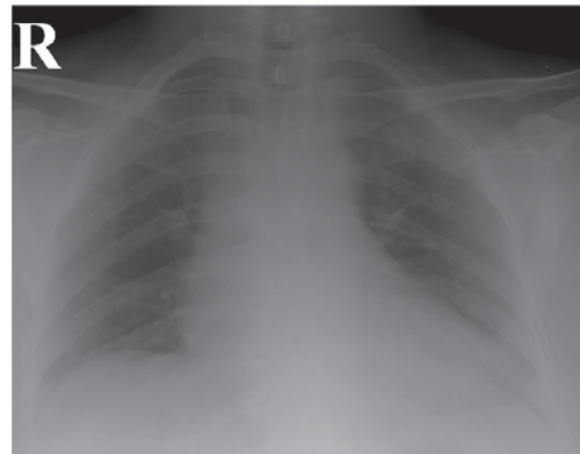


Fig.1: Chest X-ray revealed an enlarged cardiac silhouette and pulmonary oedema

Six hours later an ECG change was observed with ST elevation in II, III, aVL and V1 to V6 suggesting antero-lateral myocardial infarction (Fig-2). A repeat sample for cardiac biomarkers showed raised Creatine kinase-MB fraction (CK-MB) (33 U/L) and Troponin-I (7.45 ng/ml). Echocardiography showed akinetic mid anteroseptum, apex and mid anterior wall; moderate LV systolic dysfunction (ejection fraction 35-40 %); Trace MR, Trace TR and Normal PASP; Diastolic relaxation abnormality stage I; no pericardial effusion or intra-cardiac thrombus seen. Coronary angiography revealed normal coronary arteries (Fig-3). A diagnosis of severe dengue myocarditis was made and steroid treatment was initiated with methylprednisolone.

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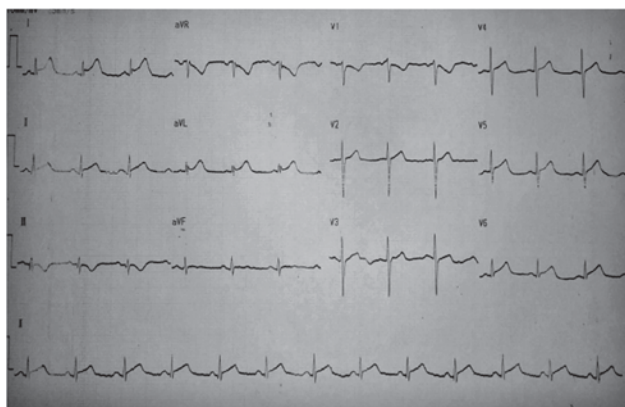


Fig.2: ST elevation in I, aVL and V4 to V6 suggesting antero-lateral myocardial infarction



Fig.3: Coronary angiography revealed normal coronary arteries

On day ten, her ECG showed sinus rhythm, giant T wave inversion and prolonged QT interval; Chest X-ray showed reduction of cardiac silhouette and a marked decrease in pulmonary interstitial oedema (Fig-4). The condition of the patient improved on day eleven and she was shifted to general ward. On the following day the echocardiography demonstrated normal heart dimensions and ejection fraction 60%. On day thirteen the patient was discharged. On follow-up visit after four weeks the patient had no complaints and echocardiography of the patient suggested normal heart dimensions with ejection fraction 67%.



Fig.4: Chest X-ray showed reduction of cardiac silhouette and a marked decrease in pulmonary interstitial oedema

Discussion:

The mechanism of dengue myocarditis is still unclear though both direct viral infection and immune response mediated by cytokines through complement activation have been suggested to be the cause of myocardial damage.³ At the onset of her disease, the patient apparently had no myocardial involvement. It was only six days later, when she complained of chest pain associated with pulmonary edema, new electrocardiogram changes and cardiac biomarkers elevation that indicated clear evidence of myocardial compromise. Left ventriculography demonstrated severely reduced ejection fraction and Coronary arteries were normal on angiography. An early diagnosis and prompt management produced a very good recovery.

Dengue viruses are shown to cause cardiac disease with clinical manifestations ranging from mild elevation of biomarkers to myocarditis and/or pericarditis and death. Cardiac complications in dengue fever, previously thought very rare, are now increasingly observed. Myocarditis is the most common cardiac manifestation in Dengue fever.⁴ Evaluation of cardiac involvement in dengue fever, through systematic investigation by using sensitive and specific biomarkers associated with imaging methods, should be included as a part of dengue fever management plan. Cardiac Magnetic Resonance Imaging (CMR) is considered the gold standard for evaluation of myocarditis and pericarditis as it has a positive predictive value of 95%.⁵ Centres unable to provide CMR facility should evaluate patients with echocardiography which visualizes functional abnormalities and pericardial effusion.

Conclusion:

The cardiac complications in Dengue fever are still mostly under-diagnosed in clinical practices and are relentlessly contributing to the mortality scores. Proper knowledge and awareness of cardiac complication can promote early

detection and prompt resuscitation. Further studies are needed to evaluate the hemodynamic impact of myocardial involvement in severe dengue infection and to establish the relationship between serotypes, antigenicity and cardiac involvement.

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