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A CASE OF DENGUE MYOCARDITIS

General Medicine

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ABSTRACT

40 year female Known Diabetic presented with 5 days H/O Fever, Breathlessness (NYHA Class 4) Orthopnea , Abdominal distension, Swelling of feet. On examination patient had Tachypnea, tachycardia, with Bilateral Pitting Pedal edema and raised JVP. CVS Examination- S3+, Abdomen-free fluid and Tender Hepatomegaly. ECG showed Ischemic Changes (ST depression in V3-V6 with T wave inversion), and cardiac Biomarkers were normal, Suggestive of myocarditis. On Investigation it was found that Dengue NS1AG And IGM was Positive. 2DEcho-showed Global Hypokinesia(EF 40%). All of the changes in ECG and ECHO were returned to normal with control of failure. Clinical manifestations of cardiac complications varied considerably, from self-limiting tachy-brady arrhythmia to severe myocardial damage, leading to hypotension and pulmonary edema. To avoid otherwise preventable morbidity and mortality, physicians should have a high index of suspicion for cardiac complications in patients with dengue illness and should manage this accordingly.

KEYWORDS

Introduction

Dengue is the most important disease caused by an arbovirus (1, 2, 3 and 4 serotypes) worldwide. Dengue infection is a leading cause of illness and death in tropical and subtropical regions of the world. Forty percent of the world's population currently lives in these areas. The clinical picture resulting from dengue infection can range from relatively minor to catastrophic hemorrhagic fever.

The cardiac complications in dengue are not common. Myocarditis is the most common documented cardiac pathology in dengue and is considered to be one of the atypical manifestation. There is increase in frequency of atypical manifestations which are often missed due to lack of awareness which add on to mortality and morbidity.

The prevalence of myocarditis in dengue was reported from 9% to 15%.1,2 The incidence of cardiac complications in patients with dengue illness varies greatly from one series to another.

The pathophysiology of myocardial cell injury in dengue illness is not yet fully understood. Myocardial involvement in dengue may result either from direct DENV invasion of the cardiac muscles or a cytokine-mediated immunological response, or both.

Formed immune complex in dengue infection could not be entrapped in the valvular space, therefore, dengue endocarditis could not exist. Hence early identification and prompt restoration of hemodynamic instability are important.

case report

A 40 year old Lady presented to the ER with h/o Fever since 5 days, Abrupt onset of high grade fever, Associated with Chills, Generalized body pain followed by Sudden onset of Breathlessness NYHA Class 4 with positive history of Orthopnoea, Associated with Pedal edema and Abdominal Distension.

There was No history of Rash/Bleeding Tendencies, cough with expectoration Haemoptysis, Dysuria, Chest pain or Palpitations.

On Her Physical Examination patient was Moderately built and nourished and she had Tachypneoa with RR of 30/min, Pulse Rate of 110/min, regular Fever of 100oF, BP = 100/60 mmHg, Bilateral Pitting type of Pedal edema ++, and patient was Mildly Icteric.

Cardiovascular Systemic Examination of the patient revealed JVP of 15 cmH20, Tachycardia, LV S3 with No murmurs.

On Per Abdomen examination there was Free fluid and tender hepatomegaly noted. Chest-normal vesicular breath sounds, Occasional Rhonchi and Basal Crepitation were heard.

The following table shows the patients investigations on admission and at discharge. (Table 1)

Table 1: Investigations On admission and at discharge.

	On Admission	At Discharge
HB	11.3gm/dl	13gm/dl
PCV	39	34
TC	3600	7200
DC	P-45, L-52, M-0, E-3	P-60, L-37, M-2, E-1
Platelet	60,000	1,20,000
ESR	03mm/hr	

Liver profile showed an elevated Total bilirubin of 3mg/dl with SGOT of 1230 IU/L and SGPT of 954 IU/L. (Table 2)

Dengue infection was confirmed with positive Dengue NS1AG, IgM antibodies by enzyme-linked immunosorbent assay(ELISA).

Her ECG showed Sinus Tachycardia, ST depression in V3-V6 with T wave inversion, Low voltage complexes. (Fig 1)

Table 2: Liver function Tests On admission and at Discharge.

LFT	On admission	At Discharge
TB	3.0	1.0
SGOT	1230	66
SGPT	954	74

Figure 1: ECG on admission

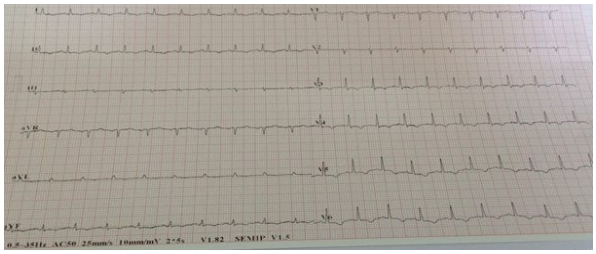

Figure 2: ECG at Discharge

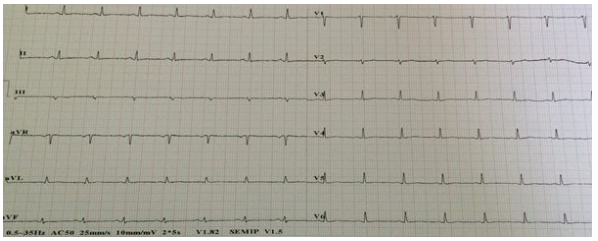

Figure 3: Chest Skiagram on admission

Her chest Skiagram showed evidence of cardiomegaly with signs of Pulmonary edema.

Her routine Biochemical parameters were normal but her CPK 41(26-192), CPK-MB – 0.3 (up to 3.38) were raised and Trop I - < 0.01 (< 0.01).

An urgent Echo cardiogram was performed which showed Global Hypokinesia of LV with EF – 40 %, LV systolic Dysfunction and Mild Pericardial Effusion. (Table 3) USG abdomen revealed Mild B/L Pleural Effusion Liver – Hepatomegaly, Ascites, GB wall edema and Splenomegaly.

In view of the above findings and correlating with the investigations the diagnosis of Dengue Myocarditis, Congestive Cardiac Failure and Dengue Hepatitis was made.

Patient was treated with Diuretics, Bronchodilators and ACE Inhibitor (Ramipril 2.5 mg OD) for Five days following which Patient was stable with the Platelet count of 1,20,000 lak/cumm. All the Bioche mical parameters were under normal.

Table 3 shows 2D Echo Post Treatment which was normal. At Discharge Her chest skiagram was nomal and Her ECG changes reverted back to normal sinus Rhythm. (Fig 2)

Patient was Discharged after 10 days of hospital course.

Table 3: 2D ECHO on admission and at Discharge

On admission 2D ECHO	Post Treatment 2D ECHO
EF- 40%	EF-68%
Global Hypokinesia of LV	NO RWMA
LV systolic Dysfunction	Normal LV systolic function
Mild Pericardial Effusion	No Pericardial Effusion

Discussion

The incidence of cardiac complications in patients with dengue illness varies greatly from one series to another. From India, Agarwal et al. in the year 2010 reported that only one of 206 patients subjected to cardiovascular evaluation experienced cardiac symptoms.[3]

Wali et al., reported that 70% of 17 patients with DHF/DSS who underwent myocardial scintigraphic study suffered diffuse left ventricular hypokinesia with a mean ejection fraction of 40%.[4]

In the study by Gupta et al, systolic dysfunction was absent in all patients, mild diastolic dysfunction was present in 14.28 percent.[5]

Myocardial dysfunction has been reported to be more severe inpatients with DSS when compared to those with DF or non-shock DHF.[6]The pathophysiology of myocardial cell injury in dengue illness is not yet fully understood. Myocardial involvement in dengue may result either from direct DEN invasion of the cardiac muscles or a cytokine-mediated immunological response, or both.[7,8]The upsurge in serum tumor necrosis factor-a, interleukins 6, 13 and 18, and cytotoxic factors in patients with dengue illness lead to increased vascular permeability and shock;[9,10]whether these cytokines play a role in the development of myocardial cell injury is unknown.

Though in many cases the disease is self limiting, occasionally it may cause fatal myocarditis. The pathogenic mechanism of cardiac dysfunction is not well established though altered autonomic tone and prolonged hypotension may play a significant role. In a study by Kosala et al., Post mortem autopsies conducted revealed distinct histological changes in the myocardium showing interstitial edema with inflammatory cell infiltration and necrosis of myocardial fibres. Significant histo-pathological changes were also seen in the lungs, liver, brain, and spleen.[11]

CVS Manifestations in Dengue Include
Rhythm disorders
Atrioventricular blocks
Atrial fibrillation
Sinus node dysfunction
Ectopic ventricular beats
QRS / QT prolongation.
Diffuse T wave inversion.
Ventricular arrhythmias.

With inflammation of the adjacent pericardium, ECG features of pericarditis can also been seen (= myopericarditis)

Patients usually are asymptomatic or have mild cardiac symptoms which have benign self-limiting course despite relative bradycardia, transient atrioventricular block, and or ventricular arrhythmia.

As for the cardiac complication in this reported patient, the differential diagnosis included acute myocardial infarction and acute myocarditis; the former is characterized by a blockage of the coronary arteries, while the latter has patent coronary arteries.[12]The bleeding Risk because of thrombocytopenia in this patient posed a high risk for an invasive angiographic study procedure and angioplasty in the case of myocardial infarct. However, rapid clinical improvement after the development of hypotension and acute pulmonary edema unequivocally indicated that this was a case of myocarditis.

Patients may experience acute pulmonary edema and or cardiogenic shock due to severe myocardial cell damage with left ventricular failure.

The low incidence of dengue myocarditis is because of the reason that patients are most of the times asymptomatic or have vague symptoms and diagnosis is easily missed. Studies showed that asymptomatic myocardial involvement in dengue fever is much more common than previously thought but almost all cases of dengue myocarditis are self-limiting.

Conclusion

To conclude, dengue fever can have varied and multi systemic presentation with typical and atypical manifestations.

Atypical manifestation is included in case definition of severe dengue, Hence need aggressive treatment even in the absence of shock.
Early recognition of myocardial involvement in dengue illness, prompt restoration of hemodynamic stability while avoiding fluid overload and sparing unnecessary invasive management are important in treating dengue affected patients with severe myocarditis.

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