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RESEARCH ARTICLE

AN INTERESTING CASE OF DENGUE HEMORRHAGIC FEVER WITH THROMBOCYTOPENIA AND MYOCARDITIS

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ABSTRACT

Dengue is one most of the most common viral disease in India. It has been associated with alot if complications of not treated early and well. This case deals with a young male with dengue hemorrhagic fever with myocarditis treated with antibiotics supportive care and recovered totally.

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INTRODUCTION

Dengue Fever is a mosquito-borne tropical disease caused by the dengue virus.[1] Dengue has become a global problem since the Second World War and is commonly in more than 110 countries.[11][12] Each year between 50 and 528 million people are infected and approximately 10,000 to 20,000 die.[5][6][13][14] The earliest descriptions of an outbreak date from 1779.[12] Its viral cause and spread were understood by the early 20th Century.[15] Apart from eliminating the mosquitoes, work is ongoing for medication targeted directly at the virus.[16] It is classified as a neglected tropical disease.[17] Symptoms typically begin three to fourteen days after infection.[2] This may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin rash.[1][2] Recovery generally take two to seven days.[1] In a small proportion of cases, the disease develops into the life-threatening dengue hemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs. Dengue is spread by several species of mosquito of the *Aedes type*, principally *A.aegypti*. [1] The virus has five types,[7][8] infection with one type usually gives lifelong immunity to that type, but only short-term immunity to the others.[1] Subsequent infection with a different type increases the risk of severe complications.[1] A number of tests are available to confirm the diagnosis including detecting antibodies to the virus or its RNA.[2] A vaccine for dengue fever has been approved and is commercially available in a number of countries.[4]

Other methods of prevention are by reducing mosquito habitat and limiting exposure to bites.[1] This may be done by getting rid or or covering standing water and wearing clothing that covers much of the body.[1] Treatment of acute dengue is supportive and includes giving fluid either by mouth or intravenously for mild or moderate disease.[2] For more severe cases blood transfusion may be required.[2] About half a million people require admission to hospital a year.[1] Paracetamol (acetaminophen) is recommended instead of nonsteroidal anti-inflammatory drugs (NSAIDs) for fever reduction and pain relief in dengue due to an increased risk of bleeding from NSAID use.[2][9][10] A variety of cardiac complications have been reported in dengue-affected patients[15-23], which include atrioventricular conduction disorders [20], supraventricular arrhythmia[21] and myocarditis. A better understanding of cardiac complications will potentially improve the treatment of dengue illness by avoiding otherwise preventable morbidity and mortality in the affected patients.

Symptoms of Dengue Fever

1. Sudden, high fever
2. Severe headache
3. Retro orbital pain
4. Severe joint and muscle pain
5. Fatigue
6. Nausea
7. Vomiting
8. Skin rash, which appears two to five days after the onset of fever

9. Mild bleeding (such as nose bleed, bleeding gums, or easy bruising)

Warning signs of severe dengue

1. Worsening abdominal pain
2. Ongoing vomiting
3. Liver enlargement
4. Mucosal bleeding
5. High hematocrit with low platelets
6. Lethargy
7. Serositis

Classification of dengue

The World Health Organization's 2009 classification divides dengue fever into two groups: Uncomplicated and severe. Severe Dengue is defined as that associated with severe bleeding, severe organ dysfunction, or severe plasma leakage.

All other cases are uncomplicated[16-17]

The 1997 classification divided dengue into undifferentiated fever,

1) Dengue Fever
2) Dengue Hemorrhagic Fever[11],17

Dengue Hemorrhagic fever was subdivided further into grades I-IV.

Grade I is the presence only of easy bruising or a positive tourniquet test in someone with fever,

Grade II is the presence of spontaneous bleeding into the skin and elsewhere,

Grade III is the clinical evidence of shock, and

Grade IV is shock so severe the blood pressure and pulse cannot be detected[17].

Grade III and IV are referred to as **"dengue shock syndrome"**.[16,17]

CASE REPORT

24 year old male came with chief complaints if fever with chills since 4-5 days Dyspnoea on exersion since 2 days and nasal bleed a night prior to admission Fever was associated with weakness, body ache and fatigue.

On examination

Pulse - 49/min Blood Pressure - 110/60mmhg Temperature - Febrile
Pallor - Absent

Respiratory System - Bilateral basal crepts were present Per Abdomen - Tender hepatomegaly was present Cardiovascular System - Within normal limits
Central Nervous System - Within normal limits

Investigation

Haemoglobin - 16.6gm/dl WBC - 14,400cmm Platelets - 35,500cmm SGPT - 227IU/L SGOT - 538IU/L S.CPK - 266IU/L S.CPKMB - 411IU/L TROPONIN T HS - 269.7pg/ml

ECG - Left anterior hemiblock with ST changes in anterior levels CHEST X-RAY PA VIEW - RIGHT SIDE PLEURAL EFFUSION

ECHO AS ON 22/9/2018 - Moderate LV systolic dysfunction, Global hypokinesia

Ejection Fraction - 35%

Treatment

Patient was treated symptomatically with I/V fluids, INJ Dytor and Levo-carnitine Patient responded well to the above treatment

Repeat 2-D Echo as on 28/9/2018 - Mild systolic dysfunction

Ejection Fraction - 50%

DISCUSSION

The incidence of cardiac complications in patients with dengue illness varies greatly from one series to another. From India, Agarwal *et al.* reported that only one of 206 patients subjected to cardiovascular evaluation experienced cardiac symptoms[29]. Wali et al., reported that 70% of 17 patients with DHF/DSS who underwent myocardial scintigraphic study suffered diffuse left ventricular hypo kinesis with a mean ejection fraction of 40% of 4 and Kabra *et al.* reported that 16.7% of 54 children with dengue illness had a decreased left ventricular ejection fraction of <50%. 7 recent report from Sri Lanka showed that 62.5% of 120 adults with dengue fever (DF) had an abnormal electrocardiogram.3 These series suggest that cardiac complications in patients with dengue illness are not uncommon, and might have been under-diagnosed because most of the cases with cardiac complications are clinically mild and self-limited[17]. The clinical manifestations of cardiac complications in dengue illness vary considerably[17,23,28-38]. At the end of the clinical spectrum, patients are asymptomatic or have mild cardiac symptoms despite relative bradycardia, transient atrioventricular block, and/or ventricular arrhythmia[17,20,21,28,35]. At the other severe end, patients may experience acute pulmonary edema and/or cardiogenic shock due to severe myocardial cell damage with left ventricular failure[18,19,22,23,30,34,36,38,47]. Myocarditis can masquerade as acute acute myocardial infarction[38,39]. The diagnosis of acute myocardial infarction can be based on a rise in biochemical markers of myocardial necrosis (serum creatine kinase-MB and/or cardiac troponin I), coupled with ischemic symptoms and/or electrocardiographically developed Q waves or ST segment elevation/depression[40]. When it comes to indicators of myocardial necrosis, troponin I is more sensitive and more specific than creatine kinase-MB[27]. 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[41]. The bleeding tendency in this patient posed a high risk for an invasive procedure and thus precluded an angiography study for the differential diagnosis and for angiography 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. Myocarditis is not uncommonly found in viral infection other than dengue[41]. With respect to volume replacement for DHF patients with a >20% increase in hematocrit, the World Health Organization recommends intravenous infusion with 5% glucose in physiological saline at 6 ml/h/kg for the initial 1-2h, followed by 3-5 ml/h/kg, which may be discontinued at 24 to 48 h depending on the normalization of hematocrit, pulse rate, and blood pressure and overhydration may lead to fluid overload, resulting in respiratory distress in patients with dengue[25]. In the present case, despite improvement in the serial hematocrit after fluid therapy, hypotension is developed on the third day of treatment suggesting that this resulted from cardiac dysfunction rather than insufficient intravenous fluid replacement, thus indicating that the patient's pulmonary edema was cardiogenic due to impairment of left ventricular function[42]. Myocardial dysfunction has been reported to be more severe in patients with DSS when compared to those with DF or non-shock DHF. 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[43,44]. The upsurge in serum tumor necrosis factor-a, interleukins[21,28,33] and cytotoxic factors in patients with dengue illness lead to increased vascular permeability and shock[45,46] whether these cytokines play a role in the development of myocardial cell injury is unknown. Of note, only DEN-2 and DE-3 were reported to be the culprit viruses in dengue patients with cardiac complications where the DEN serotype was mentioned[17,20]. Further studies are needed to clarify the role that DEN serotype plays, if any, in cardiac complications in dengue affected patients.

Conclusion

Our review shows that cardiac complications are not uncommon in dengue illness. ALthough it was self-limiting in our patient under supportive treatment, acute myocarditis in dengue may be clinically severe to such an extent that it has a fatal outcome. Early recognition of myocardial involvement in dengue illness, prompt restoration of hemodynamic instability while avoiding fluid overload, and sparing unnecessary invasive management are important in treating dengue-affected patients with severe myocarditis.

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