

Short Communication

Cardiac Complications of Dengue Fever

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Dengue fever (DF) has become a prominent infectious disease with outbreaks in many parts of the world. According to historical accounts dengue fever emerged from Africa almost 500 to 600 years ago, and the first outbreaks reached different parts of world such as Asia, South America and Africa concurrently in the 1780s. According to historical accounts, Bangladesh saw its first recorded outbreak of DF in 1964 known as “Dhaka/Decca fever”. Possibly this year Bangladesh is witnessing second epidemic outbreak of Dengue fever.

Dengue fever is caused by four dengue virus serotypes, DENV1, DENV2, DENV3, and DENV4. DENV2 is associated with asymptomatic myocarditis and has also been shown to cause myocardial dysfunction in children. Although there are no reports of cardiac involvement in DENV1 or DENV4, there is inadequate evidence to determine whether a particular serotype is preferentially associated with cardiac involvement.

The pathophysiology of cardiac involvement in dengue is poorly understood. Myocardial involvement in dengue may result either from direct viral invasion of cardiac muscles or cytokine-induced immune damage, or both. Cardiac involvement, although often mild, can be severe enough to result in progressive and intractable acute heart failure with global hypokinesia and acute cardiac dilatation. Lactic acidosis, which occurs as a result of the sluggish circulation, possibly contributes to myocardial depression in severe cases.

The main difficulty in describing the manifestations and frequency of cardiac involvement in dengue is the lack of clear criteria to define cardiac involvement. Hypotension, shock, arrhythmias, and pulmonary edema have all been described in severe cases of dengue. However, patients with severe dengue can have gross derangement of hemodynamic and homeostasis as a consequence of plasma leakage and tissue hypo perfusion.

A diverse range of ECG abnormalities have been reported with dengue, including rate and rhythm abnormalities, heart block, wave form abnormalities, and voltage abnormalities. Reported rhythm abnormalities include relative bradycardia sinoatrial

block, junctional rhythm, second-degree and complete heart block and monomorphic premature ventricular contractions, atrial flutter, atrial fibrillation, self-limiting tachy-brady arrhythmia. Electrocardiographic features mimicking acute myocardial infarction have also been reported.

Cardiac biomarkers may indicate the presence of cardiac involvement in dengue. 25% of patients had abnormal results in one or more biomarkers. However, the correlation between biomarkers and cardiac function has not been clearly demonstrated.

Echocardiographic evidence of systolic and diastolic abnormalities is increasingly seen with more severe grades of dengue. There may be global and segmental wall motion abnormalities with reduction of LVEF. However, no real correlation is seen with severity of dengue and reduction in LVEF. Two-dimensional (2D) speckle tracking echocardiography may be a more sensitive tool for the detection of early and subtle myocarditis.

Acute pericarditis, characterized by chest pain, has been reported in dengue. Pericardial effusions are also known to occur, and these are often of little clinical significance, identifiable only by echocardiogram. It could be postulated that these are a result of plasma leakage.

An observational study conducted over 1 year in India highlights raised CK-MB and Troponin I was observed in 33.3% and 26.7% patients. ECG findings revealed normal rhythm among 95% with 15.8% of them having an abnormal heart rate. Rhythm disturbance was noted in 5% of the patients with AV block being the most common (66.67%).

In Dhaka Medical College, the scenario is striking and worsening day by day. Since January 2019, around 5146 patients were admitted. 4569 patients were improved and discharged. But 32 patients died. At present, around 545 patients are now in hospital and getting treatment. There is no clean cut data about how many of patients have cardiac involvement but it appears that less than 5% patient has cardiac involvement. Asymptomatic sinus bradycardia is the most common ECG presentation. Myocarditis and heart failure is the most common cardiac complication of dengue fever in Dhaka Medical College.