

Cardiac Manifestations in Dengue Patients in a Rural Tertiary Care Centre in Coastal Kerala

H. Poornima¹, Juby John^{*2}

¹Additional Professor, ²Assistant Professor,

Department of General Medicine, Government Medical College, Alappuzha, Kerala, India

*Corresponding author: Juby John; drjubyjohn@gmail.com

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Abstract

Background: Dengue epidemic is a major health problem in India. Kerala has reported the highest number of dengue related deaths in the country in 2017 as per the reports of the directorate of National Vector Borne Disease Control Programme (NVBDCP). The aim of the present study is to find out the cardiac manifestations of patients admitted with dengue fever during the epidemic in 2017 in a rural tertiary care centre in coastal Kerala. **Method:** 341 patients who were admitted in the medicine department of a rural tertiary care Centre in Kerala with Dengue were included in the study. W.H.O case definitions were used for the diagnosis. Complete blood counts, RBS, serum creatinine and liver function tests and E.C.G were carried out in all patients. Echocardiogram and cardiac biomarkers were done when indicated. **Results:** Males predominated. 317 were diagnosed as dengue fever, 12 as dengue hemorrhagic fever and 12 had dengue shock syndrome. Only four patients succumbed to death. Head ache and myalgia were the common symptoms at the time of presentation. 72 patients had abnormal ECG, but all had normal ECG at the time of discharge, indicating a transient change during the episode. **Conclusion:** This retrospective observational study included 341 patients admitted in a rural tertiary care Centre in Kerala. Patients were diagnosed as per W.H.O. case definition for dengue. 317 were diagnosed as dengue fever, 12 as dengue hemorrhagic fever and 12 had dengue shock syndrome. Study population was predominantly males. 72 patients had abnormal ECG, but all had normal ECG at the time of discharge, indicating a transient change during the episode.

Keywords: Dengue fever, ECG, Sinus bradycardia.

Introduction

Dengue is endemic in at least 100 countries. Approximately 2.5 billion people live in areas where there is a risk of dengue transmission. The World Health Organization (WHO) estimates that 50 to 100 million infections occurs yearly, including 500,000 DHF cases and 22,000 deaths.

Dengue rarely affects the heart. There are no cardiac manifestations which are specific for dengue. It can range from sinus bradycardia to arrhythmias. Other rare manifestations include atrioventricular conduction disorders and myocarditis. Ventricular dysfunction has been also been described by several authors. (1-10)

Materials and Methods

This retrospective observational study was conducted after getting approval from Institutional Ethics Committee. 341 Patients admitted with seropositivity for Dengue in General Medicine department of a rural tertiary care centre of coastal Kerala during the period of four months from 01-05-2017 to 30-08-2017 were included in the study. W.H.O case definitions were used for the

diagnosis of dengue. Participants were evaluated as per the proforma designed for the study. Complete blood counts, RBS, serum creatinine and liver function tests were carried out and E.C.G was recorded in all patients. Chest X ray was taken for those who had complaints of cough and breathlessness. All participants were positive for NS1 antigen and/or anti-dengue antibodies. Echocardiogram cardiac biomarkers were carried out only when indicated. Patients who were on antiplatelets, those with history of heart diseases, diseases with thrombocytopenia, alcoholism and pregnancy were excluded from the study. Data was analyzed using SPSS version 16 software. Qualitative variables were expressed in percentages and proportions and quantitative variables were summarized in mean with standard deviation. Association between the variables and the outcome variables were tested using chi square test and p value less than 0.05 was considered as statistically significant.

Results

The observation was made in 341 patients in the age group of 14 - 65 years, who fulfilled the inclusion criteria. All the patients were referred from other hospitals. 317 were diagnosed as dengue fever,

12 as dengue hemorrhagic fever and 12 had dengue shock syndrome. 212 (62.1%) were males and 130 (38.12%) were females. Myalgia (95.5%) was the commonest symptom next to fever. Head ache was present in 276 (80.7%) patients. Other symptoms were vomiting in 126(36.8%), abdominal pain in 72 (21.1%) dizziness in 66 (19.3%) rashes in 36(10.5%) and retro orbital pain in 22(6.4%).Hemorrhagic manifestations were present in 206(60.23%).Diarrhea was present in 58(16.95%).Hypotension was observed in 18(5.3%), out of which only 12 patients fulfilled the criteria for dengue shock syndrome. Only four patients succumbed to death. 72 patients had abnormal ECG (21.11%), Sinus bradycardia, the commonest cardiac abnormality, was observed in 30 patients (8.79%). T inversion was recorded in 14(4.1%).ST depression was present in 8 patients (2.3%), AV block in 8 (2.34%),and transient atrial fibrillation in10 patients (2.93%).Four patients had junctional rhythm (4%).Supraventricular tachycardia developed in only two patients. Six patients had ventricular ectopics (1.75%).None had ventricular bigeminy or trigeminy. Echocardiogram was normal in all patients. Pericardial effusion was detected in 8(2.3%).Cardiac biomarkers were normal in all cases. ECG was normal in all cases at the time of discharge, indicating a transient change during the episode. All the four patients, who succumbed to death, had normal ECG.

Discussion

Various viral infections cause myocardial damage. This is thought to be due to direct invasion or an autoimmune reaction resulting in myocardial inflammation. The cardiac abnormalities in dengue are invariably benign, transient, and self-limited and are attributed to subclinical viral myocarditis. Cardiac manifestation in dengue fever ranges from asymptomatic bradycardia to severe myocarditis. Wiwanitkit et al^[1] observed statistically significant correlation between cardiac manifestations and the warning signs whereas Kabra et al^[2] couldn't find any such correlation. Our study exposes an agreement with the latter observation.^[2,3] Other ECG abnormalities observed in dengue include sinus bradycardia, supraventricular arrhythmias, prolongation of PR interval, transient AV block, and even transient ventricular arrhythmias. Other cardiac manifestations include myocarditis, systolic and diastolic dysfunction and pericardial effusion which were observed during acute phase of viral dengue infection.^[4] During convalescence period, sinus bradycardia and ventricular ectopic have also been reported.

In the study by Gupta et al^[5] sinus bradycardia was found in 14.28% cases, and sinus tachycardia in 21.4% cases. AV dissociation, ventricular bigeminy, ventricular trigeminy and ventricular tachycardia were noted in one patient each. In our study, six patients had ventricular ectopics (1.75%), none had bigeminy or trigeminy. In the study by Sheetal et al^[6] all the ECG changes reverted back to sinus rhythm in 24 hours. Interestingly, in our study also, all had normal ECG at the time of discharge. Lateef et al^[7] showed sinus bradycardia as the commonest rhythm abnormality (32%).Our study also had the same observation. Wichmann et al^[8] have described direct cardiac involvement in

dengue fever patients as evidenced by positive cardiac biomarkers. Nagaratnam et al^[9] found no correlation between myocardial involvement and clinical severity of dengue fever. Our study also had the same observation. An epidemiological study in Columbia^[10] on dengue patients have also shown similar results as ours.

Conclusion

This retrospective observational study included 341 dengue patients admitted in a rural tertiary care centre in Kerala. Patients were diagnosed as per W.H.O. case definition for dengue. 317 were diagnosed as dengue fever, 12 as dengue hemorrhagic fever and 12 had dengue shock syndrome. Study population was predominantly males. 72 patients had abnormal ECG. Sinus bradycardia was the commonest ECG abnormality. Interestingly, transient atrial fibrillation was observed in10 patients (2.93%).All had normal ECG at the time of discharge, indicating a transient change during the episode. These transient ECG abnormalities do not indicate severity of the disease .There was no ECG finding which is specific for dengue.

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