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Spontaneous Resolution of Junctional Rhythm Amar Taksande, in a Child with Dengue Fever

Abstract

Atypical manifestations of dengue fever are rising but they may be under reported. In dengue hemorrhagic fever (DHF), cardiac rhythm abnormalities observed were ventricular arrhythmia, atrial fibrillation and atrioventricular block. Here we report an 11 year old boy who presented with dengue fever and developed bradycardia and hypotension. His electrocardiogram (ECG), during the bradycardia, showed a junctional rhythm. The spontaneous resolution of junctional rhythm occurred after 7 days of admission.

Keywords: Junctional rhythm; Dengue fever; Rhythm abnormality

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Introduction

Dengue, the mosquito-borne viral disease affecting humans and threatens the health of more than 2.5 billion people of the tropics and subtropics. Dengue viral infections, caused by any of the four dengue serotypes (DEN 1, DEN 2, DEN 3, and DEN 4), are amongst the leading causes of hospitalization and death amongst children in several tropical countries [1, 2]. Dengue is transmitted by bites of Aedes aegypti mosquito. It is characterized by fever, myalgia, arthralgia, rash, leucopaenia and thrombocytopaenia [1]. Cardiac manifestations of dengue are uncommon but cardiac rhythm abnormalities such as atrioventricular blocks, atrial fibrillation, sinus node dysfunction and ectopic ventricular beats have been reported. Most of the cases are asymptomatic and have a benign self-limiting course with resolution of infection [3-6]. Here, we report a case of dengue fever in a child with junctional rhythm which was spontaneously resolved.

Case Report

An 11 year old male child admitted in pediatric ward at AVBRH Hospital, Sawangi with complaints of fever and vomiting since 4 days. Fever was high grade not associated with chills and rigors. Vomiting was non bilious, non projectile, 3-4 episodes not containing blood. There was no history of myalgia and bone or joint pains palpitation, syncopal attack, seizure, rash, cyanosis, nor was there a history of rash or bleeding from any site. There was no past history of arrhythmia or cardiac disease. The urine output was adequate. On examination, the patient was febrile, but not dehydrated. The vital signs were stable at admission; his heart rate was regular at 50/min, respiratory rate at 24/ min and blood pressure (BP) at 110/60 mmHg. The Hess test (tourniquet test) for capillary fragility was negative. No pedal

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edema, cyanosis or clubbing. Jugular venous pressure was within normal limit. Cardiac auscultation revealed an S3 gallop without a significant murmur. Other systemic examination did not reveal any abnormality.

On investigation, a complete blood count [CBC] revealed the following: white blood cell count 7,900/mm³ [with 82% neutrophils, 14% lymphocytes, and 4% monocytes]; hemoglobin 8.3 g/dl; hematocrit 44%; platelets 60,000/mm³. Her slowest heart rate was 50 beats/minute in a junctional rhythm seen on 12-lead electrocardiography (Figure 1). Dengue serology was reactive for immunoglobulin G (IgG) and immunoglobulin M (IgM), suggesting acute primary infection. The liver enzymes and renal profile, including serum electrolytes, were normal. The calcium level was found to be normal. USG abdomen was suggestive of ascites with normal liver echotexture. Chest radiography was normal, with a regular heart size. A two dimensional echocardiogram showed normal cardiac structures, no valvular regurgitation, and normal left ventricular (LV) systolic function) ejection fraction 60%. The patient's heart rate during the hospital stay remained at 46-54/ min, but the BP and other hemodynamic parameters were normal. The patient was asymptomatic, and his vital signs were closely monitored for the development of any complications. He was discharged after ten days, with a heart rate of 72/min and a normal BP, and the ECG showed a normal heart rate. ECG reverted to a normal sinus rhythm.

Discussion

Dengue fever is an acute mosquito-transmitted disease caused by dengue virus and characterized by headache, myalgia, rash, and hemorrhagic manifestations. When associated with thrombocytopenia, evidence of plasma leakage, bleeding

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manifestations, it is termed dengue hemorrhagic fever (DHF). Dengue shock syndrome (DSS) criteria include those for dengue hemorrhagic fever as well as hypotension or narrow pulse pressure (\leq 20 mm Hg). This is associated with a significant mortality without early appropriate treatment. In dengue fever, cardiac dysfunction occurred because of alternation of autonomic tone and prolonged hypotension but not very well explained. Myocardium is involved in dengue fever because of the direct effect of dengue virus or effects of cytokine mediators or immune response. The possibility of IgM antibodies cross-reacting with a myocardial antigen is unlikely, as ECG change was recovered later, when antibodies were still in circulation. DHF patients have higher levels of TNF-á, interleukins-6, -13 and - 18, and cytotoxic factor. These cytokines have role in causing increased vascular permeability and shock during dengue infection but remain unclear [6-9]. Kularatne et al [10], classified DF cases into two groups: cardiac and non-cardiac, based on the presence or absence of ECG abnormalities (T inversion, ST depression, bundle branch blocks). ECG changes were seen in 75 of 120 (62.5%) patients [cardiac group] and these patients were found to be more susceptible to fatigue, dyspnea, low peripheral oxygen saturation in room air, chest pain, and flushing of skin compared to 45 (37.5%) patients with normal ECGs (non-cardiac group).

Electrocardiographic (ECG) abnormalities have been reported in 44-75% of patients with viral hemorrhagic fever, and prolongation of the PR interval, sinus bradycardia or atrioventricular block commonly occurred [4]. In viral myocarditis, Sino-Atrial, Ario-Ventricular and bundle branch blocks, AV dissociation, complete heart block and premature ventricular contraction have been reported [9]. Rhythm abnormalities reported in dengue fever include sinus bradycardia, complete AV block, first degree AV block, atrial fibrillation, Mobitz type I second-degree AV block, ventricular arrhythmia, ST segment elevation and non-specific ST-T changes and sinus node dysfunction [1-3]. Most of these rhythm abnormalities are transient and revert to normal. Wali et al [8] described cardiac involvement in DHF/DSS in 17 patients, which showed global hypokinesia in 70.6%. Only five patients showed ST and T wave changes with ECG changes, echocardiographic and radionuclide ventriculography all returning to normal within three weeks. Kabra et al [11] found no correlation between myocardial involvement and clinical severity in DHF children. Gupta VK et al [12] mentioned 4 cases (14%) had bradycardia in electrocardiography, and 4 cases (14%) had grade 1 diastolic dysfunction in 2D-echocardiography which is a manifestation of cardiac involvement in DF cases.Kirawittaya T et al [13] reported that transient left ventricular systolic and diastolic dysfunction was common in children hospitalized with dengue and related to severity of plasma leakage. The functional abnormality spontaneously resolved without specific treatment. By doing echocardiography, abnormal right and left ventricular functions, left ventricular hypokinesia, mitral regurgitation and pericardial effusion have also been documented [6, 10]. Left Ventricular ejection fraction of <50% occurred in approximately 20% of those who developed DHF, and are likely to return to normal within a few days [8]. Echocardiography study was normal (EF: 60%) in our patient. The presence of fever, thrombocytopaenia, and positive IgG and IgM titers for dengue virus prompted us to suspect dengue virus as the probable causative agent. Atropine and isoproterenol drugs are used in bradycardia due to AV blocks [14] but these drugs were not used in our patient. The patient was kept under close follow-up, and spontaneous resolution was observed after 7days. In conclusion, the rhythm abnormalities in dengue fever are benign and self-limited, and resolve spontaneously at discharge.

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