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Case Report

Bradyarrythmia in Acute Phase of Viral Hemorrhagic Fever

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ABSTRACT

Cardiovascular complications are known to occur during dengue fever including both tachyarrhythmias and bradyarrythmias. We report a case of 15 year old boy with severe dengue fever who had rhythm disturbance showing a 2:1 heart block with hemodynamic instability during acute phase of illness. The child responded to atropine and did not require any further intervention requiring a pacemaker.

Key words: Dengue, arrhythmia, viral hemorrhagic fever, Pediatric

Introduction

Tachyarrhythmias are the commonest abnormality found in cardiac involvement in dengue fever during the acute phase of illness. Among those abnormalities sinus tachycardia is probably the most frequently seen phenomenon. Other commonly seen manifestations include T wave abnormalities, ST segment depressions and elevation, sinus pauses, ectopic that are either atrial or ventricular in origin, ventricular trigeminy, atrial fibrillation. Bradyarrythmias including, heart blocks such as first-degree block and Mobitz type I second-degree AV block, bundle branch blocks and rarely complete atrio-ventricular dissociation can also occur. Bradycardia is more commonly seen in defervescence and convalescence, due to parasympathetic activity[1,2]. There are few case reports of bradyarrythmias in the literature during the convalescence phase. In our case child had bradyarrythmias during acute phase of Dengue illness which, to our knowledge has not been reported in past.

Case Report

15 years old, male child was admitted (on Day 3 of illness) in the ward as a case of Dengue fever. After 6 hours of admission, child developed difficulty in breathing and restlessness. Child was transferred to Pediatric intensive care unit (PICU). On examination child had tachycardia with tachypnea, maintaining oxygen saturation 88% on room air. His Blood pressure was 120/73 mmHg with warm extremities. On auscultation there was a significant decreased air entry right side and ascitis. Child was put on Bilevel positive airway (BiPAP) support with the settings of inspiratory peak airway pressure (iPAP) of 16 cm of water and an expiratory pressure (ePAP) of 8 cm of H2O with Fi O2 of 0.5 and was continued on maintenance IV fluids. Chest Xray revealed bilateral pleural effusion Right>Left (Fig.1). Blood reports showed Hb-13.2gm/deciliter, PCV-41.5, Platelets-15,000/cu mm, TLC- 3800/cu mm, INR-2.6, SGOT-726, SGPT-415.

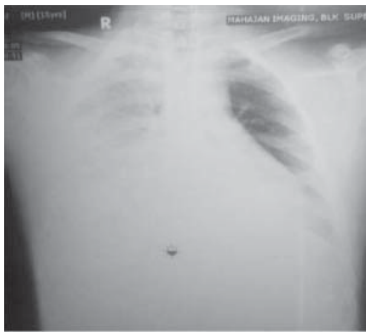

Figure 1: showing right pleural effusion chest radiograph

At 12 hours of admission, child became hemodynamically unstable on BiPAP support- 16/8. At that time we also noticed child was having marked fluctuation in his systolic BP from 60-180 mmhg along with changes in heart rate (HR) as HR would come down the Blood pressure would increase up to as high as 240 mmHg. Possibility of Hypovolemia and Dyselectrolytemia or possibly raised intracranial

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tension was considered. An Echocardiogram performed at the bedside showed normal ejection fraction with minimal pericardial effusion. ECG showed progressively increased P-R interval with 2:1 heart block (Fig.2). A cardiology consult was obtained and upon discussion with Pediatric Cardiologist it was planned to give Atropine and see the response.

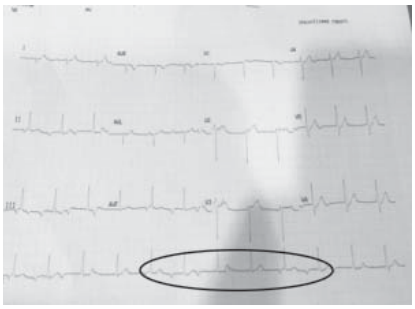

Figure 2: ECG: Progressively increased PR interval 2:1 block

After giving atropine ECG showed regular rhythm with normal P-R interval (Fig.3).

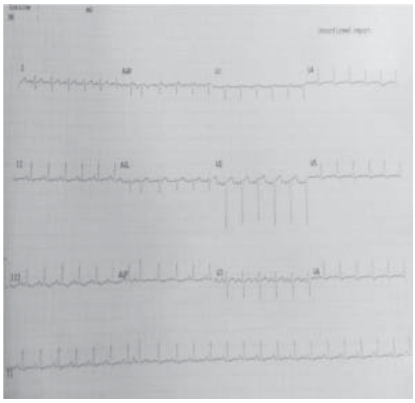

Figure 3: ECG rhythm Afteradministratin of atropine

Child had no further episodes of rhythm disturbances and he was discharged on 10th day of admission. The child has been followed up for 2 months with no symptoms related to palpitation, dizziness or respiratory distress or any other significant complaints.

Discussion

Theoretically Electrolyte imbalance (hyponatremia and hypokalemia) and myocardial inflammation in dengue can cause arrhythmias. The incidence of electrocardiographic abnormalities is somewhere in the range of 44 - 75% in cases of viral hemorrhagic fever[2]. Sinus bradycardia and prolongation of the PR interval were commonly observed, however, atrio-ventricular blocks beyond first degree are, a rare complication of dengue myocarditis. In one review by George and Lum[3] in 1997 has described varying degrees of nodal block during convalescence period in dengue patients. In our case the child had a cardiac rhythm disturbance demonstrating 2:1 heart block during the acute phase of illness (day 3 of illness) with marked fluctuation in the blood pressure . These accompanied swings in the blood pressure can be explained by the rapid shifts in the fluid which is seen during the leaky phase of disease,or possibly due to autonomic disturbances.

Bradyarrythmias may be attributed to transient functional (rather than anatomical) impairment in the autonomic tone, adenosine metabolism, or derangements in calcium storage in the infected cells[4-6]. *Salgado et al*[6] in 2010 further demonstrated the abnormalities of calcium as well as localized pathology such as minute bleedings in the areas of Sinuatrial (SA) and atrioventricular (AV) nodes may directly contribute to cardiac manifestations in pediatric patients.

AV block in an asymptomatic patient during the recovery phase of dengue fever may be benign, and careful observation alone in such a patient may suffice. *Khongphatthallayothin et al*[5] reported two cases of Mobitz type 1 second degree atrio-ventricular block during recovery from haemorrhagic dengue; both had spontaneous resolution. However, in other case series by *Donegani and Briceno et al*[7] where four children with dengue who had developed complete atrio-ventricular block, required a permanent pacemaker. In our case, the child had hemodynamic instability along with the first degree heart block but he responded to one dose of atropine with a restored hemodynamic stability and recovered completely following natural course of the disease.

Conclusion

Cardiovascular system involvement may occur as a complication during any phase of viral illness and lead to an increased morbidity and mortality. Timely interpretation of clinical parameters and electrocardiographic abnormalities will help in institution of the appropriate management and help

avoid unnecessary invasive intervention.

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