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Reverse Takotsubo Cardiomyopathy with Severe Dengue: Case Report from Pakistan.

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CASE REPORT

Reverse Takotsubo Cardiomyopathy with Severe Dengue: Case Report from Pakistan

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Abstract

Takotsubo Cardiomyopathy is an established transient cardiomyopathy found predominately in females with intense emotional and physical strain. It has four notable variants: Apical, Mid-Ventricular, Basal and Focal. Mid Ventricular variant is also referred to as Reverse Takotsubo Cardiomyopathy. Dengue is a viral arthopod-borne tropical disease endemic to Pakistan, with multiple reports of cardiovascular involvement. We report an atypical presentation of a 17 year old male, suffering from Dengue Fever, who presented to a tertiary care hospital with Reverse Takotsubo Cardiomyopathy.

Keywords: Reverse Takotsubo Cardiomyopathy, Severe dengue, Case report, Pakistan, Cardiomyopathy

1. Introduction

Dengue is a mosquito-borne viral infection that results in flu-like symptoms and a decrease in platelets for up-to 10 days. Dengue has progressively become endemic to countries like Pakistan which experience a significant period of monsoon.[1] Around 80 % of these infections are mild and self managed at home but complications may arise.[2] Cardiac associated complications of dengue fever are reported to be uncommon and almost exclusively found in severe cases.[3]

Takotsubo Cardiomyopathy, also called 'Apical Ballooning Syndrome', is a transient condition arising typically in post-menopausal females in response to intense physical or emotional stress. It has been described to mimic an acute myocardial infarction without the presence of any coronary artery obstruction.[4] Takotsubo Syndrome borrows its name from the Japanese word 'Tako-Tsubo' meaning octopus trap due to the similarity in its characteristic shape consisting of left ventricle wall abnormalities with apical ballooning and pinching at the neck. There are several different anatomical variations of this syndrome with 4 prominent ones being widely accepted and observed; Apical, Mid-Ventricular, Basal and Focal.[5] The typical 'apical ballooning' phenotype is most common. Atypical forms such as the mid-ventricular type (also referred as Reverse Takotsubo Cardiomyopathy) have been documented.[6] It is characterized by mid-ventricular hypokinesis and hyperdynamic apical and basal regions. The basal variant appears as mid-ventricular with apical hyperkinesis and basal stunning. Furthermore, in focal variations, focal wall motion patterns are observed.[7] Takotsubo Syndrome is characterized by a decreased ejection fraction along with an elevation in cardiac enzymes with nonspecific ST segment changes on ECG. This is widely attributed to an increase in catecholamine secretion. The pathogenesis is hypothesized as microvascular dysfunction and microvascular spasm or due to direct catecholamine toxicity. The symptoms typically resolve on their own without the need for treatment.[7] Although generally studied in elderly females, we report the case of a young healthy male who developed reverse takotsubo cardiomyopathy secondary to dengue fever.

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2. Case

A 17 year old male patient with no previous comorbidities presented with a 13 day history of high grade fever and productive cough. The patient also had nausea and vomiting for 7 days, followed by bilateral flank and epigastric pain for 5 days. The patient was initially treated for dengue fever (Dengue NS1 test positive) at rural health care facilities in Kashmir. The patient developed sinus bradycardia, heart rate of 37 beats per minute, with borderline blood pressures of 100/70 mmHg that was managed with Atropine and transferred to the tertiary care hospital in Islamabad. On admission, patient was afebrile with normal liver function tests, thyroid profile, Antineutrophil Cytoplasmic Antibodies (ANCA) profile and Extractable Nuclear Antigen Antibodies (ENA) profile. Further workup revealed weakly positive (Antinuclear Antibody) ANA and elevated serum creatinine of 1.5 mg/dL (0.5–1.0 mg/dL) which was presumed to be pre-renal acute kidney injury. Baseline Hemoglobin was 14.7 g/dL, White blood cell count 4350/uL, and Platelets of 140 thousand/uL. On day 2 of admission he was started on intravenous fluids and empirical antibiotics. On the 3rd day of admission, patient developed apprehension. 12 lead ECG was done along with cardiac enzymes. Cardiac enzymes were found to be elevated with Troponin I of 2610 pg/mL and CKMB 9 %, however ECG did not reveal any specific ischemic changes. Echocardiography performed on day 2 of admission was consistent with reduced LV systolic function of 35 % with mild tricuspid and pulmonary regurgitation, along with mid-ventricular ballooning and hyperdynamic apices depicting reverse takotsubo syndrome [Fig. 1]. Patient was shifted to critical care unit thereon for cardiac monitoring. He was started on guideline directed medical therapy for cardiomyopathy.

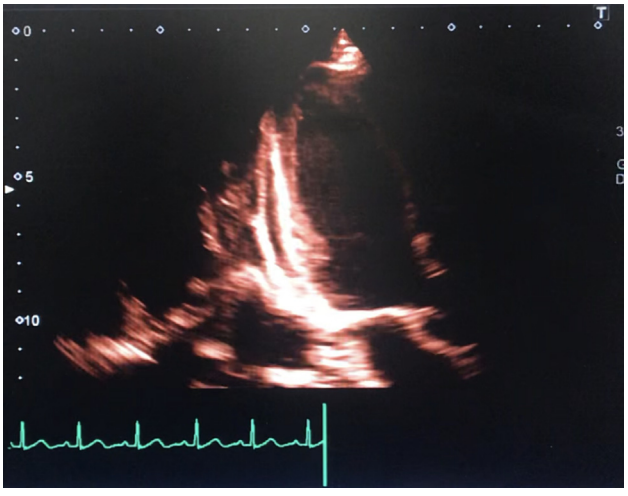

Fig. 1. Image from Echocardiogram showing mid-ventricular ballooning.

During his stay in critical care unit the patient developed sinus bradycardia (heart rate ranging between 40 and 60 beats per minute, which did not require Atropine) with hypotension. Hypotension was largely attributed to hypovolemia, which resolved with careful intravenous fluid resuscitation. IV fluids were discontinued after adequate oral intake was established. Bradycardia improved sequentially.

Repeat echocardiography was performed after 72 h which revealed same ejection fraction as before. Patients blood and urine culture were sent to the lab and revealed no microbial growth. At the time of discharge patient was hemodynamically stable and afebrile. His cardiac enzymes had improved with Troponin I down to 862 pg/mL and CKMB 3.4 %. Labs revealed improved serum creatinine of 1.25 mg/dL. His bradycardia had fully resolved and he was discharged with a plan for follow up echocardiography after 5 days. Discharge medications included Valsartan tablet 40 mg once daily (OD), Aspirin 75 mg tablet OD and a multivitamin tablet 22.5 mg OD all to be taken orally for a month.

Furthermore, he was found to be Vitamin D deficient (Vit D levels 6 ng/mL – Normal range 20–50 ng/mL), therefore a Vitamin-D3 cholecalciferol tablet once daily was added to his prescription. For persistent dyspepsia Tablet Omeprazole 40 mg tablet OD was also prescribed to be taken orally for 14 days. Tablet Valsartan 40 mg and tablet Aspirin 75 mg were continued on once daily dosage. On follow up 5 days after discharge repeat echocardiography showed complete reversion to normal left ventricle function and improvement of ejection fraction to 60 %.

3. Discussion

Dengue Fever has become more prevalent in Pakistan due to recent flooding and worsening climate crisis. WHO reported an incidence of 25,932 confirmed dengue cases and 62 deaths nation-wide between 1st January to 27th September 2022.[8] These high numbers identify the elevated risk of fatality and mortality of a benign infection.

Dengue fever has been associated with multiple systemic manifestations including renal damage, neurological involvement, lymphadenopathy, liver damage, respiratory distress.[9] It has also been proven to have significant cardiac involvement in severe cases ranging from hypotension and bradycardia to much rarer forms such as cardiomyopathies.[3] The burden of these systemic complications has grown

with rarer presentations now being observed in clinics. One of these extremely rare presentations is dengue associated Takotsubo cardiomyopathy with research and studies reporting over 80 % of the Takotsubo syndrome patients being post-menopausal women.[10] Our case presentation of a young male is unique especially with a rare atypical form of the disease. With supportive treatment and an angiotensin receptor blocker, Valsartan, the patient showed exceptional recovery with all changes reverting back to normal within 2 weeks. The ejection fraction improved to 60 % from previous 35 %, demonstrating a good prognosis in males inflicted with takotsubo cardiomyopathy secondary to dengue fever. On extensive literature research, we found an incident regarding Takotsubo Syndrome in a Sri Lankan female with Dengue Fever.[11] A similar case was reported in a 72 year old female from Taiwan.,[12] however Reverse Takotsubo has not been reported. Current literature on the disease especially in Asian countries has been limited with more literature on cardiomyopathies, myocarditis and cardiogenic shock.[13] Hence, we report a good prognosis in managing dengue fever induced reverse takotsubo cardiomyopathy in young males in Pakistan.

4. Conclusion

We report a rare presentation of cardiac involvement with Dengue Fever. Our patient was of pediatric population, with no known prior co-morbids, and of male gender. He was found to have Reverse Takotsubo Cardiomyopathy, an atypical variant. He recovered from this viral illness and his ejection fraction returned to 60%. We therefore encourage our fellow clinicians to remain vigilant with rare cardiac presentations especially in males in Dengue endemic countries.

Disclaimer

This case report has not been submitted to any other journal, and/or presented at a conference or meeting.

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Conflicts of interest

The authors of this article have no conflicts of interest with the subject matter.

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