Case Report

Concomitant Takotsubo Cardiomyopathy with PRES Syndrome: A Coincidence or a Real Heart-Brain Connection?

Yadav D1*, Garg L1, Narwal P1, Ladkany R1 and Franey L2

1Department of Internal Medicine, Beaumont Health System, USA
2Department of Cardiovascular Medicine, Oakland University William Beaumont School of Medicine, USA

Abstract

Takotsubo cardiomyopathy is a clinical entity characterized by ventricular dysfunction in the absence of obstructive coronary artery disease. Posterior reversible encephalopathy syndrome is another rare clinical syndrome characterized by reversible neurological symptoms. Concomitant occurrence is being increasingly reported leading to credence to hypothesis of “heart brain connection”. We present a case of 60 year old female admitted for neurological symptoms that developed Takotsubo cardiomyopathy within 24 hours of admission.

INTRODUCTION

Takotsubo cardiomyopathy, also known as Apical Ballooning Syndrome (ABS) is characterized by reversible left ventricular dysfunction commonly associated with a stressful triggering factor. Catecholamine excess and increased sympathetic tone has been speculated to be the cause of these changes in the heart. Similar mechanism in the brain could produce another recently recognized condition known as Posterior Reversible Encephalopathy Syndrome (PRES).

CASE PRESENTATION

A 60 year old female with chronic back pain presented to our hospital with sudden onset bilateral vision loss. The night before, her dog of 16 years was put to sleep causing significant emotional stress. She also reported multiple other recent stressors including financial hardship and job loss. Her vision loss was associated with a bifrontal stabbing headache, nausea and multiple episodes of vomiting. She denied any focal weakness but admitted to having paresthesias in the extremities. The patient denied history of similar episodes in the past. She did not have eye redness, trauma, tearing or conjunctival injection. She did not have history of coronary artery disease, stroke, transient ischemic attack or hypertension.

On initial evaluation, the patient was complaining of diffuse pain and was very restless and anxious. Blood pressure was 165/94 with a heart rate of 101 and temperature of 100.9 F rectal. On head and neck examination, her pupils were round and reactive with intermittent bilateral horizontal nystagmus. Ophthalmologic examination could be not completed because of poor cooperation. Eye pressures were normal bilaterally. Non-organic vision loss was suspected in the initial evaluation, although we were unable to assess visual acuity. Examination of the chest and abdomen was unremarkable. Neurological examination did not reveal focal motor or sensory deficits.

On initial presentation, a complete blood count showed leukocytosis with a white blood cell count of 19.1 bil/ L with normal hemoglobin and platelet counts. A chemistry panel revealed mild hypokalemia with normal renal and hepatic function. Urine drug screen was negative for illicit substance. Initial troponin-I was <0.03 ng/ ml and ECG showed normal sinus rhythm. A CT scan of head did not show an acute intracranial process. The patient was admitted with the provisional diagnosis of a CNS infection and was started on empiric antibiotics for meningitis. Conversion disorder was also considered given her recent stresses. An MRI of the brain showed vasogenic edema involving bilateral posterior frontal and parietal lobes with a tiny area of restriction diffusion involving bilateral posterior parietal lobes (Figure 1). These findings were suggestive of PRES. A brain MRA was unremarkable. Blood pressure was well controlled with beta blocker and ACE I.

On the night of admission, the patient reported chest discomfort. Her repeat troponin was found to be elevated at 18 ng/ml. A subsequent ECG showed ST depression in V2 and V3 with ST elevation in the inferior leads (Figure 2). An infero-posterior STEMI was considered and patient was started on intravenous heparin, statin, aspirin along with Angiotensin Converting Enzyme inhibitors.

Clinical course

Patient’s neurologic symptoms slowly began to resolve with improved blood pressure. 24 hours later, her vision had improved and she could make out faces and shapes. She was able to read large letters and numbers and count fingers; visual fields were full to threat bilaterally. Results from lumbar puncture ruled out meningitis and antibiotics were stopped.

Subsequent ECGs during her hospital stay improved with the resolution of ST depression and elevation. Her troponin was trending down and she continued to improve clinically. MRI of the heart was done after a few days to confirm Takotsubo which showed normal left ventricular systolic function with basal and mid inferior and inferolateral wall hypokinesis. There was no evidence of delayed enhancement to suggest prior myocardial infarction or fibrosis. She has been seen by the cardiology service since her discharge and has been doing well from a cardiac perspective and has no residual neurological deficits.

DISCUSSION

Takotsubo cardiomyopathy accounts for approximately 2% of all acute coronary syndromes and presents with chest pain, ST segment elevation and elevated cardiac biomarkers in absence of obstructive coronary artery disease [1-3]. In “typical” apical ballooning syndrome, cardiac wall motion abnormalities are seen in the mid and apical segments of left ventricle with hypokinesia of basal wall. Reverse Takotsubo is a rare variant, characterized by transient dysfunction of mid segment of left ventricle with sparing of the apical portion [4]. Takotsubo cardiomyopathy is usually associated with favorable outcomes and complete recovery in most cases [3]. Postmenopausal women are disproportionately affected with more than 80% of cases in that group. The majority of these patients report preceding emotional or physical stressors.
PRES is another rare clinical syndrome characterized by headache, seizures, altered mental status and has typical findings of vasogenic edema involving the posterior regions of brain on neuroimaging [5,6]. Most cases have been associated with hypertensive encephalopathy, eclampsia, renal disease, vasculitis, electrolyte abnormalities, and immunosuppressive agents [6]. Interestingly it is found to be more frequent in post menopausal women similar to Takotsubo syndrome.

Both of the above discussed medical disorders are more common in postmenopausal women and have been associated with good prognosis with supportive management. Vasogenic edema, noted as hyper intensity on T2 weighted MRI is characteristic of PRES [7]. Likewise, Takotsubo has been associated with myocardial edema on cardiac MRI [8]. The pathophysiology of these two medical conditions has been poorly explained. Earlier studies have shown elevated circulating catecholamine levels in patients with Takotsubo that may cause direct myocardial injury [9]. Similarly, increased sympathetic tone which controls normal cerebral flow may contribute to PRES. In brief, autonomic and endovascular dysfunction may be the central mechanism contributing to both PRES and Takotsubo [10].

The presence of these two uncommon, apparently distinct abnormalities in the same patients lends credence to the theory of “heart brain connection” [11]. Both of these disorders may have common pathophysiology and precipitating factors which needs to be further explored.

REFERENCES
8. Abdell-Aty H, Cocker M, Friedrich MG. Myocardial edema is a feature of Tako-Tsubo cardiomyopathy and is related to the severity of systolic...

