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Recurrent stress induced cardiomyopathy

***Corresponding Author: Karolina Viquez Beita**
Internal Medicine, Indiana University, USA.
Email: kviquezbe@iuhealth.org

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Abstract

Stress induced cardiomyopathy presents as acute heart failure syndrome often related to preceding emotional or physical stressful events. This condition is reversible and considered benign although in some cases the event can be severe developing complications such shock, arrhythmias and death [1]. The risk of recurrence is 2-4% per year; no clear patterns for recurrence have been identified yet. Here we present a 59-year-old Female with a recurrence of stress cardiomyopathy.

Introduction

Stress-induced cardiomyopathy is a reversible condition that leads to Heart Failure (HF) following a physical or emotional stressful event. Although the condition is typically benign and ventricular function often recovers within weeks to months, some cases can result in life-threatening complications [1,2]. Identified risk factors include female sex, diabetes, and asthma. Treatment is primarily supportive. For patients experiencing HF, guided medical therapy with beta blockers (BB) and angiotensin-converting enzyme (ACE) inhibitors, or alternatively angiotensin II receptor blockers (ARBs), are recommended [3]. Recurrence is relatively common, but identifying individuals at higher risk remains challenging. There is some evidence suggesting that maintaining patients on guided medical therapy after recovery may reduce the risk of recurrence, though the data is inconclusive [4-9].

Case presentation

A 59-year-old female, past medical history of hypothyroidism, coronary artery disease, hypertension and stress induced cardiomyopathy 6 years ago, presents to the hospital with chest pain. During her last event of stress induced cardiomyopathy, the patient's ejection fraction (EF) was 40%, no complications were present, she was started on beta blocker (BB) but developed hypotension and bradycardia then medication had to be discontinued. At 3 months follow up, her EF was 57%. Patient mentions she has been under a lot of stress since a family member passed away 3 days ago. On admission vitals showing blood pressure 100/83 mmHg, heart rate 102 bpm. Work up showing hemoglobin 11.4 g/dl, troponin 550 ng/L. ECG showing less than 1 mm ST segment elevation in leads I, 2 aVL, no reciprocal changes. Chest Xray unremarkable. Echocardiogram done showing left ventricular systolic function reduced at 43%, apex, mid inferoseptal, and mid anterolateral wall akinesis. Patient was started on metoprolol succinate 12.5 mg/daily, unfortunately given low blood pressure the dose of beta blocker could not be up titrated. The patient was discharged home with a plan to follow up with cardiology.

Discussion

Stress cardiomyopathy is characterized by an acute and transient left ventricular (LV) dysfunction often related to an emotional or physical stressful event in the preceding 1-5 days [1]. The precise mechanisms underlying stress cardiomyopathy remain uncertain. However, it is believed that an overactivation of the sympathetic nervous system, accompanied by elevated catecholamine levels, initiates an interleukin cascade, ultimately leading to endothelial damage [2]. The incidence of this syndrome has been increasing in recent years, and this is thought to be due to an increased awareness of the disease. Recurrences of stress cardiomyopathy are relatively common, occurring at a rate of 2-4% annually and up to 20% over a decade [3]. Even after the LV function returns to normal, patients may still experience persistent long-term symptoms, including fatigue, exercise intolerance, shortness of breath, chest pain and palpitations, contrary to earlier descriptions. In patients with stress cardiomyopathy, the LV function typically normalizes within a few weeks. However, various complications can arise before systolic function recovers such as acute heart failure, cardiogenic shock, LV outflow tract obstruction, arrhythmias, systemic

thromboembolism, and intramyocardial hemorrhage or rupture [1]. Risk factors for developing this syndrome include being a female of menopausal age, experiencing intense physical or emotional stress, and having conditions such as asthma, diabetes, or cannabis use. Researchers have been working to identify patients at higher risk for recurrence, with the goal of implementing prolonged follow-up strategies. However, no clear baseline characteristics have been linked to recurrence thus far [1,4]. Conservative treatment and resolution of the emotional/physical stress results is resolution of symptoms but when there are complications such as Heart Failure (HF), shock or thrombosis, more invasive therapy is needed [1,5]. It is crucial to distinguish between shock with Left Ventricular Outflow Track Obstruction (LVOT) and shock without LVOT as volume depletion and vasodilator therapy should be avoided in cases involving LVOT [6]. Patients with HF with reduced ejection fraction who are hemodynamically stable are treated with standard medications for HF including BB, ACE inhibitors/ARB and diuretics as necessary to treat volume overload [5-7]. These medications are continued usually until the systolic function recovers. Some authors recommend continuing BB therapy indefinitely in the absence of contraindications or intolerance with the aim to reduce the chance of future recurrences, although the data is conflicting [8-10]. After discharge from the hospital, patients should have a close follow up cardiology, and serial echocardiograms should be performed to confirm the resolution of the cardiomyopathy.

Conclusion

In conclusion, stress cardiomyopathy is a complex and often underrecognized condition marked by transient LV dysfunction, typically following emotional or physical stress. While recovery of systolic function is common within weeks, significant complications can occur, and lingering symptoms may persist. Management ranges from conservative therapy to more intensive interventions in severe cases, with a focus on differentiating clinical scenarios such as shock with or without LVOT obstruction. Long-term follow-up, including cardiology assessment and serial imaging, is essential, particularly given the risk of recurrence and the need to monitor recovery and guide ongoing therapy.

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