EPINEPHRINE-INDUCED TAKOTSUBO ASSOCIATED WITH EMERGENT TREATMENT OF CHRONIC IDOPATHIC URTICARIA

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Introduction

Epinephrine is used widely in patients with Chronic Idiopathic Urticaria (CIU) to treat anaphylaxis. Here is a presentation of Takotsubo Cardiomyopathy resulting as a consequence of epinephrine treatment for anaphylaxis-related CIU.

Case Description

- 23-year-old female presented to the Emergency Department (ED) with symptoms of dyspnea and urticaria.
- Patient has history of Chronic Idiopathic Urticaria- CIU
- Prior to arrival, patient self-administered epinephrine without improvement.
- In the ED, she inadvertently received intravenous epinephrine 0.3mg, 3 times the recommended intramuscular dose. She immediately complained of chest tightness and increased dyspnea. Electrocardiogram revealed lateral wall ST elevation. Troponin I was elevated as well. Treatment with IV Lorazepam and sublingual nitroglycerin resulted in rapid improvement of symptoms, along with resolution of electrocardiogram changes.
- Admission transthoracic echocardiogram demonstrated a globally hypokinetic left ventricle (LV), particularly involving the apex, with ejection fraction 30-35%.
- Given history of Marfan's disease and IV contrast allergy, Risk for coronary angiography was felt to be greater than benefit
- She was started on 3.125mg oral carvedilol twice daily.
- Repeat echocardiogram demonstrated improved LV function with EF 50-55%. Clinical picture was consistent with Takotsubo Cardiomyopathy.
- She was discharged on carvedilol with recommendation to follow up with Allergist/Immunology to discuss treatment with Omalizumab.

Data

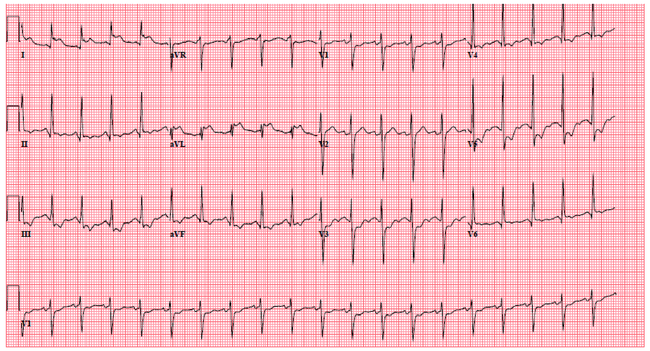

Figure 1: EKG performed after IV Epinephrine was given and patient became symptomatic. EKG conveys ST changes in Leads I, V3, V4, V5.

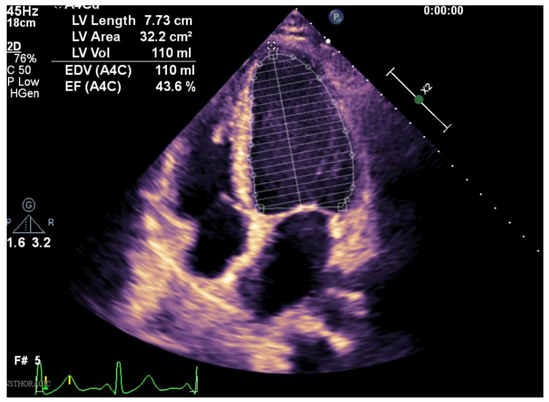

Figure 2: Normal wall thickness, Cavity is mildly dilated. Mod-Severely decreased ejection fraction at 30-35%. Abnormal Septal motion. Globally hypokinetic LV with dyskinetic IVS. This was performed on the day of admission.

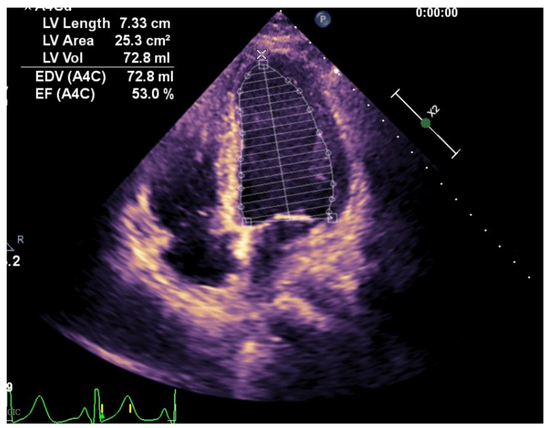

Figure 3: (Limited Study) Normal cavity size and wall thickness. Normal ejection fraction, EF 50-55%. This was performed on the day of discharge. C

Discussion

- Stress Cardiomyopathy is characterized by dysfunction of left ventricle apical ballooning. Pathogenesis not well understood, however some theories on its mechanisms include release of catecholamine, or coronary artery spasm.
- Clinical manifestations include ST changes on EKG, elevated cardiac biomarkers, and elevated BNP. Echocardiography findings include apical ballooning, hyperkinesis of basal walls, and reduced ejection fraction. It is also imperative to exclude coronary artery disease with angiography.
- Diagnostic criteria includes the presence of the following: LV dysfunction, absence of coronary disease, EKG abnormalities in ST segment or T wave, and absence of pheochromocytoma or myocarditis.
- There have been no randomized clinical trials to define the optimal treatment of stress cardiomyopathy in patients not presenting with shock. Inadequate number of studies address the risk/benefits of ACE/ARB or beta blockade therapy in these patients.
- In this case study, patient was given carvedilol in treatment of her stress cardiomyopathy, however it is also important to factor in the timing of decrease in level of catecholamines given from the epinephrine injection.
- Uncertainty remains whether treatment with beta blockade or reductions in catecholamine concentrations is the cause of clinical improvement [1][2].

Conclusion

This case illustrates the potential complication of Takotsubo Cardiomyopathy in patients with CIU exposed to epinephrine during emergent episodes, particularly when given in supra-therapeutic doses. Patients with CIU, who may require multiple therapeutic doses at short intervals, warrant close monitoring for this complication.

References

1. "Clinical Manifestations and Diagnosis of Stress (Takotsubo) Cardiomyopathy." UpToDate, www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-stress-takotsubo-cardiomyopathy?search=takotsubo%2Bcardiomyopathy&source=search_result&selectedTitle=1~92&usage_type=default&display_rank=1.

2. "Management and Prognosis of Stress (Takotsubo) Cardiomyopathy." *UpToDate*, www.uptodate.com/contents/management-and-prognosis-of-stress-takotsubo-cardiomyopathysearch=takotsubo%2Bcardiomyopathy%2Btreatment&source=search_result&selectedTitle=1~92&usage_type=default&display_rank=1.