

Insecticide Induced Takotsubo Cardiomyopathy

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Citation

H Enuh, R Rajah, B Gala, J Nfonoyim. *Insecticide Induced Takotsubo Cardiomyopathy*. The Internet Journal of Cardiology. 2013 Volume 11 Number 1.

Abstract

Takotsubo cardiomyopathy is a transient syndrome that has been rarely reported as a cause of chest pain, elevated cardiac enzymes and ST elevations mimicking acute coronary syndrome with no coronary artery stenosis. It commonly occurs in post-menopausal women due to elevated catecholamines, mainly from intense emotions or stress. Only one case of insecticide induced takotsubo cardiomyopathy from a suicide attempt has been documented. However, we present this very rare case of takotsubo cardiomyopathy from use of an insecticide spray in a post-menopausal woman with no identifiable acute emotional or physical stress.

INTRODUCTION

Takotsubo cardiomyopathy is a transient syndrome that has been rarely reported as a cause of chest pain, elevated cardiac enzymes and ST elevations mimicking acute coronary syndrome with no coronary artery stenosis. It commonly occurs in post-menopausal women due to elevated catecholamines, mainly from intense emotions or stress. Only one case of insecticide induced takotsubo cardiomyopathy from a suicide attempt has been documented. However, we present this very rare case of takotsubo cardiomyopathy from use of an insecticide spray in a post-menopausal woman with no identifiable acute emotional or physical stress.

CASE SUMMARY

A 72 year old Caucasian woman presented to the emergency room because of persistent, atraumatic, non-radiating, non-pleuritic left sided chest pressure with no relieving or aggravating factors. There was associated dyspnea. The pain started few minutes after the use of a roach fumigator (containing pyrethroid) in an enclosed space. She did not leave the room after spraying the insecticide. She did not report any significant emotional stress, cocaine use or unusual exercise prior to the symptom. She is a non-smoker and occasional drinker.

Her past medical history was significant hypertension and type II diabetic mellitus for which she was taking ramipril and metformin. Examination revealed an elderly woman in moderate distress due to pain. She was afebrile with a respiratory rate of 20 per minute, oxygen saturation of 100%

on room air, a regular pulse at a rate of 76 beats per minute and blood pressure of 126/73 mmHg. There was no chest wall tenderness. The rest of physical examination was within normal limits.

Laboratory work-up revealed hemoglobin of 12.2g/dl, hematocrit 37.1g/dl and white count $9.1 \times 10^9/L$ with a normal differential. Basic metabolic profile and lipid profile were within normal limits except for bicarbonate of 21.3meq/L and blood urea nitrogen 21.3mg/dl. Initial troponin was 4.37 ng/ml, which peaked to 5.53ng/ml and gradually trended down. The total creatine kinase was 197mg/dl, with a MB fraction of 14.37 ng/ml.

Electrocardiogram showed sinus rhythm with ventricular rate of 78 beats per minute and septal infarct (figure 1). Transthoracic echocardiogram showed hypokinesis of the apical, mid-distal and anterior segments with an estimated left ventricular ejection fraction of 35 to 40%. A tentative diagnosis of non ST elevation myocardial infarction (NSTEMI) was made and patient was treated with oxygen, nitroglycerine, aspirin, clopidogrel, low molecular heparin, metoprolol and ramipril. Her chest pain subsided and she had coronary angiogram thereafter, which revealed no epicardial artery stenosis or evidence of plaque rupture (figure 3,4,5). Left ventriculogram (figure 2) revealed hypokinesis and ballooning of the anteroapical segments with reduced ejection fraction of 35% and hyperdynamic basal segments, a picture consistent with takotsubo cardiomyopathy. Heparin and clopidogrel were discontinued. The patient was observed for 48 hours and safely discharged home with appropriate medications. A

repeat echocardiogram after eight weeks showed significant improvement of the ejection fraction and resolution of the anteroapical ballooning.

Figure 1

EKG showing septal infarct

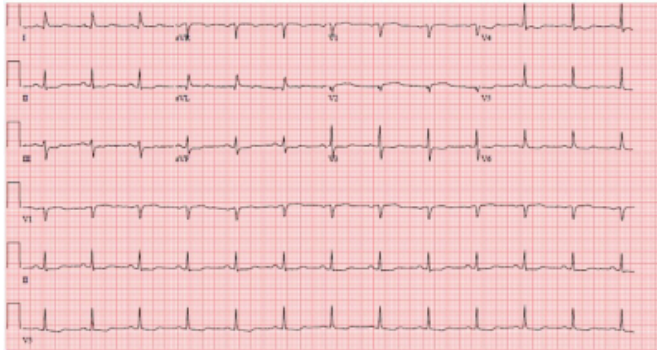


Figure 2

Ventriculograms showing hypokinesis and ballooning of the anteroapical segments.

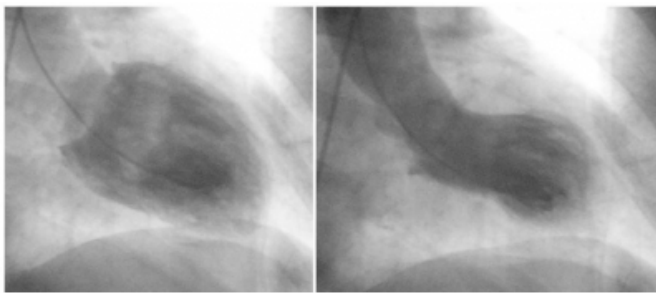


Figure 3

Showing normal left circumflex coronary artery



Figure 4

showing normal right coronary artery

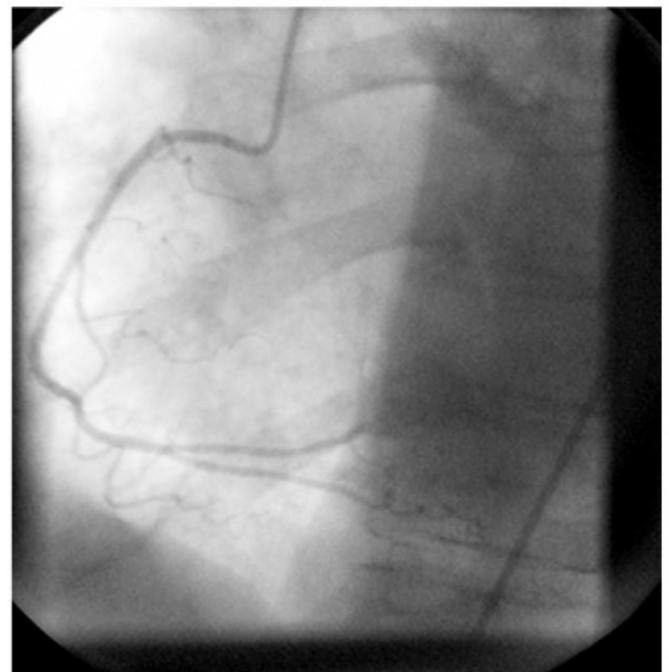
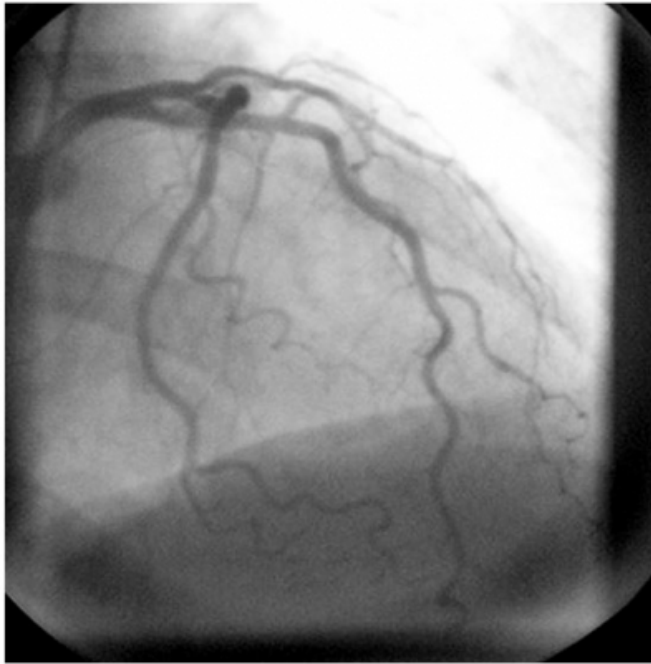


Figure 5

showing normal left anterior descending artery



DISCUSSION

Takotsubo cardiomyopathy accounts for 1 to 2 % of all cases presenting with suspected acute coronary syndrome¹. It has been referred to by many different names including apical ballooning syndrome, stress cardiomyopathy and broken heart syndrome, probably because of the paucity of information on the pathogenesis of this transient disease. The most postulated mechanism is catecholamine excess from any cause of stress². The higher density of beta

adrenergic receptors at the left ventricular apex may account for the sensitivity to catecholamine and predominant involvement in takotsubo cardiomyopathy³. Insecticides have different components in various proportions. The most popular ones have pyrethroid and/or organophosphates. A study in rats showed an increased catecholamine as the mechanism of pyrethroid toxicity⁴. In humans, one case of takotsubo cardiomyopathy from ingestion of cypermethrin (a synthetic pyrethroid) containing insecticide in a suicide attempt⁵ has been reported. Our patient presented after using a roach fumigator with similar contents. She had remained indoors after spraying. It is most likely that the product was inhaled. Takotsubo cardiomyopathy has an excellent prognosis as also seen in our patient with complete resolution. About 95% of patients experience complete recovery within 4–8 weeks. However, life threatening complications have been reported such as heart failure, cardiogenic shock, mitral regurgitation, ventricular arrhythmia, left ventricular mural thrombus formation, left ventricular free-wall rupture, and even sudden cardiac death⁶.

Insecticide induced takotsubo cardiomyopathy should also be entertained as a possible root cause of acute chest syndrome, but should not delay the implementation of chest pain treatment algorithm considering its rarity. People and domestic animals should not stay indoors during spraying of insecticides.

References

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