



## Reversible cardiomyopathy in scorpion sting-a case report

### KEYWORDS

scorpion sting, antiscorpion serum, myocarditis, cardiomyopathy.

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**ABSTRACT** Scorpion envenomation is an important public health hazard in tropical and sub-tropical regions. Envenomation by scorpions can result in a wide range of clinical effects, including, cardio toxicity, neurotoxicity and respiratory dysfunction. Out of 1500 scorpion species known to exist, about 30 are of medical importance. (1) Although a variety of different scorpion species exist, majority of them produce similar cardiovascular effect. Scorpion envenoming syndrome results in severe autonomic storm with massive release of catecholamines, increased levels of angiotensin2, and increase in glucagon, cortisol, thyroid hormones; either suppressed insulin levels or hyperinsulinemia (insulin resistance), hyperglycemia: increased circulating free fatty acid level. These hormonal alterations could be responsible for the pathogenesis of variety of clinical manifestation. Under these condition scorpion sting with myocardial damage, cardiovascular disturbances, peripheral circulatory failure, respiratory and cardiac pulmonary edema, and many other clinical manifestations, result in a syndrome of fuel energy deficits and inability to use the existing metabolic substrate by vital organs causing multisystem organ failures and death. Here we report a case of reversible cardiomyopathy due to scorpion sting induced myocarditis.

### INTRODUCTION

Scorpion sting are common in our country, particularly in the rural areas. Among 86 species of scorpions present in India, *Mesobuthus tumulus* (Indian red scorpion) and *Heterometrus swammerdami* are of medical importance. Though local symptoms including severe pain and burning sensation at the site of sting are the most common manifestations, systemic complications can ensue. Cardiovascular manifestations are particularly prominent following stings by Indian red scorpion. Such bites infrequently have serious clinical sequel, including myocardial infarction, acute pulmonary edema, cardiogenic shock and even death. (2)

### CASE REPORT

A 22 yr old male, was brought to emergency room with history of scorpion sting on the 2<sup>nd</sup> toe of left foot. The killed scorpion was not available for identification. Patient presented to the emergency department 3 hrs later. He complained of pain at the bite site, breathlessness, profuse sweating, vomiting, and increased salivation. His vitals were pulse -137/min, BP- 90/70mmHg and respiratory rate of 38/min. ECG showed sinus tachycardia and nonspecific ST-T changes. Suspecting myocarditis patient was advised 2D-ECHO. The ECHO findings were global hypokinesia, severe left ventricular dysfunction with an ejection fraction of 25%. He was immediately started on dopamine and dobutamine infusion and anti scorpion venom was given. Laboratory test showed elevated SGOT,SGPT,CPK,MBPK ratio .Hb% level also increased to 18mg/dl with increase MCHC and PCV.Blood sugar found to be 240mg/dl.There is also leucocytosis with TLC 25000/cumm.Ten ml of sterile water for injection was used for reconstitution of one vial of antiscorpion serum.Antiscorpion serum test dose was given. Patient was observed for hypersensitivity to antiscorpion serum for 15 minutes. Three ml of reconstituted antiscorpion serum is injected intramuscularly every 15 minute and the content in one antiscorpion serum vial is given in an hour. Patient was assessed clinically again after administration of one vial of antiscorpion serum.

As clinical severity was not noticed, so stopped with first vial injection of antiscorpion serum. Drugs like atropine, cardiac glycoside, diuretics glucocorticoids, beta-blocker ,ACE inhibitors are avoided as because these drugs of no use and may do more harm.(3)With treatment the patient improved with in 3 days and his review 2D-ECHO showed only mild left ventricular dysfunction with an ejection fraction of about 45%.

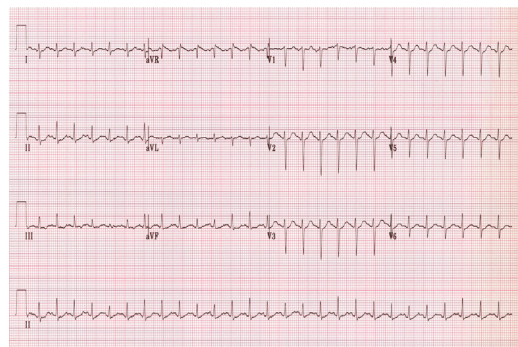


Fig1.ECG shows feature of sinus tachycardia with nonspecific ST-T changes.

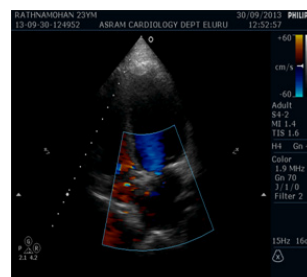


Fig2 echo show global hypokinesia

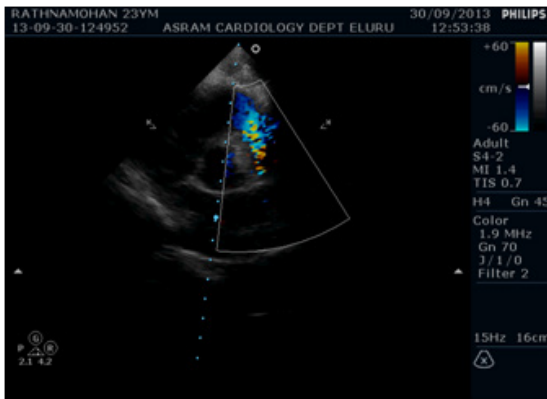


fig3 echo show severe LVdysfunction

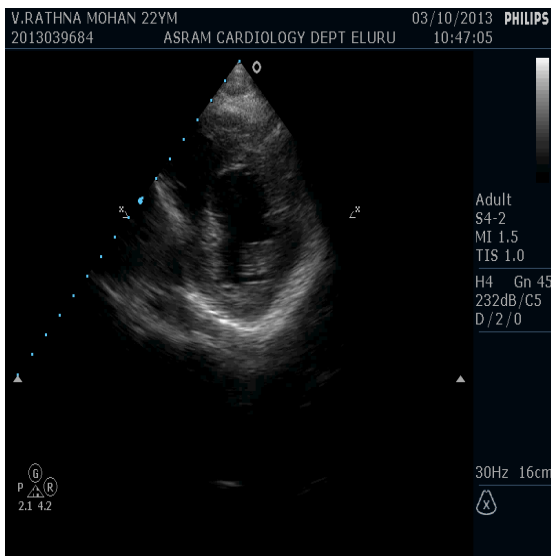


Fig4 echo show mild LV dysfunction.

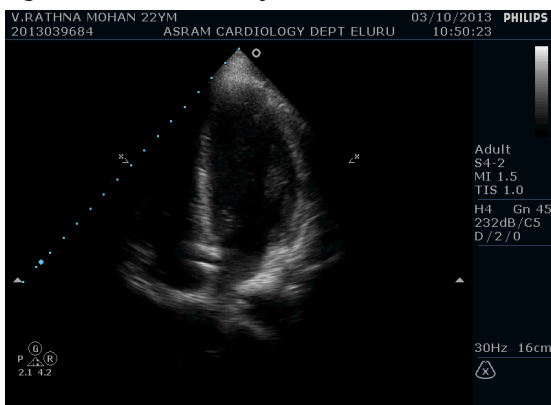


Fig5 echo show normal chambers

## DISCUSSION

The scorpion venom is a water soluble antigenic complex mixture of neurotoxin, cardio toxin, nephrotoxin, hemolysins, phosphodiesterases, phospholipase, hyaluronidases, histamine and other chemicals. The venom can cause myocardial damage by several pathogenetic mechanisms: Myocardial ischemia by coronary spasm, release of vasoactive, inflammatory and thrombogenic peptides and amine constituents (histamine, serotonin, bradykinin, leukotrienes, thromboxane), which act on the coronary vasculature and induce coronary artery vasospasm and facilitate platelet aggregation as well as thrombosis. Direct cardio toxic effect of the venom causing toxic myocarditis by reduction of Na-K-ATPase and adrenergic myocarditis by releasing adrenaline and noradrenaline from neurons, ganglia and adrenals, thereby increasing myocardial oxygen demand by direct inotropic and chronotropic effect on already compromised myocardial blood supply.(4) Anaphylactic reaction, due to release of allergenic proteins causes anaphylactic shock leading to hypotension with vasodilation and decreased of intravascular volume with reduced myocardial perfusion. Scorpion venom inhibits angiotensin converting enzyme (ACE), resulting in accumulation of bradykinin, which is implicated in the development of pulmonary edema. On basis of clinical manifestations at the time of arrival to hospital and according to severity they are graded in 4 grades.

Grade 1: severe excruciating local pain at the sting site radiating along with corresponding dermatomes, mild local oedema with seating at the sting site, without systemic involvement.

Grade 2: signs and symptoms of autonomic storm characterized by acetyl choline excess or parasympathetic stimulation and sympathetic stimulation

Grade 3: cold extremities, tachycardia, and hypotension or hypertension with pulmonary edema (respiratory rate > 24 per minute, basal rales or crackles in lungs).

Grade 4: tachycardia, hypotension with or without pulmonary edema with warm extremities (warm shock) (6)

## CONCLUSION

Cardiomyopathy due to myocarditis developing following scorpion sting can threaten life due to left ventricular systolic dysfunction. This consequence has been attributed to increased catecholaminergic activity or direct effect of toxin to myocardial fibers. ECG must be performed, cardiac enzymes must be monitored and echocardiography must be done to evaluate cardiac involvement in cases suffering from such bites. Severe cases must be taken to the intensive care unit in order to monitor respiratory and circulatory systems. (5) As there was no evidence of coronary vascular, insufficiency, this was most probably due to a direct toxic effect of the scorpion venom on the myocardium or secondary to venom-induced catecholamine release from the adrenals or sympathetic nerve endings.(7)

## REFERENCE

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