

Myocarditis and Mobitz Type I Heart Block Following Wasp Sting

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Citation

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Abstract

Hymenoptera sting envenomation has been associated with a variety of allergic and systemic reactions involving many organs, rarely the heart. Though many theories have been proposed to explain the systemic reactions, the exact mechanism of etiopathogenesis of wasp venom in causing various organ disorders remains unknown. Very few cases have been reported wherein the wasp venom has been implicated in cardiac disorders. We hereby report a case of myocarditis following multiple wasp stings.

INTRODUCTION

The females and not males, insects belonging to the order Hymenoptera such as wasps and bees can sting. They have a characteristic feature that they assign individuals in the colony who aggressively defend their flocks by pouring their toxic venom through stinging, which may lead to morbidity and occasionally mortality¹ of the victim.

Wasps are commonly found in many countries including Nepal. Victims of their bite have been reported from various parts of the world. We have come across a rare manifestation of myocarditis and heart block in a young and healthy patient following multiple wasp sting envenomation.

CASE REPORT

A 25 year old male was referred to our tertiary care hospital with history of multiple wasp stings (40-50) all over the body, followed by pain at the site of stings, swelling of the limbs and passing of red coloured urine.

At the time of admission his pulse was 64/min, blood pressure was 160/120 mmHg and no other systemic abnormality was found on physical examination. His laboratory investigations at the time of admission revealed Hemoglobin- 15.4 gm/dl, WBC-15.8x10³/cu.mm, Differential Count showed Neutrophils-89% and Lymphocytes-11%. His biochemical parameters were as follows: Creatinine kinase (Total CK) – 17000 U/L, CK-MB – 27 U/L, Total protein – 5.3 g/dl, Albumin – 3.0 g/dl, Total bilirubin – 1.0 mg/dl, Direct Bilirubin – 0.4 mg/dl, Indirect bilirubin – 0.6 mg/dl, Aspartate transaminase (AST) – 1160

U/L, Alanine transaminase (ALT) – 820 U/L, Alkaline phosphatase (ALP) – 166 U/L, Calcium – 9.6 mg/dl and Phosphorous – 3.3 mg/dl. The urine examination revealed amorphous urate crystals with urine protein more than 2000 mg/day (qualitative dip stick method).

A preliminary diagnosis of rhabdomyolysis following wasp sting was made and patient was shifted to intensive care unit (ICU). Electrocardiogram done on arrival at ICU did not reveal any abnormality. He was treated symptomatically and was closely monitored. On 4th day following wasp stings his liver function tests were as follows: Total protein – 6.5 g/dl, Albumin – 4.0 g/dl, Total Bilirubin – 2.4 mg/dl, Direct bilirubin – 0.6 mg/dl, Indirect bilirubin – 1.8 mg/dl, AST – 394 U/L, ALT – 194 U/L, ALP – 199 U/L. On the same day, the patient developed transient bradycardia and Mobitz type I heart block (Fig 1). His Total CK and CK-MB levels were 49930 U/L and 590 U/L respectively. A diagnosis of myocarditis was made and the patient was closely monitored. Echocardiogram showed a decrease in ejection fraction (EF: 45%)

During the course of the hospitalization the patients renal function parameters were deteriorating and hence the patient was taken up for hemodialysis. The findings of serial measurements of serum urea and creatinine are given in the table.1 which shows that inspite of regular hemodialysis, the patient's urea and creatinine levels increased. The patient was shifted out of the ICU on the 13th day as he was hemodynamically stable and developed no further complications and was discharged after 23 days of

hospitalization. His urea and creatinine levels at the time of discharge were 70 mg/dl and 3.2 mg/dl respectively.

Figure 1

Fig 1: ECG showing Mobitz type-I heart block



Figure 2

TABLE 1: SERIAL MEASUREMENTS OF ROUTINE BIOCHEMICAL PARAMETERS

	UREA (mg/dl)	CREATININE (mg/dl)	SODIUM (mEq/L)	POTASSIUM (mEq/L)
Day 1	52	2.4	139	3.6
Day 2	88	3.0	130	5.3
Day 3	93	6.2	131	4.7
Day 4*	112	6.4	137	4.5
Day 5	180	10.2	135	3.9
Day 6*	170	9.4	135	3.3
Day 8*	94	9.3	127	3.8
Day 9	217	12.8	Not done	Not done
Day 10*	178	13.4	130	3.5
Day 12	112	9.8	Not done	Not done
Day 13	104	11.7	131	3.0

* Days on which patient received hemodialysis. Sampling was done after hemodialysis.

DISCUSSION

Wasp stings have been associated with a wide variety of local and systemic reactions. Acute renal failure in association with intravascular hemolysis, rhabdomyolysis and abnormal LFT's¹ are recognized as a unique complication of multiple insect stings from order Hymenoptera. The wasps have venom toxic to kidneys

causing acute renal failure, to blood causing intravascular hemolysis, to muscles causing rhabdomyolysis, to liver causing hepatic dysfunction and to heart causing arrhythmias.

Many pharmacologically active constituents of wasp venom have been isolated including mellitin, hyaluronidase, apamine, histamine, serotonin, dopamine, noradrenaline and phospholipase A.² Phospholipase A² and other surface agents such as mellitin and apamine act in concert on red cell membrane provoking hemolysis, which may contribute to the development of acute tubular necrosis³. Other toxins may cause rhabdomyolysis,⁴ but arrhythmogenic mechanism of wasp venom is unclear.

Cardiovascular complications reported till date include acute myocardial infarction in patients with normal and abnormal coronary arteries^{5,6} and a report of atrial flutter occurring after single wasp sting in the absence of anaphylaxis.⁷ Atrial fibrillations after stings have been described in patients with anaphylactic shock before receiving adrenaline and following venom and pollen immunotherapy.⁸

Multiple wasp stings though rare has been encountered frequently in Nepal. Myocarditis and Mobitz Type I heart block in patients following multiple wasp stings has not been reported to our knowledge, and the mechanism of such, is unclear. Hyperkalemia can also lead to heart block, but in our case the potassium levels on the 4th day was in the normal range and thus rules out electrolyte abnormality as the cause for heart block. Hence, this unusual case highlights the potential cardiovascular complications associated with wasp sting envenomation. A thorough cardiovascular evaluation, therefore, is essential in patients stung by wasps, since the various toxic constituents of wasp venom may provoke cardiovascular complications as manifested in the present case. There could be some factors which could predispose the patient to cardiac complications, or the wasp venom may contain certain toxins affecting the heart.

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