Case Report

Unusual Case of Acute Renal Failure Following Multiple Wasp Stings

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Abstract

The wasp stings usually cause local reactions and rarely anaphylaxis. However the multiple wasp stings may cause multisystem involvement. We report a case of acute renal failure (ARF) following multiple wasp stings. A middle aged healthy gentleman presented with pain and swelling of the upper part of the body following multiple wasp stings. After 2 days, he developed progressive decrease in urine output with high colored urine. Physical examination revealed the edematous and tender affected part. On investigating, it was found to have sequential elevations in renal function tests. The markers of muscle injury were grossly elevated and liver enzymes were deranged. These findings suggest multisystem involvement predominantly ARF secondary to rhabdomyolysis. With the initiation of the intense hemodialysis, all the above parameters became normal. Timely intervention of multiple wasp stings causing ARF with multiorgan involvement by hemodialysis not only prevents mortality but also other complications.

Keywords: Acute renal failure, Multiple wasp stings, Multisystem involvement

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Introduction

Wasp stings are a well known form of envenomation in the tropical countries. The most common forms of toxicity are local and systemic allergic reactions. Acute renal failure following wasp stings is an uncommon complication. This case report reveals the importance of a rare complication of this common form of envenomation.

Case Report

A 40-year-old healthy male, who is a farmer by occupation, presented with burning pain and swelling all over the upper part of the body following multiple wasp stings. When the patient was cycling and going to his village, the nest of the wasps fell down from the weak branch of a tree and by this, the wasps were disturbed and around 50 wasps attacked him at once and caused the above injury and later after 2 days of this incidence, the patient developed progressive decrease in urine output.

Access this article online

Quick Response Code:

Website: www.najms.org

DOI: 10.4103/1947-2714.93380

The patient did not have any other significant illness in the past including hypertension, or any history of nephrotoxic drug intake. Examination revealed a pulse rate of 110/min, blood pressure of 150/100 mm of Hg and had swollen and edematous scalp, left upper limb, and upper thorax. There were multiple sting marks over the head, neck, face and the left upper limb [Figure 1]. Other systemic examination was clinically normal.

Investigations revealed a blood urea of 120 mg/dl, serum creatinine which rapidly worsened from 1.2 mg/dl to 4.5 mg/dl over next three days, the hematocrit was 50% and platelet count was 1.32 lakhs/mm^3. The urine was reddish brown colored and showed 3+ proteinuria and 100 of red blood cells (RBCs). Activated partial thromboplastin time (APTT) was prolonged (32 s with a control of 26 s). Bleeding and clotting time was normal. The rest of the biochemical analysis showed serum creatinine phospho kinase (CPK) of 1 10 000 IU/l, lactate dehydrogenase (LDH) of 5250 IU/l, AST 1450 IU/l, ALT 950 IU/l. Serum potassium was 6.0 meq/l, serum sodium 130 meq/l, serum calcium 9.0 mg/dl, serum phosphorous 6.2 mg/

Figure 1: Wasp bite marks

Table 1: Showing deteriorating renal functions

Renal function tests	Day 1	Day 2	Day 3
Blood urea	60 mg/dl	90 mg/dl	120 mg/dl
Serum creatinine	1.2 mg/dl	2.6 mg/dl	4.5 mg/dl
Serum potassium	4.5 meq/l	5.5 meq/l	6.2 meq/l

dl and serum uric acid 7.0 mg/dl. Serum bilirubin was 1.9 mg% and urine myoglobin assay was more than 1000 ng/ml. The ultrasound of the abdomen showed normal sized kidneys with normal echotexture and preserved corticomedullary differentiation. Liver was normal in size and echotexture.

The patient had progressively worsening renal failure and remained oliguric (250-300 ml/day) for 3 days [Table 1], in spite of adequate hydration. Hence, the patient was initiated on intensive hemodialysis, and continued the antibiotics, antihistamines and corticosteroids till the signs of inflammation came down. The patient underwent eight sessions of hemodialysis. After about 2 weeks, the patient entered a diuretic phase and his urine output started improving and serum potassium, APTT, and liver function tests became normal. Three weeks later his renal functions gradually became normal (serum creatinine 1.1 mg/dl).

Discussion

Wasp sting induced acute renal failure though described, is an uncommon complication. The pathogenic mechanisms responsible for the clinical sequelae following insect stings of the order hymenopterae (which comprises wasps and bees) include allergic reactions, rhabdomyolysis, hemolysis and direct tissue toxicity. The major causes of renal failure are acute tubular necrosis (ATN) due to hypotension or pigment nephropathy resulting from rhabdomyolysis and intravascular hemolysis, and acute interstitial nephritis.[1] Their venom contains protein toxins, biogenic amines, and enzymes that allow the toxins to spread.[2] Renal failure has resulted from stings ranging from 22 to 1000. The acute renal failure (ARF) due to wasp sting bites the toxic principles include active amines like histamine, serotonin, kinins, phospholipase A2, hyaluronidase, mellitin and apamine.[3,4] The exact mechanism of rhabdomyolysis is not known but a direct toxic effect of venom on muscle is believed to be the main cause.[5] However, other mechanisms postulated for renal damage due to wasp stings are: (i) direct nephrotoxicity due to toxin; (ii) hypotension leading to ischemic tubular necrosis and (iii) nephropathy due to hemoglobinuria and myoglobinuria.

Our patient also developed ARF secondary to rhabdomyolysis causing pigment nephropathy.

The manifestations other than renal failure include myocardial necrosis and infarction, centrilobular necrosis of liver, and thrombocytopenia as a result of direct platelet toxicity.[6-8] Our patient had a rapidly worsening renal failure with markedly elevated serum levels of CPK and urinary myoglobin suggesting rhabdomyolysis. The elevated LDH levels points towards a hemolytic process. In view of the prolonged APTT disseminated intravascular coagulation was considered and, hence renal biopsy was not done. As the patient manifested all the stage of acute tubular necrosis and finally went to diuretic phase, the diagnosis of ATN was made, though the renal biopsy was not done.

Atmaram *et al*. (2005) reported similar case in southern part of India, in which patient had suffered from acute renal failure and multi organ dysfunction following wasp sting.[9] Nace *et al*. (1992) have reported a case of acute renal failure without rhabdomyolysis and hemolysis implicating direct venom toxicity as the probable cause.[10]

Thus the clinical sequelae of multiple wasp stings can result in multisystem involvement ranging from intravascular hemolysis, rhabdomyolysis, acute renal failure, hepatic dysfunction, and occasionally thrombocytopenia and coagulopathy. Most common renal involvement is in the form of ATN. Initial management includes removal of stings at the earliest. When progressive renal failure ensues, intensive hemodialysis results in good renal recovery with return of renal functions to normal in majority of the survivors.

Conclusion

Multiple Hymenoptera envenomation is a serious condition and people with this are at high risk of developing multi-system involvement, predominantly acute renal failure. Our case indicates timely intervention with intensive hemodialysis not only prevents mortality but also other organ complications.

References

1. Patil PL, Salkar HR. Wasp sting induced acute renal failure. Indian J Nephrol 2004;14:30-1.
2. Vetter RS, Visscher PK, Camazine S. Mass envenomations by honey bees and wasps. West J Med 1999;170:223-7.
3. Habermann E. Bee and wasp venoms. Science 1972;177:314-22.
4. Sakhuja V, Bhalla A, Pereira BJ, Kapoor MM, Bhusnurmath SR, Chugh KS. Acute renal failure following multiple hornet stings. Nephron 1988;49:319-21.
5. Kim YO, Yoon SA, Kim KJ, Lee BO, Kim BS, Chang YS, *et al*. Severe rhabdomyolysis and acute renal failure due to multiple wasp stings. Nephrol Dial Transplant 2003;18:1235.
6. Ferreira DB, Costa RS, De Oliveira JA, Muccillo G. An infarct like myocardial lesion experimentally induced in Wistar rats with Africanized bee venom. J Pathol 1995;177:95-102.
7. Levine HD. Acute myocardial infarction following wasp sting report of two cases and critical survey of the literature. Am Heart J 1976;91:365-74.
8. Joshua H, Ishay J. The anticoagulant properties of an extract from the venom sac of the oriental hornet. Toxicon 1975; 13:11-20.
9. Atmaram VP, Mathew A, Kurian G, Unni VN. The Indian Society of Nephrology. Indian J Nephrol 2005;15:30-2.
10. Nace L, Bauer P, Lelarge P, Bollaert PE, Larcan A, Lambert H. Multiple European wasp stings and acute renal failure. Nephron 1992;61:477.

How to cite this article: Rachaiah NM, Jayappagowda LA, Siddabyrappa HB, Bharath VK. Unusual case of acute renal failure following multiple wasp stings. North Am J Med Sci 2012;4:104-6.

Source of Support: Nil. **Conflict of Interest:** None declared.