Introduction

The insect order Hymenoptera consists of many medically important groups of stinging insects – Apoidea (bees) and Vespoidea (paper wasps, hornets, and yellow jackets commonly referred as wasps).\(^1\)

Systemic complications such as liver impairment, respiratory, and cardiac impairments have also been reported,\(^2,3\) and this can also led to renal failure and even multiorgan dysfunction.

Case History

A 24-year-old healthy female resident of New Delhi presented with burning pain and swelling over the nape of neck and the upper limb following multiple wasp stings. There was a total of 45 bite marks over the body. Figures 1 and 2 show the bite on the upper limb and the nape of the neck. The patient complained of progressive decrease in urine output and became anuric on the fifth day of presentation to the hospital.

The patient did not have any other significant illness in the past including diabetes mellitus, hypertension, blood transfusion, or any history of nephrotoxic drug intake. Examination revealed a pulse rate of 110/min, blood pressure of 120/90 mm Hg, and swollen and edematous nape of neck and upper thorax. There were multiple sting marks over the neck, upper limbs, and the thorax.

Investigation at the time of admission revealed a blood urea of 346 mg/dL, serum creatinine 17.6 mg/dL, hemoglobin 10.4 g%, and platelet count 30,000/dL. The urine was reddish brown in colored and showed 1+ proteinuria and 30–32 red blood cells; myoglobin was not analysed because of limited resources. Other laboratory parameters showed serum creatinine phosphokinase (CPK) of 10000 IU/L, lactate dehydrogenase (LDH) 754 IU/L, aspartate aminotransaminase (SGOT) 58 IU/L, and alanine aminotransferase (SGPT) 256 IU/L. Serum potassium was 5.8 meq/L, serum sodium 141 meq/L, serum calcium 9.0 mg/dl, serum phosphorous 6.2 mg/Dl, and serum uric acid 17.0 mg/dl.

Ultrasound of the abdomen showed normal sized kidneys with normal echo texture and preserved corticomедullary differentiation.

Address for correspondence: Dr. Chandan Kumar, Department of Nephrology and Renal Transplant Medicine, VMMC and Safdarjung Hospital, New Delhi - 110 029, India. E-mail: chandan8867@gmail.com

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Abstract

Wasp bite usually presents with local complications. It may very unusually present with acute renal failure (ARF) and multiple organ dysfunctions. We present an interesting case of a 24-year-old female with multiple wasp bites all over the body leading to ARF, hepatic dysfunction, and rhabdomyolysis. Intensive hemodialysis and other conservative measures led to complete recovery. Proper management and early intervention is necessary for recovery from even drastic complication and is beneficial in terms of improvement of overall morbidity and mortality.

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The patient had progressively worsening renal failure and remained oliguric (250–300 mL/day) for 4 days, despite adequate hydration. Then she became completely anuric. The patient was initiated on intensive hemodialysis, and all conservative therapy was started and continued on antibiotics, diuretic, and corticosteroids till the signs of inflammation came down and kidney function improved. The patient underwent six sessions of hemodialysis. Need of renal biopsy was explained, but consent for renal biopsy was not given by relatives. Fortunately, on treatment and dialysis support, clinical improvement started. Urine output started and increased slowly within the time after 10 days of hospitalization. She was kept under close observation till improvement of renal function and other laboratory and clinical parameters. The patient was discharged in clinically stable condition with all laboratory parameters in normal ranges. There was no further need of dialysis.

### Table 1: Laboratory investigations

| Lab parameter | Day 1       | Day 3       | Day 11      | Day 14      |
|---------------|-------------|-------------|-------------|-------------|
| Blood urea    | 346 mg/dl   | 243 mg/dl   | 140 mg/dl   | 62 mg/dl    |
| Serum creatinine | 17.6 mg/dl | 14.6 mg/dl  | 9.4 mg/dl   | 1.1 mg/dl   |
| SGOT          | 58 IU       | 16 IU       | 37 IU       |             |
| SGPT          | 256 IU      | 114 IU      | 57 IU       |             |
| Serum K       | 5.8 meq/l   | 4.2         | 4           | 4           |

### Discussion

Acute renal failure (ARF) due to wasp sting bites is a known but uncommon presentation of known envenomation. The toxic principles include active amines such as histamine, serotonin, kinins, phospholipase A2, hyaluronidase, mellitin, and apamine.[4]

Increased serum liver enzymes suggest acute hepatic injury, and raised serum LDH, uric acid, and increased serum CPK level suggests rhabdomyolysis. Hematuria is suggestive of intravascular hemolysis. Renal biopsy in this case was not done because of severe thrombocytopenia. Patient with multiple organ failure responded well to intensive hemodialysis and intravenous steroids.

In the context of all the available literature, most have common consensus of Acute Tubular Necrosis (ATN) as renal biopsy findings. Thiruventhiran et al. analyzed 24 cases of acute kidney injury due to hymenopteran bites. Altered liver function tests (9 cases), hemolysis (14 cases), hypotension (6 cases), and rhabdomyolysis (11 cases) were seen. Hemodialysis was done in 17 patients and 6 patients died. Renal biopsy was done in nine patients and all showed ATN.[5] Nace et al. have reported a case of ARF without any evidence of hemolysis and rhabdomyolysis indicating direct venom toxicity as a cause of ARF.[6] Besides renal failure, other known complications include hepatic necrosis, disseminated intravascular coagulation, and thrombocytopenia as a result of direct platelet toxicity.[7]

### Conclusion

Multiple hornet stings cause a wide spectrum of clinical sequel ranging from intravascular hemolysis, rhabdomyolysis, ARF, and hepatic dysfunction. ATN and Acute Interstitial Nephritis (AIN) are the major contributors of ARF in multiple hornet stings. Removal of stings is the earliest step. Intensive hemodialysis support helps in restoration of acute kidney failure with full recovery of multiple organ dysfunction as described in our case. Long-term renal morbidity is not exactly defined in literature so early treatment may prevent fatal outcome.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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