



## Case Report

# Ant bite causing acute oliguric renal failure – A case report

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## ABSTRACT

Ant bites usually cause mild local reactions without significant complications. Extensive bites may lead to subclinical myonecrosis or secondary bacterial infection. Here, we present a case of acute renal failure as a rare complication of extensive bites by carpenter ants. The patient improved on supportive management and hemodialysis.

**Keywords:** Acute kidney injury, Ant bite, Hymenoptera

## INTRODUCTION

Order *Hymenoptera* of Class *Insecta* consists of *Apidae* (bees), *Vespidae* (wasps), and *Formicidae* (ants). Their sting/bite is an important health concern. Usually, they produce allergic or hypersensitive reactions, multiple stings can produce rhabdomyolysis, hepatic, and renal dysfunction; these are more with bees and wasps. Ant bites are common in the general population. Other than producing itching and mild inflammatory reactions, serious systemic complications are very rare. This unique case of multiple ant bites in a male person has resulted in severe oliguric renal failure.

## CASE REPORT

A 44-year-old male with no comorbid illness and a history of chronic alcohol intake had a fall on a night after binge alcohol (whisky) intake following which he was extensively bitten by ants all over his body including his face. He developed pain and itching at that site and was treated with iv fluids and paracetamol from a local hospital. After 2 days, he developed generalized edema followed by oliguria. No history of high colored urine or frothing of urine. No dyspnea, orthopnea, chest pain, vomiting, muscle cramps, jaundice, and abdominal pain. No history of seizures. No history of non-steroidal anti-inflammatory drug intake. No history of fever.

On examination, he was conscious, and oriented. Periorbital puffiness was present. No pallor, icterus, cyanosis, and clubbing. Small tender inguinal lymph nodes present bilaterally. Bilateral lower limb edema and scrotal edema was present. Extensive ant bite marks were present all over his body [Figure 1]. The ants were identified as carpenter ants [Figure 2]. No stigmata of chronic liver disease.

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**Figure 1:** (a) Multiple ant bites over leg, (b) multiple ant bites over neck, and (c) multiple ant bites over hand.



**Figure 2:** (a-c) Carpenter ants in the premises of the patient's home.

Pulse-88/min, regular; blood pressure-160/90 mmHg; respiratory rate-18/min, regular; and the patient were febrile. His urine output was 200 mL over 24 h.

Chest-no evidence of pleural effusion; abdomen-free fluid present; cardiovascular system-JVP (Jugular venous pressure) elevated, no cardiomegaly, normal heart sounds, and no pericardial rub; and nervous system-no focal deficits.

A provisional diagnosis of fluid overload probably due to acute oliguric renal failure was kept and investigated. The etiologies considered were as follows:

- Toxin-induced acute tubular necrosis (ATN)
- Toxin-induced acute interstitial nephritis (AIN)
- Rhabdomyolysis-induced ATN or
- Infection-related acute glomerulonephritis.

### Investigations

Urine routine microscopy – white blood cells – 3–5/hpf, red blood cells-nil, and tubular casts present.

Ultrasound abdomen – ascites present, liver echoes normal, normal sized kidneys with raised echoes, and normal corticomedullary differentiation.

Peripheral smear – Normal.

Ascitic fluid study – High serum-ascites albumin gradient.

He was given one session of hemodialysis and his urine output improved.

Since there was no significant elevation of creatine phosphokinase to suggest rhabdomyolysis, no evidence of hemolysis in peripheral smear and no evidence of chronic

<b>Hemoglobin-13.5 g/dL</b>	<b>ESR-42 mm/h</b>	<b>SGPT/SGOT-38/48 U</b>
MCV-88.1 fl	RBS-101 mg/dL	ALP-47 U
RDW-14.2%	Sodium/potassium-114/4.6 meq	Urine R/E-RBC: 8–10
Total WBC count-9700 cells/mm <sup>3</sup>	Urea/creatinine-182/8.8 mg/dL	PC: 2–3
Differential count-N58L36M6	Bilirubin total/direct-0.5/0.2 mg/dL	PT INR-1.28
Platelet-1.66 lakh cells/mm <sup>3</sup>	Total protein/albumin-6.5/3.3 g/dL	APTT-34/30 s
		Calcium/PO <sub>4</sub> /Uric acid-6.7/6.3/9.2 meq

ESR: Erythrocyte sedimentation rate, RBS: Random blood sugar, SGPT: Serum glutamate-pyruvate transaminase, SGOT: Serum glutamate-oxaloacetate transaminase, ALP: Alkaline phosphatase, MCV: Mean corpuscular volume, RDW: Red cell distribution width, PC: Pus cells, WBC: White blood cells, RBC: Red blood cells, PT-INR: Prothrombin time-international normalized ratio, and APTT: Activated partial thromboplastin time

Urine protein creatinine ratio-0.2	SLDH-1251 (225-550) IU/mL
S C3-76.39 (80-165) mg/dL	ECG-normal
S CPK-379 (30-170) IU/mL	CXR-normal

S LDH: Serum lactate dehydrogenase, S C3: Serum C3, S CPK: Serum creatine phosphokinase, ECG: Electrocardiography, and CXR: Chest X-ray

kidney disease, a final diagnosis of acute kidney injury (AKI) due to toxin (ant venom) mediated ATN/AIN was considered. The renal function gradually improved over 2 weeks to become normal.

## DISCUSSION

### Insect bite/sting envenomation

The renal effects of hymenoptera venom include ATN, rhabdomyolysis-related AKI, acute allergic interstitial nephritis, acute cortical necrosis, thrombotic microangiopathy-hemolytic uremia syndrome, nephrotic syndrome, and renal tubular acidosis. These are due to both immune mediated and toxic effects.<sup>[1]</sup> This case was interesting due to the fact that ant venom producing AKI has been very rarely reported in the literature. The culprit ants in our case were identified as carpenter ants. Evidence suggests that supportive therapy with or without dialysis will completely restore the kidney function without any recurrence.

## CONCLUSION

Ant bites may result in serious systemic complications like AKI as suggested by this case and measures to prevent insect bites as well as early recognition and management are important.

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Department of Medicine and Nephrology, Government Medical College, Kozhikode, Kerala.

## Ethical approval

The research/study complied with the Helsinki Declaration of 1964.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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## Conflicts of interest

There are no conflicts of interest.

## Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

## REFERENCE

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