

Acute Kidney Injury Following Envenomation by African Bees in an Eight-Year-Old: Case Report

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Background: Acute Kidney injury is a very rare complication of bee sting envenomation. It is associated with high morbidity and mortality and early identification of acute kidney injury and management can be life-saving in children.

Case report: An eight-year-old boy referred to our unit from a peripheral hospital after he was stung by a swarm of bees. He developed features of acute kidney injury and was commenced on steroids, antihistamines and peritoneal dialysis. The urine output improved by the third day and kidney function

normalized by the seventh day upon which the peritoneal dialysis was stopped. The child was discharged from the hospital two days later with full recovery.

Conclusion: Acute kidney injury is a rare but serious complication of bee sting envenomation. Good supportive management is very important for good outcomes. Acute peritoneal dialysis is an effective renal replacement modality in children with bee sting associated acute kidney injury.

Key words: Bee sting envenomation, acute kidney injury, acute tubular necrosis, rhabdomyolysis, peritoneal dialysis.

Introduction

Bee sting envenomation is rare pediatric emergency encountered worldwide. It is an extremely rare cause of acute kidney injury. The African Bee (*Apis Mellifera Scutellata*) also known as killer bee is prevalent in Africa and with the Africanized bees of South America, it is associated with acute kidney injury due to the fact that they sting in groups. The incidence of bee sting associated acute kidney injury is not known and there are only few cases reported in Africa^{1,2,3}

It has been shown that though most cases of bee stings result in minor allergic reactions, in some case the envenomation results in acute kidney injury with high morbidity and mortality.⁴

I present a case of bee sting associated AKI at our institution who needed peritoneal dialysis and recovered thereafter.

Case report:

An eight-year old boy was stung by a swarm of bees a few hours prior to presentation to the hospital. He received more than 100 stings on his body. He was initially admitted to Intensive Care Unit at Rift Valley General Referral Hospital and received steroids, antihistamine and intravenous fluids. He was referred to Paediatric nephrology unit at Kenyatta National Hospital three days later for review after he developed oliguria and deranged renal function. Admission findings were generalized oedema, hypotension of 60/40 mmHg and Glasgow coma scale of 11/15. The child received intravenous saline bolus plus maintenance fluids, intravenous steroids, antihistamines and analgesics. Initial laboratory works revealed haemoglobin 9.7g/dl and thrombocytopenia of $105 \times 10^9/l$, urea of 69.1 mmol/L, serum creatinine of 529 $\mu\text{mol/L}$ with an estimated glomerular filtration rate of 12ml/min/1.73 m², raised transaminases: AST 550 iu/l, ALT 761 iu/l. The blood gas analysis showed high anion gap and metabolic acidosis. Peritoneal dialysis was initiated

within 24 hours of arrival to the hospital. His consciousness level normalized after 2 days, his urine output normalized on day 3 and both kidney and renal function normalized at day 7 and peritoneal dialysis was stopped. The child was discharged home at day 9 post admission.

Discussion

In the case reported, the eight year old boy developed Acute kidney injury after massive envenomation by African Bees. This has been seen in cases in Tanzania, Nigeria and Togo as well.^{1,2,3} Other studies from Brazil showed envenomation by Africanized bees.⁵ These are hybrid bees from European bees and African bees.⁵

Bees, unlike wasps leave 50-150mcg/ml per sting and the effects vary from mild local reaction to serious systemic reactions. Acute kidney injury is associated with high load of envenomation: 30-50 stings in children have shown to result in renal failure.^{6,7}

Acute kidney injury results from three different ways: direct tubular damage by the phospholipase A in the venom leading to proximal tubular damage. This is manifested as increase in fractional excretion of sodium. It presents like acute tubular necrosis on renal biopsy.^{6,7}

Secondly, the toxins in the venom: mellitin, phospholipase A also cause direct cell damage leading to hemolysis and rhabdomyolysis. This leads to hemoglobinuria and myoglobinuria leading to sudden rise in serum creatinine. An elevated creatinine kinase and haematuria on dipstick but no red cells on microscopy are suggestive of this process.^{6,7}

Severe anaphylaxis and release of histamine leads to vasodilatation and hypotension. This in turn leads to renal hypoperfusion and tubular damage leading to features of acute tubular necrosis.

Management of massive envenomation by hymenoptera species is largely supportive: early

removal of stings, antihistamines, steroids, a lot of fluids for hydration and close monitoring.^{8,9,10,11} The indications for renal replacement therapy are the same as with other conditions. There is no evidence in superiority of any one type of renal replacement therapy.¹² In our patients, we used peritoneal dialysis, as it is readily available in our unit and easier to institute.

Both the children with hymenoptera envenomation associated acute kidney injury were associated with complete recovery. It has been shown in some studies that mortality may be up to 22%. Poor prognosis is associated with the number of bee stings, time taken to remove the stings and initiation of supportive management.^{7,13,14}

Conclusion

Multiple hymenoptera stings may cause acute kidney injury. Immediate supportive treatment including epinephrine, antihistamines and hydration is the mainstay to reduce morbidity and mortality in such cases. Acute peritoneal dialysis is an effective renal replacement modality in these children.

Declaration:

No conflict of interest.

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