



Acute Renal Failure after Multiple Honeybees' Stings (Case Report)

Kambiz Ghassemi¹, Maryam Esteghamati*¹, Ali Reza Moayedi¹, Seyed Ali Alavi²

¹ Department of Pediatric, Hormozgan University of Medical Sciences, Children Clinical Research Developments Center, Bandar Abbas, Iran

² Student Research Committee, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

* Corresponding author's Email: kambizghassemi@yahoo.com

ABSTRACT: Insect stinging is a common cause of anaphylaxis. Cumulative dose of multiple stings can cause morbidity and mortality associated with honeybee-sting incidents. The reaction of human immune system against that considered as a variety of allergic reaction (local) and direct toxic effect (systemic). Local reaction includes pain, swelling, erythema, itching, rhabdomyolysis and systemic reaction appear with multiple organ involvement (renal, liver, gastrointestinal effect) and that is different from person to person. We had a report about a 4 year old girls with multiple stings on face, head and limbs. Case report: We had a report about a 4 year old girl was stung on face, head and limbs with honey bees and the other complications within a day after sting. She developed anuria, nausea and vomiting. She discharged after 7 days with receiving his medication and without significant complications.

Key words: Honeybee, Sting, Allergic Reactions.

INTRODUCTION

Insect sting are known to cause a variety of allergic reactions (local) and direct toxic effects (systemic) (Shahidi, Ashrafi et al., 2008). There is agreement that a local reaction is generally characterized by pain, swelling, redness, itching and wheal surrounding the wound made by stinging (Müller 1990, Reisman 1992, Van der Linden, Hack et al. 1994). The severity and duration of this reaction can vary from one person to another. However multiple stings can sometimes lead to angioedema, vasculitis, renal failure and hepatic failure (Van der Linden, Hack et al. 1994). Usually acute renal failure is due to acute tubular necrosis secondary to intravascular hemolysis, rhabdomyolysis or shock (Golden, Kagey-Sobotka et al. 2001, Shahidi et al., 2008). In this report we describe a 4 year old girl who had multiple honey bee stings and developed acute renal failure.

CASE PRESENTATION

A 4 years old girl was stung on face, head and limbs with honey bees 48 hours prior to admission to hospital. A day after sting she developed anuria, nausea and vomiting. Then she was referred to children hospital. In the first visit after admission, she was conscious and there was no history of cough and breathlessness. On examination at least 40 stings were found on face, head and limbs. Her blood pressure was 90.50 mm Hg, pulse rate 125/min and normal temperature.

Investigation revealed hemoglobin 9.5 gr/dl platelet count 425000/mm³ and some leukocytosis 12000/mm³ with normal differential count. Peripheral blood film revealing microcytosis with hypo chromia and anisopoikilocytosis,

blood biochemistry revealed urea 190mg/dl, creatinine of 1.9mg/dl, serum potassium 6.2meq/l, sodium 133meq/l. Transaminases (Alt & Ast) were increased 3 fold than normal value and creatine phosphokinase (CPK) 7000 Iu/L. urine examination showed 3+ blood, 17-20 red blood cell (RBC) and albumin 2+ and urine myoglobin 1250 ng/ml (normal 0-10).

Her renal failure was managed by peritoneal dialysis, her urea and creatinine decreased and after 35 cycles of dialysis gradually her urine output increased to 2cc/kg/h. The child recovered and discharged on 7 days of hospitalization. She also received hydrocortisone, ranitidine and antibiotic with adjust dose throughout her hospitalization, at the time of discharged her blood urea and creatinine were 20mg/dl and 0.8mg/dl respectively, urine revealed trace albuminuria and hematuria. Two months after discharged her creatinine was 0.5 mg/dl and normal serum electrolyte and normal urine analysis. Ultrasound scan showed normal kidney on both side.

DISCUSSION

Stinging insects of the order Hymenoptera (bees, wasps, ants) are common. These species have venom apparatus consisting of gland or pair of and a system (sting) meant to inject venom. The active components of honey bee venom include enzymes, other proteins and peptides, and amine. The principal small protein and peptides are melittin, apamin and peptide (Müller 1990, Müller 1990, Golden 2005). In most instances, insect stings are only followed by allergic reactions but sometimes intravascular hemolysis, rhabdomyolysis and acute tubular necrosis and acute hepatic injury have been

reported (Haugaard, Nørregaard et al. 1991, Clark et al. 2005, Golden, 2005).

There has been various case report of acute renal failure in victims with Hymenoptera stings. Initially it was attributed only to tubular necrosis either due to shock or pigment nephropathy due to intravascular or rhabdomyolysis (Levine 1976, Zhang, Meleg-Smith et al. 2001, Daher, Silva Junior et al. 2003, Chao, Yang et al. 2004).

Our patient venom induced rhabdomyolysis and rapid onset of renal insufficiency with CPK elevation (9000 iu/l), representing the high level after mass honey bee envenomation. In severe cases, often involving a considerable delay in treatment, anuria and electrolyte abnormalities may develop, requiring temporary dialysis (peritoneal or hemodialysis) followed by improvement in renal function (Zhang et al. 2001, Daher, Silva Junior et al. 2003). Early intervention and aggressive hydration during the first 12 hours prevented this patient of developing worsened renal dysfunction (Van der Linden et al. 1994, Sharma et al. 2006).

In conclusion, even though allergic complications are common after bee stings but we should be aware of potential life threatening rare complication of renal failure and early prompt treatment of it can be lifesaving, therefore, those who have multiple stings by honey bees should be taken to hospital as soon as possible, even if they appear to be well.

REFERENCES

- Chao, Y.W. et al. (2004). Acute interstitial nephritis and pigmented tubulopathy in a patient after wasp stings. *American Journal of Kidney Diseases* 43(2): e15-e19.
- Clark S. et al. (2005). Multicenter study of emergency department visits for insect sting allergies. *Journal of allergy and clinical immunology* 116(3): 643-649.
- Daher E.D.F. et al. (2003). Acute renal failure after massive honeybee stings. *Revista do Instituto de Medicina Tropical de São Paulo* 45(1): 45-50.
- Golden D.B. (2005). Insect sting allergy and venom immunotherapy: a model and a mystery. *Journal of allergy and clinical immunology* 115(3): 439-447.
- Golden D.B. et al. (2001). Insect sting allergy with negative venom skin test responses. *Journal of allergy and clinical immunology* 107(5): 897-901.
- Haugaard L. et al. (1991). In-hospital sting challenge in insect venom-allergic patients after stopping venom immunotherapy. *Journal of allergy and clinical immunology* 87(3): 699-702.
- Levine H.D. (1976). "Acute myocardial infarction following wasp sting: report of two cases and critical survey of the literature." *American heart journal* 91(3): 365-374.
- Müller U.R. (1990). *Insect sting allergy. Allergy and Allergic Diseases, Volume 1, Second Edition: 1980-1994.*
- Müller U.R. (1990). *Insect sting allergy: clinical picture, diagnosis and treatment. Insect sting allergy: clinical picture, diagnosis and treatment.*
- Reisman R.E. (1992). Natural history of insect sting allergy: relationship of severity of symptoms of initial sting anaphylaxis to re-sting reactions." *Journal of allergy and clinical immunology* 90(3): 335-339.
- Shahidi S. et al. (2008). Patients with massive honeybee stings: report of four cases." *Tehran University Medical Journal* 66(8): 5.
- Sharma A. et al. (2006). Acute tubulo-interstitial nephritis leading to acute renal failure following multiple hornet stings." *BMC nephrology* 7(1): 18.
- Van der Linden, P., et al. (1994). Insect-sting challenge in 324 subjects with a previous anaphylactic reaction: current criteria for insect-venom hypersensitivity do not predict the occurrence and the severity of anaphylaxis." *The Journal of allergy and clinical immunology* 94(2 Pt 1): 151-159.
- Zhang R. et al. (2001). Acute tubulointerstitial nephritis after wasp stings. *American Journal of Kidney Diseases* 38(6): E33.