

Case Report

Fatal Asian Giant Hornet's Sting: First Case Series from Kumaon Hills of Uttarakhand, India

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Abstract

Hornet stings are medically important stings which can cause allergic manifestations and in severe cases, may lead to acute renal failure (ARF), myocarditis and hepatitis. Venom from hornet stings can also contribute to myocardial injury or liver impairment. The delay in diagnosis, treatment and unawareness of fatal complication may also be a contributory factor for fatal outcome. In the remote, backward area of hills of Uttarakhand, where the emergency medical facilities are not easily available, lead to increase mortality. Here, we report the case series of farmers who were working in their field in a village at an altitude of around 6500 feet above sea level. Out of six farmers who were bitten by hornet three died before reaching our hospital and one in our hospital. Only two farmers could survive out of six. We are describing three cases of hornet stings that reached our hospital leading to ARF, myocarditis and hepatitis. Case two complicated with ARF and myocarditis and case three with hepatitis. Both of these recovered their body physiology after a 26 days and 6 day stay in the hospital, respectively, whereas Case one died.

Key Words: Hornet sting; Acute renal failure; Multiple hornet stings; Hepatitis

Introduction:

The insect order Hymenoptera consists of many medically important groups of stinging insects: Apoidea (bees), Vespoidea (paper wasps, hornets and yellow jackets commonly referred as wasps [1] and Formicidae (ants). [2]

Hymenoptera venoms are concentrated and highly complicated mixtures of biochemically active agents. [7] Though allergic manifestations to Hymenoptera stings are well documented, severe reactions to 'Hymenoptera' stings are generally attributed to allergic mechanisms. In cases of multiple stings, severe reactions and even death may result from the toxic actions of venom. [7]

Systemic complications such as ARF, cardiac, liver and respiratory complications have also been reported. [4, 5, 7] Here, we report the case series of farmers who were working in their field in a village at an altitude of around 6500 feet above sea level.

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We are describing three cases of hornet stings that reached our hospital with three different clinical manifestation followed by multiple hornet stings at the same time.

Case Reports:

Case One:

A 34 -year-old male was referred to our hospital with complaints of multiple hornet stings on face, back, upper and lower limbs, from one of the peripheral hospital. (Fig. 1)

On examination, there was generalized swelling of the body and multiple rounded erythematous lesions of 2-4 cm size, with skin necrosis. Features of cellulites were also present over face, neck, back and extremities. (Fig. 1) The patient was in altered sensorium having tachypnea, and oliguria.

The systolic blood pressure of the patient was 80 mm of mercury. The patient was put on inotropic support and was shifted to ICU. On ABG analysis the patient was having metabolic acidosis with pH of 7.1.

Corrective measures were taken. ECG was showing sinus tachycardia with non specific ST-T changes, suggestive of myocarditis. The patient's condition deteriorated progressively and in the afternoon he had sudden cardiac

arrest. Cardio-pulmonary resuscitation was done and patient was put on ventilator support.

Despite all efforts by ICU team the patient could not be survived.

Case Two:

Our 2nd case was of 38 years old male who had hornet bites on face, neck, back and upper limbs. There were total 26 bite marks. The patient was having severe pain at the site of bites, generalized swelling all over the body and oliguria. He was anemic and having features of intravascular hemolysis.

Investigations revealed Hemoglobin only 4.4 gm%, TLC 27,700/cubic mm & platelet count 4.5 lacs/ cubic mm. Urine examination was positive for RBCs. CPK and transaminases were also mildly elevated with CPK- 487 U/L, SGOT- 264 U/L & SGPT of 448 U/L. His renal functions were deranged with Blood Urea of 108 mg% & Serum Creatinine of 2.3 mg%.

The patient was put on intravenous antibiotics, antihistamines along with corticosteroids. The patient was shifted to ICU for and was transfused 4 units packed RBCs and 5 units of fresh frozen plasma as prothrombin time (PT) was also prolonged.

Two days after admission to the hospital the patient's condition deteriorated. He developed anuria, hypertension and tachypnoea. His blood urea rose to 164 mg% and serum Creatinine to 7.7 mg%.

The patient developed metabolic acidosis and was hemodialysed. During the course of his illness the patient required hemodialysis support seven times.

The patient gradually improved with the treatment. His liver as well as renal function tests improved and after a stay of 26 days in our hospital he was discharged.

Case Three:

Third case was 34 years female the only female among the seven who were stung by hornets. She fortunately had only 6 bites on face and back as she was wearing a 'sari' which protected her from the stings of the hornets.

She was having severe pain at bite sites. There was swelling and erythema around the lesions. She was not having any features suggestive of acute renal failure or hemolysis.

On investigations she had raised WBC and polymorph count. She had mild elevation of liver and muscle enzymes with SGOT- 384 U/L, SGPT- 100 U/L and CPK of 356 U/L. Her renal function tests and urine examination was normal. She had normal ECG.

She was managed conservatively in the medicine ward with intravenous fluids,

antibiotics, antihistamines and other supportive measures. She became completely well in 6 days and took care of her husband the only other survivor who had renal failure and was on hemodialysis support. (Case 2 described above)

Discussion:

Insect bites and stings can have a spectrum of clinical symptoms ranging from minor allergic reactions to rhabdomyolysis, acute myocardial infarction, acute renal failure and even anaphylactic shock.

Stinging insects are classified as hymenoptera which includes apids (honey bees, Africanized bees) and vespids (wasps, yellow jackets & hornets). Hornet stings are generally followed by minor allergic reactions and rarely anaphylaxis. [1, 2]

The incidence of anaphylaxis caused by insect stings has been estimated from 0.3 to 3% in the general population. [3] In cases of multiple bites there can be systemic involvement including liver, kidney, heart, muscles and brain.

The patients may have acute myocardial infarction, acute renal failure, acute myocarditis, and acute encephalomyelitis. [4-6] The venom may contain a variety of components, such as melittin, apamine, phospholipases, hyaluronidase, acid phosphatase, histamine, and kinin. These have direct and indirect hemolytic effects, neurotoxic and vasoactive properties which can cause intravascular hemolysis and rhabdomyolysis. [7]

Mass envenomation by hornets may trigger massive allergic reaction leading to the systemic complications and even death as seen in our case. One of our cases died due to cardiac derangement. However case no 2 & 3 could be saved due to meticulous support and various combination regimes.

In our case series total six person were bitten by hornet sting. One died on spot within one hour as there was no health facility in that remote village of hilly region. One died during treatment nearby P.H.C (Primary Health Centre) and one during transportation to our hospital.

One of our patients died in our hospital. Out of six farmers who had stings of hornets only two could survive.

In the present cases, there was a prolonged delay in the initiation of treatment due to lack of awareness about severe complication that may arise due to sting and the unusual manifestation may causes considerable difficulties in establishing the diagnosis. Lack of healthcare facilities and delay in getting treatment may all add to the severity and complications.

Conclusion:

The delay in diagnosis, unawareness of fatal complication & delay in treatment may also be a contributory factor for fatal outcome. In the remote, backward area of hills, where the emergency medical facilities are not easily available, lead to increase mortality.

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Fig. 1: Sting Marks with Central Skin Necrosis & Erythematous Borders on Back of Case one



Fig. 2: Multiple Sting Marks With Central Skin Necrosis & Erythematous Borders Umblicated Lesions on Back of Case Two



Fig. 3: Sting mark with Central Skin Necrosis & Erythematous Borders on the neck of case Three



Fig. 4: Asian Giant Hornet nest at an altitude of 6500 feet

