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## Case Report

# A Case of Acute Kidney Injury Following an Insect Bite in a Rural Setting of Bangladesh - ৗ

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## ABSTRACT

Insect bite is a common problem though less common cause of hospital admission. It may cause serious life threatening reaction if left untreated. Bees, wasps, hornets, yellow jackets, and fire ants are members of the Hymenoptera family. They are commonly found in Bangladesh specially in rural setting, bites or stings from these species may cause serious reactions in people who are allergic to them. Death from bee stings is 3 to 4 times more common than death from snake bites. Bees, wasps, and fire ants differ in how they inflict injury. Sometimes Acute Kidney Injury (AKI) also can occur by the bites of wasps and bees. Here we present a case who was 13 years old boy bitten by multiple wasps and subsequently develop AKI. Fortunately he recovered uneventfully after dialysis and general care.

## INTRODUCTION

Insects are a class of invertebrates within the arthropods phylum that have chitinous exoskeleton, a three part of body (head, thorax, and abdomen), three pairs of jointed legs, compound eyes and one pair of antennae. They dominate the present-day land fauna. They represent about three-fourths of known animal life. In fact, the actual number of living species is not known and is estimated to be over 10 million [1]. The orders that contain the greatest numbers of species are a) Coleoptera (beetles) b) Lepidoptera (butterflies and moths) c) Hymenoptera (ants, bees, wasps), d) Diptera (true flies). Most insects do not usually attack humans unless they are provoked. Many bites and stings are defensive. Insects sting to protect their hives or nests or when incidentally touched or disturbed (so hives and nests should not be disturbed or approached) [2].

A sting or bite injects venom composed of proteins and other substances that may trigger an allergic reaction in the victim. The sting also causes redness and swelling at the site of the sting. In Bangladesh among different insect bites Wasp Stings (*Vespa affinis*) is common [3]. It was found that mass envenomation caused by wasp sting may produce systemic reaction and organ dysfunction including rhabdomyolysis, hemolysis, coagulopathy and hepatic, renal, cardiac and neurological complications.<sup>3</sup> Here we present a case of multiple wasps bites who subsequently developed AKI.

## CASENOTE

A 13 years old was playing nearby his house in a rural area of Chittagong, Bangladesh. After throwing a stone in a tree he was attacked by multiple wasps (Figure 1a) and bitten by them. He had excruciating pain over the bitten areas of his back. He was given some local medicine with which his symptoms were not resolved. After 8 hours of bite he noticed that there was no urination since the occurrence. He was taken to the nearby health complex where the medical officer referred him to the tertiary level hospital. In the tertiary center he was investigated and found anuric for 14 hours with anorexic and ill. His back was filled with multiple bitten marks (Figure-1b). His Hb, cell count was normal, serum potassium was raised to 5.9mmol/l, serum creatinine was found 5.4 mg/dl at day one of admission. He was given IV frusemide with normal saline. In the day second his serum creatinine and potassium raised to 6.1mmol/l and 7.1mg/dl respectively. He had very small amount of micruration about 100ml/24 hours. Planning of dialysis was taken and after three consecutive day hemodialysis his urine flow became normal and potassium and creatinine reduced to near normal level. After 6<sup>th</sup> day he was discharged in a good health.

## DISCUSSION

Insects are arthropods of the class Insecta. Insects have an adult stage characterized by a hard exoskeleton, 3 pairs of jointed legs, and a



Figure 1: Wasp.



Figure 2: Bite marks.

body segmented into head, thorax, and abdomen. Insects comprise the most diverse and numerous class of the animal kingdom and include numerous species of praying mantis, dragonflies, grasshoppers, true bugs, flies, fleas, bees, wasps, ants, lice, butterflies, moths, and beetles. The number of species is estimated at between 6 and 10 million, with more than a million species already described. Insects represent more than half of all known living organisms and potentially represent more than 90% of the differing life forms on Earth. Hence, human contact with insects is unavoidable. Exposure to biting or stinging insects or to their remains can range in severity from benign or barely noticeable to life threatening [4-6].

Most stinging insects are of the order Hymenoptera, which is made up of multiple families, including 3 that are clinically important: Apidae (bees), Vespidae (wasps), and Formicidae (ants). Bees have barbed stingers that disengage, causing them to die after a single sting. Wasps, hornets, and yellow jackets (Vespidae family members) do not have barbed stingers and, as such, can sting multiple times [7,8].

Anaphylactic shock is the most notable immediate risk associated with insect exposures. Hypersensitivity to otherwise harmless insect saliva, venom, body parts, excretions, or secretions can

cause systemic responses in some individuals. Diagnosing the early phases of a systemic allergic reaction preceding anaphylactic shock is of paramount importance in treating any patient in whom insect exposure is suspected. Severe anaphylaxis can be fatal in as little as 10 minutes.

In a local reaction, the patient may complain of discomfort, itching, moderate or severe pain, erythema, tenderness, warmth, and edema of tissues surrounding the site. Although it may involve neighboring joints, local reactions cause no systemic symptoms. In a severe local reaction, complaints include generalized erythema, urticaria, and pruritic edema. Severe local reactions increase the likelihood of serious systemic reactions if the patient is exposed again at a later time.

In a systemic or anaphylactic reaction, the patient may complain of localized symptoms as well as symptoms not contiguous with the bite location. Symptoms can range from mild to fatal. Early complaints typically include generalized rash, urticaria, pruritus, and angioedema. These symptoms may progress, and the patient may develop anxiety, disorientation, weakness, gastrointestinal disturbances (eg, cramping, diarrhea, vomiting), uterine cramping in women, urinary or fecal incontinence, dizziness, syncope, hypotension, stridor, dyspnea, or cough. As the reaction progresses, patients may experience respiratory failure and cardiovascular collapse [8].

Delayed reactions may appear 10-14 days after a sting. Symptoms of delayed reactions resemble serum sickness and include fever, malaise, headache, urticaria, lymphadenopathy, and polyarthritis.

Most insect stings produce a transient local reaction that can last up to several days and generally resolves without treatment. Marked local swelling extending from the sting site is usually an *IgE*-mediated late-phase reaction. The risk of a systemic reaction in patients who experience large local reactions is no more than 5% to 10%. More serious anaphylactic sting reactions account for at least 40 deaths each year in the United States [9]. It is estimated that potentially life-threatening systemic reactions to insect stings occur in 0.4% to 0.8% of children and 3% of adults [2]. Systemic reactions are characterized by symptoms and signs, including any combination of urticaria and angio edema, broncho spasm, edema of the large airway, hypotension, or other clinical manifestations of anaphylaxis. The most serious anaphylactic reactions involve the cardiovascular and respiratory systems and are potentially life-threatening. The most common cardiovascular reaction is hypotension. Respiratory

symptoms include symptoms of upper or lower airway obstruction. Laryngeal edema and circulatory failure are the most common causes of death from anaphylaxis [4].

In a study done in Nepal [10] noted that death has been documented to occur when the Wasp stings were in the range of 20-200 and may occur within 4 hours to 9 days of stings. After insect stings, systemic reactions that are potentially life-threatening occur in 0.4% to 0.8% of children and up to 3% of adults. A review of national mortality data in the United States from 1980 to 1999 found that at least 40 deaths per year are a result of sting induced anaphylaxis, with the likelihood of additional sting related deaths in persons reported to have died of cardiovascular causes or “unknown cause.”

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