Case Report

Bee Sting Envenomation: Rare Fatality

[1]Sudhansu Sekhar Sethi, [2]Manoj Kumar Jena

Abstract

Among the invertebrates, insects, particularly hymenoptera, most commonly cause anaphylaxis. In stinging bees, wasps and ants, the ovipositor of female has been modified into a stinger. Honey bees leave behind their barbed stinger in the victim's body and eventually die by evisceration. Bee sting in most of the situations is potentially serious, the severity and duration of reaction varies from one person to another depending on location and no of bee stings received. The spectrum of bee sting disease ranges from local reaction to death. Stings from bees usually cause a transient local reaction which may last for several days and generally resolves without treatment. Occasionally death may occur mostly due to anaphylactic shock. Non anaphylactic causes of death are mainly due to multi organ failure. Honey bee sting is responsible for large number of casualty in tropical and subtropical countries.

Key Word: Bee stings, Envenomation, Anaphylaxis, Post-mortem Examination

Introduction:

The majority of insects causing stinging reactions belong to the order hymenoptera and the species under this order which are medically important are Apidae- honey bees; Vespidae- yellow jacket and hornet, wasp; Formicidae- ant. [5] Reaction to sting depends on

- The amount of venom injected,
- Absence and presence of sensitivity,
- Site of sting. [6]

Risk factors are associated with higher chance of insect sting and their reactions. Occupation like gardening, beekeeping, farming, greenhouse worker and other outdoor activities are more susceptible to bee bite. Cold climates and insect behavior also contributes risk.

Patients using NSAID, ACEI, and Beta blocker are also at increased risk. Most deaths related to hymenoptera stings are the result of immediate hypersensitive reaction causing anaphylaxis and less commonly death occurs from toxic effects of massive envenomation involving hundreds to thousands of stings.

Case Report:

Although honey bees sting is rare, yet it is not uncommon in rural and forest area. But unfortunately he was received dead.

Corresponding Author:

[1]Senior Resident,
Dept. of Forensic Medicine &Toxicology
S. C. B. Medical College, Cuttack
Odisha, PIN-753007, India
E-mail: yoursudhansu@yahoo.com
[2] Prof and HOD,
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The history revealed that he got multiple bee stings while he was working in the field early in the morning. A swarm of bees attacked him and bee sting occurred over whole body.

The presenting complaint was pain at the site of sting. He was referred to our centre and found dead at the emergency ward. The body was sent to central morgue for post-mortem examination.

Autopsy Findings:

The dead body was average body built, conjunctiva clear, nail beds are livid, faint post-mortem lividity on back, rigor mortis was present over whole body, natural orifices were normal. No sign of decomposition was present.

On external examination, multiple stings bites marks were found over whole of the body. Whale and flare were found around the site of the bites. (Fig. 1& 2)

Brain was intact, congested and edematous. Larynx and trachea were edematous. All other internal organs were congested. Cause of death was "Death due to anaphylactic shock".

Discussion:

The honey bee's barbed sting cannot be withdrawn by the insect, once it has penetrated the skin. The bee's only means of escape is to tear away part of its abdomen leaving behind the sting with its venom sac attached. The muscles of the sting apparatus continue to pulsate after the bee has flown away, driving the sting deeper into the skin and injecting more venom. [4]

The venom of winged hymenoptera contains over 30 individual compounds. These include biogenic amines e.g. acetylcholine,

dopamine, histamine, nor epinephrine, serotonin; polypeptide or protein toxins e.g. Apamin, melittin, kinins, MCD peptides; Enzymes e.g. hyaluronidase, Phospholipase A, acid phosphatase and protease. [7]

Table 1: Major Constituent of Honey Bee Venom and Their Activities [1]

Peptides	Melittin	Hemolytic and Cytolytic activity
	Apamin	Neurotoxic activity, block potassium channel
	MCD peptides (mast cell degranulation)	Include release of histamine and allergic reaction
Enzymes	Phospholipase A	Block biological function of membrane, inhibit blood coagulation, decrease blood pressure
	Hyaluronidase	Cause spread of inflammation
	Acid phosphatase	Allergic reaction
	Protease	Tissue necrosis
Amines	Histamine	Allergic hypersensitivity and inflammation
	Dopamine	Increase pulse rate
	Norepinephrine	Increase pulse rate

Most of the death from hymenoptera stings are caused by dysfunction of body immune system where as the venom allergen principally reacts with cell bound specific Immunoglobulin E. [8]

The dermal, respiratory, circulatory and gastrointestinal system reacts to sting after one or a few initial sensitizing stings (type 1 hypersensitivity). The striking feature is the rapidity of death e.g. 58% dies in less than one hour and over 75% die within 6 hours. [8]

Autopsy report of 150 sting induced death showed that 70% were caused by airway obstruction followed by Anaphylactic shock as most important cause of death.

Mass envenomation occurs with greater than 500 honey bee stings. This is not an allergic response but is related to large amount of venom received by the victim.

The dose of sting bee that was calculated to kill half of the victim (LD50) is 19 stings per kilogram of body weight. [9] The spectrum of bee sting disease ranges from local reaction to death. [4]

The symptoms of most stings are:

1. Normal reaction: e.g. redness, flare, whale;
2. Local reaction: e.g. swelling; superimposed Infection e.g. cellulites'
3. Toxin reaction: e.g. Venom injection (no sensitivity);
4. Generalized allergic reaction: e.g. sensitivity;
5. Delayed reactions: 1-2 weeks after sting;
6. Psychological reaction: e.g. anxiety present; fatal reaction. [6]

Management:

The first local treatment is removal of stings from skin by scraping them out. Bee venom is acidic so it should be neutralize. Adrenaline is the only known effective control of immediate hypersensitivity reaction.

Cold pack should be applied locally to reduce pain. IV fluid, chorpheniramine with close monitoring of respiratory, cardiac and renal functions are effective in treatment.

Conclusion and Suggestions:

Prevention is better than cure. Always try to avoid or prevent a situation where these insect get infuriated by human intrusion into their hives. The best possible cure or remedy is to run away from the place as fast as possible because this insect swarm usually does not attack beyond their own area. [3]

The local method adopted toward off sting bite by means of ignition and also the body is smeared with kerosene substance.

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Fig. 1: Multiple Stings over Face

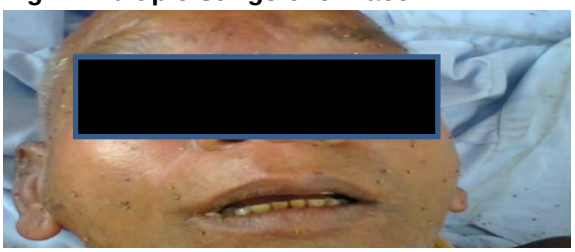

Fig. 2: Multiple Stings over Upper Limb