

Fatal anaphylaxis from hymenoptera stings

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Abstract

Venomous insect stings are a cause of morbidity and mortality worldwide. The sting reactions are unpredictable and vary among individuals. A case of fatal insect sting in an elderly female is presented to discuss the associated challenges during necropsy.

Keywords

Insects, stings, anaphylaxis, autopsy, medico-legal investigations

Introduction

Winged insects of Hymenoptera group are capable of inducing fatal anaphylaxis in humans. *Hymenoptera* is the third-largest order of insects, comprising the sawflies, wasps, bees, and ants. Over 150,000 species are recognized. The IgE-mediated reactions are provoked from the constituents of its sting venom. The venom contains dopamine, histamine, and neurotoxic enzymes which are responsible for skin reactions from the sting.^{1–4} When death occurs, forensic pathologists with only a clinical history of insect sting are challenged to give an opinion on the cause of death.⁵ Lack of sophisticated specific tests post-mortem in a developing country may further complicate the issue, but histopathological investigations may provide sufficient evidence for diagnosis. We present a case of an elderly female who died following insect stings and discuss the challenges faced in such cases during the necropsy.

Case report

A 65-year-old female was attacked by a swarm of flying insects (they looked like bees) at around 9:45 in the morning, following which she was taken to the emergency department (ED) of a hospital within 25 min. On presentation, she complained of intense pain and itching all over her body. She was in a fair general condition. At the time of ED admission, her blood pressure was 110/70 mm Hg, pulse rate 78 beats per minute, and she had a respiratory rate of 18 breaths per minute.

This afebrile patient had haemoglobin of 11.6 g% and total WBC count of 8800/cu mm. The differential counts were neutrophil 60%, lymphocytes 34%, eosinophil 04%, monocytes 2%, and no basophils. Her erythrocyte sedimentation rate was 15 mm per hour. Bleeding time and clotting times were within normal limits. She was given anti-tetanus prophylaxis. Other medications included parenteral administration of chlorpheniramine, dexamethasone, diclofenac, and ranitidine. An intravenous line was maintained with 5% dextrose aqua and later with 5% dextrose in normal saline. The patient was stable with occasional complaints of pain until 14:35 when she became restless with her blood pressure dropping to 90/60 mm Hg. Oxygen inhalation was started immediately, and she was then injected with dexamethasone and adrenaline. All efforts of resuscitation failed and she died in the emergency room at 15:15.

The autopsy was conducted the following day. On external examination, it was observed that body was cold and stiff, averagely built and nourished, measuring

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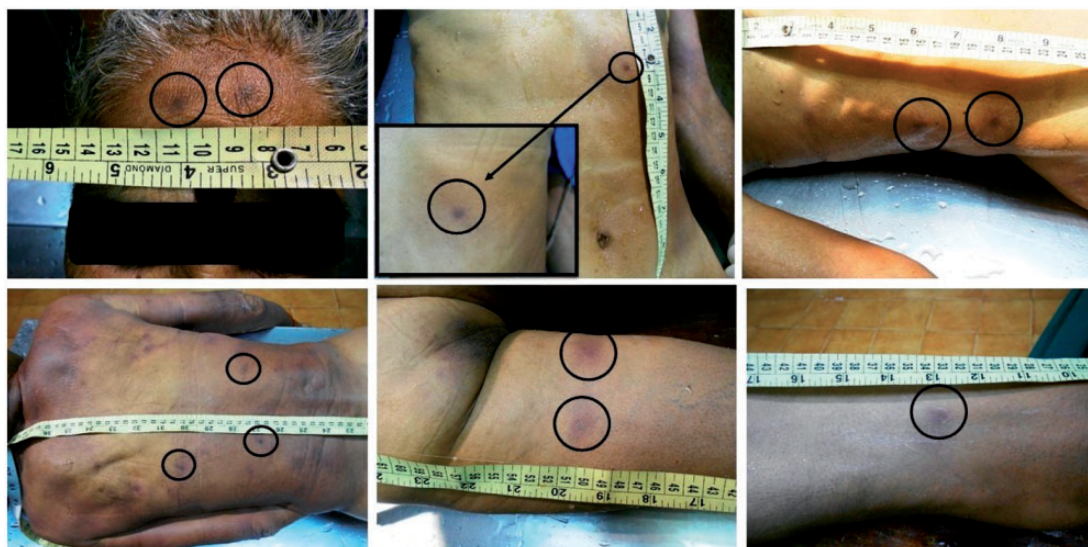


Figure 1. Circular reddish lesions with black-brown area in the centre distributed over the entire body. (See online version of this paper for colour image.)

155 cm in length and weighing 40 kg. Post-mortem lividity was present on the back but was not fixed. The conjunctiva was pale bilaterally. All natural body orifices were intact and unremarkable. The back of the right hand was swollen. Circular reddish lesions with black-brown area in the centre were widely distributed over the entire body (approximately 23 in number) the dimension of which varied from 0.5×0.5 cm to 3×2 cm (Figure 1). The brain was congested and oedematous. The lungs and kidneys were congested on cut section. The rest of the internal viscera had unremarkable findings.

Toxicological analysis was negative for the poisons analysed in viscera sent for analysis. Heart, lungs, liver, spleen, and kidneys were subjected to histopathological examination. The report revealed the presence of pulmonary oedema and the sections from the lungs showed focal coalesced alveoli with intra-alveolar eosinophilic fluid.

Discussion

Venomous insect stings cause local skin reactions which usually subside within hours and indurations resolving within a few days. Skin indurations that are larger than usual are considered large local reactions (LLR). In some sensitive individuals, LLR to a sting becomes evident at 6 h and may gradually increase for a day or two and eventually subside after day 5 or more.³ The sting reactions follow an individualistic pattern with variable severity and such reactions may even recur years apart. The sting reactions are unpredictable and may be exaggerated by fear and panic.⁴ Therefore, it is reasonable to say that morbidity or mortality may not depend

upon number of stings but upon individual susceptibility.⁶ Adrenaline remains the mainstay treatment in cases of serious insect stings yet an individual may be resistant especially if the victim is on a β -blocker.⁷ It was not known in our case whether the elderly patient was on a β -blocker.

Litigation claiming malpractice on the part of doctor/hospitals by the family members is not uncommon following an unexpected outcome. In such cases, report of a meticulous autopsy can assist the court to resolve the issue. Not all necropsies reveal an adequate morphological cause of death, especially in non-violent deaths like anaphylaxis, for which forensic laboratory investigations aided by histopathological analysis are important to refute the allegation in question.

There are different tests done in cases of insect envenomation the reliability of which is questionable. Venom immunotherapy test performed in insect stings is available only in the United States.⁴ An accurate and reliable diagnostic and prognostic test to determine whether an individual would suffer insect sting anaphylaxis is a current need which would prevent mortality from insect stings in future.

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References

1. Castells MC, Hornick JL and Akin C. Anaphylaxis after hymenoptera sting: is it venom allergy, a clonal disorder, or both? *J Allergy Clin Immunol Pract* 2015; 3: 350–355.
2. Ewan PW. Venom allergy. *BMJ* 1998; 316: 1365–1368.
3. Golden DB. Large local reactions to insect stings. *J Allergy Clin Immunol Pract* 2015; 3: 331–334.
4. Golden DB. Anaphylaxis to insect stings. *Immunol Allergy Clin North Am* 2015; 35: 287–302.
5. Herbst J, Heath K, Heddle R, et al. Multiple bee stings, peritumoral mast cell degranulation and anaphylaxis – is there a relationship? *J Forensic Leg Med* 2013; 20: 591–594.
6. Dhakal AK, Basnet NB and Shrestha D. Acute kidney injury due to multiple wasp stings in an eight-year-old child. *J Kathmandu Med Col* 2013; 3: 145–147.
7. Warpinski JR and Bush RK. Stinging insect allergy. *Wilderness Environ Med* 1990; 1: 249–247.