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Case Report

Bee stings envenomation: a case report

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ABSTRACT

Bee stings are common in rural areas where people are engaged in farming and other allied occupations. They are classified under organic irritant poisons of animal origin. Usually, bee stings result in pain, itching and swelling. Rarely, they may cause death due to severe anaphylaxis. We report a case of death of a 65 year old male who was found dead near farmlands outside village. More than 100 bee stingers were present in situ on body at places. They were barbed and lodged into flesh. On internal examination, both lungs were found congested and edematous. Laryngeal apparatus was edematous with multiple petechiae present. Trachea was filled with whitish froth. The cause of death was opined as death due to anaphylactic shock consequent upon antemortem multiple bee stings envenomation.

Keywords: Anaphylaxis, Bee sting, Envenomation

INTRODUCTION

Bee stings are common in rural areas where people are engaged in farming and other allied occupations. They are classified under organic irritant poisons of animal origin.[1] Usually, bee stings result in pain, itching and swelling. Rarely, they may cause death due to severe anaphylaxis.[2] The venom of the honeybee contains histamine, mast cell degranulating peptide, melittin, phospholipase A2, hyaluronidase and acid phosphatase. The three proteins in honeybee venom which are important allergens are phospholipase A2, hyaluronidase and acid phosphatase.[3] Drone bees, the males, are larger and do not have stingers. The female bees (worker bees and queens) are the only ones that can sting, and their stinger is a modified ovipositor.[4] The honeybee has barbed stinger which remains in skin of victim. After the sting, honeybee dies as part of its digestive tract, venom sac and stinger are eviscerated and left behind.[5] Anaphylaxis is a medical emergency and a life-threatening acute hypersensitivity reaction. It is defined as a rapidly evolving, generalized, multi-system, allergic reaction which may prove fatal in absence of proper treatment due to respiratory collapse.[6] However, anaphylactic shock is a type of distributive shock resulting due to severe hypersensitivity reaction mediated by immunoglobulin E (Ig-E). Common allergens include drugs (e.g., antibiotics, NSAIDs), food, insect stings, and latex.[7]

Severe anaphylactic reaction to venomous stings may lead to laryngeal edema resulting in asphyxia and subsequent death.[8] However, death is not due to anaphylaxis alone. It depends on various factors like location and number of stings, history of previous allergic reactions, pre-existing coronary atherosclerosis.[5,9] We report a case of death due to Anaphylactic Shock consequent upon multiple bee sting envenomation.

CASE REPORT

A 65 year old male was found dead near farmlands outside village. A swarm of bees was seen at the site of incident. Many dead honeybees were also seen. He was brought to emergency department by his relatives accompanied by police personnel. He was declared ‘brought dead’ by duty doctors. Body was shifted to mortuary and police

requested for post-mortem examination. All inquest papers were examined thoroughly before commencing examination of body.

External findings

Deceased was clad in white kurta and dhoti. Many dead honeybees were present on clothes. More than 100 bee stingers present in situ on body at places (Figure 1 and 2). They were barbed and lodged into flesh. Deceased was averagely built and nourished. Rigor mortis was well developed all over the body. Livor mortis was present on back and dependent parts and fixed. Both eyes and mouth were open. There was marked edema of face, neck and both upper limbs. There were numerous sting marks with stingers in situ all over body. Multiple lesions of pinhead size with surrounding erythematous patches were present on ear lobes, neck and upper limbs. On giving incisions, haemorrhagic infiltrates were seen underneath sting marks.

Internal findings

Scalp, skull, vertebrae and membranes were healthy. Brain was congested. On opening the thoracic cavity, both lungs were found congested and edematous. (Figure 3) On cut section, it exuded whitish froathy fluid. Laryngeal apparatus was edematous with multiple petechiae present. Trachea was filled with whitish froth. Grossly, heart appeared congested (Figure 4). All other internal organs were congested. Samples for toxicology were preserved which did not reveal any poisoning. Histology revealed congestion of all organs.

On perusal of all documents and autopsy examination, cause of death was opined as death due to Anaphylactic Shock consequent upon antemortem multiple bee stings envenomation.

Figure 1: Multiple bee stingers *in situ*.

Figure 2: Multiple bee stingers *in situ*.

Figure 3: Whitish froth oozing from laryngo-tracheal apparatus.

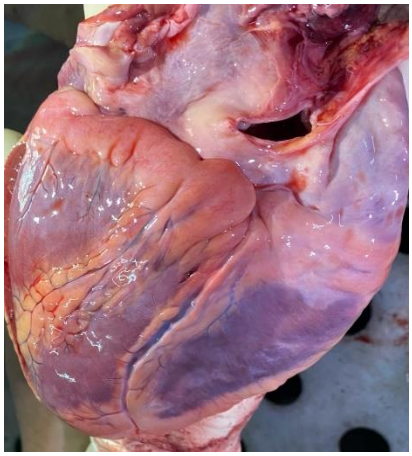

Figure 4: Gross congestion of heart.

DISCUSSION

Deaths due to bee stings are rare. Only few authors have reported cases of deaths due to bee stings. Most cases of insect-related anaphylaxis are caused by stinging insects of order hymenoptera. There are 3 families of hymenoptera

with clinical importance: the bees (honeybees, bumblebees), vespids (yellow jackets, hornets, wasps), and stinging ants (genus Solenopsis and others). The most aggressive Africanised honeybee ('killer bee') is a hybrid resulting from an experiments intended to enhance honey production. The danger from the africanized honeybee is due to large numbers of stings because of swarm-and-attack behaviour.[10] Local reactions to bee stings include pain, swelling and itching. Allergic reactions may cause intense local reaction or generalized systemic reactions. Although anaphylaxis may result in sudden fatal outcomes but delayed and prolonged local inflammation increasing over 24 to 48 hours and resolving in 3 to 10 days is also seen. These reactions resemble 'late phase reactions' which are IgE dependent. Most patients with large local reactions patients have detectable venom-specific IgE.[11]

Systemic allergic sting reactions result in cutaneous, vascular or respiratory symptoms and signs, either singly or in any combination, with possible involvement of other less common target tissues.[10] Chances of systemic reaction are increased if there are multiple stings at one time or repeated stings in same season.[12] Shetty et al reported a case of 71 years old male who was stung by bees all over the body.[9] On post mortem examination multiple bullae with purpuric lesions were seen on body at places accompanied by edema. Grossly, organs such as the heart and lungs were found congested. Anolay et al described a similar case of 49 years old man who was found dead near bee nests. Deceased had history of bee sting allergy.[5] Body had multiple stings all over. Autopsy revealed pulmonary edema and swelling in laryngeal area. Cause of death was given as anaphylactic shock resulting from bee stings. Valliappan et al have also reported a similar case.[13]

In addition to autopsy examination, some lab investigations are also known to help in diagnosis of anaphylaxis. Mast cell tryptase (MCT) measurement in cadaveric blood is one such investigation. Tryptase is a stable analyte and can be detected in post mortem blood samples even after days or weeks. Serum tryptase concentrations of greater than 100 µg/l in a post-mortem sample are consistent with anaphylaxis contributing to, or being the cause of, death provided there are relevant clinical or post-mortem findings.[8] In the present case, no such investigation was done due to lack of required facilities.

Apiculture as an occupation is on rise. Policies regarding safety of bee keepers must be formulated by government of India. Some state governments have already started giving compensations for deaths due to bee stings.[14]

CONCLUSION

Bee stings are common in rural areas where people are engaged in farming and other allied occupations. They are classified under organic irritant poisons of animal origin. Usually, bee stings result in pain, itching and swelling. Rarely, they may cause death due to severe anaphylaxis. Deaths due to bee stings are rare and underreported. Detailed autopsy examination, relevant laboratory investigations and crime scene investigation can help in reaching correct diagnosis.

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REFERENCES

1. Ashour ZA, Shawky HA, Hassan HM. Outcome of pregnancy in women with mechanical valves. Tex Heart Inst J. 2000;27(3):240-5.
2. Ewan PW. Venom allergy. BMJ. 1998;316(7141):1365-8.
3. Griffiths ECM, Bleiker TO, Chalmers R, Creamer D. Rook's Textbook of Dermatology. 9th ed. Wiley-Blackwell; 2009: 34.
4. Wikipedia. Bee sting, 2022. Available at: https://en.wikipedia.org/w/index.php?title=Bee_sting&oldid=1103949572. Accessed on 12 July 2022.
5. Anolay N, Arslan M, Kumral bahadır, Büyük Y. Death Caused by Honey Bee Stings: Case Report. Med Sci. 2014;3:1305-14.
6. McLendon K, Sternard BT. Anaphylaxis. Treasure Island (FL): StatPearls Publishing; 2022.
7. Haseer KH, Paul M. Shock. Treasure Island (FL): StatPearls Publishing; 2022.
8. The Royal College of Pathologists. RCP Guidelines, 2022. Available at: https://www.rcpath.org/uploads/assets/4. Accessed on 12 July 2022.
9. Shetty S, Ullal HG, Kassam ZN, Chidhananda PS, Boloor A, Rastogi P, et al. Death due to massive bee injury- a case report. J Punjab Acad Forensic Med Toxicol. 2012;12:33-6.
10. Golden DB. Insect sting anaphylaxis. Immunol Allergy Clin North Am. 2007;27(2):261-72.
11. Green AW, Reisman RE, Arbesman CE. Clinical and immunologic studies of patients with large local reactions following insect stings. J Allergy Clin Immunol. 1980;66(3):186-9.
12. Barnard JH. Studies of 400 Hymenoptera sting deaths in the United States. J Allergy Clin Immunol. 1973;52(5):259-64.
13. Valliappan S, Singh A, Barwa J, Harish D, Kumar A. Anaphylactic death due to multiple bee stings-A Case report. J Indian Acad Forensic Med. 2017;39:212.
14. PTI. HP Govt to give compensation for death due to bee, wasp sting, 2022. Available at: https://theprint.in/india/hp-govttogivecompensation-for-death-due-to-bee-wasp-sting/898485/. Accessed on 12 July 2022.

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