Case Report

Delayed Death Due to Multiple Honeybee Stings – A Case Report

Pramod Kumar GN[1] 0000-0002-5626-959X, Raja Suriya Varman BR[2], Roopa Urs AN[3] 0000-0002-8150-0191, Shankar M Bakkannavar[4] 0000-0001-6599-7014

Abstract

Deaths due to insect bites and Honeybee stings are not common. It depends on the number of bee stings and hypersensitivity reactions of everyone. Insects of the order Hymenoptera, which include honeybees, wasps, ants and hornets, are frequently involved in accidental stings to humans around the globe. Hymenoptera order members are particularly important because they are nearly ubiquitous in nature. Their stings may lead to fatal allergic reactions. The severity and duration of reaction to bee venom can differ from one person to another. We report a case of death due to multiple honeybee stings exacerbated by preexisting coronary artery disease in an 82-year-old male while he was moving towards his agricultural farm.

Keywords: Honeybee; Sting; Hypersensitivity; Postmortem; Histopathology; Coronary artery disease

Introduction:

Hymenoptera venom consists of a mixture of biologically active substances including enzymes which cause localized and systemic reactions that may be fatal.[1,2] Deaths from bee stings are uncommon.[3,4,5] However, when they occur, they usually result in death due to anaphylactic shock, suffocation after stings in the airways or from an exacerbation of some pre-existing disease such as atherosclerotic heart disease[6]. In addition to the usual hypersensitivity reactions to an allergen, in very few cases, symptoms appear after several days (i.e. serum sickness). Delayed deaths after a wasp bite can occur due to the effect of anaphylactic shock which acts as a catalyst for preexisting conditions to cause death and in some cases of envenomation, toxins can induce rhabdomyolysis[8]. We report a case of death due to multiple honeybee stings exacerbated by preexisting coronary artery disease in an 82-year-old male in southern India.

[1]Professor & Head, [2]Post Graduate, [a]Department of Forensic Medicine and Toxicology, Karwar Institute of Medical Sciences, Karwar, India, [3b]Assistant Professor, Department of Pathology, Karwar Institute of Medical Sciences, Karwar, India, [4c]Associate Professor, Department of Forensic Medicine and Toxicology, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, India
Correspondence: Dr. Shankar M Bakkannavar
Email: shankar.mb@manipal.edu
Contact: +919110240992

Received on 25.04.2024 | Accepted on 15.05.2024

Case Report

An 82-year-old male with a history of death due to multiple honeybee stings was subjected to medicolegal autopsy. According to the Police & relatives' information, the deceased was attacked by multiple honeybees in the morning hours while he was working near his agricultural farm on 9.8.2024. He was treated at a local hospital for intense pain and was taken care of at home for 15 days. He became sick and was brought to the district hospital on 24.8.2023 and died on the same day.

Autopsy findings

On examination, multiple brownish black scabs of varying sizes (Fig 1) measuring 1x 0.5 cm, 1cm x 1cm & 2 cm x 1 cm were present over the front of right arm, forearm, abdomen, groin, thigh, back of thigh, gluteal region, left thigh and leg. Bed sores were present on the back in an area of 10 cm x 12 cm.

Figure 1: Multiple brownish black scabs of bee sting

The brain was congested. A cut section of lungs showed froth in right upper lobe & left lower lobe. The heart showed multiple petechial haemorrhages (Fig 2). The aorta showed atherosclerotic plaques adherent to the inner walls and around the coronary sinuses. Aortic and mitral valve thickening with vegetations was present. The left coronary artery showed obstruction with wall thickening and calcification throughout its course. The right coronary artery showed 30% block in the upper 1/3rd. Two hundred millilitres of fluid was present in the peritoneal cavity. The stomach showed mucus like plugs. The surface of the stomach was haemorrhagic. Routine viscera were sent to the Regional Forensic Science Laboratory

Figure 2: Petechial haemorrhages on surface of heart

and were negative for the presence of volatile poisons, alkaloids, pesticides, etc. The normal skin along with scab areas, heart, lungs, liver, kidney and spleen were sent for histopathological examination (HPE). HP examination revealed 60% narrowing of the left coronary artery and the left anterior descending artery showed 70% narrowing due to atherosclerosis. The atheroma in the right coronary artery and the left circumflex artery showed 50% narrowing. The lungs showed pulmonary congestion and oedema in both lungs. A cell block from peritoneal fluid showed haemorrhage. The skin sections studied showed an ulcerated epidermis with clotted blood intermixed with inflammatory cells (Fig 3). Dense neutrophilic inflammatory cell infiltration was noted beneath the area. The sub epithelium showed fibro collagenous tissue.

Discussion

The well-known members of the Hymenoptera order are bees, wasps, hornets, yellow jackets and trousers. Among the species of Hymenoptera, bees are the most

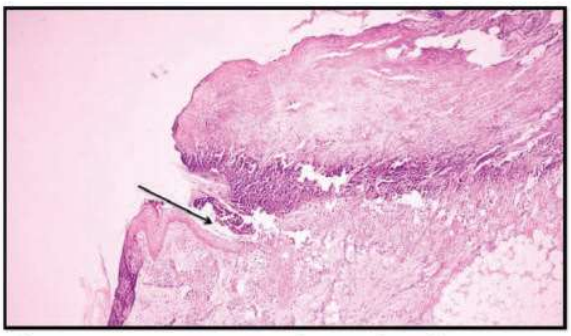

Figure 3: Ulcerated epidermis with clotted blood intermixed with inflammatory cell infiltration (H&E, x100)

common because of their beekeeping activities. Hymenoptera venom consists of a mixture of biologically active substances including enzymes (phospholipases, and hyaluronidases), peptides (melittin, apamin, and bombolitins) and other low molecular weight compounds (biogenic amines, acetylcholine, lipids and free amino acids.

The severity and duration of reaction to bee venom can vary from one person to another. Most people experience a local non serious allergic reaction to bee venom. However, this depends on the location and number of bee stings. A case of death due to honeybee sting was reported by Nezih Anolay et al,[7]where a 49-year-old man with a history of allergic reaction to bee sting was found dead near 9 nests. There were many dead honeybees on him. External examination of the body revealed more than 50 stings all over the body. In the present case, more than 35 stings were noted on the deceased. The deceased patient also had preexisting coronary artery disease (atheroma and atherosclerosis) in both arteries which might have been exacerbated by bee sting hypersensitivity. Histopathological examination confirmed inflammatory cells infiltration with eosinophils in the sections studied. In the present case no eosinophils were noted in HPE probably because of delays in death and examination of the sting site.

Levine HD reported two patients who developed acute myocardial infarction after a wasp sting. Acute myocardial infarction in both patients was caused by deficient coronary perfusion secondary to anaphylactic shock induced by the wasp sting[9].

When injected, Hymenoptera antigen, can cause a wide range of severe delayed effects such as serum sickness; neurological disturbances such as polyradiculomyelitis (Guillain-Barre syndrome); seizures; acute renal failure; haemolysis; thrombotic thrombocytopenic purpura (TTP); disseminated intravascular coagulation (DIC); myocardial infarction and cardiac arrhythmias. Atypical and unusual reactions were similarly observed in the case reported by Shetty SK et al[4], some of which occurred a few hours or even a few days after the bee stings.

Conclusion

Death due to honeybee stings occurs within a few hours to days due to hypersensitivity to venom due to multiple stings if the individual is sensitive or by multiorgan failure due to envenomation or it can provoke the preexisting conditions that can lead to death. Delayed deaths due to such cases may be due to exacerbation of underlying preexisting disease in an individual as observed in this case. Laboratory tests and histopathological examination play a vital role in confirming death due to hypersensitivity reactions since there is greater chance of an obscure or negative autopsy. Protective equipment should be used by vulnerable people to prevent such incidents in the future.

Conflict of Interest: None to Declare

Ethical permission: Obtained from Institutional Ethics Committee.

References:

1. Steen CJ, Janniger CK, Schutzer SE, Schwartz RA. Insect sting reactions to

bees, wasps, and ants. Int J Dermatol. 2005;44(2):91-4.
2. AP Rayamane, MP Kumar,DG Kishor, Dayananda R, A Saraf. Honeybee stings and anaphylaxis: review. J For Med science and law 2014;23(1)
3. Riches KJ, Gillis D, James RA. An autopsy approach to bee sting-related deaths. Pathology. 2002; 34:257-262.
4. Shetty SK, 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(1):33-6.
5. Knight B. The Pathology of Sudden Death. In: Saukko P, Knight B. Knight's Forensic Pathology. 3rded. London: Arnold, 2004:527-541.
6. Vij K. Sudden and Unexpected Deaths. In: Textbook of Forensic Medicine and Toxicology. 3rd Ed. New Delhi: Elsevier, 2005: 197-215.
7. Anolay, Nezih & Arslan, Murat & Kumral, bahadır & Büyük, Yalçın. Death Caused by Honeybee Stings: Case Report. Medicine Science. 2014; 3: 1305-1314.
8. Das S, Mukta Venkatesan, Kar Rakhee, Shaha K, Patra Ambika & Das Ashok. Fatal Wasp Sting with Pre-Existing Undiagnosed Diabetes and Hypertension. Journal of the Indian Academy of Forensic Medicine. 2012; 34: 276-79.
9. Levine HD. Acute myocardial infarction following wasp sting. Am Heart J 1976; 91: 365-374.