Case Study

Postmortem Analysis of Lethal Honeybee Stings: A Case Report

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How to cite this article: Rajiv Ratan Singh, Santosh Kumar, Raja Rupani. Postmortem Analysis of Lethal Honeybee Stings: A Case Report. Indian Journal of Forensic Medicine and Toxicology/Volume 18 No. 3, July - September 2024.

Abstract

The deceased, a 55-year-old male, arrived at our mortuary after succumbing to multiple honeybee stings. Initial examination disclosed pronounced facial swelling and urticarial eruptions. The deceased, who was engaged in gardening, experienced a rapid onset of symptoms following numerous bee stings. Surprisingly, his medical history showed no prior severe allergic reactions to bee stings. This suggested an acute anaphylactic response, highlighting the unpredictability of such reactions. The absence of previous hypersensitivity underscores the sudden and fatal nature of the incident, emphasizing the need for prompt medical intervention in cases of unexpected severe allergic reactions.

Keywords: Honeybee stings, Anaphylaxis, Autopsy, Case Report

Introduction

Lethal outcomes following honeybee stings are rare but pose a significant public health concern, warranting comprehensive postmortem analysis to elucidate contributing factors and improve forensic understanding.[1] While honeybee stings are generally innocuous, severe allergic reactions leading to fatality remain an infrequent yet critical manifestation [2]. According to epidemiological data from the World Health Organization (WHO), an estimated 1-2% of the global population exhibits severe allergic reactions to insect stings, with honeybees being one of the primary culprits [3] . Furthermore, honeybee-related fatalities have been reported across various regions, with notable incidence rates in areas of high beekeeping activity or where honeybee populations thrive. For instance, in agricultural communities heavily reliant

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Submission date: February 1, 2024 **Revision date:** February 14, 2024 **Published date: July 17, 2024**

on beekeeping for pollination services, occupational exposure to honeybee stings may contribute to an increased risk of severe reactions and adverse outcomes [4]. The scarcity of detailed postmortem investigations in such cases underscores the need for a focused exploration into the pathological and toxicological aspects. We present a case report detailing the tragic consequences of an individual subjected to multiple honey bee stings, resulting in a fatal outcome.

Postmortem examination:

Rigor mortis was present all over the body. Postmortem staining was present on the back of the body. Multiple bee stings (more than 100) on face **(figure-1)** and exposed parts of neck and hands were present. Diffuse edema, erythematic patches were present over the affected areas. Soft tissue edema observed in epiglottis area and laryngeal mucosa during internal examination leading to significant laryngeal obstruction **(figure-2)**. Pleural and peritoneal fluids were present. The lungs were congested and edematous (right lung 1124g; left lung 1104 g). The kidneys showed congestion.

Figure-1: Multiple bee stings (more than 100) on face

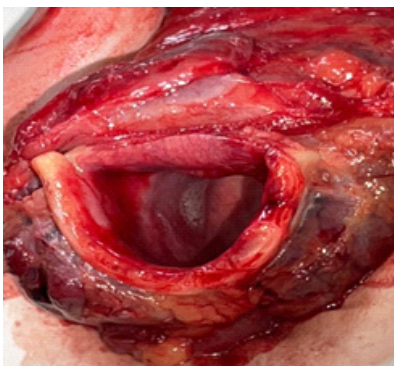

Figure-2: Soft tissue edema observed in epiglottis area and laryngeal mucosa

Cause of death:

Asphyxia from upper airway edema following acute anaphylactic shock from several honey bee stings was determined to be the cause of death.

Discussion

The comprehensive postmortem examination of individuals who have succumbed to honeybee stings unveils significant external and internal gross findings indicative of fatal reactions. External examination typically reveals multiple bee sting puncture wounds distributed across exposed skin surfaces, often concentrated around the head, neck, and extremities. These findings align with the characteristic defensive behavior of honeybees and provide valuable circumstantial evidence of exposure [5]. Internally, gross examination frequently reveals signs of acute anaphylaxis, including diffuse tissue edema, pulmonary congestion, and hemorrhage. Notably, the presence of airway obstruction due to laryngeal edema or bronchospasm may be evident, further corroborating the diagnosis of fatal allergic reaction [6]. The observed soft tissue edema suggests localized inflammatory responses in the upper airway, contributing to the pronounced symptoms [7]. The patent airways and moderate fluid collections indicate a rapid and severe systemic reaction [8]. The congested and edematous lungs signify respiratory distress, a common consequence of anaphylaxis [9]. Kidney findings may suggest circulatory compromise [9, 10]. The absence of known allergies reinforces the sudden and unpredictable nature of severe reactions to honeybee stings [9, 10].

Conclusion

This case underscores the potential severity of multiple honey bee stings, emphasizing the need for heightened awareness and prompt medical intervention. The postmortem findings provide valuable insights into the complexities of severe bee sting reactions. This report aims to contribute to the understanding of such cases, facilitating improved recognition, and management, ultimately aiming to prevent similar tragic outcomes. The absence of a documented history of bee sting allergies underscored the unexpected and severe nature of the reaction. These postmortem findings contribute

to our understanding of lethal honeybee stings and inform forensic protocols for similar cases.

Learning objectives:

Swift identification of anaphylaxis, especially in the absence of documented allergies, is crucial for effective intervention.

Thorough diagnostic evaluation, including allergen-specific testing and postmortem analysis, is essential for accurate cause-of-death determination.

Forensic investigations, guided by detailed postmortem analysis, contribute significantly to understanding and refining protocols for fatal honeybee stings.

Tailoring treatment strategies based on individual patient characteristics enhances the management of severe anaphylactic reactions.

Ongoing medical education for healthcare professionals and public awareness campaigns are vital for preventing and managing fatal outcomes following honeybee stings.

Conflicts of interest: Nil

Informed Consent: Informed consent was obtained after explaining the purpose of research to the family member.

Source of funding: None

Ethical Clearance: Not required as it is a case report.

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