

SHORT REPORT

Work-related anaphylaxis to wasp sting

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Objective	To describe the frequency and epidemiological features of wasp venom allergy in the workplace.
Methods	Retrospective review of 98 adult patients (age 18–65) who suffered an anaphylactic reaction to a wasp sting. Patients were asked about reactions during working hours. Personal history of atopy and previous wasp stings as well as the season, month and type of locality (urban or rural) at the moment of the sting were recorded. Serum-specific IgE levels to venoms from <i>Vespula</i> , <i>Polistes</i> and <i>Apis</i> were measured.
Results	Eighteen patients (18%) suffered a reaction to wasp venom during working hours. The average age was 37.4 years, 89% were men and 94% had a personal history of atopy. All patients but one reported more than three previous stings, the last sting occurring at least 1 year previously in 61%. Previous systemic reactions had occurred in 17%. Gardening was the most frequently reported occupation (39%). Most reactions occurred during the summer season (61%) and took place in rural areas (56%). Serum-specific IgE was positive to <i>Vespula</i> in all patients, <i>Polistes</i> in 78%. In the 80 cases occurring outside of working hours, the mean age was 40.6, the male/female ratio was 35/45 and 23% of these patients were atopic.
Conclusion	Most anaphylactic reactions were not work related. Gardeners were the most frequently involved workers. Workplace anaphylactic reactions showed higher prevalences of atopy (94%) compared to those outside working hours (22%).
Key words	Anaphylaxis; hymenoptera venom allergy; occupational allergy.

Introduction

Vespid (wasps and hornets), bees and ants are stinging insects of the order Hymenoptera. Occasionally, persons with IgE specific to Hymenoptera venom may suffer from allergic reactions such as anaphylaxis, defined as a 'severe, life-threatening generalized or systemic hypersensitivity reaction' [1]. Hymenoptera stings may cause systemic hypersensitivity reactions in the workplace and is well recognized in beekeepers [2–4]. Reports, however, of wasp venom allergy related to occupational activities are currently very limited. A previous study shows a significantly higher frequency of sting exposures and systemic reactions to the common wasp in forestry workers compared to office workers [5].

Methods

We performed a retrospective review of 98 consecutive adults (age ≥ 18 years) who were referred to the Allergy Department of the Puerta de Hierro University Hospital, Madrid, Spain, for anaphylaxis after a wasp sting. Records reviewed included cases seen between 1 January 1994 and 31 December 2005. Anaphylaxis was defined as a severe systemic IgE-mediated hypersensitivity reaction. Serum-specific IgE to venoms from *Vespula* (common wasp or yellow jacket) and/or *Polistes* (paper wasp) was measured using the Pharmacia CAP System method (Uppsala, Sweden). The patients resided in the north-western area of the greater Madrid metropolitan area. Patients > 65 years of age were excluded as this is the mandatory retirement age. Patients filled out both a personal history questionnaire and a questionnaire regarding the specific circumstances of the sting. All patients were asked if the reaction occurred during working hours. In the case of an affirmative response, their specific professional activity was recorded. Age, sex, personal history of atopy and previous wasp stings were recorded. Atopy was defined as a history of atopic dermatitis, respiratory allergic disease (rhinitis, asthma)

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or food hypersensitivity confirmed by positive skin prick tests to either airborne or food allergens, respectively. Data were collected regarding the number of previous stings (more or less than three), elapsed time from the last sting (≤ 1 year or > 1 year) and type of reaction to the last sting (local or systemic). Data collected with respect to the specific circumstances at the moment of the anaphylaxis-induced sting included season, month and geographical area (urban or rural). Results of the specific IgE to wasp venom, as well as honeybee venom, were obtained from a review of the medical record. Patients were determined as having primary sensitization to whichever genus of wasp (*Vespula* and/or *Polistes*) for which the highest level of specific IgE was observed. The data were recorded and analysed using SPSS for Windows, version 12.0.

Results

Of the total 98 cases, 18 patients (18%) suffered a systemic reaction to a wasp sting during working hours. Of these 18, the average age was 37.4 years (SD = 2.95), 16 (89%) were men and atopy was present in 17 (94%). All 18 reported previous wasp stings in the workplace, and 17 (94%) reported more than three stings in the past. The interval between the last reported sting and the anaphylaxis-inducing sting was > 1 year for 11 patients (61%), with 3 patients (17%) reporting at least one previous systemic reaction.

Gardeners (workers who take care of gardens or tend plants without productive purpose) accounted for the profession with the highest systemic reaction frequency (39%), followed by construction workers and vehicle drivers (Table 1). All gardeners were atopic men. Most reactions occur in the summer season ($n = 11$; 61%). The months with the highest number of cases were August ($n = 6$; 33%) and October ($n = 5$; 28%). The sting that caused the reaction took place in rural areas in 10 cases (56%).

All 18 patients showed serum-specific IgE to *Vespula*, whereas IgE to *Polistes* was detected in 14 (78%). Specific IgE antibodies to honeybee venom were found in six

patients (33%). The primary sensitization was to *Vespula* in nine cases (51%) and *Polistes* in three cases (17%). There was no difference between the levels of specific IgE to both venoms in 6 of these 18 patients (33%).

As for the 80 patients who did not suffer the sting while at work, the mean age was 40.6 (SD = 12.32). The male/female ratio was 35/45, and only 18 patients (23%) had a personal history of atopy. A chi-square test for the variables sex and atopy showed a statistically significant difference between occupational and non-occupational cases ($P < 0.05$).

Discussion

This study found that most anaphylactic reactions to wasp venom were unrelated to work. Only 18% of our cases occurred during working hours. Most work-related anaphylactic reactions occurred in atopic individuals and in males. Men are probably affected more than women because they perform more outdoor occupations with a higher risk of exposure to wasp stings. The higher prevalence of atopy in the anaphylactic incidents occurring in the workplace is difficult to explain. Previous studies in the general population indicate that atopy is not a risk factor for systemic reactions to Hymenoptera stings [6]. However, sensitivity to Hymenoptera venoms has been associated with atopy-related IgE hyperresponsiveness [7]. The data demonstrates that gardeners, more than other professions, suffered the highest number of work-related anaphylactic reactions to wasp stings in our population. This fact is significant in that other common agricultural activities did not account for any cases. The region in which the study took place is comprised primarily of urban areas, with some agricultural parcels. Residential neighbourhoods and even mountains (defined as rural areas), however, are also found in the region in which the study took place.

We found a higher frequency of hypersensitivity to *Vespula* venom in our study population. Both *Vespula* and *Polistes* species are present in Spain. *Vespula* is widespread in Europe, but *Polistes* is not currently present in northern countries, including UK [8].

Table 1. Occupation as it relates to the frequency of anaphylaxis to wasp venom

Occupation	Number of patients	Percentage
Gardener	7	39
Construction worker	3	17
Car driver	2	11
Horsewoman	1	6
Horse breeder	1	6
Mechanic	1	6
Scrap merchant	1	6
Waiter	1	6
Fishmonger	1	6

Key points

- Most anaphylactic reactions are unrelated to work. Only 18% of cases were work related.
- In the study population, gardeners suffered more work-related anaphylactic reactions to wasp stings than other occupations.
- The majority of anaphylactic reactions during working hours occurred in atopic individuals.

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Conflicts of interest

None declared.

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