

Allergo J Int (2017) 26:119–121
DOI 10.1007/s40629-017-0018-y



Bee venom allergy: a recent trend among amateur beekeepers

Gwendolyn Dinkel · Katharina Pietschke · Katharina Belge · Amir Yazdi · Jörg Fischer

Received: 29 July 2016 / Accepted: 22 November 2016 / Published online: 24 March 2017
© Springer Medizin Verlag GmbH 2017

Keywords Bee venom allergy · Beekeepers · Incidence

To the editor

There are regular reports in the media that the honey bee is endangered under current agricultural conditions in Germany [1]. According to statistics from the German Beekeepers' Association, the number of bee colonies in Germany declined by around 30% between 1980 and 2008 [2]. In response to a request from the authors, the managing director of the German Beekeepers' Association, Ms. Barbara Löwer, reported a trend reversal in Germany since 2008. According to Ms. Löwer, the number of beekeepers has risen again nationwide. Amateur beekeeping has become a popular hobby in Germany. The pilot study presented here investigated whether there is a proportionally higher number of beekeepers presenting in allergy outpatient departments with bee venom allergy due to this increase in beekeeping activity.

A monocentric study conducted in the allergy unit at the department of dermatology of the University of Tübingen, Germany, determined the incidence of bee venom allergy for the period 01 November 2011 to 31 December 2015 and analyzed the proportion made up by beekeepers. Newly presenting bee venom-allergic individuals were identified by the constellation of requested (single) allergens in specific IgE determination using the statistics module of the SwissLab (Swisslab GmbH, Berlin, Germany) laboratory information system, and their medical records were retrospectively reviewed by departmental physicians. Pa-

tient histories for bee venom-allergic individuals were taken for a 10-year period at initial presentation using a standardized checklist; all patients were questioned about bee stings and beekeeping activities. All bee stings sustained by beekeepers or family members while in the immediate vicinity of their own beehives were classified as beekeeping-related stinging incidents.

Preliminary analysis of patient behavior showed that 50.8% of patients presented to an allergist for evaluation in the same year as the sting, 37.1% in the following year. Only 12.1% of patients presented later, whereby time intervals varied significantly, with some being as long as 20 years. Therefore, for the purposes of incidence calculation, the December 31st of the following year was chosen as the cutoff date, thereby, including 87.9% of all newly presenting cases for 1 year. In a deviation from this approach, an interim analysis was performed for the year 2015 up to 31 December 2015, meaning that only data on presentations within the year of the stinging incident were available for that particular year.

During the period 01 November 2011 to 31 December 2015, 240 patients presenting with bee venom allergy for the first time were included in the analysis. The percentage of beekeepers affected by bee venom allergy in relation to all newly presenting cases was 26.7% for the observation period of 5 years. The percentage of bee venom-allergic individuals that were minors in relation to the total collective was 10.8% (Table 1). On a descriptive level, no differences were identified between beekeepers and non-beekeepers in terms of the prevalence of double sensitization or the severity of the allergic reaction (according to Ring and Messmer [3]) (Table 1). However, there were more males in the beekeepers group and beekeepers presented to an allergist earlier following an allergic reaction.

G. Dinkel · K. Pietschke · K. Belge · A. Yazdi · Dr. J. Fischer (✉)
Department of Dermatology, Allergology,
Tübingen University Hospital,
Liebermeisterstraße 25, 72076 Tübingen, Germany
joerg.fischer@med.uni-tuebingen.de

Table 1 Demographic data and bee sting-related parameters for beekeepers and non-beekeepers with bee venom allergy seen during the period 01 November 2011 to 31 December 2015

	Total collective (in %)	Beekeepers (in %)	Non-beekeepers (in %)
Total collective (n = 240)	–	26.7	73.3
Sex			
Males	53.3	65.6	48.9
Females	46.7	34.4	51.1
Average age (SD)	–	43.6 years (±11.5)	42.8 years (±19.4)
Minors	10.8	0	10.8
Severity			
I	27.1	28.1	26.7
II	52.1	57.8	50.0
III	20.4	14.1	22.7
IV	0.4	0	0.6
Serological double sensitization	55.0	50.0	56.8
Visit in same year as stinging incident	–	65.6	45.5
Visit in year after stinging incident		29.7	39.8
SD standard deviation			

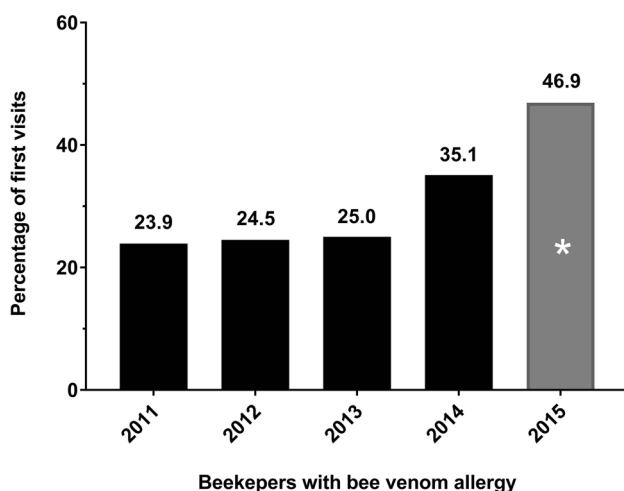


Fig. 1 The percentage of beekeepers with bee venom allergy in relation to the incidence of bee venom allergy in the Tübingen area during the period 01 November 2011 to 31 December 2015. (For each year, patient visits up to 31 December of the following year were taken into consideration) (*The preliminary incidence given here for 2015 is based on an interim evaluation with a cutoff date of 31 December 2015.)

Analysis of the beekeepers' group in terms of newly presenting cases per year showed that 11 of 49 (23.9%) initial presentations in 2011, 12 of 49 (24.5%) in 2012, 8 of 32 (25%) in 2013, and 13 of 37 (35.1%) in 2014 were beekeepers (Fig. 1). To date, 15 of 32 beekeepers (46.8%) presented to the allergology unit at the department of dermatology at the Tübingen University Hospital for the first time in 2015 (up to 31 December 2015; Fig. 1).

The incidence of bee venom-allergic individuals among beekeepers in German-speaking countries

at the allergy unit of the dermatological department at Tübingen University Hospital (anaphylaxis severity classification according to Ring and Messmer [3])

is put at between 4.4% and 43% and is subject to significant variation depending on methodological approach [4–7]. The percentage of beekeepers determined in this study over a period of 5 years is comparable with results seen in the early 1990s (24%, Basel area, Switzerland) [4]. This demonstrates that beekeepers that acquire allergies have long represented an important subgroup of bee venom-allergic individuals.

Beekeeping currently classifies as a popular amateur hobby in Germany. Thus, the increase in bee colonies in Germany is not due to professional/agricultural beekeeping, but rather to a large number of new amateur beekeepers with a comparatively low number of beehives. This development may be relevant in terms of the risk of bee venom allergy in two ways. On the basis of epidemiological studies, a recent position paper on the prevalence of immediate-type allergies in Germany suggests that disposition to allergy is on the rise in the German population [8].

Earlier studies on bee venom allergy in beekeepers showed that a low annual number of bee stings (<10 stings/year) is a risk factor for the development of bee venom allergy [7]. The combination of atopic diathesis and occasional exposure to bee venom could promote the onset of bee venom allergy. Although the duration of beekeeping activities was not recorded in a standardized manner over the 5-year study period, the overall impression was that the allergic amateur beekeepers presenting for the first time in the preceding months were “new beekeepers” (beekeeper ≤ 24 months) in the vast majority of cases. A breakdown of the incidence for the preceding 5 years revealed a trend in the Tübingen region: the percentage

of beekeepers among bee venom-allergic individuals rose continually. As this was a monocentric study, one cannot rule out that regional features affected the results, and this should be borne in mind when generalizing results.

In summary, this pilot study concluded that the trend toward more widespread amateur beekeeping can result in an increase in the number of beekeepers among the bee venom-allergic population. We recommend that greater attention be paid in the coming years to the incidence of bee venom allergy among beekeepers.

Conflict of interest G. Dinkel, K. Pietschke, K. Belge, A. Yazdi, and J. Fischer declare that they have no competing interests.

References

1. Sauer S. Bienensterben: Massenhafter Tod eines wichtigen Nutztieres 2016. <http://www.berliner-zeitung.de/wirtschaft/bienensterben-massenhafter-tod-eines-wichtigen-nutztieres-23946176>. Accessed 21 July 2016.
2. Deutscher Imkerbund. Imkerei in Deutschland. Zahlen, Daten, Fakten 2016. http://deutscherimkerbund.de/161-Imkerei_in_Deutschland_Zahlen_Daten_Fakten. Accessed 31 Dec 2015.
3. Ring J, Messmer K. Incidence and severity of anaphylactoid reactions to colloid volume substitutes. *Lancet*. 1977;1:466–9.
4. Eich-Wanger C, Müller UR. Bee sting allergy in beekeepers. *Clin Exp Allergy*. 1998;28:1292–8.
5. Münstedt K, Hellner M, Winter D, von Georgi R. Allergy to bee venom in beekeepers in Germany. *J Invest Allergol Clin Immunol*. 2008;18:100–5.
6. Bousquet J, Ménardo JL, Aznar R, Robinet-Lévy M, Michel FB. Clinical and immunologic survey in beekeepers in relation to their sensitization. *J Allergy Clin Immunol*. 1984;73:332–40.
7. Müller UR. Bee venom allergy in beekeepers and their family members. *Curr Opin Allergy Clin Immunol*. 2005;5:343–7.
8. Bergmann KC, Heinrich J, Niemann H. Current status of allergy prevalence in Germany: Position paper of the Environmental Medicine Commission of the Robert Koch Institute. *Allergo J Int*. 2016;25:6–10.