Contact allergy to propolis in beekeepers

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SUMMARY

Background: Some toothpastes, cosmetics and ointments contain propolis, a bee product, and it is increasingly popular as a dietary supplement. Although propolis is known to cause contact allergy, there have been no studies of the prevalence of this.

Objectives: This study aimed to determine the prevalence of contact allergy to propolis in beekeepers and any relationship between propolis allergy and environmental and physical and mental health characteristics in this group.

Subjects and methods: A specially developed instrument which included a validated questionnaire on emotional stability was included in the issues of three German beekeeping journals sent to subscribers in a number of regions (potential readership 35,000). A reference group also completed questionnaire.

Results: 1051 questionnaires were returned and 37 cases of allergic reactions to propolis were reported (3.6 %). Only 10 of the 37 (27 %) beekeepers had recognised the allergy before participating in this study. Propolis contact allergy was significantly associated with lung diseases and other allergic reactions. Only some affected beekeepers protected their hands more while working with bees and showed significantly greater emotional instability than those not sensitised to propolis.

Conclusions: Contact allergy to propolis is common among beekeepers, but they do not seem to recognise the problem or protect themselves properly.

Key words: Contact allergy. Propolis. Beekeeper. Beekeeping.

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INTRODUCTION

Propolis is a substance collected by worker bees from the resin of trees and flowers and used by them as a multifunctional material in constructing and maintaining their hives. Man has used propolis for centuries. In ancient Egypt, it was used for embalming the dead. Aristotle (around 330 BC) reported the first use in medicine, but it took more than 350 more years until the Roman scholar, Caius Plinius Secundus (23-79 AD), and the Greek, Pedanios Dioscorides (around 50 AD) continued with the medical uses of the substance[1]. In the 17th century, Stradivarius used varnish containing propolis on his violins, and more recently a preparation called Propolisin, made from petroleum jelly and propolis, was used to treat wounds during the Boer War in South Africa (1899-1902)[2]. Although scientific evaluation has provided substantial information on the biological activity and toxicity of propolis and indicates that the substance has antibiotic, antifungal, antiviral and anti-tumour properties, no

propolis-containing preparation has yet found a place as accepted treatment in mainstream, western medicine. Nevertheless, many 'over the counter' products containing propolis are currently available, including cosmetics, toothpastes and ointments, and propolis is used increasingly as a dietary supplement.

The increase in the use of propolis has been paralleled by the publication of numerous case reports on contact allergy to the substance. Studies on patients with contact allergy from unknown causes found that 1.2 to 6.6 % of those who were patch-tested for dermatitis were sensitive to propolis[3]. In addition, many contact allergens have been found in propolis[4]. Beekeepers probably have more contact with propolis than others and may be the group most affected by propolis contact allergy, since the first case was described in a beekeeper in 1915. Because of this we undertook a study on beekeepers' health in order to determine the prevalence of propolis contact allergy in this group and its possible association with other health conditions.

METHODS

Study questionnaires

Because there have been no previous studies on this subject we had to develop a suitable instrument for gathering information – this was the Questionnaire for the Assessment of Beekeepers' Health (QABH). The questionnaire was based on previous research in other fields of medicine and on reports of various disorders in beekeepers[5-14]. The questionnaire was tested in 10 volunteers for intelligibility. The QABH was combined with the Inventory for the Measurement of Bodily Negative Affectivity – trait version (INKA-h) questionnaire. The INKA-h provides validated and robust evidence of emotional instability such as neuroticism, negative affectivity or stress-reactivity[15]. This is important since published reports show that emotional instability is associated with psychological and somatic disorders as well as subjective bodily discomfort[16-25].

Subjects

In Germany, some 81,818 beekeepers are members of the national Deutscher Imkerbund (DIB; German Beekeepers Association), an organization which is structured into regional groups. According to the association, only 5 to 10 % of German beekeepers are not members. Most members subscribe to journals informing them of regional news. The Deutscher Landwirtschaftsverlag GmbH (www.dlv.de) publishes three of these journals – *Die Biene*, *Der Imkerfreund*, and *ADIZ*. Journal readership is particularly high in the following geographic areas: Baden, Bavaria, Hesse, Mecklenburg-Western Pomerania, Nassau, Rhineland-Palatinate, Rhineland, Saxony, Saxony-Anhalt, Saarland, and Thuringia. The QABH and INKA-h were incorporated into one questionnaire and included in the May 2006 issues of the three Deutscher Landwirtschaftsverlag beekeeping journals sent to subscribers in the areas mentioned above. The survey therefore reached approximately 35,000 beekeepers (Deutscher Landwirtschaftsverlag GmbH, personal communication). Readers were asked to complete the printed questionnaire and to return it by mail or fax or to complete the electronic questionnaire on the Internet. A copy of the questionnaire is available from KM.

Reference group

Members of the beekeeping association in the Giessen region were asked to serve as a reference group in order to detect or rule out any potential biases between beekeepers who responded to our journal survey and non-respondents. The Giessen association has 181 members – 178 individual members and 3 institutional members. Concurrently with the distribution of the questionnaire in journals, individual members of the Giessen association were asked to complete the questionnaire and return it using a postage paid envelope.

Statistical analysis

SPSS version 10.0 (SPSS, Chicago) was used for data management and statistical analysis. Various statistical methods were used in the study, including simple descriptive methods, bivariate correlations, cross-tabulation, and one-way ANOVA. A p-value of less than 0.05 was considered significant.

Ethical approval

The study was submitted to and approved by the ethics committee of the Justus-Liebig-University.

RESULTS

Questionnaires returned

In all, 1051 questionnaires were returned, mainly by mail or fax, but a few via email. Altogether 58 bee-