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ORIGINAL RESEARCH ARTICLE

# Honey as a treatment option for rhinoconjunctivitis

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## Summary

Treatment with honey is one of many unconventional methods for the treatment of rhinoconjunctivitis. A recent study reported the inefficacy of honey treatment despite earlier reports on the efficacy of oral desensitization with honey in children. We asked beekeepers in Germany, Austria and Switzerland to hand out a questionnaire to their customers who bought honey for the treatment of rhinoconjunctivitis, which assessed the modalities of honey administration, efficacy of honey treatment (using the German version of the Rhinoconjunctivitis Quality of Life Questionnaire from Juniper) and the patient-rated success of treatment. Twenty-nine questionnaires were received. Twenty three were evaluable for response. The study showed that the majority of participants (91.3%) considered the use of honey in this respect to be a reasonable or very reasonable approach. Comparison of quality of life before and after honey treatment also showed significant improvements in most cases. In spite of the limitation of this study due to its design, we were able to provide evidence that the use of honey could help to improve symptom control in patients with rhinoconjunctivitis.

**Keywords:** rhinoconjunctivitis, pollen, honey, oral desensitization

## Introduction

Pollen grains are the microgametophytes of seed plants, that produce the male gametes which germinate after landing on a compatible pistil of a flowering plant or the female cone of a coniferous plant. Pollen transfer can be mediated by the wind (from anemophilous, non-flowering seed plants), insects or birds (from entomophilous plants). Bees are a major pollinator of flowering plants and are rewarded with honey for their services and they also use pollen as a source of protein for brood rearing.

During the flowering season uncountable numbers of pollen grains are released. Most of them will not reach their destination. Instead, some come into contact with the eyes or are inhaled and may then cause symptoms such as rhinoconjunctivitis and/or asthma. In this respect pollen affects about 15–25% of the general population, varying greatly according to patient age and geographical distribution (Bartra *et al.*, 2009). About 52% of the patients with allergic rhinitis and about 44% of patients with asthma are sensitive to pollen, making pollen the most common allergen (Bartra *et al.*, 2009). However, an immunological or even allergic reaction towards pollen is not the only mechanism involved. Pollen also liberates lipids with chemical and functional similarities to leukotrienes and prostaglandins, the so-called pollen-associated lipid mediators (PALMs), which either activate innate immune cells such as neutrophils and eosinophils (immunostimulatory PALMs) or block IL-12 production of dendritic cells, resulting in the preferential induction of T(H)2 responses (immunomodulatory E(1)-phytoprostanes) (Gilles *et al.*, 2009).

The main elements of treatment of rhinoconjunctivitis are the avoidance of the allergen and the use of oral anti-histamines and local steroid sprays during the period of time when the allergens are present. However, several unconventional methods also exist, including mental healing, herbal formulas, healing hand therapies, acupuncture, and sublingual immunotherapy, all of which have been described with mixed results that lack consistency (Kapoor & Bielory, 2009). An alternative treatment that is recommended repeatedly is the regular consumption of locally produced unfiltered honey. This supposedly contains the local plant pollen to which a patient is allergic. In this respect the honey would work much like sublingual immunotherapy. Patients are often advised to start "treatment" with honey well before the season begins or to take honey all year round. The fact that many people have experienced anaphylaxis from eating

honey means that there may be enough pollen to stimulate the immune system, but a clinical study on the subject found no evidence of this (Fuiano *et al.*, 2006; Helbling *et al.*, 1992; Rajan *et al.*, 2002). However, there are several problems associated with the latter study performed (Rajan *et al.,* 2002). There was a total number of 35 patients for a three-armed randomized trial which was too low, and the drop-out rate was about 33%, mainly because participants could not tolerate eating one tablespoon of honey every day due to the overly sweet taste, means that these results can be questioned.

Because of the prevalence of rhinoconjunctivitis, the above-mentioned problems with a recent trial, and the frequent recommendation of honey for this disease despite the evidence, we decided to assess data from patients who had experience with honey in this respect, with the aim of evaluating the topic on the basis of recent data and providing a better background for future trials on the subject.

# Materials and methods

## Subjects

Via several beekeeping journals in Germany, Austria, and Switzerland we asked beekeepers to hand out questionnaires to honey customers who they knew bought their honey especially to treat their rhinoconjunctivitis. They were given internet addresses that allowed them to download the questionnaires; beekeepers without access to the internet could request the questionnaire from KM by mail.

## Study questionnaire

The first part of the questionnaire concerned demographic information of each participant, and the second part elicited information on the modalities of honey intake (dose and schedule of administration), need for additional drug intake before and after honey treatment, and the perceived efficacy of honey treatment for rhinoconjuctivitis. In order to estimate the possible benefit of honey treatment we asked the participants to describe their rhinoconjunctivitis-associated complaints before and after honey therapy using the German version of the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) (Juniper & Guyatt, 1991).

## Statistical analysis

SPSS version 17.0 (SPSS, Chicago) was used for data management and statistical analyses.

## Ethical approval

The study was submitted to and approved by the ethics committee of the Justus-Liebig University (application number 106/2009).

# Results

Within 5 months of publication of our appeal we received 29 responses. One person who used pure bee pollen found that this effectively improved her rhinoconjunctivitis. Two respondents had only recently started treatment of rhinoconjunctivitis with honey and thus were unable to judge the efficacy of honey treatment. One of these two and three others had undergone other treatments for rhinoconjunctivitis (homeopathy or conventional desensitization). These cases were excluded which left 23 patients for evaluation. The characteristics of the evaluated cases are given in Table 1.

In 19 cases (82.6%) the background of rhinoconjunctivitis was investigated. The main allergens were birch tree (n = 8), hazelnut tree (n = 8), willow tree (n = 3) and mugwort (n = 2). On average the participants had used honey for rhinoconjunctivitis for 8.1 years (SD = 9.5, range 1 to 34 years). The average distance to the beekeeper who provided the honey was 3.3 kilometres; however, in 8 cases the participants were beekeepers themselves who kept bees in their backyard. In most cases (n = 16; 69.6%) the participants in this study used honey for the entire year; the remaining participants started honey therapy in the autumn and stopped in the spring. The average dose was 34.2 g/day (SD 28.6; range 5.0 to 90.0 g/day).

Before honey treatment 4 respondents (17.4%) reported that they required no additional medication during the pollen season, 3 (13.0%) required occasional medication, 11 (47.8%) a daily medication and 5 (21.7%) a medication more than once a day. After honey treatment 12 (52.2%) participants required no further medication; in 9 cases the need for an additional medication decreased. In one case (4.3%) the treatment had no effect and in one case (4.3%) the situation worsened. Accordingly, the majority (91.3%) considered the use of honey in this respect to be reasonable (n = 4; 17.4%) or very reasonable (n = 17; 73.9%). Comparison of quality of life before and after honey treatment also showed significant improvements. Figure 1 shows the differences before and after honey treatment for the various subscales of the RQLQ. The differences are statistically significant. The average scores for overall

***Table 1***: Characteristics of the 23 participants (N = 23)

| **Variable** | |
|---|---|
| Age [Mean (SD)] | 52.3 (16.5) |
| Gender [n (%)]<br>female<br>male | <br>17 (73.9)<br>6 (26.1) |
| Incidence of atopic dermatitis [n (%)] | 4 (17.4) |
| Incidence of other allergies [n (%)] | 18 (78.3) |

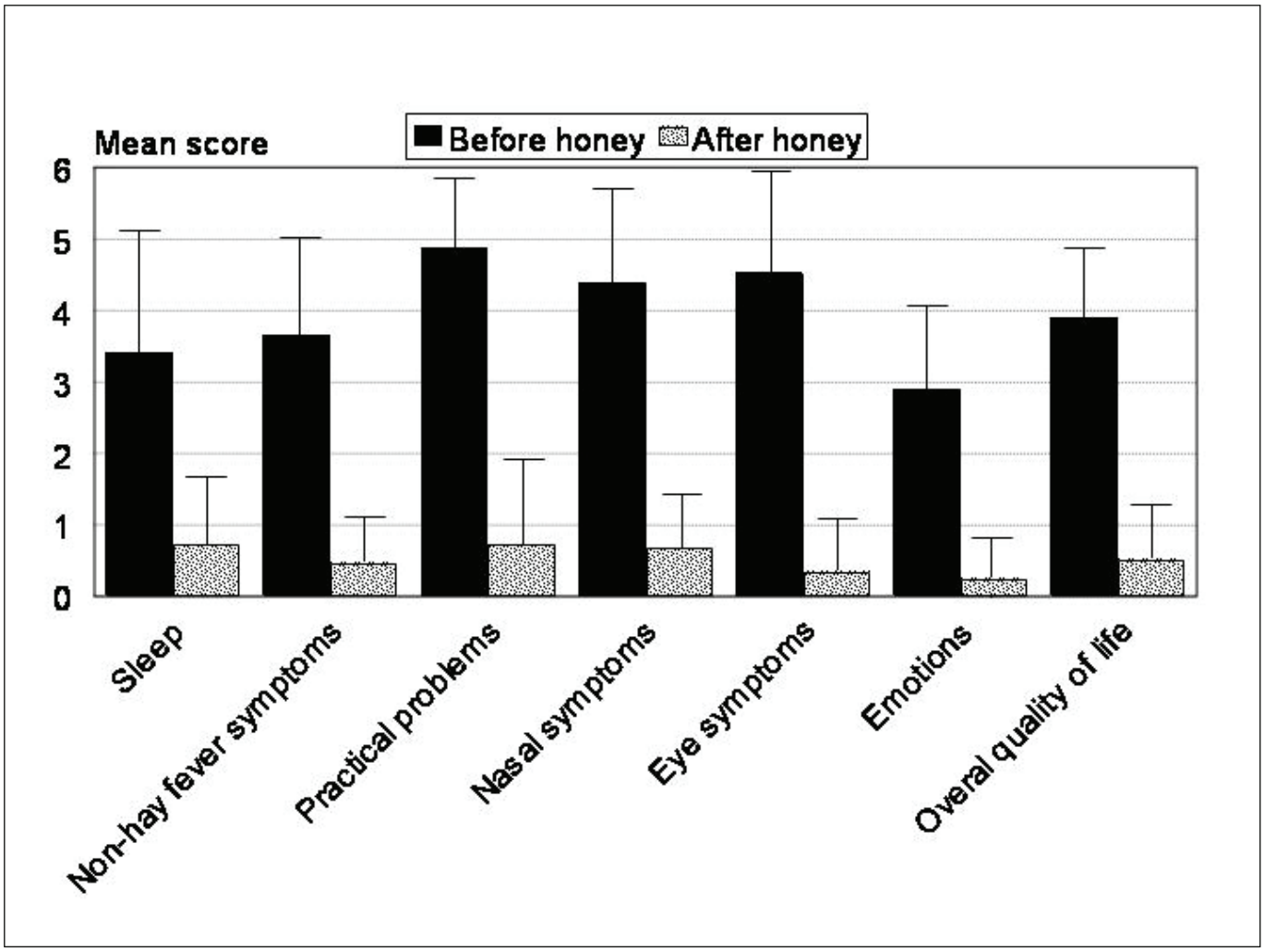


***Fig. 1***: Scores of various subscale and of overall quality of the RQLQ-Questionnaire which assessed symptoms on how much participants were troubled on a scale from 0 = not troubled to 6 = extremely troubled.

quality of life dropped from 3.96 (SD 0.92) to 0.51 (SD 0.84) (T-test $T = 11.6$; $df = 17$; $p < 0.001$).

Respondants also had an opportunity in the questionnaire to make spontaneous comments on the effects of honey treatment. Four of them reported a decreased incidence of upper respiratory tract infections.

# Discussion

Our results provide further evidence that the use of honey can improve rhinoconjunctivitis-associated symptoms such that many patients do not require further additional medication.

However, the study has several limitations. First, the number of people who responded to our appeal was low, and second, there was clearly a bias because it must be assumed that we mainly reached people with favourable experiences of honey treatment. Due to the type of assessment we were also unable to verify the reported symptoms before and after honey treatment. Furthermore, it would have been interesting to analyse the honey for the existence of pollen to which the patients were known to be allergic.

As mentioned before, the only randomized trial on the subject that found no evidence for the successful use of honey for rhinoconjunctivitis also had several limitations (Rajan *et al.*, 2002). In addition to the problems of this trial mentioned in the introduction, the discussion widely ignored studies that had already shown a benefit from honey in this respect. An earlier study from Switzerland found a 75% response rate (15/20) after oral desensitization with honey (von Arx, 1957). A second study summarized data of 21 patients who consumed 10 to 20 grams of honey each day. Here, 16 patients reported benefits (76.2%) (Croft, 1990). Another study evaluated the effects of honey in 353 children and found an average response rate of 69% among children of various age groups (Wortmann, 1965). These data suggest that treatment with honey is more effective in children younger than 11 years old. However, Wortmann did not use conventional honey but added 120 grams of a pollen product to 1 kg of native honey. Although the treatment was

not specifically adapted to individual sensitivities the author reported the incidence of rhinoconjunctivitis symptoms when the children received more than the scheduled dose of honey.

The fact that honey does not necessarily contain the pollen to which the patient is allergic does not mean that this type of honey would not work. Earlier work detected common antigens between the pollen of anemophilous and entomophilous plants, so the absence of the specific pollen does not mean that the treatment will not work (Mazzi, 1964).

Higher age is frequently considered a negative prognostic factor for oral desensitization although this and other reports show that oral desensitization with honey is at least possible (Croft, 1990).

Thus our findings are in accordance with important earlier studies of honey in rhinoconjunctivitis and also agree with other studies that show that oral desensitization is a possible way to improve the situation. As many patients with chronic diseases are looking for reasonable and natural methods of treatment, they may thus be advised to try honey. Although no information on the efficacy of the treatment in adults is available, honey is an inexpensive and comparably safe treatment as reactions to honey are rare, perhaps even less frequent in comparison to sugar-cane syrup (adverse symptoms with honey = 26% vs. placebo 41%; Kiistala *et al.*, 1995).

In conclusion, this preliminary study provides further evidence for the use of honey for rhinoconjunctivitis. Further prospective studies that would determine efficacy in adults and in larger collectives are required.

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