

Anaphylactic Reaction After Ingestion Of Bee Pollen

John P. Geyman, MD

The nutrient value of bee pollen, as well as other plant pollen, has been claimed around the world for many centuries. Bee pollen has received particular attention in recent years in the United States, especially in the lay press, as an unusually nutritious health food. Spurred by a growing national interest in alternative medicine, advocates have claimed curative and healing properties for bee pollen for a wide range of diseases, including respiratory tract infections, endocrine diseases, colitis, and allergies.¹⁻³ Widely available in health food stores, it is marketed in capsule, tablet, or granule form as a "superfood," with an allegedly complete balance of proteins, carbohydrates, fats, all essential amino acids, vitamins, and minerals.¹ Therapeutic claims for bee pollen are enthusiastic; a writer in a current issue of *Well Being Journal*,⁴ for example, says that bee pollen "detoxifies and purifies the blood stream, protecting against poisons such as carbon monoxide, other air pollutants, ozone, lead, mercury, x-rays, and unclean water . . ."; bee pollen is also extolled for its role as a cancer-preventive supplement. Many athletes have taken bee pollen in the belief that their strength, health, and endurance will be improved.³ Further claims of the rejuvenating and life-prolonging effects of bee pollen have been made.⁵ Despite these exaggerated statements, no scientific evidence has yet been published confirming the health benefits of bee pollen.⁶⁻⁸ It appears that bee pollen is just another health fad enjoying widespread popularity and use based on unproven claims.

Bee pollen is energetically marketed as a safe product within the health food industry. Its adverse effects are not widely known, and no warnings about possible risks are attached to the product. There are, however, reports in the medical literature of acute, allergic reactions following ingestion of bee pollen.^{9,10} This report describes

another case involving a life-threatening allergic reaction to bee pollen, together with a brief discussion of its pathogenesis and occurrence.

Case Report

During a recent visit to San Juan Island in the Pacific Northwest, a 33-year-old man in good general health ingested bee pollen. Within 15 minutes, he noted a sour taste, constriction of the throat, and itching first on the right side of his neck, then the left side. This was rapidly associated with increasing swelling on both sides of his neck. Within another 10 minutes, he was having acute respiratory distress. He telephoned 911 and was told to come immediately to Inter-Island Medical Center in Friday Harbor. He was brought in by a friend and was seen several minutes later for emergency care.

On initial examination, the patient had marked swelling of the lateral aspect of the neck below the angle of the mandible, about 8 cm on the right and 6 cm on the left. His blood pressure was 140/90 mmHg, heart rate 116 beats per minute, and respirations 24/min. He was quite anxious and needed to keep his neck hyperextended to keep an airway patent. There were no wheezes, the lungs were clear to percussion and auscultation, the skin was clear, and the remainder of the examination was within normal limits. He gave no history of allergic reactions, allergies, current medication, or serious illnesses. He had had previous bee stings in early childhood without reaction. There was no family history of atopy. Except for the bee pollen, there was no history of unusual exposure that day to dietary or environmental allergens.

The patient was given 0.3 mg of 1:1,000 aqueous epinephrine hydrochloride subcutaneously when first seen, followed by another 0.2 mg subcutaneously 10 minutes later. An intravenous infusion was started with a lactated Ringer solution, and 100 mg of methylprednisolone sodium succinate (Solu-Medrol) was administered intravenously. He was monitored closely for a 3-hour period, during which time his neck swellings resolved almost entirely, and his blood pressure, heart rate, and respirations stabilized without

Submitted 28 October 1993.

From the Inter-Island Medical Center, Friday Harbor, Washington. Address reprint requests to John P. Geyman, MD, Department of Family Medicine, HQ-30, University of Washington, Seattle, WA 98195.

hypotension. His dyspnea and anxiety resolved as his airway improved. He never developed a rash, wheezes, or angioedema elsewhere. He was released in stable condition, without postural changes, 3 hours later and prescribed diphenhydramine hydrochloride (Benadryl) 25 to 50 mg to be taken four times a day for the next several days. He was advised to avoid any further exposures to bee pollen and given a bee sting kit for possible future emergency treatment. Follow-up telephone calls the next day and 1 week later revealed that he had no further sequelae from this incident.

Discussion

This case involving bee pollen allergy was beyond my previous experience and raised questions about its frequency, pathogenesis, treatment, and whether any relation exists with bee venom allergy. A MEDLINE search was carried out targeting "anaphylaxis" and "bee pollen." Two reports of anaphylactic-acute allergic reactions to bee pollen were found. The first report by Cohen and his colleagues⁹ in 1979 described three such cases; two of the patients gave a previous history of allergic rhinitis, and none had experienced a systemic reaction to bee sting. Another case of anaphylaxis to bee pollen was reported in 1981 by Mansfield and Goldstein,¹⁰ who mentioned four other cases; none of these patients had a history of systemic bee sting reaction, whereas some had allergic rhinitis. Follow-up allergy and laboratory studies demonstrated sensitivity to bee pollen itself, which was found to vary considerably with the locale and region, as well as season in which the pollen was collected.¹⁰

Bee pollen is a granular form of nonairborne pollen that is collected by bees from male seed flowers. It is mixed with secretions from the bee, formed into granules, and carried on the hind legs.¹⁰ Upon return to the hive, the bee stores the pollen as beebread for feeding the larvae.⁴ The pollen is collected by the beekeeper by screening the entrance to the hive, thereby forcing the pollen granules out of the pollen sacs.¹⁰ In Sweden, tons of bee pollen have been collected by this process for consumption as a health food, and it is estimated that the bee pollen industry in the United States is of similar magnitude.⁹

In earlier years bee pollen was not considered to have antigenic potential for allergic reactions.¹¹⁻¹³ In their 1979 report, Cohen, et al.⁹ were the first

to observe an apparent cause-and-effect relation between sensitivity to the nonairborne allergens contained in bee pollen and the occurrence of acute allergic reactions. Their 3 patients were found to have immunoglobulin E-mediated sensitivity to bee pollen on the basis of in vivo (cutaneous) and in vitro (radioallergosorbent test [RAST]) techniques; these techniques also showed sensitivity to ragweed and dandelion extracts. Cross-reactivity was documented for bee pollen, ragweed, and dandelion, all members of the Compositae family.⁹

Later reports have strengthened the case for a causal relation between bee pollen and systemic allergic reactions in susceptible individuals. In 1989, Lin and colleagues¹⁴ described a patient who developed hypereosinophilia associated with malaise, headache, nausea, diarrhea, abdominal pain, pruritus, and memory deficit 6 weeks after the start of recurrent ingestion of bee pollen. No other cause for the patient's hypereosinophilia was found, and skin tests were positive to the pollens contained in the bee pollen product. All symptoms and the hypereosinophilia resolved after ingestion of bee pollen was stopped, and they were all observed to recur 2 months later upon challenge with bee pollen in the hospital. In 1992 Helbling and his colleagues¹³ reported the findings of their studies of 22 patients who had a history of systemic allergic reactions after ingestion of honey. On the basis of skin and RAST tests, they found that three quarters of the honey-allergic patients were sensitive to dandelion honey, 13 of 22 were sensitive also to Compositae pollen, and 9 of 22 were sensitive also to honeybee venom.

In recent years there have been reports of anaphylactic reactions to other ingested pollens of the Compositae family, which, in addition to dandelion, also includes ragweed, chrysanthemum, sunflower, and some herbs and spices, such as chamomile.⁹ Noyes, et al.¹⁶ in 1978 described 3 patients who experienced anaphylaxis after ingestion of sunflower seeds; all showed reaginic sensitivity to sunflower seed on skin and RAST reactivity. Benner and Lee¹⁷ in 1973 described a patient with ragweed-sensitive asthma who had an anaphylactic reaction to chamomile tea, apparently due to cross-reactivity within the Compositae family. On the basis of such reports, *The Medical Letter* in 1979 called attention to potential toxic, even lethal, effects of many plant products sold in health food stores.¹⁸

Although rarely reported, acute systemic allergic reactions to bee pollen are seen more often than suggested by the meager literature on the subject. Consultation with an allergist at the University of Washington Medical Center revealed that one or two cases are seen each year. No further allergy workup was recommended for the patient reported here. Management consists of awareness of the problem, avoidance of the pollen allergens, and preparedness for the acute treatment of allergic reaction should unintentional exposure occur.

Although some allergists have called for warning labels on bee pollen products for some years,⁹ this step has still not taken place. Instead, bee pollen is being aggressively marketed as a universally safe "superfood" with almost unlimited health-giving properties. The Institute of Medicine has recently issued a report noting the continued proliferation of health claims for many foods and is calling for more responsible labeling of food products.¹⁹ Progress is being made in this direction following passage of the 1990 Nutritional Labeling and Education Act. This legislation will require that nutritional products claiming health benefits be backed by "significant scientific agreement" for such claims.²⁰

Summary

Bee pollen allergy, although relatively rare, can present a life-threatening medical emergency. Conventional treatment of anaphylaxis is indicated, and further allergic workup is not necessary. There is little awareness of this hazard among the general population. Warnings to include product labeling of potential adverse reactions in sensitive individuals are urgently needed to protect the public from this hazard.

References

1. Rector-Page LG. *Healthy healing: an alternative health reference*. 9th ed. Sonora, CA: Healthy Healing Publications, 1992:89.

2. Brown R. *The honeybee pollen story*. Scottsdale, AZ: C.C. Pollen Company, 1980:1-16.
3. Hedgebeth W. Swarming to the magic of bee pollen. *Mainliner Magazine (United Airlines)* 1972; 21:124.
4. Catero M. The remarkable rejuvenating food of royalty. *Well Being Journal* 1993; Sept/Oct:7.
5. Wade C. *Bee pollen and your health*. New Canaan, CT: Keats Publishers, 1992.
6. Herbert V. *Nutrition cultism: facts and fictions*. Philadelphia: George F. Stickley Co., 1980.
7. Barrett S, editor. *The health robbers: how to protect your money and your life*. 2nd ed. Philadelphia: George F. Stickley Co., 1980.
8. Whitney EN, Sizer FS, editors. *Nutrition: concepts and controversies*. 3rd ed. New York: West Publishing Company, 1985:183-4.
9. Cohen SH, Yunginger JW, Rosenberg N, Fink JN. Acute allergic reaction after composite pollen ingestion. *J Allergy Clin Immunol* 1979; 64:4:270-4.
10. Mansfield LE, Goldstein GB. Anaphylactic reaction after ingestion of local bee pollen. *Ann Allergy* 1981; 47:154-6.
11. Stanley RG, Linskens HF. *Pollen: biology, biochemistry management*. New York: Springer-Verlag, 1974; 164:81.
12. Binding GJ. *About pollen: health food and healing agents*. 2nd ed. Northamptonshire, Great Britain: Thorsons Publishing, Ltd, 1980.
13. Jackson JL, Houghton RP, Snider P. Bee pollen: review of clinical studies and case reports. *Int J Biosoc Res* 1983; 5:47.
14. Lin FL, Vaughan TR, Vandewalker ML, Weber RW. Hypereosinophilia, neurologic, and gastrointestinal symptoms after bee-pollen ingestion. *J Allergy Clin Immunol* 1989; 83:793-6.
15. Helbling A, Peter C, Berchtold E, Bogdanov S, Muller U. Allergy to honey: relation to pollen and honey bee allergy. *Allergy* 1992; 47:41-9.
16. Noyes J, Boyd GK, Settipane GA. Sunflower seed anaphylaxis. *J Allergy Clin Immunol* 1978; 61:182. Abstract.
17. Benner MH, Lee HS. Anaphylactic reaction to chamomile tea. *J Allergy Clin Immunol* 1973; 52:307.
18. Toxic reactions to plant products sold in health food stores. *Med Lett Drugs Ther* 1979; 21(7):29-32.
19. Institute of Medicine. *Improving America's diet and health: from recommendations to action*. Report of the Committee on Dietary Guidelines Implementation. Food and Nutrition Board. Washington, DC: National Academy Press, 1991.