

Hidden hazelnut is a threat to allergic patients

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• A 5-YEAR-OLD boy with a history of urticaria pigmentosa and asthma developed severe colic and itching of his urticaria pigmentosa lesions 12 h after eating bread with chocolate spread. These symptoms resolved spontaneously about 1 h later. He had never suffered from adverse reactions to chocolate spread before. However, 2 years before, his parents had noticed urticaria around his mouth after he had eaten hazelnut-containing chocolate spread. Subsequently, hazelnut-containing food products had been eliminated from his diet. Skin prick tests (SPT) were performed and specific IgE was determined by the CAP System (Pharmacia, Uppsala, Sweden) for several food allergens. The results showed a monosensitization to hazelnut (SPT 3+ and CAP 1.79 kU/l). The reference standard for diagnosing adverse reactions to food is the double-blind, placebo-controlled food challenge (DBPCFC). However, in view of the history of urticaria pigmentosa, it would not have been ethical to challenge this patient. The boy did not eat any suspected hazelnut-containing food that day, except for the chocolate spread. It was prepacked chocolate spread in 10-g cups for 'single-use'. Although the label listed only lactose,

Allergy after ingestion of chocolate spread.

vegetable oil, cacao, and vanillin, the possibility of contamination of the chocolate spread with hazelnut was considered because hazelnut-containing products (hazelnut-containing chocolate spread) are produced by the same manufacturer.

A sample of chocolate spread (a 10-g cup) from the same production batch as the complaint sample was provided by the parents. This sample and six other samples from different production batches, supplied by the manufacturer, were analyzed together with hazelnut-containing chocolate spread as a positive control. An enzyme immunoassay, specific for hazelnut protein (1), demonstrated the presence of hazelnut in all the samples (Table 1). As mentioned earlier, the patient had eaten chocolate spread before without having symptoms. This can be explained by the varying levels of contamination (up to 20-fold). Probably, the previously ingested chocolate spread contained lower amounts of hazelnut than the complaint sample and therefore was not able to induce an allergic reaction.

In summary, a 5-year-old boy, allergic to hazelnut, as shown by a history of adverse

reactions to hazelnut, an elevated specific IgE level, and a positive SPT, developed gastrointestinal and cutaneous symptoms after ingestion of chocolate spread highly contaminated with hazelnut. Because of the relatively long period between ingestion and the development of symptoms, the association between the chocolate spread and the described symptoms is uncertain. However, this case illustrates that varying amounts of hazelnut can be present in chocolate spread without declaration on the label. Little is known yet about the minimal provoking doses of hazelnut in hazelnut-allergic patients. Malmheden Yman et al. described a patient with an adverse reaction after ingestion of 7.2 mg of hazelnut protein, corresponding to about 30 mg of hazelnut (2). Assuming a consumption of 10 g of chocolate spread, about 56 mg of hazelnut would have been ingested by this patient. As such minute quantities of allergenic foods can induce severe allergic reactions, these allergen-contaminated consumer products can be a threat to food-allergic patients (2, 3).

Table 1. Hazelnut content in samples of chocolate spread and hazelnut-containing chocolate spread

Product	Description	Hazelnut content		
		Declared	Measured %	ppm
Chocolate spread	Natural (sample of complaint batch)	–	0.56	5600
	Natural 1	–	0.036	360
	Natural 2	–	0.03	300
	Natural 3	–	0.35	3500
	Natural 4	–	0.023	230
	Natural 5	–	0.044	440
	Natural 6	–	0.048	480
	Hazelnut	+	3.4	34000

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Asthma and hand dermatitis to leek

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Key words: hypersensitivity; leek; occupational allergy.

● LEEK (*Allium porrum*) is a widely cultivated and consumed vegetable. It belongs to the Liliaceae family, which includes onion (*A. cepa*), garlic (*A. sativum*), and asparagus (*A. officinalis*).

Members of the Liliaceae family can be potent contact allergens for people handling them in large amounts (1, 2). They also can cause IgE-mediated occupational diseases

(3–5). Leek is sometimes mentioned as a cross-reactive allergen, but it has never been described as the main allergenic source.

Patient J.D., a 26-year-old woman, presented with asthma and eczema. She had been harvesting and handling leek for 3 years.

She had no history of atopy. Some months after having started this work, she began to complain of conjunctivitis, rhinitis, asthma, and eczema on the hands. She could not remember having allergic reactions to any other vegetable than leek.

Pulmonary function tests revealed broncho-obstructive lung disease with a forced vital capacity of 3130 ml (98% of normal) and a FEV₁ of 1950 ml (70% of normal value), values which returned to normal after treatment with inhaled corticosteroids (fluticasone) and short acting β_2 -agonists. Blood tests revealed increased eosinophilia (820/mm³).

Skin prick tests with commercial allergen extracts of grass-pollen mixture, tree-pollen mixture, weed pollen, *Dermatophagoides*, molds, latex, and cat and dog dander were negative. Specific IgE to latex, mugwort, dandelion, English plantain, goosefoot, and nettle was also negative.

A prick-prick test with raw leek leaf and leek bulb, followed by a scratch test with a piece of leek leaf or bulb, resulted in immediate local reactions of more than 10 mm with pseudopods, which were greater than with the negative control. A patch test with leek leaf, read at 48 h, was positive, while a patch test with the European Standard Series of contact allergens was negative.

Proteins were extracted from leek leaf, garlic cloves, and onion bulb, by the method of Rudeschko et al. (6). Cooked leek was prepared by boiling leek in distilled water.

Proteins were then extracted from the cooked pieces as mentioned. The liquid phase was also kept and concentrated 10-fold.

The Coomassie brilliant blue-stained SDS–PAGE leek protein pattern displayed a high number of bands. The onion and garlic patterns were different from that of leek, and from each other. In cooked leek (liquid and solid phase), a great number of bands disappeared, as compared with raw leek extract. However, some proteins were temperature-resistant. In SDS–PAGE immunoblots, patient J.D.'s serum IgE reacted with a unique band at 41 kDa of the raw leek extract. It did not recognize any band in the onion and garlic extract. The two extracts from cooked leek showed no reactivity either, suggesting that this 41 kDa allergen might be temperature-sensitive.

The peculiarity of the present case is that the patient did not show any sign of common inhalant allergies, nor was there cross-reactivity with the closest botanically related vegetables, namely onion and garlic. The patient presented with contact eczema on handling leek, and the patch test with leek was positive. Because proteins of a high molecular mass, such as the one at 41 kDa, are not likely to penetrate the intact epidermis, another pathomechanism involving smaller components of leek must be held responsible for the cutaneous reactions. Diallyl disulfide in garlic, and allyl isothiocyanate in onion are two such small molecules that are known to induce type IV hypersensitivity (2).

This report documents the possibility of occupational sensitization and IgE reactivity to leek in the absence of sensitization to common inhalant allergens. Despite the high number of people handling or consuming leek worldwide, this allergy is not a major concern. However, the potential of leek as an occupational allergen must be kept in mind.