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# A case of allergy to Zucchini

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## KEY WORDS

Food allergy, zucchini, cucurbitaceae, plant food allergens

## SUMMARY

*A case of mono-sensitization to a heat- and pepsin-stable allergen in zucchini is described.*

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## Case presentation

Zucchini (*Cucurbita pepo*), a member of the Cucurbitaceae family, are a rare cause of allergy. In most cases zucchini allergy has been associated with hypersensitivity to the plant pan-allergen, profilin (1-3), or reported within the so-called latex-fruit allergy syndrome (4), although in single patients hypersensitivity to specific zucchini allergens has been detected as well (1,2). One further case of isolated zucchini allergy is reported here.

A 46-year-old man was recently seen at this allergy clinic. The man reported 3 episodes of urticaria with angioedema at both hands and head associated with severe gastric pain during the last year; in all cases the episodes occurred few minutes after the ingestion of cooked zucchini. Symptoms

lasted about 45 minutes and subsided spontaneously. The patient did not report any intolerance to foods other than zucchini and he had never suffered from respiratory allergy. SPT with commercial extracts of a large array of plant-derived foods, including peanut, sunflower seed, wheat, maize, soybean, walnut, hazelnut, tomato, carrot, celery, orange, peach, kiwi, sesame seed, and banana (all by ALK-Abellò, Madrid, Spain) scored negative, as SPT with commercial extracts of different pollens including birch, mugwort, grass, ragweed, pellitory, olive and cypress (Allergopharma, Reinbeck, Germany) and extracts of both natural rubber latex and date palm pollen profilin (ALK Abellò; 50 µg/ml). In contrast, a skin test with a fresh zucchini by the prick-prick technique produced a strong skin wheal and flare response (mean wheal diameter 12 mm).

In an attempt to characterize the offending zucchini allergens an immunoblot analysis was carried out. To this end, 200 g of fresh zucchini purchased at a local market were homogenized. The homogenate was mixed with 300 ml of pre-cooled acetone and equilibrated at  $-20^{\circ}\text{C}$  overnight. After removal of the supernatant the precipitate was washed twice with acetone and once with acetone/ether (1:1, v/v) and then dried carefully. The resulting powder was extracted as previously described (5). Protein concentration of the extract, measured according to Bradford (6) (BioRad, Milan Italy), was 1.7 mg/ml.

Electrophoresis of extracts (30  $\mu\text{g}/\text{lane}$ ) was carried out in a 10% polyacrilamide precast Nupage Bis-Tris gel with MES buffer according to manufacturer's instructions (Invitrogen, Milan, Italy) at 180 mA for 1 h. The resolved proteins were transferred for 1 h onto a nitrocellulose membrane according to Towbin et al. (7). The membrane was saturated with 0.1 mol/L tris-buffered saline containing 5% fat-free milk powder (saturation buffer) and incubated for 16 h at  $4^{\circ}\text{C}$  with serum (1:2 in saturation buffer). After 3 washings, bound specific IgE were detected by peroxidase-conjugated anti-human IgE antibodies from goat (1:4000 in saturation buffer Biospecific, Emeryville, CA, USA) and using an ECL western blotting kit (Amersham, Milan, Italy) as substrate.

Unfortunately, the immunoblot analysis scored negative.

This patient reacted to zucchini-specific allergens, as shown by the lack of IgE reactivity to potential cross-reacting pan-allergens, including profilin, natural rubber latex, Bet v 1-like, and lipid transfer protein (as shown by negative SPT with commercial peach extract). The offending zucchini allergen(s) were both heat-stable and pepsin-stable, as shown

by the fact that all 3 allergic reactions were caused by cooked zucchini and that the offending food induced systemic symptoms in all cases. Unfortunately, we were not able to characterize the causative protein(s) further by immunoblot, possibly due to the low concentration of either the allergens or of specific IgE. The skin test with fresh material remains an essential and also the most sensitive way to detect hypersensitivity to plant-derived foods.

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