

Allergy from giant pumpkin (*Cucurbita maxima*) is not a fairy tale

M. M. Hagendorens*, M. Carrette, C. H. Bridts, W. J. Stevens, D. G. Ebo

Key words: anaphylaxis; basophil; giant pumpkin (*Cucurbita maxima*)

A 2.5-year-old boy was referred because of an allergic reaction with vomiting, coughing, dyspnoea, urticaria and angioedema almost immediately after drinking two spoons of home-made pumpkin (*Cucurbita maxima*) soup that contained pumpkin, onion, tomatoes, bouillon cube. He was successfully treated with epinephrine and budesonide nebulization. Since this event, he initially refused eating soup and solid foods. Gradually, soup (containing onion, bouillon cubes) and solids could be reintroduced. He tolerated pumpkin soup on several occasions in the past. Quantification of specific IgE (sIgE) and/or skin tests confirmed an allergy for birch, grass and weed pollen and house dust mite. As no sIgE test for *C. maxima* is readily available, sIgE for zucchini pumpkin (*Cucurbita pepo*; ImmunoCAP-FEIA, Sweden) was used as a surrogate marker and was found to be clearly positive (25.20 kUa/l, normal <0.1). A skin prick test with the frozen remainder of the pumpkin that was used to make the soup and fresh giant pumpkin revealed a wheal and flare of 3/7 and 5/15 mm, respectively. Flowcytometric analysis (FACSCalibur, BD-Immunocytometry-Systems, San Jose, CA, USA)

A child with anaphylaxis from a giant pumpkin is presented. Diagnosis was established by history, skin tests and basophil activation test.

of activated basophils was performed using Alexafluor-448-coupled-anti-IgE (Sigma-Aldrich-Chemic GmbH, Steinheim, Germany) and phycoerythrin-conjugated anti-CD63-antibodies (Pharmingen-BD Biosciences, Erembodegem, Belgium). The test included a negative and positive control (anti-IgE, Pharmingen BD Biosciences, San Diego, CA, USA), and the skin test applied extracts from giant pumpkin (serial dilution 0.1 up to 100 µg/ml). Upon challenge with the pumpkin, basophils of the patient showed a manifest dose-dependent up-regulation from 1% up to 66% for the highest stimulation concentration (see Fig. 1). In contrast, expression of CD63 on basophils from the three control individuals remained unchanged. Giant pumpkin was spotted on nitrocellulose slides and incubated with serum of the patient that showed a significant dose-dependent IgE binding as compared to the three control individuals in which no binding was demonstrable.

The melon family (*Cucurbitaceae*) of plants comprises about 120 genera and 760 species. Many plants in this family are cultivated for their fruits (1). The melons and musk melons come from varieties of *Cucumis melo*. The cucumber (*Cucurbita sativus*) is cultivated for its long green fruits, which are eaten in salads when they have reached full size.

The vegetable marrow *C. pepo* (zucchini) has elongate varieties which are green, yellow, or variegated in colour. Small forms, gathered young, are courgettes. Round-fruited varieties of *C. pepo* are small pumpkins and the orange giant pumpkin *C. maxima*, well-known as the Cinderella's midnight carriage and the carved Halloween pumpkin. Allergy for *cucurbitaceae* fruits and vegetables such as melon (*C. melo*), cucumber and zucchini is a well-known phenomenon (2, 3). The clinical manifestations vary from oropharyngeal discomfort as seen in an oral allergy syndrome (OAS) up to severe life-threatening anaphylaxis. To the best of our knowledge, anaphylaxis from pumpkin (*C. maxima*) has not been described yet.

In the absence of a commercially available skin test extract and quantification of sIgE most physicians will rely upon prick tests with fresh foods to confirm their clinical suspicion. Unfortunately, such prick-prick tests are difficult to standardize and can yield equivocal results. In addition, patients or relatives might refuse skin test, particularly when the patient has suffered from a severe reaction. The principals and applications of the BAT in primary and pollen-related food allergies have recently extensively been reviewed elsewhere (4–6). Upon activation with specific

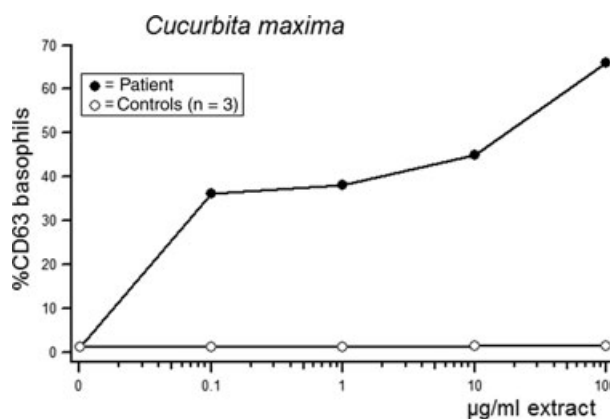


Figure 1. Percentages of CD63 positive basophils in the patient and three healthy control individuals.

allergens that cross-link membrane-bound sIgE molecules, basophils up-regulate the expression of different intracellular as well as cell membrane markers such as phosphorylated p38 MAPK (mitogen-activated protein kinase), CD63 and CD203c. Although the BAT does not distinguish between IgE and nonIgE-mediated reactions, the skin tests, quantification of sIgE and IgE immunoblot experiments in our patient point to an underlying IgE-mediated mechanism.

*Department of Pediatrics

Department of Immunology, University
Antwerp

Campus Drie Eiken T401

Universiteitsplein 1

B 2610 Antwerpen

Belgium

Tel.: +32 (0) 3 8202595

Fax.: +32 (0) 3 8202655

E-mail: immuno@ua.ac.be

Accepted for publication 30 April 2009

Allergy 2009

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DOI: 10.1111/j.1398-9995.2009.02124.x

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