

Spice allergy in celery-sensitive patients

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Scratch tests (SCT) with powdered commercial spices were performed in 70 patients with positive skin tests to birch and/or mugwort pollens and celery. Positive SCT to aniseed, fennel, coriander and cumin – all from the same botanical family (Apiaceae) as celery – were observed in more than 24 patients. Spices from unrelated families (red pepper, white pepper, ginger, nutmeg, cinnamon) elicited positive immediate skin test reactions only in three of 11 patients. Specific serum IgE to spices (determined in 41 patients with positive RAST to celery) up to class 3 were seen especially in patients with celery-mugwort or celery-birch-mugwort association, and concerned various botanical families. Celery-birch association pattern was linked to positive reactions (RAST classes 1-2) to spices from the Apiaceae family only.

Key words: birch pollen; celery; food hypersensitivity; mugwort pollen; scratch tests; spices; RAST.

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CLINICAL ASPECTS

Allergy to spices is often observed in celery-allergic patients. In cases with the mugwort-celery association pattern several high RAST values (up to class 3) were seen to various spices from Apiaceae as well as from unrelated botanical families (celery-mugwort-spices association). This sensitization can be of clinical importance, as anaphylactic reactions to spices in food are well documented. The birch-celery association pattern gave some positive RAST results of classes 1-2 to the spices from the Apiaceae family only – suggesting cross-reactivity between Apiaceae and Betulaceae, probably due to thermolabile allergens.

The study of celery allergy associated with birch and mugwort pollinosis (13) was continued by investigation of spice allergy because of the well-known “celery-carrot-mugwort-spice-syndrome” described in our previous publications (1, 6, 7, 11, 12) and by others (5, 8). Spices can enter the body through inhalation, particularly on industrial exposure (9, 10), or via the gastrointestinal route (3), the latter being of interest to us as allergic symptoms can occur even after ingestion of food subjected to long-time cooking, suggesting the existence of thermolabile allergens.

MATERIAL AND METHODS

Skin tests. Scratch tests (SCT) with various powdered commercial spices (red pepper, white pepper, ginger, nutmeg, cinnamon and cumin) were performed in the 70 atopic patients with positive skin tests to celery, birch and/or mugwort pollens and in the 12 healthy controls of our previous study (13). In the latter, as no positive immediate reactions were seen using the native spices, non-specific results due to skin irritation could be excluded.

Serological tests. Specific IgE to different spices (as specified above) were done in all patients with positive Phadebas RAST to celery (f85) ($n = 41$).

Spice discs were prepared by coupling 10 μ l of an extract $1/10$ w/v in 0.15 M NaCl per CNBr-activated filter paper disc as described (13).

RESULTS

Scratch tests to spices. In all 70 patients scratch tests with spices from the same botanical family as celery (aniseed, fennel, cumin, coriander: Apiaceae, prior Umbelliferae) gave positive results in 24 of 46 patients (Fig. 1). Other spices from different families rarely provoked positive immediate skin test reactions, the most common was red pepper in 11 cases.

RAST to spices. As shown in Fig. 2, positive RAST results to spices were seen particularly in patients with a celery-mugwort ($n=6$; $\odot$) or celery-birch-mugwort ($n=22$; $\bullet$) association on

RESULTS OF SCRATCH-TESTS WITH SPICES (n = 70)

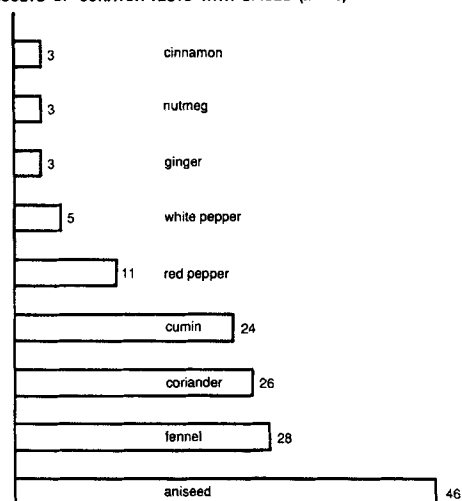


Fig. 1. Number of patients with a positive scratch test to nine different spices. A total of 70 patients were tested.

RESULTS OF RAST TO SPICES (n = 41)

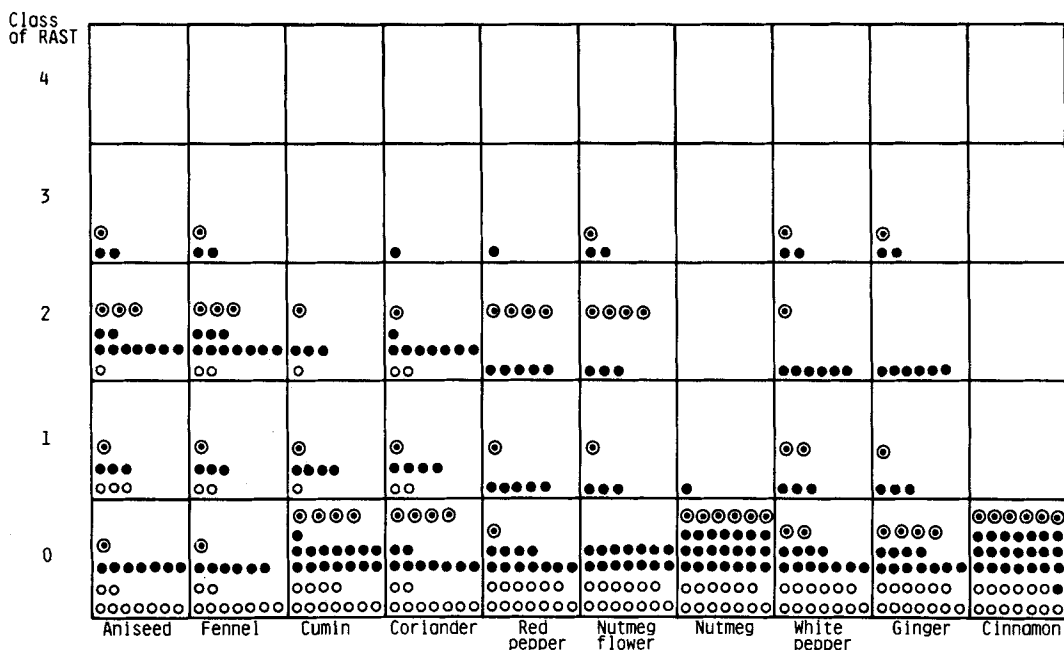


Fig. 2. Results of RAST in RAST class to 10 spices. Serum samples of 41 patients were analysed (○ = celery-birch RAST positive sera, $n = 13$; ⊙ = celery-mugwort RAST positive sera, $n = 6$; ● = celery-birch-mugwort RAST positive sera, $n = 22$).

the basis of skin tests and RAST results (1). Only patients with these association patterns showed a high RAST activity (up to class 3). Celery-birch allergic patients ($n = 13$; ○) presented only weakly positive RAST reactions (classes 1 to 2) to spices of the Apiaceae family (Fig. 2). No specific IgE was found to nutmeg - in contrary to nutmeg flower - or to cinnamon.

DISCUSSION

Our results of the skin tests and specific IgE determinations to spices support once more the celery-spices-mugwort association, already shown in our previous works (1, 6, 7, 11, 12) as well as in the papers of Kauppinen (3), Thiel & Fuchs (5) and Pauli (7). The celery-birch association showed only a few positive reactions to spices. The spices concerned were aniseed, fennel, cumin and coriander, all from the same Apiaceae family as celery, suggesting cross-reactivity among the Betulaceae/Apiaceae family, probably due to thermolabile allergens (13).

Positive skin tests with dialysed spice allergens and RAST results to spices were also often found by the group of Niinimäki (4) among patients allergic to birch pollen. They suggested a cross-allergy between birch pollen and spices from different botanical families. Among their 50 patients with at least one positive skin prick test (SPT) reaction to spices (mustard, paprika, coriander, caraway, cayenne and white pepper) were 40 patients SPT or RAST positive to birch pollen and 15 to mugwort pollen. Positive RAST results to some spices were also seen in four patients without birch and mugwort sensitization; unfortunately no information on sensitization to celery or other vegetables was given. As shown by several authors (4, 9, 10) the sensitization pattern also depends on the route by which the allergen enters the body. Spice exposure by dust inhalation appears to have another mode of antisen action in the lung than via the gastro-intestinal sensitization route. In the former no concomitant sensitization to mugwort seems to be present.

Although structural similarity between various spices of the same botanical family exists as well as partial sharing of epitopes between pollens-vegetables and other plant antigens (2, 10), the exact nature of these antigens present on various plant allergens, including spices, is still not known. Further studies in patient groups with isolated birch, mugwort, celery and spice allergy must be done in order to obtain a true understanding of cross-allergy problems.

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