

Not one lancet for multiple SPT

M. Kupczyk, I. Kupryś*, P. Górski, P. Kuna

Key words: allergy; skin prick tests.

• SKIN prick tests (SPT) are a common diagnostic method used in allergology. The sensitivity and specificity of this method depend on the allergen extracts and the method used to perform the tests. This study aimed to determine whether one lancet can be used for skin prick testing with several allergens in the same patient, as this method is used by many practitioners in an attempt to reduce costs.

Twelve women and 24 men with (23) or without (13) positive SPT to common allergens participated in the study.

Standardization of the method was in line with the position

papers of the EAACI (1, 2). Tests were performed with single-use lancets, made of metal with a 1-mm long point, specially designed for SPT (Pohl), and standard allergen extracts (Der p, Der f, cat, and grass) (Allergopharma). Positive controls were histamine (10 mg/ml) and codeine (10 mg/ml); the negative

control was 50% glycerosaline solution. SPT were applied simultaneously by two methods: one lancet and one prick on one forearm (the “single test” method), and one lancet and multiple pricks on the other (the “multiple test” method). If one lancet was used for more than one prick, it was carefully cleaned with cotton moistened with 75% ethanol. The skin tests were applied to the volar surfaces of both forearms with a distance of 3 cm between the test sites. The methods were randomly assigned to the left and right forearms, respectively. Histamine, codeine, and allergens were applied alternatively with placebo. The tests were read after 10 min for histamine and after 15 min for the other extracts. All wheal sizes were measured as the mean of the longest diameter and the midpoint of the perpendicular diameter. A false-positive reaction was defined as a reaction to placebo after a positive reaction to histamine, codeine, and allergen: mean wheal of ≥ 1 mm above baseline – first variable; mean wheal of ≥ 3 mm above – second variable. The statistical analysis was done with the Wilcoxon rank-sum test and the Spearman rank factor.

In the “multiple test” method, false-positive tests at the placebo site following allergen administration were recorded in 20 out of 35 pricks performed when all

reactions were considered, and in 13 out of 35 pricks when a 3-mm cutoff was considered. This was observed neither in the “single test” method nor with histamine or codeine in both methods. The number of false-positive reactions in the “multiple test” method was statistically significant and independent of the criteria for false-positive tests ($P=0.0001$ for wheal of ≥ 1 mm; $P=0.0015$ for wheal of ≥ 3 mm). The size of the false-positive lesion after allergen did not depend on the type of allergen but on the intensity of the reaction to the allergen applied before placebo ($R=0.672$, $P=0.00001$) (Fig. 1).

The use of one lancet (0.1 euro) to perform 20 skin pricks would result in a saving of 1.9 euro. Unfortunately, our study has shown a statistically significant rise in the number of false-positive tests when using one lancet for multiple skin pricks. This is due to trace amounts of allergen remaining on the lancet even after thorough wiping. False-positive results are mainly observed in subjects who have strong reactions to specific allergens. Therefore, the above method cannot be used to identify factors responsible for allergy, particularly in patients who have been qualified for immunotherapy and in scientific studies. For financial reasons, it can be used in screening tests and epidemiologic studies of

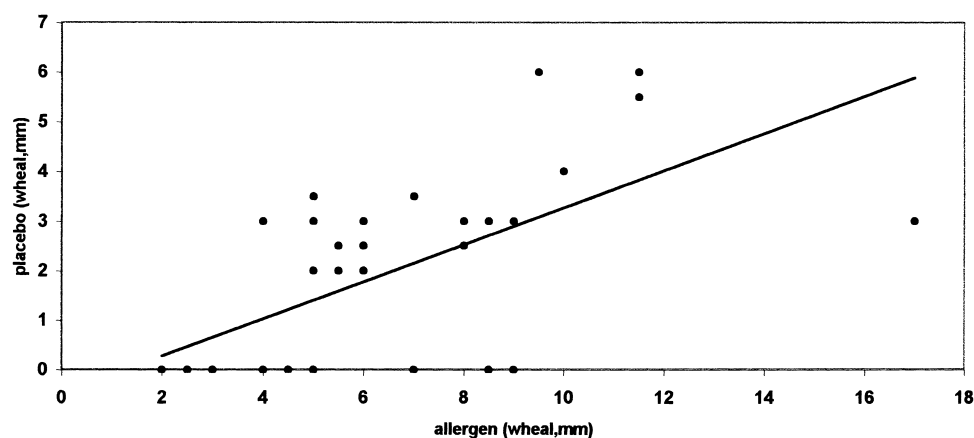


Figure 1. Relation of lesion size at placebo site to strength of reaction to preceding allergen.

atopy where it is not necessary to identify the specific allergen.

*Department of Pneumonology and Allergology
Medical University
22 Kopcińskiego Str.
90-153 Łódź
Poland
Tel. +4842 6787505
Fax: +4842 6782129
E-mail: izabelak@bg.am.lodz.pl

Accepted for publication 5 December 2000
Allergy 2001; 56:256–257
Copyright © Munksgaard 2001
ISSN 0105-4538

References

1. Allergen standardization and skin tests. EAACI Position paper. Allergy 1993;**48** Suppl 14:48–82.
2. DREBORG S, FREW A. Skin test used in type I allergy testing. EAACI Position paper. Allergy 1989;**44** Suppl 10:1–59.

IgE-mediated allergy to bromelain

E. Nettis*, G. Napoli, A. Ferrannini, A. Tursi

Key words: allergy; bromelain; drug; IgE.

● BROMELAIN is a plant-derived enzyme, of the family of the Bromeliaceae, included in the group of proteolytic enzymes, which, because of their catalytic activity, are generally used by the drug and food industries, and in diagnostics. Together with papain, bromelain is used in the industrial preparation of meat and in brewing (1); it is also used as an anti-inflammatory drug.

We describe a patient presenting an IgE-mediated reaction to bromelain used as a drug (Ananase). This 47-year-old

woman had a history of allergic rhinoconjunctivitis and a negative family history in terms of drug reactions. She came to our attention because of an adverse reaction that occurred 10 min after she took the seventh tablet of Ananase. The reaction was characterized by generalized urticaria and angioedema, palpebral-labial edema, nausea, abdominal pain, and diarrhea.

Because she had suffered three adverse reactions with urticaria and angioedema after the administration of ASA, oral ibuprofen, and nimesulide, the patient had begun taking Ananase as a NSAID, and she had subsequently been using it with no problem for two consecutive therapeutic cycles.

Furthermore, 4 months before the visit, she presented an adverse reaction with generalized urticaria, dyspnea, and glottis edema, after ingestion of raw celery. After this reaction, celery manipulation caused contact urticaria.

After giving informed consent, the patient underwent a full allergologic examination:

- 1) The skin prick test (SPT) was done with bromelain provided by Rottapharm (Monza, Italy), diluted in 0.9% NaCl at concentrations of 10, 100, and 1000 µg/ml. Histamine chloride (0.1%) and NaCl (0.9%) were used as positive and negative controls, respectively (1). SPT for bromelain was positive.
- 2) SPT was performed for celery, latex, pineapple, fig, kiwi, fennel, carrot, wheat flower, and rye, and for grass pollen, cypress pollen, *Parietaria officinalis*, Compositae mix, olive pollen, *Dermatophagoides farinae*, *D. pteronyssinus*, dog dander, and cat dander. SPT was positive for celery, Compositae mix, cypress pollen, and grass pollen.
- 3) Prick by prick tests were executed for celery, fennel, and carrot. They were positive for celery.
- 4) Total IgE in the patient's serum was measured by PRIST (CAP System FEIA), and the result was 473 kU/l.

5) RAST was done for bromelain and for all allergens tested with SPT except for Compositae, and also for papain. A positive reaction for RAST was defined as >0.35 kU/l. Positivity was found for bromelain (15.4 kU/l), papain (3.1 kU/l), celery (27.2 kU/l), fennel (0.9 kU/l), carrot (1.2 kU/l), cypress pollen (8.3 kU/l), and grass pollen (*Lolium perenne*) (3.7 kU/l).

6) A patch test with immediate and delayed reading was performed for bromelain and celery. The patch preparations (celery as is and bromelain 10% in petrolatum) were applied with Finn chambers on Scampor according to the IRDGC recommendations (2). Immediate reading of the patch test was negative for bromelain and positive for celery while the delayed reading was negative. SPT for bromelain and the immediate and delayed patch tests for bromelain and celery were also done on a control group of 10 people with a negative history of adverse reactions to drugs and foods, and their results were negative.

7) Oral challenge test with erythrosine (E127) contained in Ananase was negative. In this case, the adverse reaction documented in the patient's history was confirmed by the positive SPT and RAST for bromelain, showing that oral administration of this drug containing bromelain induced an immune IgE-mediated reaction.

There are adverse reactions to bromelain reported in the literature, characterized mainly by allergic asthma after inhalation of the substance. Bromelain is a powerful sensitizing substance and sensitization usually follows its inhalation, and not its ingestion (3). The positive prick and/or RAST for celery, papain, carrot, fennel and cypress pollen, grass pollen, and Compositae may confirm cross-reactivity between bromelain and these foods or pollens (4–6), particularly between bromelain and papain (4); furthermore, it has been shown that celery-allergic and