

Case report

Skin-prick-test-induced anaphylaxis

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An anaphylactic reaction occurred in a 57-year-old man after a prick by prick test with fresh kiwi and in a 29-year-old man after prick tests with some species of fish. Both patients had a history of anaphylaxis after ingestion of kiwi and fish, respectively. These cases suggest that, especially in patients with a history of anaphylaxis, all efforts should be made to minimize the risk of systemic reactions, and skin prick testing should be performed only in places equipped to treat anaphylaxis.

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In recent years, skin testing (ST), because of its high sensitivity, low cost, and immediate availability of results, has been commonly considered to be the most appropriate tool for diagnosis of IgE-mediated diseases. Skin prick testing (SPT) is preferred for the initial test because it is more rapid, less expensive, less invasive, and less apt to cause systemic reactions than intradermal testing (2). In fact, systemic reactions have been reported (11), when associated with intradermal testing. Skin prick testing may be considered to be very safe, since minor adverse reactions occur in a maximum of 0.49% of the tested patients (14); however, even this test, like all *in vivo* tests, may induce systemic reactions in highly sensitive patients (5).

This paper describes two cases of anaphylactic reactions after SPT.

Case reports

Case 1

In the previous 2 years, a 57-year-old man had presented two episodes of anaphylactic shock. The first attack, which began 2-3 min after eating a piece of fruit cake (with apricot, kiwi, strawberries, and grapes), was characterized by itching throat, cough, dyspnea, hypotension, and cold sweating. In the second attack, he experienced cough, itching throat,

gastric pain, collapse, and vomiting after eating a small piece of kiwi. He recovered from both attacks without therapy.

To confirm the suspicion of an IgE-mediated kiwi allergy, his daughter, a clinician in a pediatric allergy and immunology unit, performed a prick by prick test at home with fresh kiwi that yielded a strongly positive reaction. Twenty-five minutes after SPT, the patient manifested erythema of the face and neck, cough, itching throat, dyspnea, and hypotension. After administration of iv steroids and oral antihistamines, all symptoms disappeared in a few minutes except the cough, which lasted 2 h.

None of his family presented allergy-related symptoms, and there were no personal allergy symptoms in his case history, except for mild rhinitis and itching throat when mowing the lawn. The patient refused to undergo other skin prick tests. Total serum IgE (Kallestad Diagnostics, Chaska, MN, USA) was 222 IU/ml. Specific serum IgE (RAST FEIA Pharmacia CAP System, Kabi Pharmacia, Uppsala, Sweden) was positive to kiwi (5.74 kU/l, class 3) and to *Lolium perenne* pollen (1.0 kU/l, class 2), and negative to house-dust mite, *Alternaria*, *Cladosporium*, olive, mugwort, pellitory, cat, dog, cow's milk, egg-white, tomato, hazelnut, wheat, peanut, rice, and soy.

Case 2

A man, aged 29, had suffered since the first year of life from dyspnea without wheezing, angioedema of the face, and generalized urticaria, after eating various species of fish (codfish, sole, gilthead). His father and grandfather were also allergic to fish. There were no other allergy symptoms (such as atopic dermatitis, rhinitis, and asthma) in his case history. The patient had already been treated three times (at 1, 5, and 25 years) in a hospital emergency unit with subcutaneous epinephrine and iv steroids. Recently, he had presented anaphylactic symptoms (rhinorrhea, conjunctivitis, itching throat, hypotension, and cold sweating) after eating with a fish-contaminated fork, and on smelling fish while he was in a fish shop for a few minutes.

At this time, he consulted an allergist, who decided to perform SPT with commercial extracts (Iofarma Allergeni, Milan, Italy) for some species of fish, positive results ensuing for all (salmon, tuna, dentex, sole, trout, and gilthead) except dogfish.

Twenty minutes after SPT, the patient presented the following symptoms: itching throat, severe dyspnea, and collapse. He was immediately treated with subcutaneous epinephrine, iv steroids, and intramuscular antihistamines, and he improved rapidly. SPT (Iofarma Allergeni, Milan, Italy) with common foods (milk, egg, peanut, hazelnut, wheat, tomato, rice, and soy) and aeroallergens (house-dust mites, grass, cat, dog, pellitory, olive, *Alternaria*, and *Cladosporium*) was negative.

As the patient later moved to another area, it was impossible to obtain serum for total and specific IgE determinations.

Discussion

These cases confirm that even SPT may induce anaphylactic reactions. Bousquet (6) recommends that skin tests not be performed if the value of allergenic extracts is not determined and if the concentrations are not appropriate. Dreborg (8) also recommends the use of a well-documented method with documented reproducibility and standardized allergens with a potency whose diagnostic effect has been documented.

However, in the last decade, there has been a generalized use of only one concentration for routine SPT (often the maximum sensitivity concentration of allergen) (4) and a routine performance of many tests at the same time even with allergens of unknown potency. Use of a standardized allergen extract whose potency is expressed in biological unit (BU) optimum concentrations for diagnosis of respiratory allergy by skin prick test has been recommended (1, 12, 13).

It should be noted, however, that these recommended concentrations are characteristic of the specific preparations and may not be applicable to the preparations of other manufacturers. At this time, there are no studies that deal with the determination of optimum concentrations for diagnosis of food allergy, and few standardized food-allergen extracts are available (10). Many commercial food-allergen extracts are titrated in weight/volume, a very unsatisfactory method of titration.

The prick by prick is a very practical and reproducible test in diagnosis of food allergy (9), especially when a fresh food is implicated and in some cases of "idiopathic anaphylaxis" when an exotic food is suspected and the extract is not available. Even with this method, however, the exact amount of allergen introduced is not known. In any case, even if the amount of allergen introduced with SPT is very small, the possibility of a summation of the reactions in the case of multiple positive skin tests should be kept in mind.

In fish-sensitive patients, it has been reported (3, 7) that not all fish species are allergenic; therefore, on patient request, the allergist has to identify (by means of skin tests, RAST, and challenges) the offending and nonoffending fish. In these cases, particularly in subjects with a history of anaphylaxis, only limited SPT with potentially positive allergens should be performed at the same time, and the allergist must be equipped to treat unexpected adverse and potentially life-threatening skin-test-induced allergic reactions.

In conclusion, SPT is very useful and safe in diagnosis of food allergy, but we have to keep in mind that the allergenic potency of many commercial extracts is not well known. In highly sensitive patients (especially in patients with a history of anaphylaxis), all possible effort should be made (use of different concentrations, only a few tests in the same session) to minimize the risk of systemic reactions, and SPT should be performed only in places equipped to treat anaphylaxis.

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