

Exercise-induced anaphylaxis to onion

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Key words: anaphylaxis; exercise; food allergy; Liliaceae; onion allergy.

• HYPERSENSITIVITY to onion has been described as a cause of contact dermatitis, rhinoconjunctivitis and asthma induced by handling of onions (1). However few publications in the literature report allergic reactions due to onion ingestion (2–4).

We describe the case of a 26-year-old woman who reported at least 10 episodes of generalized cutaneous erythema with itching, urticaria, angioedema of the face, profuse sweating, malaise, chest tightness, wheezing, and dyspnea during the last year. These episodes began when running for 30 minutes in different environments, and usually improved with rest, but the reactions became increasingly severe and the last ones required treatment in the emergency room with epinephrine (adrenaline), antihistamines and corticosteroids. The patient was a soldier and had to train daily. She had not related these episodes with any drugs, foods, latex, insect stings or menstruation.

We advised the patient to make a detailed list of events and a diet diary in case new reactions occurred. She reported two new episodes: the first while she was training, three hours after eating chicken cooked with tomato, onion, red pepper, and Avecrem (a commercial chicken sauce). The second happened after she had been dancing; one hour previously she had

eaten a salad with potato, raw onion, tuna, oil and vinegar.

The patient had a clinical history of rhinoconjunctivitis and asthma due to sensitivity to grass pollens. The physical examination showed no anomalies.

Laboratory investigation revealed normal complete blood count, differential, erythrocyte sedimentation rate, urinalysis, liver and renal function tests, thyroid hormones, electrolytes, coagulation studies, quantitative serum immunoglobulins, immune complexes, C3, C4, CH50, C1-esterase inhibitor, urinary levels of catecholamines and 5-hydroxyindoleacetic acid, and serologic tests for *Echinococcus*. Electrocardiogram and chest X-rays were normal.

Skin prick tests to common inhalants proved positive to mites and *Phragmites*, and mugwort pollens. Skin prick tests with commercial food extracts (ALK-Abello) were positive to banana, onion and nuts (almond, peanut and walnut). Total serum IgE was 1090 UI/ml. IgE antibody levels specific to onion were 100 kU/l, to garlic were 3.5 kU/l, to lettuce 2.40 kU/l, and to tomato 0.85 kU/l (CAP System, Pharmacia).

Prick-by-prick tests with raw and cooked onion, banana, garlic, lettuce, leek and asparagus were positive. The same tests were negative with raw and cooked chicken, tuna, tomato, red pepper, potato, and Avecrem.

Food challenges using the same foods, but performed at rest, were negative.

Exercise challenge was carried out using a treadmill with appropriate personnel and equipment for treatment of anaphylaxis. The patient gave written informed consent before the study. First, the test was performed in a fasting state and resulted negative. The next day we repeated the test two hours after eating chicken cooked with all the ingredients except onion, and it was negative again (we suspected the allergen responsible was onion because it was involved in both documented reactions). Finally, on the third day, the challenge was made two hours after eating 30 g of cooked onion. After 10 minutes of running the

patient presented generalized urticaria, dyspnea, and nausea, and we observed a fall of 30% in the forced expiratory volume in one second (FEV₁). She was treated with epinephrine (adrenaline), corticosteroids, and antihistamines, and improved within 20 min.

The patient was instructed to carry injectable epinephrine (adrenaline) while exercising, not to exercise alone and not to consume onion within 6–8 h of exercising. She has had no new episodes during the last two years.

IgE-mediated food allergy to onion seems extremely rare despite its wide use. We have found three reports in the literature (2–4), only one of which is a case of food-dependent exercise-induced anaphylaxis (2). All patients reported were sensitized to raw onion but tolerated cooked onion; in our case, the patient was highly sensitized (IgE antibody level of 100 kU/l) to both raw and cooked onion.

Like other authors, we have not found cross-reactivity with other members of the Liliaceae family (garlic, asparagus or leek) (5).

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Generalized dermatitis due to pseudoephedrine

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Key words: eczematous dermatitis; ephedrine; delayed hypersensitivity; nasal decongestant; patch test; pseudoephedrine; sympathomimetic drugs.

● PSEUDOEPHEDRINE is a sympathomimetic drug (SD), a widely used as a nasal decongestant that seldom causes an allergic reaction. We report a patient who complained of a generalized eczematous dermatitis after oral intake of a drug containing pseudoephedrine.

A 77-year-old woman presented a generalized, itchy erythematous eruption after starting oral treatment with Clamoxyl (amoxycillin) and Rinoebastel (ebastine 10 mg plus pseudoephedrine 120 mg). The lesions cleared without further desquamation within one week of stopping this

medication. The same symptoms had occurred in this patient twice previously with

Oral intake gave a positive dermatitis patch test.

other drugs taken for a common cold.

Skin tests with penicilloyl polylysine (PPL), minor determinant mixture (MDM), penicillin G and amoxycillin, and oral challenge with amoxycillin, were negative. Patch tests were carried out with Rinoebastel (0.1 and 1% in petrolatum (pet.)) and elicited a negative reaction at 48 and 96 h. A single-blind, placebo-controlled oral challenge with Rinoebastel was also performed. Within five hours, the patient developed an itchy erythematous generalized

micropapular rash, which disappeared after treatment. Oral administration of ebastine produced no reaction. A posterior oral challenge with pseudoephedrine hydrochloride (60 mg) was also followed by similar lesions.

Two months later the patient agreed to be patch tested again with pseudoephedrine (10% pet. and aqueous solution (aq.)), phenylephrine (10% pet. and aq.), epinephrine (1:1000), terbutaline (1% aq.) and albuterol (0.5% aq.). These tests revealed a positive reaction (++), in both petrolatum and aqueous solution, to pseudoephedrine, ephedrine, and phenylephrine at day 2, persisting to day 4. The remaining tests were negative. Ten healthy controls did not react to the same patch tests. Subsequent separated challenges were carried out with epinephrine 1:1000 (0.3 ml), terbutaline (2.5 mg), albuterol (2 mg), ephedrine (40 mg) and phenylephrine (20 mg). All were negative, except for ephedrine, which provoked the same symptoms.

Despite extensive oral use of pseudoephedrine, allergic reactions seem to be unusual^{3/4a} nonpigmenting fixed drug eruption being the most common cutaneous reaction (1,2). Also reported have been eczematous dermatitis (3,4), an unspecified rash with joint swelling (5), scarlatiniform eruptions (6), a recurrent toxic shock syndrome (7) and a vacuolar interface dermatitis (4). In order to verify the cause of a suspected drug eruption, a challenge test is usually required. Patch tests are not usually a reliable diagnostic method; a literature search revealed only four cases of positive patch tests to pseudoephedrine (1,3,4). Positive results have been obtained at 1% concentration and with the use of petrolatum as a vehicle. However, in our patient, the patch tests were positive for both types of vehicles, but only when a higher concentration (10%) was used.

Cross-sensitivity among SDs has been rarely reported. We have found cross-reactivity between pseudoephedrine and ephedrine, which have a closely related chemical structure derived from the phenylpropanolamine skeleton. On the contrary, no cross-reaction has been observed in provocation tests with other SDs (phenylephrine, epinephrine/

adrenaline) which are phenylethanolamine-derived. Although our patient's patch test with phenylephrine was positive, she tolerated it well. Thus (with the exception of ephedrine) all SDs should not be routinely prohibited in cases of sensitization to pseudoephedrine.

In summary, the challenge and patch-testing results suggest a delayed hypersensitivity mechanism to pseudoephedrine in our patient's dermatitis. In our study, pseudoephedrine 10% was a suitable concentration with which to perform the patch test.

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