

Case Report

Anaphylactic reaction after skin-prick testing in an 8-year-old boy

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This paper presents the case of an 8-year-old boy who developed an anaphylactic reaction after skin-prick testing (SPT). The tests were performed with commercial extracts and were strongly positive for dog and grass. The boy had no incidence of anaphylaxis reported in his history. At the time tests were performed, he had been admitted to the hospital because of persistent wheezing and had a dog at home for a few days. Although anaphylaxis is very rare after SPTs, these tests should always be performed in a place equipped to treat anaphylaxis.

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Skin-prick testing (SPT) is commonly considered the most appropriate tool for diagnosis of IgE-mediated diseases, particularly in pediatric patients, because of its high sensitivity, ease of performance, immediate availability of results, low cost and high safety factors. SPT may be considered very safe (1), with only minor adverse reactions in a maximum of 0.04% of patients tested (2). Systemic reactions have been reported mainly in association with intradermal testing (3). However, very rarely, even SPT, like all *in vivo* tests, may induce systemic reactions in highly sensitive patients (4–7). We describe a case of anaphylactic reaction after SPT in an 8-year-old boy.

Case report

The patient was an 8-year-old boy, suffering since his first year of life from atopic dermatitis and wheezing. Family history was positive for atopy: an asthmatic sister and a brother suffering from allergic rhinitis.

The boy refused to eat tomatoes and experienced diffused itching and urticaria on the face after eating salmon and kiwi. He reported

wheezing after eating ham, cod and prawns. He tolerated cow's milk at the age of 18 months. Asthma was reported as appearing frequently in spring and fall and after contact with dogs; his parents reported also exercise-induced asthma. He had always been treated only with β_2 -agonists when necessary. There were no reported anaphylactic reactions in his history.

The boy entered our hospital emergency unit complaining of persistent wheezing in the previous 2 weeks. A dog had been in the home for 15 days. He had been treated with inhaled β_2 -agonists and steroids, with a cephalosporin antibiotic for a week and with low doses of systemic steroids for 4 days. The day after admission, clinical and respiratory conditions had improved.

To confirm suspicion of an IgE-mediated dog allergy and to convince the boy that the dog should be removed from the home, we performed a SPT with commercial extracts (Bayer Milan, Italy) for house-dust mites, grass, *Parietaria*, *Artemisia*, *Alternaria tenuis*, cat and dog, and a positive (histamine chloridrate 1%) and a negative (glycerol-saline fenolate solution) control. We applied the allergens on the patient's fore-

arms using the prick-puncture method with single point lancets (Kallergen Settimo Milanese, Italy). The total number of tests performed was 10. At the time SPT was performed, there was no wheezing. The boy resulted strongly positive for dog and grass, with whealing and erythema greater than in the reaction to histamine (sizes of whealing/erythema in mm: histamine 5/20, dog 7/20, grass 9/25) and presence of *pseudopodia*.

Twenty minutes after the SPT, the boy complained of diffused itching, a feeling of impending doom, nausea and abdominal pain. He became pale and sweaty, had a weak pulse (rate 60/min) and manifested wheezing and dizziness. He was immediately treated with subcutaneous epinephrine 1:1000, 0.01 ml/kg, oral cetirizine (0.25 mg/kg) and β_2 -agonists through inhalational therapy, with rapid improvement.

Laboratory studies, performed the day after testing, showed increased blood eosinophils count and total serum IgE. Radioallergosorbent tests (RAST) were positive to dog (23.11 kU/l), *Lolium perenne* (8.28 kU/l) and *Cynodon dactylon* (13.79 kU/l) pollen.

Discussion

In this paper we present a child who developed an anaphylactic reaction after SPT with commercial extracts. The diagnosis is based on the rapid onset after SPT and on the peculiar signs and symptoms. A vasovagal reaction can be excluded, because of the itching and because of bronchospasm and gastrointestinal symptoms, usually absent in a vasovagal reaction. In addition, the improvement was obtained with appropriate therapy and not with postural measures alone.

Usually SPTs are considered very safe, with minor adverse reactions in a maximum of 0.04% of patients tested (2). Systemic reactions and fatalities have been reported mainly in association with intradermal testing (3). However, although very rarely, even SPT may induce systemic reactions in highly sensitive patients (4–7).

Two cases are described (4) where an anaphylactic reaction had occurred after a prick-by-prick test with fresh kiwi and after prick tests with commercial extracts for some species of fish. Both patients were adults and had a history of anaphylaxis after ingestion of kiwi and fish, respectively.

Another two cases are reported (5,6) after latex SPT in a 17-year-old patient with a history of contact urticaria as well as anaphylactic shock reactions and in a 34-year-old operating room nurse with hand eczema and episodic anaphylactic-type reactions to natural latex. Furthermore, in a series of 118 patients with latex allergy manifestations, SPT with a crude latex antigen preparation was shown to elicit anaphylactic reactions in four cases (7).

Our case confirms that SPT may induce anaphylactic reactions, even in pediatric patients. It is noteworthy that the reaction occurred with commercial, standardized extracts of aeroallergens and the patient had no previous history of anaphylactic reactions.

The fact that we performed SPT in an asthmatic boy with persistent wheezing 2 weeks prior to admission, who had a dog at home for a few days, could be significant. As recommended for immunotherapy (1), it may be important not to perform the tests during exacerbation of the allergic disease and when the patient is symptomatic.

In conclusion, SPTs are very useful for diagnosis of IgE-mediated diseases and generally very safe; anaphylaxis could be an occasional event in highly sensitive patients. It is, therefore, essential to always perform SPTs in a place equipped to treat anaphylaxis.

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