

Anaphylaxis due to Brazil nut skin testing in a walnut-allergic subject

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Abstract. The diagnosis and management of nut allergy can be difficult because of the possible severity of the clinical manifestations and the cross reactivity between different species. We report a case of anaphylaxis due to skin testing in a young adult with clinically ascertained walnut allergy. After an episode of anaphylaxis due to walnut ingestion, a routine diagnostic workup was carried out, involving skin prick test with commercial extracts, prick by prick with fresh food and CAP-RAST assay for different nuts. Immediately after pricking with fresh Brazil nut, a severe episode of anaphylaxis occurred, that required epinephrine and intravenous steroids. The subject had never eaten Brazil nut before. Therefore we hypothesize a cross reactivity effect, since this phenomenon is well known for tree nuts. Our case suggests that *in vivo* diagnosis, especially if fresh nuts are used, should be performed only if adequate equipment to treat anaphylaxis is available.

Key words: anaphylaxis, skin testing, walnut, Brazil nut.

Introduction

Peanut allergy, and tree nut allergy in general, are often associated with severe clinical manifestations and, consequently, with not negligible morbidity and mortality [1]. Therefore an accurate aetiological diagnosis can help preventing severe events, since individuals with ascertained peanut and/or tree nut allergies can be advised to avoid the kinds of tree nuts they are sensitized to. Of course, the oral food challenge, possibly blinded and placebo controlled, still remains the gold standard for diagnosing nut allergy, but it carries the risk of severe reactions. For this reason, in clinical practice, the diagnosis of “nut allergy” is essentially based on a suggestive history and the presence of specific IgE and skin prick test positivity, although both tests have intrinsic limits [2], including the low sensitivity. A better diagnostic efficiency can be achieved by using raw extracts, the prick by prick technique, or the systematic combination of skin tests and RAST assays [3]. The diagnosis and management of nut allergy may be further complicated by the wide and variable cross-

reactivity among different species of nuts [4], which can result in unexpected reactions to foods that are not clinically suspected.

We report herein a case of anaphylaxis following skin prick test with Brazil nut in a young adult with ascertained walnut allergy.

Case description

The subject was an 18-year old male, referred to our service after a severe adverse reaction due to walnut ingestion. A few minutes after eating a cake the patient had generalized urticaria, angioedema of the face, wheezing dyspnoea and hypotension. He was treated at the Emergency Unit with subcutaneous epinephrine, intravenous steroids, antihistamines and inhaled albuterol, and experienced prompt recovery. Looking at the clinical history, the patient reported previous episodes of urticaria and oral itching after eating walnuts, and we could ascertain that the cake that had provoked anaphylaxis also contained walnuts. Walnuts were

Table 1. Diagnostic workup.

Food	Skin Prick Test (commercial extract)	Prick by prick (fresh food)	CAP (kU/L) (negative <0.35)
Sesame	Neg	Neg	< 0.35
Peanut	Neg	Neg	< 0.35
Hazelnut	Neg	Neg	< 0.35
Brazil nut	Positive (3 mm)	Positive (17 mm)	4.40
Almond	Neg	Neg	< 0.35
Coconut	Neg	Neg	< 0.35
Pistachio	Neg	Neg	< 0.35
Walnut	Positive (3 mm)	Positive (4 mm)	0.52
Pine nut	Neg	Neg	< 0.35



Figure 1. The strong skin positivity elicited by the Brazilnut prick-to-prick test.

therefore reasonably supposed to be the food responsible for allergic reactions. No history of respiratory symptoms attributable to aeroallergens, or adverse reactions to drugs was present. We carried on a diagnostic procedure, involving skin prick test (ALK-Abellò, Lainate, Italy), prick by prick with fresh foods and CAP-RAST (Pharmacia, Upssala, Sweden) assays, in order to confirm the clinical diagnosis and identify other possible concomitant sensitizations (Table 1). During the prick-by-prick session, the patient developed a strong positivity for Brazil nut (flare > 5 cm, wheal = 1.7x3 cm)(Figure 1), followed by acute wheezing

dyspnoea, facial angioedema and precipitating hypotension (max = 90 mmHg). He recovered rapidly after intramuscular clorpheniramine and epinephrine, intravenous corticosteroid, oxygen and inhaled albuterol plus ipratropium.

A slight increase of serum tryptase to 15.3 µg/mL (normal range 4.8-13.5 µg/mL, UniCAP Tryptase System FEIA, Pharmacia, Upssala, Sweden) was documented during the episode, and a positive CAP-RAST to Brazil nut was also found. Of note, the patient denied any previous ingestion of Brazil nut, but the positivities to allergy testing were even greater for Brazil

nut than for walnut. Skin tests for common aeroallergens were negative. All routine biochemical parameters were within the normal range and circulating total IgE were 195 kU/L. Due to the high risk of severe systemic reactions, no oral challenge was performed. The patient was advised to avoid the ingestion of tree nuts and to carry with him an adrenaline autoinjector.

Discussion

The cross reactivity among different nuts (walnut, hazelnut, peanuts, coconut etc), is well known [4, 5, 6]. Cross-reacting proteins include profilins, lipid transfer proteins and the more species-restricted leguminin and vicilin [7]. Some cases of cross reactivity have been clinically described also with Brazil nut [8, 9]. In particular, Asero et al described one case of walnut allergy with IgE cross-reactivity to Brazil nut, but without Brazil nut- induced symptoms [8]. Also in our patient, a cross reactivity is likely to have occurred. In fact, no previous contact with Brazil nut was present in the clinical history. Moreover, Brazil nuts are quite uncommon and rarely used in our country, therefore an inadvertent/hidden ingestion is difficult to hypothesize. Nevertheless, to our knowledge, anaphylaxis after Brazil nut skin testing has never been reported before. This case suggests therefore, according to previous reports, that in patients with a history of anaphylaxis, all efforts should be made to minimize the risk of systemic reactions. This is particularly true when fresh foods are used for skin prick testing, since anaphylaxis is not exceptional, especially with nuts [10-12]. In this sense it has been suggested [13] that a skin prick test with diluted commercial extracts (if available) is advisable in patients at risk for anaphylaxis in order to avoid the subsequent use of prick-by-prick with fresh food.

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