

Case Report

Peanut allergy: case report

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Abstract Peanut (*Arachis hypogae*) family *Leguminosae*, also called earthnut or groundnut, is a small annual plant cultivated throughout tropical Africa and in India, Brazil, South USA and Australia. Peanut oil is used in the production of margarine and cooking fats. Peanut is commonly eaten in roasted form. Two emergency cases of peanut allergy in siblings are reported presenting with urticaria and bronchoconstriction. Peanut allergy is common and should be excluded in all allergic patients.

Key words

Peanut allergy.

Introduction

Peanut (*Arachis hypogaea*) family *Leguminosae* also called earthnut or groundnut, is a small annual plant cultivated throughout tropical Africa and India, Brazil, South U.S.A. and Australia. Various genotypes exist which show differences in the relative amount of fatty acids contained in its oil. Groundnuts are the world's fourth largest source of fixed oil.

Peanut oil (*Arachis* oil) consists of the glycerides of oleic, linoleic, palmitic, arachidic, stearic, lignoceric and other acids. When saponified with alcoholic potassium hydroxide, crystals of impure potassium arachidate separate on standing. *Arachis* oil has similar properties to olive oil, being used in the production of margarine and cooking fats.¹

The author has recently seen two cases in his practice, in emergency.

Case reports

Case 1 A young man aged 21 years, a previously known case of peanut allergy inadvertently took biscuits containing peanuts. Within a short time he developed urticaria, swelling of the eyelids and face and bronchoconstriction. Symptomatic treatment was immediately started, Antihistamine injections were given and treatment continued for 3 days. To relieve bronchoconstriction salbutamol was given.

Case 2 The sister of the same boy aged 19 years also developed a similar reaction but of low intensity and this improved by oral antihistamines.

Both these subjects knew their allergy to peanuts but were unaware that the biscuits contained that component.

Discussion

The search of literature revealed that peanut allergy had been reported from many settings. Peanut allergy is the most serious of the hypersensitivity reactions to foods due to its persistence and high risk of severe

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anaphylaxis. Currently strict avoidance of the allergenic food and ready access to self-injectable epinephrine is the standard of care for food allergy. Clinical trials for peanut allergy using the anti-IgE therapy to prevent circulating IgE from binding to effector cells are underway. Peanut allergy can be devastating as reactions range from urticaria to severe anaphylactic shock and death. The only preventive measure for peanut allergy is strict avoidance.² Peanut allergen would result in a safer immunotherapeutic agent for treatment of peanut allergic patients, desensitization is accompanied by a high risk of anaphylaxis.³ In 1948, Department of Health Committee on toxicity of chemicals in food consumer products and the environment advised pregnant mothers with a family history of atopy to avoid peanuts during pregnancy/lactation.⁴ According to the study, scoring system developed to improve the sensitivity of assessment of reactions induced by double-blind placebo-controlled food challenges with peanut, this finding was important for the clinical care of subjects with food allergy.⁵ It was concluded that with few exceptions (notably limited peanut cross-reactivity with pistachio and walnut) peanut antigens did not serologically cross react with tree nut allergens. Walnut, pecan and hazelnut form a group of strongly cross-reactive tree nuts while hazelnut, cashew, Brazil nut, pistachio and almond are moderately cross-reactive tree nuts. The strongest cross-reactivity among tree nuts follows botanical family.⁶ In response to a questionnaire given to school children in France to estimate the prevalence of food allergies, the main food reported causing adverse reactions were cow milk, peanuts, tree nuts, and shrimps.⁷

A PubMed search for the years 1980-2004, using the search terms peanut allergy, food allergy, anaphylaxis, peanut allergen structure and peanut immunotherapy revealed that peanut allergy was the most serious of the hypersensitivity reactions to foods due to its persistence and high risk of severe anaphylaxis. The major peanut allergens and their associated immunodominant IgE-binding epitopes have been characterized.⁸ According to a study the protein microarray immunoassay confirmed that Ara h1, Ara h2, and Ara h3 are major peanut allergens and allow for parallel epitope analysis.⁹ Peanut allergy prevalence was estimated in Montreal by administering questionnaires regarding peanut ingestion in children in kindergarten. It was shown that even with conservative assumptions prevalence exceeds 1%.¹⁰

According to a study patients with history of peanut allergy and peanut IgE levels of 5 or less have at least a 50% chance of outgrowing their allergy. Recurrence of peanut allergy may occur but appears to be uncommon.¹¹ Peanut allergenicity may be affected by the method of cooking, with roasted peanuts more allergenic than boiled or fried peanuts. A selected group of peanut allergic children who do not have a history of anaphylaxis to peanut may develop tolerance.¹² Patients are at risk of in-flight allergic reaction although there is little in the medical literature to substantiate this concern, there are anecdotal cases of in-flight allergic reactions to peanut from ingestion, dermal contact and inhalation of airborne peanuts.¹³ The methods of frying or boiling peanuts as practiced in China appear to reduce the allergenicity compared to the method of dry roasting practiced widely in

the United States. In roasting higher temperature is required that apparently increases allergenic property of peanut.^{14,15}

Treatment

Immunotherapy with modified peanut allergens and DNA based vaccines may soon move from animal studies to clinical trials.¹⁶ Several different forms of immunomodulatory therapies are currently under investigation e.g. peptide immunotherapy, mutated protein immunotherapy, allergen DNA immunization vaccination with immunostimulatory DNA sequences and anti-immunoglobulin E therapy.¹⁷

Children who outgrow peanut allergy are at risk of recurrence and this risk is significantly higher for patients who continue largely to avoid peanut after resolution of their allergy. On the basis of these findings it was recommended that patients eat peanut frequently and carry epinephrine indefinitely until they have demonstrated ongoing peanut tolerance.¹⁸ The major peanut allergen Ara h1, is relatively easily cleaned from hands and table tops with common cleaning agents and does not appear to be widely distributed in pre-school and schools. It was not detected as airborne allergen in many simulated environments.¹⁹ Emergency treatment plan include self administration of epinephrine in case of accidental ingestion. Future treatment strategies may include recombinant peanut protein immunotherapy and anti-immunoglobulin E therapy to modulate clinical reactivity to peanuts.²⁰

Conclusion

Peanut allergy has been reported from many countries. It should be included in differential diagnosis of all food related dermatological lesions of acute nature.

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