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Dr. Kaveri Hanmanthappa

Dept Physical Education
Gulbarga University Kalaburagi
Karnataka, India

Pramod. M Khed

Lecture Renuka College of
physical Education (B. P. Ed),
Hagaribommanahalli Bellary
Karnataka, India

Food allergy on human health

Dr. Kaveri Hanmanthappa and Pramod. M Khed

Abstract

Food allergy is an increasing problem in western countries, with strict avoidance being the only available reliable treatment. However, accidental ingestion can occur and anaphylactic reactions still happen. In recent years, many efforts have been made to better understand the humeral and cellular mechanisms involved in food allergy, and to improve the strategies for diagnosis and treatment. This review focuses on IgE-mediated food hypersensitivity and provides an overview of the diagnostic strategies and treatment advances. Specific immunotherapy, including different routes of administration and allergen sources, such as natural, recombinant and T-cell epitomes, are analyzed in detail. Other treatments such as anti-IgE monoclonal antibody therapy, adjuvant therapy and Chinese herbs will also be described.

Keywords: Food, Allergy, Health

Introduction

'Food allergy' refers to specific reactions that result from an abnormal immunological response to a food and which can be severe and life-threatening and triggered by minute amounts of the allergen. Conversely, 'non-allergic food intolerance' refers to reactions to food that can result from a number of causes, none of which is mediated by the immune system (e.g. pharmacological effects, enzyme deficiencies, irritant and toxic effects). Owing to their variable etiology, their effects can be acute and severe, although rarely life-threatening, but they are usually chronic and diffuse. Unlike food allergy, relatively large amounts of a food are usually necessary for adverse effects to occur.

• What are the main types of food allergy and how are they clinically presented

There are two major classes of food allergic reactions: immunoglobulin E (IgE) mediated and non-IgE mediated. The former are generally present soon after ingestion and thus easy to investigate and diagnose. They can be more violent than non-IgE mediated reactions and can even lead to death through anaphylaxis in severe cases. Non-IgE mediated reactions are often presented later and can be more subtle and often an important cause of ill health. Food-allergic reactions are generally divided into those of early onset (within minutes to an hour after food ingestion), which also tend to be IgE mediated, and those of late onset (taking hours or days), which are in general non-IgE mediated. Early-onset manifestations often include wheezing, urticaria, angioedema, rashes, vomiting and anaphylaxis, whereas late-onset symptoms include diarrhea, abdominal pain, allergic rhinitis, atopic eczema, food-sensitive enteropathy or food-sensitive colitis, protein-losing enteropathy and constipation.

• What foods are known to cause immunological mediated reactions

Common foods that can cause an allergic reaction include:

- peanuts and tree nuts (e.g. hazelnut, Brazil nut, walnut)
- milk (cow's, goat's, sheep's)
- soya
- _fish
- shellfish
- eggs
- seeds (especially sesame and caraway)
- fruits (especially apples, peaches, plums, cherries, bananas, citrus fruits)

Correspondence

Dr. Kaveri Hanmanthappa

Dept Physical Education
Gulbarga University Kalaburagi
Karnataka, India

- herbs and spices (especially mustard, paprika and coriander).

However, the most common allergies, according to the frequency they occur, are:

1. In children: cow's milk, egg, soya, peanut, tree nuts, fish and crustaceans
2. In adults: peanut, tree nuts, crustaceans, fish and egg.

The processing of food may also affect its allergenic city. For example, the

Allergenic city of many fruits may be greatly reduced by cooking, and that of eggs, milk and some fish may be attenuated. It is also possible that the boiling, but not the roasting, of peanuts may lessen their allergenic city. On the other hand, the thermal processing of food may lead to the formation of allergens that are not present in raw foods. This may be attributed to changes in the shape of protein molecules and the revealing of previously hidden epitomes. Moreover, allergies to 'new' foods commonly emerge as these foods are introduced to a new population. Thus, kiwi fruit allergy has become a significant problem in the UK in recent years. In addition, novel food proteins from genetically modified organisms or from new manufacturing processes applied to existing foods could carry a risk of food allergy.

• How can food allergy be diagnosed

The diagnosis of IgE mediated food allergy is usually based on patient's medical history and confirmed by the results of one or more specific investigations, including skin tests, blood tests [radioallergosorbent (RAST) tests, enzyme-linked immunosorbent assay (ELISA)], response to dietary restriction (single exclusion diet, multiple-food exclusion diet, elemental and protein hydrolysis formula diet) and sometimes by oral challenge tests. The confirmation of non-IgE mediated (delayed) food allergy is more difficult to achieve and is largely based on dietary restriction and oral challenge tests.



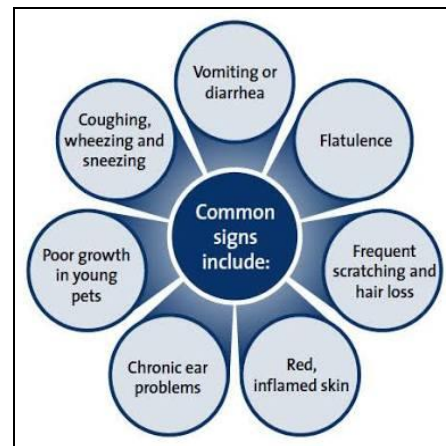
• How can a dietitian contribute to the management of food allergies

The management of allergic diseases is recognized as an area of specialization and should ideally be carried out by a clinical immunology and allergy team, which would include medical expertise from the fields of respiratory diseases, dermatology, gastroenterology and immunology and the specialist skills of dietitians and nurses. This team should identify and completely avoid the offending allergen or allergens. Specialist dietetic guidance is essential to ensure that

- all potential sources of the allergen are avoided
- The effects of the exclusion diet on the intake of other nutrients and overall dietary balance are minimized.

This is especially important for infants and children, and in the event that the excluded food is a major nutritional contributor (e.g. milk), because alternative sources of nutrients should be provided. Dietitians should also provide written guidance on the foods or types of foods that must be avoided, foods or types of foods that may need to be avoided, which is determined from ingredients lists of manufactured foods, and foods or types of foods that can be safely eaten. Dietary advice in order to prevent potential nutritional inadequacies is also crucial. Moreover, dietitians should teach their patients to:

- carefully check all ingredient labels
- learn other names of the food responsible for the allergy
- Exercise caution when eating out since restaurant staff are not always aware of specific menu ingredients or how food is prepared
- Be careful when eating food that is packaged in multi-packs with other foods: while one product may be considered safe, there is a risk of cross contamination because products may leak or become unwrapped.



Conclusion

This study shows that recall of peanut consumption during pregnancy, as assessed by a FFQ administered after two year, correlates strongly with initial assessment. Despite some minor limitations this provides a potentially useful tool for retrospectively investigating the role of relative peanut consumption during pregnancy on the later development of PA in infants. Formal validation of the accuracy of the FFQ by means of comparison with a 'truth reference' is required before its use in research studies.

You could save a life...
 Learn the symptoms of an allergic reaction.

Anaphylaxis is a serious, potentially fatal allergic reaction. Symptoms of an allergic reaction can range from mild to severe, and can include one or more of the following:

- Mouth:** swelling (tongue and/or lips), itchy mouth, blue-tinged lips
- Throat:** trouble breathing/swallowing/speaking, tightness, hoarseness
- Lungs:** repetitive cough, shortness of breath, wheezing
- Heart:** faintness, weak pulse, dizziness, confusion, paleness
- Skin:** hives, itchy rash, swelling, flushing
- Gut:** vomiting, diarrhea, crampy pain
- Other:** sense of impending doom, loss of consciousness

If you observe signs of an allergic reaction, get help immediately. If you suspect anaphylaxis, administer prescribed epinephrine and call 911.

Food Allergy Education Network, Inc.
 Empowering Families... Supporting Communities
 www.FoodAllergyEDNetwork.org • FAEdNetwork@gmail.com • 203-206-3141

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