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FOOD ALLERGIES - THE DILEMMA

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The Dilemma

- Accurate identification of the allergenic food is crucial for correct management of food allergy
- Inaccurate identification of the allergenic food leads to frustration on the part of clinician and patient, and continuation of disease
- Food allergy may be complicated by food intolerances, which are not identifiable by standard allergy tests

Consequences of Inaccurate Identification of Culprit Food

- Loss of confidence in the medical system by patient
- Doctor shopping
- Patient seeks help from unscientific practitioners
- Excessive food restriction can lead to nutritional deficiency, and its associated risks

The Dilemma

- We are often faced by a patient with signs of food allergy:
  - Symptoms may be in the skin, digestive tract, lungs and respiratory tract, or more vague (lightheadedness, dizziness, “feeling unwell”, headache)
  - Symptoms occur during or immediately after eating
  - Sometimes occur hours after eating, but patient is convinced that they are caused or exacerbated by foods

The Dilemma

- Skin and blood tests may or may not indicate food allergy
- Avoidance of the test-positive foods does not alleviate symptoms
- Question –
  - Do we advise increasing the food restrictions?
  - If so, which foods do we avoid?

Allergy Tests and Cross-Reacting Allergens

- Historically, patient testing positive to a certain food was provided with lists of "food families" and instructed to avoid all foods within the "reactive family"
- More sophisticated immunology has demonstrated the fallacy of this approach
- E.g. a person with peanut allergy usually can eat other legumes with impunity
- Each allergen is unique, but may have structural similarity to one in an unrelated food
- Antibodies to the first will trigger immune response to the second

Case History I

- 45 year old female
- Presents with tingling, “blistering” inside the mouth, and tongue swelling after eating certain foods
- Skin tests reported negative for all foods tested
- Positive for West coast trees, grasses, molds, dust mite
- 20 year history of rhinoconjunctivitis

Case history II

- 36 year old female
- Swelling and tingling of lips, perioral reddening after eating, throat tightening
- Skin test positive to a number of foods including corn, fish, milk, peas, shellfish,wheat
- Skin test positive to alder and birch trees, Timothy grass, molds, dust and dust mites, animal dander
- History of rhinoconjunctivitis
- No remission of symptoms when all skin test positive foods avoided

Oral Allergy Syndrome (OAS)

- Symptoms in the mucosa of the mouth and throat
- Result from direct contact with a food allergen
- In an individual who also exhibits allergy to inhaled allergens
- Usually pollens (pollinosis), such as
  - Alder or birch pollen on the West coast
  - Ragweed pollen in Ontario and the prairies
  - Certain grasses

Immunological Mechanism

- IgE-mediated, immediate, type I hypersensitivity reaction
- Mast cells in tissues of the upper respiratory tract release inflammatory mediators
- Histamine is responsible for swelling, itching, reddening
- Other inflammatory mediators act on local tissues and cause additional symptoms

Oral Allergy Syndrome Allergens

- Inhaled pollen allergens sensitize tissues of the upper respiratory tract - causing rhinitis and other symptoms of hay fever
- Tissues of the respiratory tract are adjacent to oral tissues, and the mucosa is continuous
- Sensitization of one often leads to sensitization of the other

Oral Allergy Syndrome Allergens

- Pollens and foods that cause OAS are usually botanically unrelated
- Several types of plant proteins with specific functions have been identified as being responsible for OAS:
  - Lipid-transfer proteins
  - Profilins
  - Pathogenesis-related proteins
  - Hevamines

Oral Allergy Syndrome
Associated foods

- Foods most frequently associated with OAS are mainly fruits, a few vegetables, and nuts
- The foods cause symptoms in the oral cavity immediately on contact:
  - Swelling
  - Tingling
  - Itching
  - "Blistering"

Oral Allergy Syndrome
Associated foods

- The associated foods usually cause a reaction when they are eaten *raw*
- Foods tend to lose their reactivity when cooked
- This suggests that the allergens responsible are heat labile
- Allergic persons can usually eat cooked fruits, vegetables, nuts, but must avoid them in the raw state

Oral Allergy Syndrome
Cross-reacting allergens

- Birch pollen (also: mugwort, and grass pollens) with:
  - Stone Fruits: Apricot Nectarine Peach Plum Cherry
  - Apple
  - Orange
  - Melon
  - Watermelon
  - Potato
  - Tomato
  - Kiwi Fruit
  - Peanut
  - Hazelnut
  - Carrot
  - Celery
  - Fennel

Oral Allergy Syndrome
Cross-reacting allergens

- Ragweed pollen with:
  - Banana
  - Cantaloupe
  - Honeydew
  - Watermelon
  - Other Melons
  - Zucchini
  - Cucumber

Latex Allergy

- Allergy to latex is thought to start as a Type IV (contact) hypersensitivity reaction
- Contact is with a 30 kd protein, usually through:
  - Abraded (non-intact) skin
  - Mucous membrane
  - Exposed tissue (e.g. during surgery)

Latex Allergy

- Antigen gains access to cells of the immune system through the non-intact skin
- CD4+ (T helper cells) encounter the antigen, probably aided by antigen-presenting cells
- Results in a Th2 response
- Antigen-specific IgE is generated
- Continued exposure to antigen up-regulates response
- Reaction becomes systemic
- Can result in life-threatening anaphylactic reaction in extreme cases

Latex Allergy
Related foods

- Foods that have been shown to contain a similar 30 kd antigen include:
  - Avocado
  - Banana
  - Kiwi Fruit
  - Fig
  - Passion Fruit
  - Citrus Fruits
  - Pineapple
  - Tomato
  - Celery
  - Peanut
  - Tree Nuts
  - Chestnut
  - Grapes
  - Papaya

Identification of the Culprit Foods

- Careful medical history
- Appropriate investigations to rule out other causes of symptoms
- Results of allergy tests
- Seven-day food and symptom record

Selection of the Appropriate Elimination Diet

- Selective elimination diet if history and food and symptom record, plus allergy tests, indicate specific foods are the problem
  - Trial for four weeks
  - Substitute foods provided
- Few foods elimination diet if allergy tests indicate many foods reactive
  - 10-14 days maximum
  - Recipes and plans provided for all meals

Confirming Accuracy of Food Allergy Tests

- Every food allergy test needs to be confirmed by elimination and challenge of the suspect food
- Must be carefully monitored and supervised because of risk of nutritional deficiency - especially in young children
- Anaphylactic reactions don't always need confirmation - if they do, challenge must always be carried out under medical supervision in a suitably equipped facility