FOOD ALLERGY

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Medical Nutrition Therapy II
Clinical Nutrition Department-3rd year
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By the end of the lecture you will:

- Know the difference between the food intolerance and food allergy.
- Be familiar with common food caused allergy.
- Be aware of the food allergy in Saudi Arabia.
- Be familiar with the symptoms of food allergy.
- Know the risk factors for food allergy.
- Recognise the different types of diagnoses.
- Know the food allergy treatment.
Food Allergy (hypersensitivity)

Is an immunoglobulin E (IgE)-mediated reaction (Immune system reaction) that occurs when the immune system identified normal food protein as harmful and releases histamine and other chemicals to “attack” the enemy.

True Allergy - Total avoidance necessary!

Food Intolerance

Inability to digest a food (non-immunoglobulin E (IgE) reactions).

Intolerance - Small amount may be tolerated.
Facts About Food Allergy

- Experts agree that atopic disease (asthma, eczema, food allergy) is more common in the developed countries as a result of greater hygiene.
- The incidence of food allergy appears to decrease with age.
- More than 160 foods have been associated with allergic reactions.
- There is no cure for food allergy, avoidance of the food is the only way to prevent a reaction.
Facts About Food Allergy

- The first exposure to food allergens may occur during pregnancy or lactation or in early childhood.

- Breast-feeding is the best nutrition and protection against food allergy disease, but it does not protect fully. However, the mother should be encouraged to not eat nuts and other potential food allergens while nursing.

- Supplementing probiotics to the pregnant woman 1 month before delivery or providing probiotic therapy for nursing mother could reduce food allergy.
Common Food Allergens

- Milk
- Eggs
- Nuts (e.g., Peanuts, walnuts, pecans, etc.)
- Wheat
- Fish
- Soy
Food Allergy in Saudi Arabia

- Aba-Alkhail and El-Gamal (2000) reported a 29% prevalence rate in a study of 1341 patients in Jeddah, Saudi Arabia.

- Study by Tayeb et al. (2009) reported that the top five food allergens were cocoa 22 (27.5%), peanuts 14 (17.5%), egg white 12 (15%), milk 10 (12.5%) and strawberry 9 (11.3%) in Makkah (sample size= 80).

- Gad Elrab et al. (1999) found most common allergens were peanuts (23%), egg (15%) and cow’s milk (13%) in Riyadh (Sample size=217).

- Additional study in Riyadh (1998) reported that peanuts (11%), egg white (3%), milk (3%), wheat (3%), bananas (3%) and fish (2%) were the most common food allergies. (Sample size=100).
Defense System

Human body has two categories:

- **Non specific defenses**
  - Physical barriers (skin and mucous membrane)
  - Chemical barriers (saliva, mucus, gastric juices, etc.)
  - Inflammation (reddenning, swelling and temperature increase of the affected sites)
  - Fever (elevated body temperature)

- **Specific defenses or specific immunity**
  - Antibodies (many kinds of antibodies for many kinds of antigens)
Immune System

- The immune system functions to clear the body from foreign substances (antigens) such as viruses and bacteria.

- Normally, when antigens interact with cells of the immune system (antibody) produced in response to an antigen that is able to clear the body without an adverse reaction.

- Three types of cells respond to antigens presented: B cells, T cells, and macrophages. They are arising from the stem cells in the bone marrow.
Antibodies

• **Five classes of Immunoglobulins:**

1) IgG: Main class of antibodies in blood.

2) IgA: Small amount in blood, but larger amount in tears, milk, saliva, mucus and the lining tissues.

3) IgM: First Antibody secreted during the primary response.

4) **IgE:** Found mainly in body fluids and skin --- Associated with allergy reactions!

5) IgD: Found in B-Cell membrane.
Symptoms of Food Allergies

- **Immediate hypersensitivity** occurs within minutes to a few hours after eating of foods.
  - **Systemic**: Itching, hives, vomiting, abdominal cramps, diarrhea and respiratory distress, and in severe cases anaphylactic shock.
  - **Localized**: hives and eczema

- **Delayed hypersensitivity** reactions (>8 hours after ingestion)

A wide range of symptoms (skin, respiratory, cardiovascular, and gastrointestinal symptoms).

Trouble swallowing
Shortness of breath
Coughing
Voice change

Swelling
Hives
Eczema
Itchy red rash

Nausea & vomiting
Diarrhea
Abdominal cramping

Drop in blood pressure
Loss of consciousness
Anaphylaxis

- A serious allergic reaction that may cause death (life threatening!!!).
- Causing reduced oxygen supply to the heart and other body tissues.

Symptoms include:
1. Difficult breathing
2. Low blood pressure
3. Pale skin
4. A weak rapid pulse
5. Death
Risk Factors for The Development of Food Allergy

- Family history plays a major role in the development of atopic disease.
- Prematurity and immunodeficiency.
- Reduced childhood infections and exposures to microbes increased incidence of atopic disease in the population.
- Food allergies are most common in children, especially infants.
- Asthma and food allergy commonly occur together. When they do, both food allergy and asthma symptoms are more likely to be severe.
Diagnosis: 1- Clinical history

- No simple test can be used to diagnose food allergy.

The first diagnostic tool is the clinical history:

A. Description of symptoms
B. Time of food intake
C. Description of the most recent reactions
D. A list of suspected foods
E. Estimate of the quantity of food required to cause a reaction.
2- A 7- to 14-day food and symptom diary is useful.

3- A 24-hour recall is helpful when reactions occur less frequently.

A. Time the food is eaten.
B. The quantity and type of food.
C. Identify all food ingredients.
D. The time symptoms appear near the time of food ingestion.
E. Any medications taken before or after the onset of symptoms.
Diagnosis: 3- Immunological test

- The fluorescein-enzyme immunoassay blood test.

- The blood test is specific, with 96% to 100% accuracy, in identifying children with milk, egg, fish, wheat, and peanut allergy; but identification of soy allergy is still only 86% accurate.
Diagnosis: 4- Skin tests

The most economic and provide results within 15 to 30 minutes. All skin-prick tests are compared with the control. Test wheals that are 3 mm greater than the control indicate a positive result.
### Diagnosis: 5- Food elimination

<table>
<thead>
<tr>
<th>Three Stages of Elimination Diets</th>
<th>Foods Allowed</th>
<th>Foods To Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elimination Diet Level 1: Milk, Egg, and Wheat-Free</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal protein sources</td>
<td>Lamb, chicken, turkey, beef, pork</td>
<td>Cow's milk, chicken eggs</td>
</tr>
<tr>
<td>Vegetable protein sources</td>
<td>Soy milk, soybeans, other beans, lentils</td>
<td>Wheat</td>
</tr>
<tr>
<td>Grains or alternative starches</td>
<td>White potato, sweet potato, yams, rice, tapioca, arrowroot, buckwheat, corn, barley, rye, millet, oats</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>All vegetables</td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td>All fruits and juices</td>
<td></td>
</tr>
<tr>
<td>Sweeteners</td>
<td>Cane or beet sugar, maple syrup, corn syrup</td>
<td>Butter and margarines that include milk</td>
</tr>
<tr>
<td>Oils</td>
<td>Soy oil, corn oil, safflower oil, coconut oil, vegetable oil, olive oil, peanut oil, milk-free margarines</td>
<td></td>
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<tr>
<td>Other</td>
<td>Salt, all spices</td>
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<tr>
<td><strong>Elimination Diet Level 2: Stricter</strong></td>
<td>Lamb</td>
<td>All other animal proteins, including meat, fish, poultry, eggs, and milk</td>
</tr>
<tr>
<td>Animal protein sources</td>
<td>None</td>
<td>Soy milk, soybeans, peas, other beans, lentils, peas, beans, sprouts, all nuts</td>
</tr>
<tr>
<td>Vegetable protein sources</td>
<td>White potato, sweet potato, yams, rice, tapioca, buckwheat, arrowroot, corn</td>
<td>Wheat, oats, barley, millet, rye</td>
</tr>
<tr>
<td>Grains or alternative starches</td>
<td>Most vegetables</td>
<td>Peas, tomatoes</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Most fruits and juices</td>
<td>Citrus fruits, strawberries</td>
</tr>
<tr>
<td>Fruits</td>
<td>Cane or beet sugar, maple syrup, corn syrup</td>
<td>Butter, margarine, vegetable oils, soy oil, corn oil, peanut oil, nonspecific shortening, or fats of animal origin</td>
</tr>
<tr>
<td>Sweeteners</td>
<td>Safflower oil, coconut oil, olive oil, sesame oil</td>
<td>Chocolate, coffee, tea, colas and other soft drinks; alcoholic beverages</td>
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<tr>
<td>Oils</td>
<td>Salt, pepper, all spices, vanilla or lemon extract, baking soda, cream of tartar</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>Elimination Diet Level 3: Severe</strong>†</td>
<td>Rice in any form (rice cakes and rice cereal being especially helpful)</td>
<td>Asparagus</td>
</tr>
<tr>
<td>Animal protein sources</td>
<td>Pineapple</td>
<td>Beets</td>
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<tr>
<td>Vegetable protein sources</td>
<td>Apricots</td>
<td>Carrots</td>
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<tr>
<td>Grains or alternative starches</td>
<td>Cranberries</td>
<td>Lettuce</td>
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<tr>
<td>Vegetables</td>
<td>Peaches</td>
<td>Sweet potatoes</td>
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<tr>
<td>Fruits</td>
<td>Pears</td>
<td>White vinegar</td>
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<tr>
<td>Sweeteners</td>
<td>Apples including canned fruit and juices of these</td>
<td>Olive oil</td>
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<tr>
<td>Oils</td>
<td>Lamb</td>
<td>Honey</td>
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<tr>
<td>Other</td>
<td>Chicken</td>
<td>Cane or beet sugar</td>
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<td></td>
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<td>Salt</td>
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<td></td>
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<td>Safflower oil</td>
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<tr>
<td></td>
<td></td>
<td>All other foods</td>
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</tbody>
</table>
Diagnosis: 6- Food challenge

The food challenge is the "gold standard" for identifying food induced symptoms. It has been approved for only six foods: egg, milk, peanut, fish, wheat, and soy.

- A food challenge is conducted once symptoms have resolved and all antihistamines are stopped.

- The three types of food challenges are as follows:
  1- Open food challenge, which allows the food to be given openly.
  2- Single-blind, placebo controlled food challenge, in which the food is hidden from the patient.
  3- Double-blind, placebo-controlled food challenge, in which the food is hidden from the patient and the health practitioner.
Diagnosis: 6- Food challenge

• A person with a positive challenge response must be given appropriate medications to stop symptoms and be monitored for an additional 1 to 2 hours.

• Those who are observed to have a negative challenge response should also be watched for an additional 1 to 2 hours.
Treatment

- Total avoidance of a food allergen is the only proven treatment for food allergy.

- Food vaccine is a possible future treatment but still considered experimental.

- Families and individuals need guidelines and suggestions for:
  1. Avoiding allergenic foods.
  2. Selecting nutritionally adequate replacement foods.
Foods to be avoided may be hidden in the diet ("safe" food was contaminated):

1- Common utensils such as at an ice cream shop, salad bar, or deli.
2- Manufacturing or restaurants may use the same equipment to produce two different products (e.g., peanut butter and almond butter).
3- A restaurant may use the same oil to fry both potatoes and fish.
4- One product is used to make a second product (mayonnaise).
Monitoring

- Physical examination (weight, height, and body mass index (and head circumference for an infant) need to be assessed during the diagnosis.

- Clinical signs of malnutrition should be assessed including the evaluation of fat and muscle stores.

- When foods are removed from the diet, alternative nutrient sources must be provided. For example, when dairy products are removed, other foods must provide calcium, vitamin D, protein, riboflavin, and energy.

- The nutritional adequacy of the diet should be monitored on a regular basis by conducting an ongoing evaluation as needed.
First Aid

Antihistamine

Epipen
Food allergy Awareness Bracelet

Available in the following styles:
- peanut
- egg
- tree nut
- dairy
- penicillin
- wheat/gluten
- fish
- soy
- latex
- pollen
- sesame
- cat
- shellfish
- insect sting

Allerbling™ is a product created for the love of our children; a portion of the proceeds from Allerbling™ will be donated to children’s charities.
Food Allergy side effects may include healthier eating habits, improved baking skills, and an increased number of meals together at the dinner table.
Contact

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