Food Allergies and Anaphylaxis

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Disclosure

- I have nothing to disclose
Objectives

• Identify signs and symptoms of an allergy reaction and how to treat an food allergy reaction
“Before we come in, was any part of your home produced in a facility that also handles wheat, milk, nuts, eggs, or soy?”
Food Allergy

• An adverse reaction that is reproducible upon exposure to a given food
• The most common food allergens are:
  – Egg
  – Milk
  – Wheat
  – Soy
  – Peanuts and tree nuts
  – Fish and shellfish
How common is a food allergy?

- One in three individuals (30%) of USA think they have food allergy
- Prevalence: Nearly 6 million children (about 8%)
- Estimated 2 children out of a class of 25 will have a food allergy
- 4% adults have food allergy
Why do food allergies develop?

- Immaturity of the infant gut
- Immaturity of the immunological mechanisms
- Genetic predisposition
- Hygiene hypothesis - “too clean”
- Processing of food - ex: boiling vs. roasting peanuts
- Changes in Diet
  - Vitamin D
  - Dietary fats (western diet vs. Mediterranean)
Diagnosis of a food allergy

• **HISTORY is the most important!!**

• Testing should be based on patient’s medical history and not consist of large general panels of food allergens.

• Serum specific IgE test can help identify foods that may provoke an IgE mediated reaction, but alone these tests are NOT diagnostic.
Patient History

- What particular food was suspected
- Amount of the food ingested
- What other foods were ingested at the same time
- How was the food prepared
- Has this food been previously tolerated
- Age of onset
- Timing of ingestion to onset of symptoms
Symptoms of an allergic reaction

- **Skin**
  - Hives, itchy rash, swelling of the face and extremities
- **Mouth**
  - Itching, tingling or swelling of lips, tongue and/or mouth
- **Gut**
  - Nausea, abdominal cramps, vomiting, diarrhea
- **Throat**
  - Tightening of throat, hoarseness, hacking cough
- **Lung**
  - Shortness of breath, repetitive coughing and wheezing
- **Heart**
  - Thready pulse, low blood pressure, fainting, pallor, blue skin
- **Other**
  - Sense of Impending doom
Other ways a child may describe an allergic reaction

- "This food is too spicy."
- "My tongue is hot [or burning]."
- "It feels like something’s poking my tongue."
- "My tongue [or mouth] is tingling [or burning]."
- "My tongue [or mouth] itches."
- "It [my tongue] feels like there is hair on it."
- "My mouth feels funny."
- "There's a frog in my throat."
- "There’s something stuck in my throat."
- "My tongue feels full [or heavy]."
- "My lips feel tight."
- "It feels like there are bugs in there." (to describe itchy ears)
- "It [my throat] feels thick."
- "It feels like a bump is on the back of my tongue [throat]."
Onset of Symptoms

• **Timing of onset after ingestion**
  – Anaphylactic reactions will typically occur within the first 20 minutes, but can be as late as 2 hours of ingestion
  – Symptoms that occur after 12 hours are not typically related to an IgE mediated response
Oral allergy syndrome

- Cross reactivity between pollens and fresh fruit and vegetables
- Symptoms are typically limited to mouth
- Treatment consists of antihistamine
- Foods usually tolerated if baked

<table>
<thead>
<tr>
<th>Pollen Type</th>
<th>Compatible Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ragweed</td>
<td>bananas, melons (watermelon, cantaloupe, honeydew), zucchini and cucumber</td>
</tr>
<tr>
<td>Birch</td>
<td>apples, pears, peaches, apricots, cherries, plums, prunes, nectarines, kiwi, carrots, celery, potatoes and peppers</td>
</tr>
<tr>
<td>Grass</td>
<td>peaches, celery, melons, tomatoes, oranges</td>
</tr>
</tbody>
</table>
The simplest action can lead to the most severe reaction.
Anaphylaxis

• A serious allergic reaction that typically comes on quickly and may cause death.

• **Life threatening symptoms of Anaphylaxis**
  • Breathing: wheezing, shortness of breath, throat tightness, cough, hoarse voice, chest pain/tightness, trouble swallowing
  • Circulation: pale/blue color, low pulse, dizziness, lightheadedness/passing out, low blood pressure, shock, loss of consciousness

• A progressing reaction that involves **two or more systems**

• Requires **immediate** injection of epinephrine and then seek medical care
Fatal Food Anaphylaxis

• Frequency ~ 150 deaths a year
• Clinical features
  – Biphasic reaction- symptoms clinically improve, then reoccurs
  – Cutaneous symptoms may not always be present
  – Respiratory symptoms are prominent
• Risk Factors
  – Teenagers and young adults
  – Underlying diagnosis of asthma
  – Denial of Symptoms
  – Delayed epinephrine- treatment with other meds first
  – Not carrying Epinephrine- most reactions occur away from home
Food Allergy Management

- Strict Avoidance
- Education
- Preparedness for allergic reactions
  - Food Allergy and Anaphylaxis Plan
  - There is no standard desensitization therapy or immunotherapy currently available
Education

- Allergen avoidance
  - Reading a food Label
- Anaphylaxis emergency action plan implementation
- Early recognition of signs and symptoms of anaphylaxis
- Appropriate IM epinephrine administration (including prescription and training)
- Medical identification jewelry or an anaphylaxis wallet card
Food Anaphylaxis Plan

Food Allergy Action Plan
Emergency Care Plan

Name: __________________________ D.O.B.: ______ / ____ / ____

Allergy to: ______________________

Weight: ______ lbs. Asthma: □ Yes (higher risk for a severe reaction) □ No

Exremely reactive to the following foods: ______________________

THEREFORE:
□ If checked, give epinephrine immediately for ANY symptoms if the allergen was likely eaten.
□ If checked, give epinephrine immediately if the allergen was definitely eaten, even if no symptoms are noted.

Any SEVERE SYMPTOMS after suspected or known ingestion:

One or more of the following:

- LUNG: Short of breath, wheeze, repetitive cough
- HEART: Pale, blue, faint, weak pulse, dizzy, confused
- THROAT: Tight, hoarse, trouble breathing/swallowing
- MOUTH: Obstructive swelling (tongue and/or lips)
- SKIN: Many hives over body

Or combination of symptoms from different body areas:

- SKIN: Hives, itchy rashes, swelling (e.g., eyes, lips)
- GUT: Vomiting, diarrhea, crampy pain

MILD SYMPTOMS ONLY:

- MOUTH: Itchy mouth
- SKIN: A few hives around mouth/face, mild itch
- GUT: Mild nausea/diarrhea

Medications/Doses

- Epinephrine (brand and dose): __________________________
- Antihistamine (brand and dose): __________________________
- Other (e.g., inhaler-bronchodilator if asthmatic): __________________________

Monitoring

Stay with student; alert healthcare professionals and parent. Tell rescue squad epinephrine was given; request an ambulance with epinephrine. Note time when epinephrine was administered. A second dose of epinephrine can be given 5 minutes or more after the first if symptoms persist or recur. For a severe reaction, consider keeping student lying on back with legs raised. Treat student even if parents cannot be reached. See back/attached for auto-injection technique.

Parent/Guardian Signature __________ Date __________

Physician/Healthcare Provider Signature __________ Date __________

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Epinephrine Injectable Devices

- Two of the products currently on the market
  - Epipen
  - Auvi-Q (talking device)
- Injected into the lateral aspect of thigh
- Always need to be carried as a 2-pack
  - 20% of patients will need a 2\textsuperscript{nd} dose within 20 minutes
Casual Contact

• Casual Exposure through skin contact and inhalation is highly unlikely to elicit anaphylaxis
  – Most common reaction is redness, itching or hives at the site of contact

• Food proteins released into the air through cooking can potentially cause an allergic reaction, but this is very uncommon
  – Most common reaction is hay fever or asthma symptoms
Cleaning of Hands and Surfaces

• All cleaning agents, including bar soap, liquid soap and commercial wipes were effective in cleaning hands

• Table surfaces were also effectively cleaned by soaps and commercial cleaning agents
Where reactions occur

- 79% of reactions occurred in the classroom, usually during skin contact during crafts projects (minor reactions)
  - 12% occurred in the cafeteria
- A study in Massachusetts showed, 46% of anaphylaxis occurred in the classroom
  - 9% in the cafeteria
Peanut butter vapors

• Vapors at room temperature do not contain protein

• Reactions to the odors, is a neurologic response triggered by volatile organic compounds
Laws regarding Epinephrine

• Carrying Prescribed Epinephrine at School
• Virtually every state has passed legislation allowing students, with appropriate consent, to carry their prescribed epinephrine at school. Depending on the wording of the law, the permission to carry may also extend to activities held on school property, and during transportation to and from school or school-related events. Many of these state laws also apply to prescribed asthma medications.

• Kansas (2005)
• Missouri (2006)
Laws regarding Epipen

• Kansas and Missouri both have laws that allow school districts to get a standing prescription from a physician that allows the district to stock each building with an epinephrine injector.

• Epipen 4 Schools Program
  – Available through Mylan Pharmaceuticals
  – www.epipen4schools.com
Missouri law

- Missouri Revised Statutes
- Chapter 167
  Pupils and Special Services
  Section 167.630

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- Epinephrine prefilled auto syringes, school nurse authorized to maintain adequate supply--administration authorized, when.
- 167.630. 1. Each school board may authorize a school nurse licensed under chapter 335 who is employed by the school district and for whom the board is responsible for to maintain an adequate supply of prefilled auto syringes of epinephrine with fifteen-hundredths milligram or three-tenths milligram delivery at the school. The nurse shall recommend to the school board the number of prefilled epinephrine auto syringes that the school should maintain.
- 2. To obtain prefilled epinephrine auto syringes for a school district, a prescription written by a licensed physician, a physician’s assistant, or nurse practitioner is required. For such prescriptions, the school district shall be designated as the patient, the nurse’s name shall be required, and the prescription shall be filled at a licensed pharmacy.
- 3. A school nurse or other school employee trained by and supervised by the nurse shall have the discretion to use an epinephrine auto syringe on any student the school nurse or trained employee believes is having a life-threatening anaphylactic reaction based on the training in recognizing an acute episode of an anaphylactic reaction. The provisions of section 167.624 concerning immunity from civil liability for trained employees administering lifesaving methods shall apply to trained employees administering a prefilled auto syringe under this section.
Bullying

• Bullying and harassment of a child was reported by 45.4% (n=251) of children and 36.3% of parents
• Bullying specifically related to food allergies was reported by 31.5% of children and 24.7% of parents
• Mainly perpetrated by classmates and included being threatened with foods
Bullying

• Bullied children reported decreased quality of life and increased distress, independent of allergy severity

• Only about half of the parents were aware of the bullying; when they were, the impact on the child lessened.
Foods Generally Tolerated

• Peanut Oil
  – That has been highly refined
  – Not cold pressed, expeller pressed or extruded peanut oil
• Soy Lecithin
• Coconut oil and shea nut oil/butter
Vaccination of Egg Allergic Children

• Less severe or local reaction to egg is **NOT** a contraindication to influenza vaccine
  – Two methods of delivery:
    • Give dose and observe for 30 minutes
    • Give 10% of dose then observe for 30 minutes and then give 90% of dose

• Patients who have had a severe reaction including angioedema, hives, allergic asthma or anaphylaxis should be evaluated by an allergist, as they may be able to receive the influenza vaccination
Research on the Horizon

• Oral immunotherapy
• Sublingual immunotherapy
• Desensitization
• Omalizumab (anti IgE)-Xolair
• Chinese Herbal Medicine

• Unfortunately- nothing ready for prime time
Component Testing

- Ability to look at the various proteins that make up allergenic foods
  - Milk - casein
  - Egg - ovomucoid

- If certain heat stable proteins are low then the patient can tolerate the allergenic food in baked goods

- Studies have shown that 75% of individuals with a cow’s milk allergy can tolerate baked goods

- Moreover, the addition of tolerating baked milk in their diet appears to accelerate the development of regular milk tolerance compared with strict dietary avoidance

- Baked good is defined as baking at 350 degrees for 15-20 minutes
References

• Food allergy research and education (FARE). Available at www.foodallergy.org
  – http://www.niaid.nih.gov/topics/foodallergy/clinical/Pages/default.aspx
Questions??
Thank You for Attending!

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