

Primary Health Care Initiatives (PHCI) Project
Contract No. 278-C-00-99-00059-00
Abt. Associates Inc.

ALLERGY IN CHILDREN

LEARNING OBJECTIVES

- Describe the basic pathophysiology of allergy in children
- Understanding the chronic nature of allergy, and correct diagnosis
- Develop an effective plan for treatment
- Important points to be communicated to parents of an allergic child

TEACHING STRATEGIES

- Review the life saving measures in the case of anaphylaxis and shock
- Use of lecture or informal presentation for material, small group discussion for prevention, counseling and patient education issues.

MATERIALS AND EQUIPMENT NEEDED

- White board or flip chart and markers for summarizing major points.
- Overhead projector and screen for transparencies

LEARNING POINTS

- General features of allergy diseases
 - Skin manifestations
 - Itching, rash, thickened skin, urticaria
 - Respiratory features
 - Clear rhinorrhea, sneezing, bronchospasm, wheezing, facial edema
 - Cardiovascular
 - Vasodilatation, hypotension, shock, tachycardia
 - G.I.Tract
 - Diarrhea, nausea, cramping
- Basic pathophysiology of allergic diseases
 - Type 1 (Immediate) – Serum hypersensitivity – caused by IgE antibodies – immediate reaction
 - Example: acute allergic reaction to bee sting, or to ingestion of nuts
 - Type II, III, IV – (Delayed) – all related to binding of antigen to antibody and eventual destruction of specific cells with inflammatory process. Involves the cell-mediated (lymphocytic) immune system
- Clinical forms of allergic disorders
 - Asthma – inflammation of upper airway, with edema, increased mucous production, and bronchospasm

- Food allergy – immediate or delayed reaction to certain foods – may cause various symptoms such as generalized rash, rash around the mouth, abdominal cramping, diarrhea, as well as acute anaphylaxis
 - Anaphylaxis – acute IgE mediated reaction with hypotension, generalized edema, generalized rash, shock, and occasionally death
 - Drug allergy – allergic reaction to medication – often a generalized rash, occasionally acute anaphylaxis
 - Urticaria – localized patches on skin of edema, itching, and increased sensitivity
 - Atopic dermatitis – a chronic, inherited condition of increased sensitivity to dryness and some allergens. Often associated with other allergic problems, such as urticaria, asthma, or allergic rhinitis
 - Allergic rhinitis – acute allergic response of naso-pharyngeal mucosa to inhaled allergens. Common symptoms include clear rhinorrhea, frequent sneezing, chronic sore throat, and occasionally allergic conjunctivitis
 - Insect Allergy – acute generalized anaphylactic reaction to bite of stinging insects such as bees or wasps. This is NOT the same as the expected local reaction of swelling and pain.
- Foods that more commonly cause anaphylaxis in children:
 - Nuts (many varieties)
 - Shellfish (clams, oysters, shrimp)
 - Eggs
 - Fish
 - Cow's milk
 - Other common allergens in children
 - Medications, especially antibiotics (penicillin, sulfa, tetracyclines)
 - Animals (dogs, cats, horses, sheep, goats)
 - Pollens (trees, grass, flowers – often seasonal)
 - Dust (especially house dust with microscopic mites (insects))
 - Molds and fungus (in areas of high humidity)
 - Clinical evaluation in child with suspected allergies
 - History
 - Type and pattern of allergic symptoms (rhinorrhea, sneezing, wheezing, rash, urticaria, abdominal cramping or diarrhea, facial or generalized edema, fainting or anaphylaxis)
 - Suspected exposures (see above list)
 - Timing of allergic symptoms with suspected exposure
 - Recurrence of symptoms related to exposures or seasonal changes
 - Presence of suspected anaphylactic symptoms (generalized edema, loss of consciousness or fainting, swelling of face or tongue, severe respiratory distress)
 - Family history of allergic symptoms
 - Physical examination
 - Vital signs, especially blood pressure and pulse
 - Look for rash (localized or generalized), edema (localized or generalized), rhinorrhea, atopic dermatitis, conjunctivitis

- Diagnostic Tests for confirmation of allergies (if history not adequate)
 - Increased blood eosinophils (>5%)
 - Total serum IgE
 - Increased nasal or sputum eosinophils on gram stain of mucous
 - Specific inhalant or skin allergy test (performed by an allergy specialist)
 - RAST (blood test for specific IgE antibodies to individual allergens)

- Treatment
 - Goals of treatment – minimize allergic symptoms
 - Management strategy
 - Child and parents must understand that this is a chronic problem – no easy solution
 - Management must be a combination of life style modifications and occasional medication for control of acute symptoms
 - Child and parents (and health care personnel) must learn to distinguish between allergic symptoms and respiratory infections
 - Life style modification
 - For allergic rhinitis –
 - Control dust by covering mattresses with plastic, frequent house cleaning with damp cloth, avoid thick carpets
 - If specific allergy to house pets, remove pet
 - May need medication during spring or fall pollen season
 - For food allergies –
 - Identify foods that persistently cause symptoms in child
 - Try to avoid those foods, but substitute nutritional alternatives (ie, if allergic to cows milk, may tolerate goat’s milk or soy milk)
 - As child gets older, teach child to avoid problem foods (nuts, eggs, shellfish)
 - Drug treatment
 - Goal of drug treatment – control allergic symptoms without causing major side effects
 - Choice of medications
 - Epinephrine – used only for acute anaphylaxis
 - Sodium cromoglycate
 - nasal spray – effective control of allergic rhinitis
 - eye drops – may control allergic conjunctivitis
 - Antihistamines
 - Traditional – chlorpheniramine, diphenhydramine (Benadryl) or brompheniramine – effective but often cause drowsiness, duration of action about 4-6 hours;
 - New – Claritin, Allegra, Tavist – all long-acting for 12-24 hours, cause drowsiness only rarely; more expensive than traditional antihistamines. Should not be used in very young children < 5 years of age
 - Corticosteroids
 - Very effective in controlling allergic symptoms
 - Nasal corticosteroid (beclomethasone, triamcinolone) effective in controlling allergic rhinitis, no drowsiness, very little systemic steroid side effects.

- Oral prednisone or injectable prednisolone may be used in severe allergic reactions, such as anaphylaxis. Should not be used for control of recurrent or minor allergic symptoms
- Management of acute anaphylaxis
 - ABC (Airway, Breathing, Circulation)
 - Remove the allergen (stinger of bee, food, etc.)
 - Place patient in supine position with feet elevated to control hypotension
 - Call for help
 - Oxygen
 - Establish IV line with Ringers Lactate, replace fluid to control hypotension
 - Adrenaline (Epinephrine – 0.1ml/kg of 1 in 10,000) IM or IV
 - Once ABC stabilized, may give methylprednisolone 40-100 mg IV
 - Transfer to hospital for observation

PREVENTIVE ISSUES AND HEALTH EDUCATION MESSAGES

- Avoidance of allergens, when possible
- Chronic and variable nature of allergic illness
- Antibiotics should be avoided unless clear evidence of respiratory infection present
- In cases of severe allergy, drugs such as adrenaline should be available at all times in case of acute anaphylaxis – teach self administration in case of emergency

CASE STUDY

Name of patient	Omar
Sex	Male
Age	5 years
Date of visit	3 March 1999
Vital signs	Pulse: 130 Resp.: 40 BP: 80/40 Weight: 20

Medical History

The child developed fever and sore throat 2 days ago, and was seen at health center and given oral Ampicillin. He had the same medication 6 months ago with no problem. A generalized skin rash was noticed on arrival home.

Physical exam.

Swollen lips with rapid breathing. Macular rash covering most of skin. Extremities are cold and pale. Tonsils were hyperemic with follicles. Chest clear. No heart murmur. Abdomen soft and non-tender.

Topics of discussion regarding case study:

1. What is the major medical problem in this patient?
2. What is the first step in the management of this child?

3. What is the most probably etiology?
4. What is an appropriate plan of management of this case?
5. What counseling issues would be most appropriate for this patient?

CRITICAL ELEMENTS FOR EVALUATION OF COMPETENCE

- Correct diagnosis of allergy and the cause if possible.
- Appropriate life-style changes and pharmacologic management of allergy
- Appropriate patient education about allergy and its management plan.
- Appropriate management of anaphylaxis and its complications

Table 1
Differential Diagnosis
Allergic Rhinitis and Upper Respiratory Infection

Allergic Rhinitis	Upper Respiratory Infection
Copious clear nasal mucous	Cloudy or green nasal mucous
Persistent mild nasal and/or pharyngeal irritation	Progressively more severe pharyngeal irritation
Often accompanied by eye or conjunctival irritation	Rarely accompanied by eye or conjunctival irritation
No fever, only mild malaise	Low grade fever, often significant malaise
Duration of symptoms – weeks to months	Duration of symptoms – days to 2 weeks
Family history of allergic symptoms	No family history
Relieved by antihistamines or beclomethasone nasal spray	Not generally relieved by antihistamines or beclomethasone nasal spray