Allergies

Lesson Goal

- Present information on causes, signs, symptoms, and treatment of allergies

Lesson Objectives

- Recognize patient experiencing allergic reaction
- Discuss role of histamine released during allergic reaction
- Describe mechanisms of allergic response
Lesson Objectives

- Describe proper assessment and treatment for patient experiencing an allergic reaction
- Establish relationship between patient with allergic reaction and airway management

Lesson Objectives

- State generic and trade names, medication forms, dose, administration, action, and contraindications for epinephrine autoinjector
- Differentiate between patients having allergic reaction and patients having allergic reaction severe enough to require immediate medical care, including use of epinephrine autoinjector

Lesson Objectives

- List signs & symptoms of anaphylactic shock
- Describe pathophysiology of anaphylactic shock
- Describe emergency medical care for patient in anaphylactic shock
Introduction
- Allergic reactions affect many body systems
- Allergies are caused by a variety of substances
- Substances enter the body in various ways
- Reactions range from mild rash to shock to death

Immune System
- Protects the body from foreign invaders
- Antigen—substance that the immune system recognizes as foreign
- Antigens induce sensitivity and immune system responsiveness

Immune System
- Allergens
  - Type of antigen
- Hypersensitivity (allergic reaction)
  - Overreaction of the immune system to a substance
- Almost anything can trigger an allergic reaction in sensitized individuals
Common Causes of Allergic Reactions

- Drugs and biologic agents
  - Antibiotics
  - Aspirin
  - Chemotherapeutics/anticancer agents
  - Insulin
  - Latex gloves
  - Local anesthetics
  - Muscle relaxants
  - NSAIDs (e.g., ibuprofen)
  - Opiates
  - Vaccines

- Insect bites & stings
  - Wasps
  - Bees
  - Fire ants
  - Spiders

- Foods
  - Cod, halibut, shellfish
  - Egg whites
  - Peanuts, soybeans
  - Strawberries

- Food additives
  - Cottonseed
  - Mango
  - Milk
  - Sesame & sunflower seeds
  - Wheat, buckwheat
Antigens, Antibodies & Allergic Reaction

- Immune system produces specific antibodies when exposed to specific antigen
- Initial exposure—sensitization
- With later exposure, antibodies detect, locate, & destroy antigen
- This process involves chemical substances called mediators

Antigens, Antibodies & Allergic Reaction

- Chemical mediators are responsible for symptoms of allergic reaction
  - Have effects on local tissue & organs
- Most important mediator—histamine

Antigens, Antibodies & Allergic Reaction

- Effects of histamine
  - Edema
  - Bronchial constriction
  - Nausea & vomiting
  - Abdominal cramping & diarrhea
  - Increased secretions
Antigens, Antibodies & Allergic Reaction

- Histamine causes small pores of capillary membrane to open
- Fluid leaks out of capillary into surrounding tissue
  - Edema
  - Hypotension
  - Flushed skin
  - Urticaria

Respiratory effects of histamine
- Swelling of mouth, throat, tongue & respiratory tract
- Increased respirations
- Wheezing
- Cyanosis
- Respiratory failure

Signs & Symptoms

- Upper airway
  - Hoarseness
  - Stridor
  - Laryngeal or epiglottic edema
  - Rhinorhea
Signs & Symptoms

- Lower airway
  - Bronchospasm
  - ↑ mucus production
  - Accessory muscle use
  - Wheezing
  - ↓ breath sounds

- Cardiovascular system
  - Tachycardia
  - Hypotension
  - Dysrhythmia
  - Chest tightness

- Gastrointestinal system
  - Nausea
  - Vomiting
  - Abdominal cramps
  - Diarrhea
Signs & Symptoms

- Nervous system
  - Anxiety
  - Dizziness
  - Syncope
  - Weakness
  - Headache
  - Seizure
  - Coma

- Cutaneous system
  - Angioedema
  - Pruritus
  - Erythema
  - Edema
  - Tearing of eyes

Anaphylaxis

- Severe allergic reaction
- Rapid recognition & aggressive treatment are critical
- Repeated exposure to allergen creates rapid, powerful release of mediators
- Can evolve into anaphylactic shock
Assessment

- Allergic reactions & anaphylaxis are similar but have different levels of severity
- Allergic reaction may progress rapidly to anaphylaxis if not treated

Initial Assessment

- Assess ABCs
  - Evaluate airway, including inspecting oropharynx & face for swelling
  - Evaluate breathing for increased work, distress, impending failure
  - Evaluate circulation by checking pulse, skin temperature, skin color

Initial Assessment

- Indications of moderate to severe allergic reaction
  - Edema of face or oropharynx
  - Respiratory distress
  - Wheezing
  - Obvious redness or hives
  - Altered peripheral pulse
History
- Get as much history as possible
- Chief complaint
- SAMPLE
- Past medical history
- Last reaction: severity? treatment?

Physical Examination
- Baseline VS
- Search for medical alert tags
- Inspect the face
- Evaluate skin
- Assess lungs
- Repeat VS frequently

Any allergic reaction, no matter how benign appearing, may progress to hypotension and cardiac arrest

Treatment
- Airway
- High-flow O₂ & ventilation
- Cover patient
- Elevate legs
Treatment

- Anaphylaxis
  - Patient deteriorates
  - Tachycardia, hypotension, cardiopulmonary arrest
  - Continually monitor VS
  - Rapid transport

Treatment

- Epinephrine autoinjector
  - Rapid onset of action to treat anaphylaxis
  - Increases cardiac function & BP, dilates airways

Treatment

- Use of epinephrine autoinjectors
  - Adult & pediatric sizes
  - Prescription only
  - Check expiration date
  - Use BSI and properly dispose of unit
  - Intramuscular injection
  - Thigh muscle preferred
Skill 21-1: Use of Epinephrine Autoinjector

1. Remove syringe/autoinjector from package. Check expiration date.

2. Expose patient’s thigh; clean with alcohol prep, if available. Remove safety mechanism on syringe.

3. Place syringe with needle side against thigh at 90° angle. Activate syringe, either by depressing button or through actual skin pressure. Keep syringe against thigh for several seconds to allow complete delivery of medication. When injection is finished, remove syringe and massage area for a few seconds. Place used syringe in appropriately labeled sharps container.
Summary

- A number of antigens cause allergic reactions
- Chemical mediators, such as histamine, cause signs & symptoms of allergic & anaphylactic reactions
- Rapid recognition & aggressive management are critical
- Many EMTs can assist patients with epinephrine autoinjector