Anaphylaxis

National Pediatric Nighttime Curriculum

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Case 1 (interns): Text page from a nurse, “Pt in room 4244 has hives”

- What do you think about this situation?
- What do you need to do?
  - What are your initial steps?
  - Do you need to do any work up?

Case 1 (interns): Text page from a nurse, “Pt in room 4244 has hives”

- Information received upon arrival to the room: 7 yo patient started IVIG infusion 15 minutes ago who has generalized hives, RR= 54, HR 154, BP = 68/38 and says his chest “feels tight”
- What do you need to do?

Case 2 (seniors) receiving sign out as night float & receive text from intern “Pt B is set to go home but c/o belly pain and a loose stool”

- What do you think about this situation?
- What do you need to do?

Case 2 (seniors) receiving sign out as night float & receive text from intern “Pt B is set to go home but c/o belly pain and a loose stool”

- Upon calling the intern back you find out: 8 yo female admitted with pneumonia 3 days prior due to respiratory distress. She has been on ceftriaxone IV and azithromycin po, and after improvement in her symptoms she was changed to all oral antibiotics today in preparation for discharge. The abdominal pain has persisted over the last hour and is crampy and disabling, she has had one loose stool.
- **What do you do??**

Case 2 (seniors) receiving sign out as night float & receive text from intern "Pt B is set to go home but c/o belly pain and a loose stool"

- She received her 1st dose of Augmentin 2 hours ago and has started to develop hives and some itching
- Is this anaphylaxis?
- What do you need to do?

Objectives

- Define the diagnostic criteria for anaphylaxis
- Recognize anaphylaxis
- Know the common etiologies of anaphylaxis in the inpatient setting
- Carry out a proper treatment plan for a patient experiencing anaphylaxis

Anaphylaxis

- An acute and potentially life-threatening systemic allergic reaction
- Usually, but not always, mediated by an immunologic mechanism
- Caused by the sudden release of biologically active mediators from mast cells and basophils
- Leading to symptoms involving the skin, respiratory tract, and cardiovascular and GI systems.

Causes you may see in hospitalized patients

- Medications
  - Antibiotics (penicillin most common cause)
  - Chemotherapy
  - Muscle relaxants
  - Blood products (including IVIG)
  - Contrast dye
- Latex
- Food

Differential diagnosis

- Vasodepressor (vasovagal-neurocardiogenic) syncope
- Syndromes that can be associated with flushing (e.g., metastatic carcinoid)
- Postprandial syndromes (e.g., scombroid food poisoning)
- Systemic mastocytosis
- Psychiatric disorders (e.g., panic attacks or vocal cord dysfunction syndrome)
- Angioedema (e.g., hereditary angioedema)
- Other causes of shock (e.g., cardiogenic)
- Other cardiovascular or respiratory events

Diagnostic criteria: anaphylaxis likely if 1 of the following…

Acute onset of illness with skin and/or mucosal involvement and…	**Two or more of the following after exposure to a likely allergen**	**Reduced blood pressure* after exposure to known allergen**
1. Signs or symptoms of respiratory compromise	1. Skin and/or mucosal changes	
and/or	2. Signs or symptoms of respiratory compromise	
2. Reduced blood pressure* or end-organ dysfunction (e.g., syncope)	3. Reduced blood pressure* or end-organ dysfunction (e.g., syncope)	**reduced BP either hypotension for age or 30% decrease in systolic BP*
	4. Persistent GI symptoms	

Adapted from *UpToDate,* Anaphylaxis: Rapid Recognition and Treatment

Signs and symptoms

- **Level of consciousness**: impairment might reflect hypoxia
- **Upper and lower airways**:, tightness in throat or chest, nasal congestion, nasal discharge, dysphonia, stridor, cough, wheezing, shortness of breath
- **Cardiovascular system**: hypotension with or without syncope and/or cardiac arrhythmias, tachycardia
- **Cutaneous/mucosa**: diffuse or localized erythema or flushing, pruritis, urticaria, angioedema of lips-tongue-uvula
- **Gastrointestinal system**: nausea, vomiting, abdominal cramps, diarrhea
- **Misc**: pruritis of mouth and face, lightheadedness, diaphoresis, headache, uterine cramps, feeling of impending doom or apprehension, unconsciousness

Management

- Assess **A**irway, **B**reathing, **C**irculation, and level of consciousness
- Establish and maintain airway
- Have someone call supervising resident, PICU **and** attending (if not already done)
- Administer **epinephrine**: Aqueous epinephrine 1:1000 dilution (1 mg/mL), 0.01 mL/kg (max dose 0.5mL) **intramuscularly** every 5 minutes, as necessary

Management continued…

- **Hemodynamic monitoring and continuous pulse oximetry**
- Place patient in the **recumbent position** and elevate the lower extremities, as tolerated symptomatically
- **Administer oxygen**
- **Intravenous access and normal saline** for fluid replacement
- **H1-antihistamine, diphenhydramine**: 1 to 2 mg/kg IV or 25 to 50 mg per dose
- **Consider H2-antihistamine, ranitidine**: 12.5 to 50 mg IV (1 mg/kg)
- **Consider systemic glucocorticoids**: 2mg/kg IV

Management (later)

- Period of observation and treatment before discharging home
- Epinephrine auto-injectors 0.3/0.15mg (EpiPen® & EpiPen Jr®: epipen.com/how-to-use-epipen, video demonstrating use and PDFs for patients)

Take home points

- **Goal of therapy**: early recognition and treatment with **epinephrine** to prevent progression to life-threatening symptoms, including shock
- If there is **any doubt**, it is generally better to administer **epinephrine**
- **Epinephrine** and oxygen are the most important therapeutic agents administered in anaphylaxis.

References

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