ALLERGY-ANAPHYLAXIS

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Overview[1,2]

Anaphylaxis can be immunologic or non immunologic. Immune mediated anaphylaxis includes IgE mediated reactions and immune complex/complement mediated reactions. Non-immune mediated anaphylaxis is secondary to a precipitating event/agent that causes sudden onset of massive mast cell or basophil degradation without involving immunoglobulins.

In IgE immune mediated anaphylaxis, activation of mast cells, basophils and eosinopils result in degradation of mast cells and release of inflammatory mediators (i.e histamine, tryptase and leukotrienes). These mediators cause vasodilatation, fluid extravasation, increased mucosal secretions and smooth muscle contraction. These reactions lead to the presentation of anaphylaxis. This is the most common type of anaphylaxis.

Definition[1]

Anaphylaxis is a serious allergic reaction that results from an immune mediated release of mast cells and basophils after exposure to an antigen that the individual was previously sensitized towards. Anaphylaxis is a life threatening medical emergency.

Diagnostic Considerations[2]

The diagnosis of anaphylaxis is made from clinical signs and symptoms. Anaphylaxis is likely when the following signs and symptoms are present:

- Acute onset of illness after exposure to antigen
- Involvement of the skin and/or mucosal tissue
- Respiratory compromise
- Reduced blood pressure or associated symptoms of end organ damage
- Gastrointestinal signs and symptoms
- Cardiovascular system, chest, abdomen (for masses or organomegaly)

Clinical Signs and Symptoms[1,2]

(Adapted with permission from Ellis and Day)

Skin	flushing, erythema, pruritis, urticaria, angioedema, conjunctival erythema, maculopapular rash
Respiratory	nasal congestion, shortness of breath, stridor, wheezing, throat/chest tightness, cough, hoarseness, dyspnea, accessory muscle use, respiratory arrest
Cardiac	cyanosis, tachycardia, palpitations, hypotension, arrhythmias, myocardial infarction, cardiac arrest
Gastrointestinal	nausea, vomiting, abdominal pain, diarrhea
Neurological	headache, dizziness, syncope, confusion, weakness, seizures

Common Triggers[1,2]

Food (e.g. peanuts, tree nuts, shellfish, fish, milk, eggs)
Insect Bites (e.g. bees, wasps, mosquitoes)
Medications (e.g.NSAIDS,antibiotics)
Latex
Inhalants (e.g. pollens, mould, animal dander)*rare*
Physical Factors (i.e. exercise, cold/heat, sunlight/UV radiation)

MANAGEMENT[1,2,3]

- Rapid assessment of ABCs
    - Intubation or emergent cricothyroidotomy if required
- If patient fulfills any one of the criteria for anaphylaxis above—administer epinephrine
- Place patient in recumbent position and elevate lower extremities
- 2 large IV bore-catheters: treat hypotension with 1-2 LIV NS bolus
- Oxygen: 8 -10L/min via facemask
- Next steps:
    - H1 Antihistamine: Diphenhydramine
    - H2 Antihistamine: Ranitidine
    - Salbutamol: 2.5 – 5mg in 3mL saline via nebulizer
    - Glucocorticoid: Methylprednisolone or Prednisone
- Treatment of refractory symptoms:
    - Epinephrine infusion
    - Vasopressors
    - Glucagon
- Observation period should occur after symptoms subside due to possible reoccurrence of symptoms as epinephrine wears off and risk of biphasic reaction (1-72h later)
- Upon discharge
    - Prescription of Epi-Pen, patient education of signs/symptoms, education of possible biphasic reaction, education to call 911 or go to ER after Epi-Pen administration, avoidance of possible trigger if identified
- Referral to Allergist/Immunologist in all cases of anaphylaxis (certain or suspected)

Medication	Indication	Dosage-Adult	Dosage-Pediatric	Frequency
Epinephrine 1:1000	Treatment of choice for anaphylaxis	0.3-0.5ml IM, mid-antero-lateral thigh	0.01ml/kg (up to 0.3ml)	Repeat Q5-15min PRN. Prepare IV Epi infusion if symptoms persisting
Diphenhydramine	Second line to help with symptoms of urticaria, pruritis	25-50mg IV/PO/IM	5.0mg/kg/day in divided doses every 6-8 hrs	Repeat Q6-8 hrs PRN
Methylprednisolone (IV) or Prednisone (PO)	Slower onset of action, not for initial management of anaphylaxis	125mg IV or 50mg PO	1mg/kg IV or 1mg/kg PO	Not to exceed 300mg/day

Bottom Line

Anaphylaxis is a rapidly fatal medical emergency. All physicians should be able to recognize the signs of anaphylaxis in order to began swift and potentially life saving management.