Anaphylactic reaction

An anaphylactic reaction is an acute systemic hypersensitivity reaction that occurs within seconds or minutes after exposure to certain foreign substances, such as medications (penicillin, iodinated contrast material), and other agents, such as latex, insect stings (bee, wasp, yellow jacket, hornet), or foods (eggs, peanuts). Repeated administration of parenteral or oral therapeutic agents (repeated exposures to penicillin) may also precipitate an anaphylactic reaction when initially only a mild allergic response occurred.

An anaphylactic reaction is the result of an antigen–antibody interaction in a sensitized person who, because of previous exposure, has developed a special type of antibody (immunoglobulin) for that particular allergen. The antibody immunoglobulin E (IgE) is responsible for most of the immediate type of human allergic responses. The person becomes sensitive to a particular antigen after producing IgE to that antigen. A second exposure to the same antigen results in a more severe and more rapid response.

An anaphylactic reaction produces a wide range of clinical manifestations, especially respiratory symptoms (difficulty breathing and stridor secondary to laryngeal edema), syncope, pruritus, swelling of mucous membranes, and a sudden hypotension secondary to massive vasodilation.

Managing an anaphylactic reaction

Establishing a patent airway and ventilation is essential. Early endotracheal intubation is essential to preserve airway patency, and oropharyngeal suction may be necessary to remove excessive secre-
Assessing for anaphylaxis
Be alert for the following signs and symptoms:

Respiratory signs
- Nasal congestion
- Pruritus
- Sneezing and coughing
- Possible respiratory distress that progresses rapidly (caused by bronchospasm or edema of the larynx)
- Chest tightness
- Other respiratory difficulties, such as wheezing and dyspnea

Skin manifestations
- Flushing with a sense of warmth and diffuse erythema
- Generalized pruritus over the entire body (indicates developing general systemic reaction)
- Urticaria (hives)
- Massive facial angioedema possible with accompanying upper respiratory edema

Cardiovascular manifestations
- Dysrhythmia
- Pallor
- Weak peripheral pulse
- Hypotension
- Circulatory failure, leading to coma and death

Gastrointestinal problems
- Nausea
- Vomiting
- Colicky abdominal pains
- Diarrhea

Simultaneously with airway management, aqueous epinephrine is administered as prescribed to provide rapid relief of the hypersensitivity reaction. Epinephrine may be administered again, if necessary and as prescribed, and administered in one of these routes of administration, as ordered:
  - subcutaneous injection for mild, generalized symptoms
  - intramuscular injection when the reaction is more severe and progressive, and with the knowledge that vascular collapse will delay absorption of the medication
  - intravenous (I.V.) route (aqueous epinephrine diluted in saline solution and administered slowly), used in rare instances when there’s a complete loss of consciousness and severe cardiovascular collapse. This method may precipitate cardiac dysrhythmias, so cardiac monitoring with a readily available defibrillator is necessary. This method is controversial and usually isn’t recommended because it can lead to more distress than initially present. An I.V. infusion of saline solution is initiated to provide for emergency access to a vein and to treat hypotension.

Additional treatments may include:
  - antihistamines (diphenhydramine [Benadryl]) to block further histamine binding at target cells
  - aminophylline titrated by I.V. drip for severe bronchospasm and wheezing refractory to other treatment
  - albuterol (Proventil, Ventolin) inhalers or humidified treatments to decrease bronchoconstriction
  - crystalloids, colloids, or vasopressors to treat prolonged hypotension
  - positive inotropes for reduced cardiac output; oxygen to enhance tissue perfusion
  - I.V. benzodiazepines (diazepam [Valium]) for control of seizures, and corticosteroids (hydrocortisone [Solu-Cortef]) for prolonged reaction with persistent hypotension or bronchospasm

After the acute symptoms have been treated, the patient is usually admitted to the hospital for observation and should be taught how to prevent future anaphylactic reactions.