

ANAPHYLAXIS

BASICS

OVERVIEW

- “Allergy” is an unusual sensitivity to a substance (such as pollen)—the immune system responds to the presence of the substance leading to signs (such as itchiness); “antigen” is a substance (such as pollen) that induces a sensitivity or immune response; “antibody” is a protein that is produced by the immune system in response to a specific antigen—when the body is exposed to the antigen, the antibody responds, causing the signs of the allergic response
- “Immunoglobulins” are proteins produced by the cells of the immune system; they include the antibodies; they are categorized into classes, including immunoglobulin A (IgA), immunoglobulin G (IgG), and immunoglobulin E (IgE)
- Mast cells are immune-system cells that frequently are located near blood vessels in the skin; mast cells contain histamine; they are involved in allergy and inflammation
- Anaphylaxis is the sudden (acute) allergic reaction following the rapid introduction of an antigen (a substance that induces sensitivity or immune response) into a host having antigen-specific antibodies (proteins produced by the immune system in response to a specific antigen) of the immunoglobulin E (IgE) subclass
- The binding of antigen (a substance that induces sensitivity or immune response) to mast cells sensitized with immunoglobulin E (IgE) results in the release of preformed and newly synthesized chemical mediators (such as histamine)
- Anaphylactic reactions may be localized (atopy) or generalized (systemic), known as “anaphylactic shock”
- “Atopy” is a disease in which the animal is sensitized (or “allergic”) to substances found in the environment (such as pollen) that normally would not cause any health problems
- “Anaphylactic shock” is a severe form of anaphylaxis; it is life-threatening; signs may include difficulty breathing, vomiting, diarrhea, collapse, and death

GENETICS

- Anaphylaxis may be more common in some families or lines of dogs

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

Breed Predispositions

- Dogs—numerous breeds documented as being susceptible for developing atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems)
- Cats—no breeds documented as having a susceptibility for atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems)

Mean Age and Range

- Dogs—age of onset of signs ranges from 3 months to several years of age; most affected animals are 1 to 3 years of age when signs are first identified
- Cats—age of onset of signs ranges from 6 months to 2 years

Predominant Sex

- Dogs—atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems) more common in females
- Cats—no reported differences between males and females

SIGNS/OBSERVED CHANGES in the ANIMAL

- Initial clinical signs vary depending on the route of exposure (such as airborne, injection) to the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction
- Shock—end result of a severe anaphylactic reaction
- Shock organ—dogs, liver; cats, respiratory and gastrointestinal systems
- May be localized to the site of exposure, but may progress to a generalized (systemic) reaction
- Onset of signs immediate (usually within minutes of exposure to substance that induces the allergic response)
- Dogs—itchiness (known as “pruritus”); hives; vomiting; defecation; and urination
- Cats—intense itchiness (pruritus) about the head; difficulty breathing (known as “dyspnea”); salivation; and vomiting
- Localized fluid build-up in the skin (known as “cutaneous edema”) at the site of exposure (such as at the site of an insect sting or an injection)
- Enlarged liver (known as “hepatomegaly”) in some dogs
- Increased excitement possible in early stages
- Depression and collapse terminally

CAUSES

- Virtually any substance; those commonly reported include venoms, blood-based products, vaccines, foods, and drugs

RISK FACTORS

- Previous exposure (sensitization) increases the chance of the animal developing a reaction

TREATMENT

HEALTH CARE

- In a suddenly affected animal, the reaction is considered a medical emergency requiring hospitalization
- Eliminate the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction, if possible

Generalized (Systemic) Anaphylaxis

- Goal—emergency life support through the maintenance of an open airway, preventing circulatory collapse, and re-establishing normal body function
- Administer fluids intravenously at shock dosages to counteract low blood pressure (known as “hypotension”)

Localized Anaphylaxis

- Goal—limit the reaction and prevent progression to a generalized (systemic) reaction

DIET

- If a food is suspected as the cause of the anaphylaxis (uncommon), avoid foods associated with allergic reaction

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

Generalized (Systemic) Anaphylaxis

- [Epinephrine](#) for shock ([administered by injection](#))
- Steroids for shock—prednisolone or dexamethasone ([administered by injection](#))
- [Atropine](#) to counteract slow heart rate (known as “bradycardia”) and low blood pressure (hypotension)
- [Aminophylline](#) is a drug that enlarges the bronchi and bronchioles in the lungs (class of drugs known as “bronchodilators”); can be used in patients having severe breathing difficulties

Localized Anaphylaxis

- [Diphenhydramine](#) ([administered by injection](#)) is an antihistamine
- [Prednisolone](#)
- [Epinephrine](#) ([administered by injection](#), at site of initiation)
- If shock develops, initiate treatment for generalized (systemic) anaphylaxis

FOLLOW-UP CARE

PATIENT MONITORING

- Closely monitor hospitalized patients for 24 to 48 hours

PREVENTIONS AND AVOIDANCE

- If antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that caused anaphylaxis can be identified, eliminate or reduce exposure

POSSIBLE COMPLICATIONS

- Death

EXPECTED COURSE AND PROGNOSIS

- If localized reaction is treated early, prognosis is good
- If the animal is in shock on examination, prognosis is guarded to poor

KEY POINTS

- Anaphylaxis is an unpredictable disease
- Recognize that the animal has an allergic condition and may require immediate medical care
- In a suddenly affected animal, the reaction is considered a medical emergency
- Eliminate the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction, if possible

