Anaphylaxis Encyclopedia Article

Anaphylaxis

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Anaphylaxis

Anaphylaxis is a severe allergic reaction. The symptoms appear rapidly and can be life threatening.

The symptoms of anaphylaxis include the increased output of fluid from mucous membranes (e.g., passages lining the nose, mouth, and throat), skin rash (e.g., hives), itching of the eyes, gastrointestinal cramping, and stiffening of the muscles lining the throat and trachea. As a result of the latter, breathing can become difficult. These symptoms do not appear in every case. However, some sort of skin reaction is nearly always evident.

Anaphylaxis results from the exposure to an **antigen** with which the individual has had previous contact, and has developed a heightened sensitivity to the antigen. Such an antigen is also known as an allergen. The allergen binds to the specific immune cell (e.g., immunoglobulin E, also known as IgE) that was formed in response to the initial antigen exposure. IgE is also associated with other specific cells of the **immune system** that are called basophils and mast cells. The basophils and mast cells react to the binding of the allergen-IgE complex by releasing compounds that are known as mediators (e.g, **histamine**, prostaglandin D2, trypase). Release of mediators does not occur when IgE alone binds to the basophils or mast cells.

The release of the mediators triggers the physiological reactions. For example, blood vessels dilate (become larger in diameter) and fluid can pass across the blood vessel wall more easily. Because the immune system is sensitized to the particular allergen, and because of the potent effect of mediators, the development of symptoms can be sudden and severe. A condition called anaphylactic shock can ensue, in which the body's physiology is so altered that failure of functions such as the circulatory system and breathing can occur. For example, in those who are susceptible, a bee sting, administration of a penicillin-type of antibiotic, or the ingestion of peanuts can trigger symptoms that can be fatal if not addressed immediately. Those who are allergic to bee stings often carry medication with them on hikes.

Anaphylaxis occurs with equal frequency in males and females. No racial predisposition towards anaphylaxis is known. The exact number of cases is unknown, because many cases of anaphylaxis are mistaken for other conditions (e.g., food poisoning). However, at least 100 people die annually in the United States from anaphylactic shock.