Anaphylaxis: symptoms, causes, treatment

ASSIGN BUSTER

Summary:

Anaphylaxis is a serious allergic reaction (1) in the response of immune system, or life-threatening allergic reaction. It is more harmful than any other allergic reaction. In severe cases, it can result in complete airway obstruction, shock, even, death. It is an unpredictable condition. A substance that produces an allergic response is called an allergen. The most dangerous symptoms of anaphylaxis are low blood pressure, breathing difficulty and loss of consciousness, all of which can be fatal. The severity of symptoms depends on the dose of the antigen, the number and distribution of antibodies, and the route of entry. Rust test is used to diagnose the anaphylaxis. Epinephrine is used in the treatment of anaphylaxis.

KEYWORDS: Allergic reaction, caused by allergens, epinephrine (auto injector)

INTRODUCTION:

Definition:

Anaphylaxis is an acute severe type 1 hypersensitivity reaction in the response of immune system or life-threatening allergic reaction. Anaphylaxis (pronounced an-a-fi-LAK-sis); which means Ana (against) and phylaxis (protection) (2) is a manifestation of hypersensitivity caused by the exposure of antigen results in life -threatening respiratory disease. It is mostly caused by foods, medications, and insect stings.

Alternative Names:

Hypersensitivity type 1 reaction; Anaphylactic reaction; Anaphylactic shock.

Description or pathophysiology:

Anaphylaxis is a severe reaction. When an initial exposure takes place or any substance enters in body then the immune system becomes sensitized to that substance. On a later exposure an allergic reaction takes place and it is sudden, severe and involves the whole body. It is a type of hypersensitivity which is triggered when an antigen or a foreign particle binds to IgE (3) (antibodies on the mast cells) (the connective tissue spreads throughout the body) which releases the inflammatory mediators. These mediators cause many symptoms, like itching, swelling and hives. Many types of antibodies are produced by B cell or B lymphocyte and destroy the substance that immune system has identified pathogens. In susceptible individual the antibodies may be produced against allergens which are the part of our food. In those antibodies the IgE activates the anaphylaxis. IgE produced even ion case when in antigen is in the body. These antibodies are attached with the surface of mast cells. So, the mast cells become the major effectors for allergic reactions. They are large cells produced by bone marrow of the bones (4). They have large granules on the antibodies that store the molecules such as histamine, vasoactive amine, prostaglandin, C4 and TNF. Histamine causes dilation of blood vessels and also smooth muscle contraction. TNF causes the anaphylactic shock. The permeability of capillaries increases and blood pressure becomes uncontrolled. Substance that is threatening source, such as bacteria or virus, is called antigen (5) .

Types of Anaphylaxis:

On the bases of pathopysiology it is divided into 2 types' True anaphylaxis and Pseudo anaphylaxis. In these types symptoms, treatment and risk of

death are same but the difference is that true anaphylaxis is due to deregulation by mast cells and pseudo is due to without mediation (6).

CAUSES:

There are some common causes:

Food (7): Many foods cause an allergic reaction, but foods that cause the majority of anaphylaxis are peanuts (8), tree nuts (e. g., walnut,), shellfish, fish, milk, eggs and preservatives.

Stinging insects(9): By stinging of honeybees, paper wasps, hornets and fire ants , horse fly(10) a severe type of anaphylaxis can cause and even deadly reactions in some people.

Medications: Many medications can cause an allergic reaction. Common medications that cause anaphylaxis are antibiotics and other medicines e. g. Penicillin, Streptomycin, Gamma globulins, Insulin, Aspirin.

Latex (11): Some products made from natural latex contain allergens that can cause reaction. The severe reaction occurs when latex comes into contact with moist areas of the body or internal surfaces during surgery.

Exercise (12): In rare cases, exercise can cause anaphylaxis. It does not occur after every session of exercise and in some cases, only occurs after eating certain foods before exercise.

SYMPTOMS:

It is life-threatening hypersensitivity reaction against antigens. This is due to release of histamine. The most common areas that are affected by this

reaction skin, gastrointestinal, heart, nervous system. The reaction may generalize by itching, hyperemia, angioedema (13), and in severe cases vascular collapse, bronchospasm, and shock. The severity of symptoms depends on the dose of the antigen, the number and distribution of antibodies, and the route of entry. Symptoms of anaphylaxis include:

Breathing problem: (70%) shortness of breath, throat tightness, cough, hoarse voice, chest pain, trouble swallowing, itchy mouth/throat, nasal stuffiness.

Circulation: pale/blue color, low heart beat, laziness, low blood pressure, shock, loss of consciousness

Skin: (70% to 80%) hives, swelling, itch, redness, rash

Stomach: (30% to 45%) nausea, cramps, diarrhea, vomiting.

Other: anxiety, itchy/red/watery eyes, headache, cramping of the uterus etc.

The most dangerous symptoms of anaphylaxis are low blood pressure, breathing difficulty and loss of consciousness, all of which can be fatal.

DIAGNOSIS:

Anaphylaxis is diagnosed based on the rapid development of symptoms in response allergen. RAST test, a blood test that identifies IgE reactions to specific allergens (14). Skin testing is done for less severe anaphylactic reactions. Blood test for Tryptase may be used for it (15).

Problem in diagnosis:

Anaphylactic symptoms sometimes like other disease like severe asthma. So, there is a problem to diagnose the anaphylaxis. If anaphylaxis occurs then the level of protein tryptase that is present in circulatory system increases and by taking the blood of patient this allergy can be checked but in some patients the level of tryptase remains same.

Treatment

A critical component is epinephrine auto injector (16) available at all times and knowing when and how to use it. Adolescent is the best treatment in anaphylaxis.

Self-treatment with epinephrine- if you are suffered to anaphylaxis, you must have at least one epinephrine autoinjector with you at all times.

It is the only medicine that completely treats anaphylactic reactions. It is most effective, before symptoms become severe. Inhalers of antihistamines and asthma inhalers cannot treat anaphylaxis as effectively as epinephrine. Intravenous fluids also required for treatment (17).

Remove the cause – Trigger for the anaphylactic reaction should be removed, whenever possible. For example, if a person has been stung, dislodge the stinger with the edge of a credit card or coin so that no more venom is released into the skin. Go to the hospital – after injecting epinephrine, it is important to go to hospital emergency department. Up to 20 percent of people with anaphylaxis have a late-phase reaction, which causes many problems.