

# Anaphylactic Shock

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## Abstract

The body can tolerate allergies of mild nature and the person affected may live with it and prevent the allergy by avoiding exposure to the substance producing this allergic reaction. If the individual is exposed to foreign materials like drugs then most likely that he would be subjected to such reaction if he is vulnerable That may happen at his home, doctor clinic and in hospital

There are many records of severe allergic reaction to the following classes of substances and items: Food, insect bite and drugs. All are incriminated in liberating histamine. Drugs, which are notorious to produce serious reactions, are: morphine, pethidine, thiopentone, dextran, haemacel Antibiotics, penicillin Immunizing agents, horse sera, latex and the list is expanding. The immediate management includes activation of the emergency services either in society or in hospital to administer life saving measures and follow up according to the following major lines

Severe reaction (Anaphylactic shock): Treatment should be immediate, ask for help from emergency services and usually in hospital setting the cardio-pulmonary resuscitation (CPR) team would be informed. Meanwhile put the patient in supine position, loosen his collar and tight belt, etc. If breathing is noisy this is called stridor, the patient will need oxygen. If swelling of the mouth and larynx happen (laryngeal oedema), the patient may need artificial airway which is usually performed by the emergency team (endotracheal intubation) which needs special instruments. So till then the patient should be given oxygen by mask. Cardiovascular collapse calls for immediate resuscitation (CPR). Guarantee the open vein, judicious use of intravenous fluids, which is usually administered by the CPR team. Adrenaline, 0.5 ml 1:1000 intravenously also can be injected in remote areas (outreach of the medical facilities) by a special pen

## INTRODUCTION

The body can tolerate allergies of mild nature and the person affected may live with it and prevent the allergy by avoiding exposure to the substance producing this allergic reaction [1,2]. In the society rarely person would have severe reaction. But if the individual is exposed to foreign materials like drugs then most likely that he would be subjected to such reaction if he is vulnerable That may be at his home, doctor clinic and in hospital [3,4,5,6,7,8,9,10]

There are many records of severe allergic reaction to the following classes of substances and items

1. Food
2. Insect bite
3. Drugs

All are incriminated in liberating histamine.

Drugs, which are notorious to produce serious reactions are: morphine, pethidine, thiopentone, dextran, haemacel Antibiotics, penicillin Immunizing agents, horse sera, latex and the list is expanding.

## DEFINITIONS

Adverse reaction affects an individual when he is subjected to foreign protein. It results in an allergic reaction manifested by major collapse and systemic symptoms and signs.

A patient can be allergic to any drug. Before giving a drug the following history should be taken.

1. Any previous history of drug allergy
2. Type of patient, atopic patient are more liable to allergic reactions, atopic patients will give you the history of Eczema, Hay fever, Bronchial asthma, all these patients have increased levels of blood IgE

3. Any history of food allergy. In allergic patients, small increase in the blood circulating histamine will evoke adverse reaction.

### ONSET OF ALLERGIC MANIFESTATION

Allergic reactions typically occur in 5-60 minutes, most reactions occur within 30 minutes. Duration of reaction: mild reaction may persist from few hours to 24 hrs. severe reaction, may persist for days.

### MECHANISM OF REACTION

Type I Hypersensitivity, immediate, immune mediated. There should be antigen this is the protein which produce the reaction which produce response from the human defense system called antibody which react together to neutralize each other.

The antibody involved in this type of reaction is an immunoglobulin called immunoglobulin E (IgE) Antigen. Any foreign protein antigen - antibody reaction occurs on the surface of the cell. The cell wall ruptures followed by a degranulation from the cell. Histamine ( which is an endogenous substance affect the vessels of the blood producing flushing and reduction in blood pressure mainly and bronchial spasm with difficulty on taking breath) is liberated, which will produce it described effect which doctor call an adverse reaction.

Drug themselves liberate histamine either by the action of a drug on blood cells called mast cells or by the activation of the complement system which is a system of messages of compounds which produce physiological reaction in the human body. The complement system has nine complements represented by the letter (C) followed by a number and may be a small letter.

Complement can take part in the anaphylactic reaction by two pathways.

1. Antigen/Antibody Reaction activates classical pathway C1, C2, C3 (cleaved products that are called anaphylotoxin). Many drugs can activate the complement system.
2. The alternate pathway for complement activation, instead of starting at C1, or C2, starts directly at C3, cleaved products of C3 the anaphylotoxins.

### CLINICAL FEATURES

Severe anaphylaxis may result in imminent death. But if it is witnessed it can be treated. Treatment should aid to support the physiological process of the body and antagonizing the effect of massive histamine release which affect the mechanism of respiration (Taking oxygen from the surrounding and eliminate carbone dioxide) and circulatory by helping the heart to pump effective volume of the blood to all organs of the body.

### RESPIRATORY SYSTEM

Nasal congestion, itching, laryngeal oedema, dyspnoea, laryngeal stridor, oedema of vocal cords, bronchial spasm, which will produce signs of wheezing, sensation of retro sternal ( behind the middle bone of the chest) oppression, rapid heart beats called tachypnea, and bluish appearance of the lips and skin called cyanosis.

### CARDIOVASCULAR SYSTEM

Reduction in blood pressure called hypotension which leads to feeling of fainting and cardiovascular collapse, in spite of rapid not well felt cardiac pulse. If the patient is connected to a cardiac monitor the heart electrical tracing called electrocardiogram (E.C.G.) will demonstrate abnormal changes like irregular beats called arrhythmias or cardiac arrest, (pulse will be absent).

### OTHER LESS IMPORTANT MANIFESTATION

Skin: will show urticaria this means itching and swelling of the face especially in the eye region and around the mouth. Eyes may feel itchy, and excessive tears (lacrymation).

The patient will feel nauseated, may vomit, and affected by abdominal pain and diarrhea.

### MANAGEMENT [,,,,,]

1. Mild cutaneous reaction will respond to intravenous or L.M. adrenaline, 0.5 ml 1:1000 and to antihistamine.
2. Severe reaction (Anaphylactic shock): Treatment should be immediate, ask for help from emergency services and usually in hospital setting the cardiopulmonary resuscitation (CPR) team would be informed. Meanwhile put the patient in supine position, loosen his collar and tight belt, etc. If breathing is noisy this is called stridor, the patient will need oxygen, If swelling of the mouth and larynx happen (laryngeal oedema), the patient may need artificial airway which is usually performed by the emergency team (endotracheal intubation)

which needs special instruments. So till then the patient should be given oxygen by mask.

3. Cardiovascular collapse calls for immediate resuscitation (CPR). Guarantee the open vein, judicious use of intravenous fluids, which is usually administered by a CPR team.
4. Adrenaline, 0.5 ml 1:1000 intravenously also can be injected in remote areas (outreach of the medical facilities) by a special pen
5. Hydro cortisone, 500 mg, intravenously
6. Aminophylline 500 mgs IN. 6 hourly. Usually organized by the emergency team. The patient may be taken to hospital in an ambulance and if he was in the hospital he will be transferred to the intensive care unit (ICU)

Careful monitoring of vital signs is usually include, blood gases, urinary output and estimation of patient blood for C3 levels and IgE. [<sup>9,10,11,12,13,14</sup>]

Then the patient will go back to normal life after establishing the link to this life threatening reaction.

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