

Immune system

Definition: The immune system is a collection of cells, tissues, and organs that work to defend the body against attacks unknown attackers

The reaction of the body to these attackers is;

- 1) To search for them and destroy them
- 2) Stop them from invading the body
- 3) Rejecting them
- 4) Release of the agent

Antigen is any substance that causes a person's immune system to produce antibodies against it. An antigen can be a foreign substance from the environment. Some examples are bacteria, viruses, and chemicals. An antigen may be formed in the body. Some of these are bacterial toxins. Toxins or other substances begin an immune response. Antigens may be soluble substance like bacteria and tissue cells. On the surface of antigens are regions. They fit and hold to receptor molecules of like structures on the surface of the lymphocytes.

Antibody Antibodies are proteins produced by the immune system when it senses substances that may harmful. They are called antigens. Examples of antigens are microorganisms (bacteria, viruses, fungi, and parasites.) Proteins are produced mostly by plasma cells and are used by the immune system to neutralize pathogens. The antibodies act sort of like immune systems sentrys. They find antigens and stick to them. The immune system can identify the type of antigen so that it can be destroyed.

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The basic structures of all antibodies are the same. There are four polypeptide chains held together by disulfide bonds.

Allergen An allergen is a substance that begins an allergic reaction. Allergens are substances that are detected by the immune system and cause an allergic reaction. Examples of allergens include pollen, dust mites, animal dander and mold. An allergic reaction can be caused by any of direct contact with the allergen. Examples are eating food or drinking something the person is sensitive to. Breathing allergens in the air, perfume, or pet dander are examples

Lymphocytes of the immune system:

- 1) Helper T cells
- 2) Cytotoxic T cells
- 3) Suppressor T cells
- 4) Memory T cells
- 5) Helper T cells
- 6) Cytotoxic T cells
- 7) Regulatory T cells (healthline.com)

There are two main types of lymphocytes which are called B cells and T cells. The B cells produce

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antibodies that are used to attack invading bacteria and viruses. The T cells destroy the body's own cells that have themselves been taken over by viruses or become cancerous.

Function of immune system

The purpose of the immune system is to keep infectious microorganisms. Examples are different bacteria, viruses, and fungi. Another purpose is to destroy infectious microorganisms that do enter the body. Lymphoid organs involved with the immune system affect growth, development, and the release of lymphocytes or also called white blood cells. The blood vessels and lymphatic vessels are important parts of the lymphoid organs. Lymphocytes travel to and from different areas in the body. Each of these organs plays a role in the producing and starting lymphocyte activity. This is one of the ways the body fights microorganisms that cause illness. The body also tries to maintain homeostasis by eliminating damaged cells. The immune system is made up of a network of cells, tissues, and organs that work together to protect the body.

Mast Cells - Mast cells cause inflammatory responses in the body. Examples are hypersensitivity and allergic reactions. They occur randomly in the connective tissues especially beneath the surface of the skin. They are close by blood vessels, lymph vessels, and within the nerves through the respiratory system. These cells are also found in the digestive and urinary tracts. Mast cells store different chemical mediators such as histamine, interleukins, and types of enzymes. They are granules looking and found in the cytoplasm of cells. If they are stimulated by allergens, the mast cells release the chemicals of their granules into the tissues that surround them. This produces local responses such as inflammation and swelling. Smooth muscles contract and there is increased mucus production. Basophil cell granules are found during an allergic reaction. Mast cells interact with bacteria and play a role in defense against

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pathogens. They are scattered through the connective tissues of the body beneath the surface of the skin. They are near blood vessels and lymphatic vessels, in nerves, and in the respiratory system. They also occur in the digestive and urinary tracts.

Histamine effects

- 1) The rate of inflammation
- 2) The amount and type of mucus production
- 3) The smooth muscles in the body (contributes to asthma attacks)
- 4) Permeability of blood vessels
- 5) Sneezing due to histamine sensory stimulation
- 6) Secretion from glandular tissue
- 7) Parietal cells are activated to produce gastric acids needed for digestion (google.com)
- 8)
- 9)

Histamines start the process that moves allergens out of the body or off the skin. They can make you sneeze, tear up, or itch. They are part of your body's defense s

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Anaphylaxis is a life threatening allergic response. It can cause swelling, hives, low blood pressure, and dilated blood vessels. People can go into shock if not treated right away. It can be fatal because a person can have an acute reaction to an antigen. The most common reactions are to food, insect stings, and certain medications. Anaphylaxis needs an injection of epinephrine and a check up to an emergency room or medical center. If you don't have epinephrine, you have to go to an emergency room immediately. If anaphylaxis isn't treated right away, the person can die.

Which antibody is involved in allergy? Immunoglobulin E is a type of antibody present in small amounts in the body. It plays a part in allergic diseases. It can stick to allergens and start the releasing substances from mast cells that most likely will cause inflammation. When IgE sticks to mast cells types of allergic reactions can begin. An antibody is a protein produced by our immune system. Antibodies circulate in the bloodstream and help remove substances such as bacteria or viruses which have made their way into the body. The IgE antibody is one different class of antibodies made by our immune system.

Atopy – This is allergic hypersensitivity associated with the overproduction of antibodies. Examples are listed below. Atopy is associated with elevated immune responses to everyday allergens and inhaled allergens

Example of atopic diseases

1) Food allergies

2) Eczema

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3) Asthma

4) Allergic rhinitis

5) Atopic dermatitis

6) Allergic rhino conjunctivitis (hay fever)

Atopy may be hereditary. Contact with the allergen or irritant has to occur before the hypersensitivity reaction develops.

Skin Allergy

Allergic skin diseases

1) Hives

2) Contact dermatitis

3) Angioedema

4) Atopic dermatitis

5) Eczema

Non-allergic skin diseases

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- 1) Eczema
- 2) Atopic Dermatitis (Eczema)
- 3) Allergic Contact Dermatitis
- 4) Urticaria (Hives)
- 5) Pruritus

Allergic contact dermatitis occurs when your skin comes in direct contact with an allergen. For instance, if you have a nickel allergy and your skin comes in contact with jewelry made with even a very small amount of nickel, you may develop red, bumpy, scaly, itchy or swollen skin in the area

Eczema and dermatitis – describe the terms

Dermatitis is inflammation of the skin. There are different causes of dermatitis. The effects are red, swollen, dry, itchy skin. A person can also have blisters. Dermatitis also causes infections. Examples of dermatitis are atopic dermatitis, allergic contact dermatitis, irritant contact dermatitis.

Dermatitis can be chronic and may reoccur. It can be painful and have a physical and emotional affects on people. Eczema (atopic dermatitis) is a very common form of dermatitis. It can affect children as well as adults. Eczema is an itchy and red. A rash can develop on parts of the body. The rash can ooze and become crusty and even get infected. Children who have a family history of conditions like asthma, hay fever, and eczema can get infections. Eczema can affect infants and adults.

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Atopic dermatitis is the most common form of eczema. It may begin in childhood. It may become milder or go away by adulthood.. Many people with atopic dermatitis have all hay fever or asthma conditions.

Causes of eczema:

Internal: A family history of eczema, asthma or hay fever. Parents who have eczema have a greater chance that their children will too. Certain food and alcohol can cause of eczema. Some examples are dairy and wheat products, some citrus fruits, and seafood. Chemical food additives, preservatives and certain colorings are also causes.

External:

Some external irritants are tobacco smoke and certain chemicals. Weather conditions are also culprits.

Allergens - house dust mites, molds , grasses, plant pollens, foods, pets and clothing, soaps, shampoos and washing powders, cosmetics and some toiletry ingredients.

Eczema – appearance on skin:

- 1) Inflamed
- 2) Cracking
- 3) Blisters
- 4) Redness

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5) Scaling

6) Itching

7) Swelling

8) Redness

9)

10)

Factors that may aggravate eczema

1) Stress

2) Sweating

3) Solvents and cleaners

4) Dust or sand

5) Cigarettes

6) Certain fabrics and clothing

7) Certain foods

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8) Smoking

9) Clothing

10)

11)

People with eczema tend to have an over-reactive immune system that when triggered by an allergen or irritant, attacks the body instead of protecting it. This results in too much inflammation, which leads to red, itchy and painful skin.

Atopic Eczema - description

Adult: Adult with the first stages of eczema may be hard to treat. Some medications are also causes. Eczema can cause oozing, crusting, and a rash on the skin. The rash can also be dry and red in color.

Contact dermatitis – Contact dermatitis is skin inflammation that begins when certain things touch the skin. They cause irritation or allergic reactions for people. Some rashes happen right away but most appear over time.

Allergic - Allergic contact dermatitis begins when allergens trigger an immune reaction in the skin. Allergic contact dermatitis causes a red bumpy rash. Blisters may also appear. People with allergic contact dermatitis usually develop reactions within a few days of exposure. The immune system fights germs. It is your body's defense system. Genes and the environment probably both play a part.

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(medlineplus.com)

Non-allergic -Allergic contact dermatitis

It causes a rash on the body.

Allergic contact dermatitis occurs when the skin begins an allergic reaction after being exposed to a foreign substance.

Substances with greater allergenic effect:

- 1) Nickel
- 2) Costume jewelry.
- 3) Perfume
- 4) Cosmetics
- 5) Hair dyes
- 6) Plants
- 7) Food
- 8) Weather

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9) Latex gloves

10) poison oak, poison ivy

Irritant Contact Dermatitis: Irritant contact dermatitis is a very common type of dermatitis that damages your skin's outer skin layer. It depends on how long the person has been exposed and the strength of the irritating substance. Bleach and types of acids may cause a reaction after a single exposure. Inflammation and swelling of skin occurs. Hands are areas of irritant contact dermatitis.

The stages of dermatitis range from a mild condition to a severe one. It can possibly be life-threatening.

(medscape.com)

Conditions making one more prone to contact dermatitis

1) Soaps

2) Chemical solvents

3) Cosmetics or skin products

4) Plants

5) Personal contact

Appearance of a rash

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Treatments depend on the type of allergic reaction

Skin can become allergic to a substance after many exposures or after just one exposure. Sometimes people will have an allergic reaction to poison ivy after one exposure. Allergic contact dermatitis includes cosmetics, dyes, and nickel.

Urticaria: Urticaria is also known as hives. It looks like an area of swollen, red bumps, patches, or welts on the skin. They usually appear soon after the skin comes in contact with the allergen. Hives is the common name. Urticaria may be acute or chronic. Children or adults can have a case of acute urticaria during their lifetime.

Hives causes itching and sting. They can appear anywhere on the body. Examples are the face, lips, throat, or ears. Hives vary in sizes. They may join together to form bigger areas called plaques. They can last hours or days before ending. Plaques are also called wheals. Sometimes hives are caused by direct contact of substances. Some of these are heat and cold. Hives can change size quickly and move around, going away in one place and reappearing in other places.

Angioedema is like hives but the swelling is beneath the skin instead of on the surface. Angioedema can cause swelling around eyes, lips, and hands. It can last longer than hives and swelling will disappear in a couple of days. Severe tissue swelling can cause disfigurement. When Angioedema is on the throat, tongue, or lungs airways can become blocked. This can cause breathing problems and be life threatening. The swelling is like hives which are under the skins surface. Angioedema can cause swelling to appear on the surface of the skin.

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Angioedema can affect deeper layers in the skin especially around the face and lips.

Allergic drug reactions

Ingested substances - A food allergy is also called hypersensitivity. A person has an abnormal reaction to food. These reactions can be caused by medications also. It can occur as a rash, or swelling. Allergic reactions to drugs are reasons for adverse drug reactions. Symptoms of food allergies can be hives and happen when certain foods are eaten. Elevated levels of the immunoglobulin IgE in the bloodstream are some of the causes of these allergies. A drug allergy is not the same as a side effect. A drug allergy is also different from drug toxicity caused by an overdose.

Rash Appearance

Severe symptoms of ingested allergies may be abdominal cramps, vomiting, and diarrhea. This may be accompanied by a rash or swelling. Sometimes anaphylactic shock happens that may result in death. The skin may itch, be warm, dry, and blisters may develop

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