

IMMUNE SYSTEM

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The article touches upon the issue of Immune system. It provides role, types, components and problems of immune system. The immune system is the most incredible part of our body. It has the task of keeping the body healthy by destroying pathogens and disease-producing organisms, and by neutralizing their toxins. The immune system employs the services of the skin, mucous membranes, hair, cilia, saliva, urine and other natural means of waste disposal to keep the body free of illness and pathogens. For instance, should foreign bacteria enter the body, the immune system will employ cells in the body to fight the invading bacteria, and to prevent their spread. Immune activity has a benefit and a cost. The negative side of immunity is the production of distressing symptoms, acute and chronic diseases. The term hypersensitivity describes increased, damaging immune response.

Keywords: immune system, vocabulary, medical students

The main roles of the immune system

The main role of the immune system – a collection of structures and processes within the body – is to protect against disease or other potentially damaging foreign bodies. When functioning properly, the immune system identifies a variety of threats, including viruses, bacteria and parasites, and distinguishes them from the body's own healthy tissue.

The main tasks of the body's immune system are:

- Neutralizing pathogens like bacteria, viruses, parasites or fungi that have entered the body, and removing them from the body;
- Recognizing and neutralizing harmful substances from the environment;
- Fighting against the body's own cells that have changed due to an illness, for example cancerous cells.

The major components of the immune system include:

Lymph nodes: Small, bean-shaped structures that produce and store cells that fight infection and disease and are part of the lymphatic system – which consists of bone marrow, spleen, thymus and lymph nodes, according to “A Practical Guide To Clinical Medicine” from the University of California San Diego (UCSD).

Spleen: The largest lymphatic organ in the body, which is on your left side, under your ribs and above your stomach, contains white blood cells that fight infection or disease.

Bone marrow: The yellow tissue in the center of the bones produces white blood cells. This spongy tissue inside some bones, such as the hip and thigh bones, contains immature cells, called stem cells, according to the NIH.

Lymphocytes: These small white blood cells play a large role in defending the body against disease, according to the Mayo Clinic.

Thymus: This small organ is where T-cells mature. This often-overlooked part of the immune system, which is situated beneath the breastbone (and is shaped like a thyme leaf, hence the name).

Leukocytes: These disease-fighting white blood cells identify and eliminate pathogens and are the second arm of the innate immune system. A high white blood cell count is referred to as leukocytosis, according to the Mayo Clinic.

Types of immunity

Humans have three types of immunity – innate, adaptive, and passive:

Innate Immunity

Everyone is born with innate (or natural) immunity, a type of general protection. Many of the germs that affect other species don't harm us. For example, the viruses that cause leukemia in cats or distemper in dogs don't affect humans.

Adaptive Immunity

The second kind of protection is adaptive (or active) immunity, which develops throughout our lives. Adaptive immunity involves the lymphocytes and develops as people are exposed to diseases or immunized against diseases through vaccination.

Passive Immunity

Passive immunity is “borrowed” from another source and it lasts for a short time. For example, antibodies in a mother's breast milk give a baby temporary immunity to diseases the mother has been exposed to.

Problems of the Immune System

Disorders of the immune system fall into four main categories:

1. immunodeficiency disorders (primary or acquired)
2. autoimmune disorders (in which the body's own immune system attacks its own tissue as foreign matter)

3. allergic disorders (in which the immune system overreacts in response to an antigen)

4. cancers of the immune system

Immunodeficiency Disorders

Immunodeficiencies happen when a part of the immune system is missing or not working properly. Some people are born with an immunodeficiency (known as primary immunodeficiencies), although symptoms of the disorder might not appear until later in life.

Autoimmune Disorders

In autoimmune disorders, the immune system mistakenly attacks the body's healthy organs and tissues as though they were foreign invaders. Autoimmune diseases include:

- **Lupus**: a chronic disease marked by muscle and joint pain and inflammation

- **Juvenile idiopathic arthritis**: a disease in which the body's immune system acts as though certain body.

- **Scleroderma**: a chronic autoimmune disease that can lead to inflammation and damage of the skin, joints, and internal organs.

Allergic Disorders

Allergic disorders happen when the immune system overreacts to exposure to antigens in the environment. The substances that provoke such attacks are called **allergens**. The immune response can cause symptoms such as swelling, watery eyes, and sneezing, and even a life-threatening reaction called anaphylaxis.

Allergic disorders include:

- **Asthma**, a respiratory disorder that can cause breathing problems, often involves an allergic response by the lungs.

- **Eczema** is an itchy rash also known as atopic dermatitis. Although not necessarily caused by an allergic reaction, eczema most often happens in kids and teens who have allergies, hay fever, or asthma or who have a family history of these conditions.

- **Allergies** of several types can affect kids and teens. Environmental allergies (to dust mites, for example), seasonal allergies (such as hay fever), drug allergies (reactions to specific medications or drugs), food allergies (such as to nuts).

Cancer happens when cells grow out of control. This can include cells of the immune system. Leukemia, which involves abnormal overgrowth of leukocytes, is the most common childhood cancer. Lymphoma involves the lymphoid tissues and is also one of the more common childhood cancers.

Immunity works in a co-ordinated fashion to respond to numerous threats from the environment. It is essential to good health, from the moment of conception, when the mother's immune system starts protecting the growing baby, until old age. As medicine has progressed, physicians have slowly learned how to apply an understanding of the fundamentals of immunology to reinforce and repurpose the immune response, providing greater protection against infection or targeting cancers.

So, immune system should function properly in order to maintain an overall health. People should avoid stress, have a balanced diet, sleep enough, do sports, and drop smoking. Therefore, they will not weaken their immune system and live a longer and healthier life.

The authors want to thank the supervisor M.ZH. Baltabayeva for the help in investigation and preparation of the article.

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