Immune system and communicable diseases.

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Abstract

Multicellular animals have specialized tissues or cells to combat the risk of infection. Some of these reactions take place right away, enabling prompt containment of an infectious pathogen. Although delayed, other reactions are more suited to the infecting agent. The immune system refers to these defenses as a whole. In a world filled with potentially harmful bacteria, the human immune system is crucial to our survival. Serious impairment of even one component of this system can put a person at risk for serious, even life-threatening infections.

Keywords: Communicable diseases, Non-specific immunity, Pathogens.

Introduction

Specific and non-specific immunity are the two types of immunity that the human immune system can provide. The human body defends itself against foreign substances it deems dangerous through non-specific immunity, also known as innate immunity. Both larger species like worms and viruses, which are very little microbes, can be targeted. When these organisms cause disease in the host, they are collectively referred to as pathogens [1,2].

Non-Specific Immunity

All animals have immune systems that are naturally resistant to common infections. Exterior barriers like the skin and mucous membranes are among these first lines of defence. Pathogens can cause substantial harm when they penetrate the outer barriers, such as through a skin wound or when inhaled into the lungs [3].

Pathogens that get through exterior defences are fought by certain white blood cells (phagocytes). A phagocyte encircles a pathogen, absorbs it, and kills it.

Specific Immunity

Even while strong phagocytes are essential for health, some infectious dangers cannot be stopped by them. The role of phagocytes and other innate immune system components is supplemented by specific immunity. Specific immunity, as opposed to innate immunity, enables a targeted attack against a particular pathogen. Only vertebrates have particular immune reactions.

The particular immune response depends on white blood cells called lymphocytes. They develop into one of several kinds after being created in the bone marrow. T cells and B cells are two of these kinds.

A foreign substance known as an antigen causes T and B cells to react. The B and T lymphocytes in the human body can recognize millions of distinct antigens. Antigens can be found in different environments, despite the fact that we typically associate them with bacteria. For instance, T and B cells may react if a person receives a blood transfusion that is not compatible with his blood type.

T and B cells can be thought of in the following fashion, which is helpful: One characteristic of B cells is crucial. They are capable of developing and differentiating into plasma cells, which create an antibody-like protein. This protein has been designed to bind to a specific antigen. B cells must receive a signal from T cells in order to start maturing because they are ineffective at producing antibodies on their own. A properly informed B cell divides and creates numerous plasma cells when it identifies the antigen to which it is programmed to react. After then, the plasma cells secrete a huge number of antibodies that combat particular antigens present in the blood.

When a specialized phagocyte known as an Antigen-Presenting Cell (APC) exhibits the antigen that the T cell is specific for, the T cell is activated. The many components of the particular immune response are triggered by this mixed cell, which is primarily human yet exhibits an antigen to the T cell.

T helper cells, a subtype of T cell, serve a variety of purposes. Chemicals are released by T helper cells to

- Help in stimulating the division of plasma cells from B cells
- Engage phagocytes to annihilate germs.
- Bring on the killer T cells

Killer T cells identify contaminated bodily cells and eliminate them after activation.

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The immune response is regulated by regulatory T cells, also known as suppressor T cells. They send signals after they determine that a threat has been neutralised.

Infection and Disease

When a pathogen enters and reproduces in bodily cells, infection happens. Immune response is frequently triggered by infection. The infection will be removed or confined if the reaction is prompt and efficient, and the disease won't spread [1-3].

Disease can sometimes result from infection. (In this section, we'll concentrate on infectious disease, which is defined as an infection that is accompanied by symptoms or other signs of sickness.) Disease can develop when a person's immune system is weak or compromised, a pathogen is highly virulent (able to cause host cell damage), and a large number of infections are present in the body [2].

Symptoms can vary widely depending on the infectious condition. A frequent reaction to infection is fever; a greater body temperature can boost the immune system and provide an unfavourable environment for germs. White blood cells attack and release chemicals involved in the immune response when inflammation, or swelling brought on by an increase in fluid in the infected area, occurs [4,5].

Conclusion

The goal of vaccination is to trigger a particular immune response that will produce memory B and T cells that are unique to a particular disease. If the virus is encountered again, the body may respond quickly and effectively thanks to these memory cells, which remain in the body.

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