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300 LEVEL

NURSING DEPARTMENT

NSC 306

**ROLE OF THE IMMUNE SYSTEM.**

 The immune system is a collection of structures and processes within the body, which protects the body 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 major function of the immune system is to protect the host from environmental agents such as microbes or chemicals, thereby preserving the integrity of the body. This is done by the recognition of self and response to non-self.

**TYPES OF IMMUNITY.**

Immunity is broadly divided into;

1. Innate immunity.
2. Acquired immunity.
3. **Innate immunity**: Innate immunity is the immune system an individual is born with, and mainly consists of barriers on and in the body that keep foreign threats out.
* Components of innate immunity include;

Anatomic barriers (skin, mucous membranes).

Physiological barriers (temperature, pH).

Phagocytic barriers (cells that eat invaders).

Inflammatory barriers (redness and swelling on skin).

Others are; stomach acid, enzymes found in tears and skin oils, mucus, cough reflex, and so on.

 Innate immunity is non-specific, meaning it doesn't protect against any specific threats.

1. **Acquired immunity:** This type of immunity targets specific threats to the body. In acquired immunity, the threat must be processed and recognized by the body, and then the immune system creates antibodies specifically designed to the threat. After the threat is neutralized, the adaptive immune system remembers it, which makes future responses to the same organism more efficient. Acquired is divided into 2;
2. Natural
3. Artificial
4. Natural: Divided into;
5. Active: Antigens enter body naturally with response of Innate and adaptive immune systems. Provides long term protection.
6. Passive: Antibodies pass from mother to fetus across placenta and infant in breast milk. It provides immediate short term protection.
7. Artificial: Divided into;
8. Active: Antigens enter body through vaccination with response of innate and adaptive immune system. Provides long term protection.
9. Passive: Antibodies from immune individuals are injected into body, referred to as Immune serum globulins (ISG), Immune globulins (IG), Gamma globulins. It provides immediate short term protection.

**TYPES OF ANTIBODIES AND THEIR ROLES.**

1. Immunoglobulin G (IgG): Is a type of antibody representing approximately 80% of serum antibodies in human. IgG is the most common antibody found in the blood circulation, IgG molecules are created and released by Plasma B-cells. IgG detoxifies harmful substances and is important in the recognition of antigen-antibody complexes by leukocytes and macrophages. IgG is transferred to the fetus through the placenta and protects the infant until its own immune system is functional.
* Role of immunoglobulin G.

 It controls the infection of body tissues by binding kinds of pathogen such as bacteria, viruses and fungi. It protects the body from infection. It also enhances phagocytosis, neutralizes toxins and viruses, protects fetus and newborns.

1. Immunoglobulin M (IgM): a IgM usually circulates in the blood, accounting for about 10% of human immunoglobulins. It is the first antibody to appear when a pathogen or antigen enters the body system. IgM production is responsible in the spleen. It is found in the blood, lymph and B cell surface (monomer).
* Role of Immunoglobulin M.

It’s the first antibody produced during an infection. It’s effective against microbes and agglutinating antigens. It also interacts with several physiological molecules.

1. Immunoglobulin A (IgA): It is an antibody that is found in mucosal areas or body secretions such as genitourinary tract, tears, saliva, respiratory and intestinal secretions and colostrum (first breast milk produced by a lactating mother). It is abundant in serum. It is produced by B-cells, and located in secretions, blood and lymph. It accounts for 10-15% of human immunoglobulins.
* Role of Immunoglobulin A

Localized protection of the mucosal surfaces and provides immunity to infant digestive tract.

1. Immunoglobulin D (IgD): It is a type of antigen bound to B cells but does not circulate, instead signals the cells to become active. It is made up of 1% protein in plasma membrane of immature B lymphocytes where it is co-expressed with IgM. It is produced in a secreted form that is found in very small amounts in serum (0.2%). It is located in B-cell surface, blood and lymph.
* Role of Immunoglobulin D.

 It’s role in serum is still unknown. On B-cell surface, it initiates immune response.

1. Immunoglobulin E (IgE): Is a type of antibody that is synthesized by plasma cells. Monomers of IgE are two heavy chains and two light chains. It evolves as the last line of defense to protect against venoms. It’s percentage serum antibodies is 0.001%. It is located in the blood, bound to mast cell and basophils throughout the body.
* Role of Immunoglobulin E.

It’s main role is in immune defense against protozoan parasites such as plasmodium falciparum. It also has an essential role in Type I hypersensitivity such as allergic reactions and in Responses to allergens such as anaphylactic reactions to drugs, bee stings.