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**DEPARTMENT: NURSING SCI.**

**COURSE TITLE: MEDICAL SURGICAL NURSING II**

**COURSE CODE: NSC306**

QUESTIONS: Explain the role of immune system

Describe the two types of immunity

Explain the different types of antibodies and their roles

**IMMUNE SYSTEM**

The immune system is a complex network of cells and proteins that defends the body against infection. It keeps a record of every germ [microbe] it has ever defeated so it can recognize and destroy the microbe quickly if it enters the body again. Abnormalities of the immune system can lead to allergic diseases, immunodeficiencies and autoimmune disorders.

There are various components of the immune system and they include;

* WHITE BLOOD CELLS: White blood cells are the key players in your immune system. They are made in your bone marrow and are part of the lymphatic system. White blood cells move through blood and tissue throughout your body, looking for foreign invaders [microbes] such as bacteria, viruses, parasites and fungi. When they find them, they launch an immune attack. White blood cells include **lymphocytes [ such as B-cells, T-cells and natural killer cells] , and many other types of immune cells.**
* ANTIBODIES: Antibodies help the body to fight microbes or the toxins [poisons] they produce. They do this by recognizing substances called antigens on the surface of the microbe, or in the chemicals they produce, which mark the microbe or toxins as being foreign. The antibodies then mark these antigens for destruction. There are many cells, proteins, and chemicals involved in this attack.
* BONE MARROW: Bone marrow is the spongy tissue found inside your bones. It produces the red blood cells our bodies need to carry oxygen, the white blood cells we use to fight infection, and the platelets we need to help our blood clot.
* THYMUS: The thymus filters and monitors your blood content. It produces the white blood cells called **T-lymphocytes.**
* SPLEEN: The spleen is a blood-filtering organ that removes microbes and destroys old or damaged red blood cells. It also makes disease-fighting components of the immune system [ including antibodies and lymphocytes].

**TYPES OF IMMUNITY**

There are two major types of immunity: **innate or natural or nonspecific and acquired or adaptive.**

* **INNATE OR NATURAL OR NONSPECIFIC IMMUNITY:** Innate immunity is inherited by the organism from the parents and protects it from birth throughout life . For example humans have innate immunity against distemper, a fatal disease of dogs. As its name nonspecific suggests that it lacks specific responses to specific invaders. Innate immunity or nonspecific immunity is well done by providing different barriers to the entry of the foreign agents into our body. Innate immunity consists of four types of barriers and they include; **physical barriers, physiological barriers, cellular barriers, cytokine barriers.**
* **PHYSICAL BARRIERS:** They are mechanical barriers to many microbial pathogens. There are two types and they include **Skin and mucous membrane**. The skin is physical barrier of the body. Its outer tough layer, the stratum corneum prevents the entry of bacteria and viruses. Mucus secreted by the mucous membrane traps the microorganism and immobiles them.
* **PHYSIOLOGICAL BARRIERS:** The skin and mucous membranes secrete certain chemicals which dispose off the pathogens from the body. Body temperature, P**H** of the body fluids and various body secretions prevent growth of many disease causing microorganisms.
* **CELLULAR BARRIERS:** These are certain white blood corpuscles [leucocytes], macrophages, natural killer cells, complement system, inflammation, fever, antimicrobial substances e.t.c
* **CYTOKINE BARRIERS:** Cytokines [chemical messengers of immue cells] are low molecular weight proteins that stimulate or inhibit the differentiation, proliferation of immune cells. They are involved in the cell to cell communication. Kinds of cytokines includes **interleukins** produced by leucocytes, **lymphocytes** produced by lymphocytes.
* **ACQUIRED IMMUNITY [ ADAPTIVE OR SPECIFIC IMMUNITY]:**Immunity that an individual acquires after the birth is called acquired or adaptive immunity. It is specific and mediated by antibodies or lymphocytes or both which make the antigen harmless. It not only relieves the victim of the infectious disease but also prevents its further attack in future. The memory cells formed by B cells and T cells are the basis of acquired immunity. Acquired immunity consists of specialized B and T lymphocytes and antibodies.

**TYPES OF ACQUIRED IMMUNITY**

Acquired immunity is of two types; active immunity and passive immunity

* **ACTIVE IMMUNITY:** In this immunity person’s own cells produce antibodies in response to infection or vaccination. It is slow and takes time in the formation or antibodies. It is long lasting and harmless. Active immunity may be **natural or artificial.** A person who has recovered from an attack of small pox or measles or mumps develops natural active immunity. Artificial active immunity is the resistance induced by vaccines. Examples of vaccines are as follows:  **Bacterial vaccines, Viral vaccines**
* **PASSIVE IMMUNITY:** When ready-made antibodies are directly injected into a person to protect the body against foreign agents, it is called passive immunity. It provides immediate relief. It is not long lasting. It may create problems. Passive immunity maybe **natural or artificial. Natural passive immunity** is the resistance passively transferred from the mother to the foetus through placenta. IgG antibodies can cross placental barrier to reach the foetus. After birth, immunoglobulin’s are passed to the new born through breast milk. Mother’s milk contains antibodies which protect the infant properly by the age of three months. **Artificial passive immunity** is the resistance passively transferred to the recipient by administration of antibodies. This is done by administration of hyper-immune sera of man or animals. Serum contains antibodies. For example, anti-tetanus serum [ATS] .

**ROLES OF ANTIBODIES**

Antibodies are also called **immunoglobulin,** a protective protein produced by the immune system in response to the presence of a foreign substance, called an **antigen.**

**TYPES OF ANTIBODIES**

* **IgD:** It account for less than 1% of human immunoglobulins. IgD may be involved in the induction of antibody production in B cells.
* **IgA:** Is abundant in serum, nasal mucus, saliva, breast milk and intestinal fluid. Accounting for 10-15% of human immunoglobulins. IgA in the breast milk protects the gastrointestinal tract of neonates from pathogens.
* **IgE:** Is present in small amounts, accounting for no more than 0.001% of human immunoglobulins. Its original role is to protect against parasites.