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**Nursing science**

**Medsurg Assignment**

1. Explain the role of the immune system

The immune system comprises cells and molecules with specialized roles in defending against infection and invasion by other organisms. Its major components include the bone marrow, the white blood cells (WBCs) produced by the bone marrow, and the lymphoid tissues.

The main function is to protect the host from environmental agents such as microbes or chemicals, thereby preserving the integrity of the body.

1. Describe the two types of immunity

There are two general types of immunity: natural (innate) and acquired (adaptive).

**Natural (innate)** is a nonspecific immunity present at birth. Natural (innate) immunity provides a nonspecific response to any foreign invader, regardless of the invader’s composition.

These responses include physical and chemical barriers, the action of WBCs, and inflammatory responses.

**Physical and Chemical Barriers**

**Physical surface** barriers include intact skin and mucous membranes which prevent pathogens from gaining access to the body, and the cilia of the respiratory tract along with coughing and sneezing responses, which act to filter and clear pathogens from the upper respiratory tract before they can invade the body further.

**Chemical barriers**, such as acidic gastric secretions, mucus, enzymes in tears and saliva, and substances in sebaceous and sweat secretions, act in a nonspecific way to destroy invading bacteria and fungi.

Inflammatory Response: This includes redness and swelling.

**Acquired (adaptive)**

Acquired (adaptive) immunity is the immunologic responses acquired during life but not present at birth. Usually develops as a result of prior exposure to an antigen through immunization (vaccination) or by contracting a disease. Weeks or months after exposure to the disease or vaccine, the body produces an immune response that is sufficient to defend against the disease upon re-exposure to it. The two types of acquired immunity are known as active and passive.

**In active acquired immunity,** the immunologic defenses are developed by the person’s own body. This immunity generally lasts many years or even a lifetime.

**Passive acquired immunity** is temporary immunity transmitted from another source that has developed immunity through previous disease or immunization. For example, immune globulin and antiserum, obtained from the blood plasma of people with acquired immunity, are used in emergencies to provide immunity to diseases when the risk for contracting a specific disease is great and there is not enough time for a person to develop adequate active immunity. For example, immune globulin may be administered to those exposed to hepatitis.

Immunity resulting from the transfer of antibodies from the mother to an infant in utero or through breastfeeding is another example of passive immunity.

Active and passive acquired immunity involve humoral and cellular (cell-mediated) immunologic responses

* Humoral immunity

Immunity that is mediated by antibodies and can be transferred by to a non-immune recipient by serum

* Cell Mediated Immunity: Immune response in which antigen specific T cells dominate

3. Explain the different types of antibodies and their roles

Antibodies are large protein called immunoglobulin because they are found in the globulin fraction of the plasma proteins. The body can produce five different types of immunoglobulin. Classification is based on the chemical structure and biologic role of the individual immunoglobulin and they include:

**IgG (75% of Total Immunoglobulin)**

• Appears in serum and tissues (interstitial fluid)

• Assumes a major role in blood borne and tissue infections

• Activates the complement system

• Enhances phagocytosis

• Crosses the placenta

**IgA (15% of Total Immunoglobulin)**

• Appears in body fluids (blood, saliva, tears, breast milk, and pulmonary, gastrointestinal, prostatic, and vaginal secretions)

• Protects against respiratory, gastrointestinal, and genitourinary infections

• Prevents absorption of antigens from food

• Passes to neonate in breast milk for protection

**IgM (10% of Total Immunoglobulin)**

• Appears mostly in intravascular serum

• Appears as the first immunoglobulin produced in response to bacterial and viral infections

• Activates the complement system

**IgD (0.2% of Total Immunoglobulin)**

• Appears in small amounts in serum

• Possibly influences B-lymphocyte differentiation, but role is unclear

**IgE (0.004% of Total Immunoglobulin)**

• Appears in serum

• Takes part in allergic and some hypersensitivity reactions

• Combats parasitic infections