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COURSE: MEDICAL SURGICAL NURSING

COURSE CODE: NSC 306

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QUESTIONS

1. Explain the role of the Immune system
2. Describe the two types of immunity
3. Explain the different types of antibodies and their roles

ANSWERS

1. Explain the role of the Immune system

The immune system is a host defense system comprising many biological structures and processes within an organism that protects against disease. The main parts of the immune system are: white blood cells, antibodies, the complement system the lymphatic system, the spleen, the thymus, and the bone marrow.

The role of the immune system is to protect our body from any foreign matters that might cause any damage or homeostatis imbalance. The success of the immune system depends on its ability to discriminate between foreign (non self) and host (self) cells. When an organism is threatened by microorganisms, viruses, or cancer cells, the immune system acts to provide protection.

When a foreign matter enters the human body, our defense system recognizes this as foreign through the immune system. How the human body recognize foreign against itself employs a complex “I.D.” system. Each cell in the human body carries on its surface a mixture of proteins and sugars that serve to identify the cell to the immune system. Foreign objects lack the identifiers that all of the body’s cells have, but each one has unique features or antigens where the immune system attaches identifiers called antibodies. This is the basis for the specific defense mechanisms. Once you have built the antibodies for a specific antigen, the immune system will respond faster than if they had being no previous exposure to the antigen (i.e. you are immune to the pathogen, but only that specific pathogen =, because your immune system responds faster.) The non-specific part of the immune system is mostly composed of phagocytes (eating-cells) which engulf and digest foreign substances like bacteria and viruses, which do not bear the body’s specific idenifers.

2. Describe the two types of immunity

Immunity is defined as the ability of a host to resist a particular infection or disease**.** Immunity involves both the specific and non-specific components.

1. Innate (Non-specific) immunity:
   *Host defense mechanisms that act from the start of an infection but do not adapt to a particular pathogen
   *Anatomic barriers (Skin,mucous membranes)
   *Physiological barriers (temperature, pH)
   * Phagocytic Barriers (cells that eat invaders)
   * Inflammatory barriers (redness, swelling)

2. Adaptive (Specific) immunity:

   *Response of an antigen specific B and T lymphocytes to an antigen

   *Immunological memory

   *Self and non-self recognition

3. Explain the different types of antibodies and their roles

I. IgG

- Structure: Monomer
- Percentage serum antibodies: 80%
- Location: Blood, lymph, intestine
- Half-life in serum: 23 days
- Complement Fixation: Yes
- Placental Transfer: Yes

Known Functions: Enhances phagocytosis, neutralizes toxins and viruses, and protects fetus and newborn.

II. IgM

- Structure: Pentamer
- Percentage serum antibodies: 5-10%
- Location: Blood, lymph, B cell surface (monomer)
- Half-life in serum: 5 days

- Complement Fixation: Yes
- Placental Transfer: No
- Known Functions: First antibodies produced during an infection. Effective against microbes and agglutinating antigens.

III. IgA

- Structure: Dimer
- Percentage serum antibodies: 10-15%
- Location: Secretions (tears, saliva, intestine, milk), blood and lymph.
- Half-life in serum: 6 days
- Complement Fixation: No
- Placental Transfer: No

Known Functions: Localized protection of *mucosal* surfaces. Provides immunity to infant digestive tract.

IV. IgD

- Structure: Monomer
- Percentage serum antibodies: 0.2%
- Location: B-cell surface, blood, and lymph
- Half-life in serum: 3 days
- Complement Fixation: No
- Placental Transfer: No

Known Functions: In serum function is unknown. On B cell surface, initiate immune response.

V. IgE

- Structure: Monomer
- Percentage serum antibodies: 0.002%
- Location: Bound to mast cells and basophils throughout body. Blood.
- Half-life in serum: 2 days
- Complement Fixation: No

- Placental Transfer: No

Known Functions: Allergic reactions. Possibly lysis of worms.