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COURSE : MEDICAL SURGICAL NURSING 2 .

COURSE CODE : NSC 306

AN ASSIGNMENT ON IMMUNOLOGY

QUESTIONS:

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

ANSWERS

The immune system is the bodily system that protects the body from foreign substances , cells , and tissues by producing the immune response and that includes especially the thymus , spleen ,lymph nodes, special deposit of lymph tissues (in the gastrointestinal Tract of the bone marrow) macrophages and lymphocytes including the B cells and T cells and antibodies.

1. The roles of the immune system is to protect the body from foreign matters that can cause damage or homeostasis imbalance when foreign matters enters the human body our defense system recognizes this as foreign through the immune system how the human body recognizes foreign against itself employs a complex I.D system . Each cell in the human body carries on the surface a mixture of proteins and sugars that serve to identify the cell to the immune system . Foreign objects lack identifiers that all the body cells have but each one has unique features or antigen where the immune system attaches identifiers called antibodies. This is the basis for the specific defense mechanism once you have built the antibodies for a specific antigen the immune system will respond faster than if it had been no previous exposure ie you are immune to 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 engulfs and digest it's foreign substance like bacteria and viruses which do not bear the body's specific identifiers . White blood cells which are called the leukocyte play an important role in immune system. Some types are called the phagocytes : chew up invading organism then the lymphocytes:help the body remember the lymphocytes and destroy them .one of the phagocytes is the neutrophil: which fights bacteria when some have infection doctors can orders blood test if it's caused by the body to have a lot of neutrophil. The two kind of lymphocytes are the B and T lymphocytes: they start out from the bone marrow and either stay there and mature into B cells or go into the thymus gland and mature into T cells . B lymphocytes are like the bodies military intelligence system -they find their targets and find defenses to lock them T cells are like soldiers - they destroy the invaders that the intelligence finds them.

2 . Describe the two types of immunity .

a .)NATURAL IMMUNITY :

This is defined as the the resistance against infection that an individual inherit genetically with which he is born certain antibodies being naturally present with his body . For instance an individual may have high natural resistance throughout his life to colds and flu, where as another person becomes ill with cold every winter . However a persons natural resistance to infectious disease can be greatly enhanced or reduced by factors as diet , environments the virulence if of the invading microorganisms.

Natural immune system functions as the first line of defense against invasion by Any

infectious agents . The exterior of the body namely the skin is an effective barrier to the entry of Most organisms and is an important part of the natural immune system . If the skin is healthy and intact no infectious organism can penetrate through it this is achieved by a variety of biochemical and physical barriers in the skin as well as in various organ as a number commensal organism survive as calories and they also compete effectively with potential pathogens preventing them to enter the body . Lysozyme an enzymes which is present in most secretions of the body such as tears saliva as well as other proteins in the blood Such as complement component or acute phase protein acts as chemical barriers to infections and are part of the innate immune system but in the event when the innate immune system is breached by invading organism the adaptive immune system gets activated and a specific immune response is mounted . The response under normal circumstances can control growth of the invading organism and the host is protected.

(b.) ACQUIRED IMMUNITY :

In a acquired immunity the individual is not born with inherited resistance to a particular organism instead he develops immunity against an organism either by actively producing his own antibodies (active immunity) or passively receiving antibodies that have been manufactured within the bodies of other people or animal (passive immunity).

Acquired immunity may either develop naturally or within an individuals body or artificially as a result of vaccination or inoculation . When acquired immunity develops naturally it results from a disease process within the body . This form of immunity is produced during the initial attack by causative bacteria or virus and it's probably on the reason the the sick individual recovers .

To acquire immunity naturally, the patient depends then upon an innate ability To develop immune bodies against particular virus or bacteria . When an individuals body is invaded with a particular organism for the first time he may suffer serious reactions . However antibodies are built up against the initial invasion of of his organism . A memory of the antigens produced by the organism is passed on to successive generations of the body cells .As a result when the body is attacker for the second time by the same antigen the reaction will be very slight or possibly the reaction will take place at all. Thus , the individual has acquired an immunity to an organism against which he had no natural immunity . This type of immunity once develops persist for two years or even for the life time of the individual. For example both smallpox and measles confer long immunity upon their victims . However , as every cold sufferer knows colds and many types of flu confer to no immunity at all .

In some unfortunate cases , individuals can develop an acquire immunity against a particular organism even though they still harbor the organism within their bodies this organism then, while harmless to it carrier can be transmitted to other and can infect them . The classic examples this situation is the typhoid carrier . In the case of a typhoid antibodies are present in this blood although typhoid bacilli continue to live in his gall bladder and intestinal tract. The individual while protected by his own antibodies remains highly infective to other susceptible individuals . When acquired immunity develops artificially as a result of vaccination or inoculation , it may be acquired actively or passively .

3 . The different types of antibodies and there roles are :

a .IgG:

- structure: monomer
- percentage serum antibodies:80%
- location : blood , lymphs ,intestine

- half life in serum : 23 days
- complement fixation : yes
- placental transfer : yes
- known functions : enhance phagocytosis neutralizes toxins and virus's protects fetus and newborn .

b. IgM :

- structure :pentamer
- percentage serum antibodies : 5-10 %
- Location : blood , lymph's B cells surface (monomer)
- Half life in serum :5 days
- Complement fixation :yes
- Placental transfer: yes
- Known functions : first antibodies produced during an infection . Effective against microbes and agglutinating antigens

c . IgA :

- Structure: Dimer
- percentage serum antibodies 10-15 %
- Location: secretions (tears, saliva , intestines,milk blood and lymph's .

Half life in serum : 6 days

- complement fixation :no
- placental transfer :no
- known functions:localized protection of mucosal surfaces . Provides immunity to infants digestive tracts

d . IgD :

- structure: monomer
- percentage serum antibodies: 0.2%
- location : B -cell surface , blood and lymph's .
- half life in serum :3 days
- complement fixation: No
- placental transfer : no
- known functions: in the serum functions is unknown on B cells surfaces initiate immune response.

e. IgE

- structure :monomer
- percentage serum antibodies: 0.002%
- location : bound to mast cells and basophils throughout the body . Blood
- half life in serum : 2 days
- complement fixation: no
- known functions: allergic reactions probably lysis of worms .

f. Production of antibodies by B cells.

- B cells develop from stem cells in the bones marrows of adults (livers of fetuses)
- After maturation B cells migrate to lymphoid organs (lymph nodes or spleen).
- clonal selections : when B cells encounters an antigen it recognizes , it's stimulated and divides into many clones called plasma cells which actively secretes antibodies.