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Q1) Write down any viral and bacterial disease in detail.

Ans) Viral disease:

Viruses are microscopic and they are at the boundary of living and nonliving. They are dead in environment but alive when they enter in a living body. Viral disease can transfer from one body to another through blood, air, etc. The effect of virus in one organism can be different in other kind of organism. Viruses can only replicate in a host they are parasitic. They contain genetic material, RNA or DNA.

Variola virus:

This virus is also known as smallpox. It spreads from person to person and causes skin rashes. This virus causes 3 deaths out of every 10 persons. The person infected by variola virus has many permanent scars over face and other parts of the body.

Person with this virus goes through different stages. And each stage has their own signs and symptoms. There are 6 stages of variola virus.

Stages:

1) Incubation period

It is from 7 to 19 days

2) Initial symptoms

- Fever
- Head and body aches
- Vomiting

3) Early rash

Small red spots starts to appear on tongue and in mouth. It then breaks and the virus spreads to the all parts of the body.

4) Pustular rash and scabs

This stage last for 10 days. The sores become pustules.

5) Scabs fall off

The scabs begins to fall off and it last for 6 days.

6) No scabs

The person is no longer contagious.

Treatment:

Variola virus effects a person once in a life. It do not effect a person again. An English physician found that the virus do not effect a person which is effected by cowpox. Variola virus and the cowpox virus is somehow similar to each other. So he concluded that if we effect a health person with the cowpox virus variola will not effect that person. So the cowpox is used as a vacancy for variola virus.

Q2) What is cancer? How cancer is diagnosed? What is the role of genetics in cancer? Also explain TNM diagnostic test for cancer.

Ans) CANCER:

Cancer is a broad term. It describes the disease that results. When cellular changes cause the uncontrolled growth and division of cells. Some type of cancer cause rapid cell growth, while others cause cells to grow and divide at a slower rate.

Certain forms of cancer result in visible growths called tumors, while others. Such as leukemia, do not. Most of the body cells have specific functions and fixed lifespans while it may sound like a bad thing, cell death is a part of a natural and beneficial phenomenon called apoptosis. A cell receive instructions to die so that the body can replace it with a newer cell that functions better. Cancerous cells lack the components that interact them to stop dividing and to die.

Cancers cells may appears in one area, then spread via the lymph nodes. These are cluster of immune cells located throughout the body.

HOW CANCER IS DIAGNOSED:

There is no single test that can accurately diagnose cancer. The complete evaluation of a patient usually requires a thorough history and physical examination along with diagnostic testing

CANCER DIAGNOSTIC METHOD:

- 1) Lab tests
- 2) Diagnostic imaging
- 3) Endoscopic exams
- 4) Genetic tests
- 5) Tumor biopsies

ROLE OF GENETICS IN CANCER:

Cancer is a genetic disease cancer is caused by certain changes to genes that control the way our cells function especially how they grow and divide.

Genes carry the instructions to make proteins, which do much of the work in our cell. Certain gene changes can cause cells to evade normal growth controls and become cancer. For example, some cancer-causing gene changes increase production of a protein that makes cells grow.

Genetic changes that promote cancer can be inherited from our parents if the changes are present in germ cells of the body (eggs and sperm) such changes are called germline changes and are found in every cell of the offspring. In general, cancer cells have more genetic changes than normal cells. But each person's cancer has a unique combination of genetic alterations. Some of these changes may be the result of cancer. As the cancer continues to grow, additional changes will occur. Cancer cells may have different genetic changes.

TNM STAGING SYSTEM:

The TNM system is the most widely used cancer staging system. Most hospitals and medical centers use the TNM system as their main method for cancer reporting.

IN THE TNM SYSTEM:

- 1) The T refers to the size and extent of the main tumor. The main tumor is usually called the primary tumor.
- 2) The N refers to the number of nearby lymph nodes that have cancer.
- 3) The M refers to whether the cancer has metastasized. This means that the cancer has spread from the primary tumor to other parts of the body.

Q3) Explain structure of bacterial cell. How antibiotics kill bacteria? What is the mode of action of antibiotics?

Ans) STRUCTURE OF BACTERIAL CELL:

The bacterium, despite its simplicity contains a well-developed cell structure. Which is responsible for some of its unique biological structure and pathogenicity. Many structure features

are unique to bacteria and are not found among archaea or eukaryotes. Because of the simplicity of bacteria relative to larger organisms and the ease with which they can be manipulated experimentally, the cell structure of bacteria has been well studied revealing many biochemical principals that have been subsequently applied to other organisms.

HOW ANTIBIOTICS KILL BACTERIA:

ANTIBIOTICS:

Antibiotics are medications used to fight infections caused by bacteria. They are also called antibacterial. They treat infections by killing or decreasing the growth of bacteria.

HOW DO ANTIBIOTICS WORK AGAINST BACTERIAS:

Antibiotics fight bacterial infection either by killing bacteria or slowing and suspending, its growth. They do this by:

- 1) Attacking the wall or coating surrounding bacteria.
- 2) Interfering with bacteria reproduction.
- 3) Blocking protein production in bacteria.

MODE OF ACTION OF ANTIBIOTICS:

Antibiotics or antibacterial action generally falls within one of four mechanisms, three of which involve the inhibition or regulation of enzymes involved the disruption of membrane structure. Many of these cellular functions targeted by antibiotics are most active in multiplying cells. Since there is often overlap in these functions between prokaryotic bacterial cells and eukaryotic mammalian cells.