

**Name: Brekhna**

**ID: 14508**

**Department: Dpt 4th semester**

**Instructor: Sir imraan**

## **PATHOLOGY**

**Q1) Write down any viral or bacterial diseases in details?**

**Ans)** Viruses are very small infectious agents.

They are made up of a piece of genetic material such as DNA or RNA, that is enclosed in a coat of protein.

Viruses invade cells in the body and use components of those cells to help them multiply.

This process often damages or destroys infected cells.

### **Contagious Diseases:**

Viral diseases are contagious, they are spread from one person to another person.

Such as bite of an infected insect or droplets from cough or sneeze.

### **Corona viruses (COVID19)**

It is a disease caused by the new virus that emerged in China in December 2019.

Symptoms include cough, fever, shortness of breath, muscle aches and some cases have caused death.

This new corona virus can spread from person to person

### **Spread of corona viruses:**

The new virus corona virus is spread through droplets released into air when an infected person coughs or sneezes. The droplets generally do not travel more than a few feet and they fall to the ground in a few seconds.

This is why social distancing is effective in preventing the spread.

**Incubation period:**

The incubation period of this virus is 14 days.

**Symptoms:**

1. cough
2. Fever
3. Shortness of breath
4. Muscles ache
5. Sore throat
6. Diarrhoea
7. Headache

In rare case corona virus can lead to severe respiratory problem, kidney failure or death.

**Diagnosis:**

Diagnosis may be difficult with only a physical exam because mild cases of corona virus may appear similar to the flu or bad cold, A laboratory test can confirm the diagnosis.

**Treatment:**

There is not specific treatment for the virus people who become sick from corona virus should be treated with supportive measure.

Those that relieve symptoms for severe cases, there may be additional option for treatment including research drugs and therapeutic.

**Q2) What is cancer? How cancer is diagnosed? What is the role of genetic in cancer? Explain TNM diagnostic test for cancer?****Ans) Cancer:**

Cancer is the uncontrolled growth of abnormal cells in the body. Cancer develops when the body normal control mechanism stop working old cells do not die and instead grow out of control, forming new abnormal cells

These extra cells may form a mass of tissues, called a tumor some cancer such as leukemia, do not form tumors

Cancer may occur anywhere in the body in women breast cancer is most common. In men it's prostate cancer.

### **Five main categories;**

- Carcinomas begin in the skin or tissues that line the internal organ
- Sarcomas develop in the bones, cartilage, muscles or other connective tissues.
- Leukemia begins in the blood and bone marrow

### **Cancer Diagnosis;**

Doctors may use one or more approaches to diagnose cancer

- 1. Physical Exam;** Doctor may feel areas of body for lumps that may indicate a tumor during physical exam he or she may look for abnormalities. Such as change in skin color or enlargement of an organ that may indicate the presence of cancer.
- 2. Laboratory tests:** Lab tests such as urine and blood tests may help doctor identify abnormalities that can be caused by cancer for instance in people with leukaemia a common blood test called complete blood count may reveal an unusual number or types of white blood cells.
- 3. Imaging test:** CT scan, bone scan MRI, PET, ultrasound, x rays.

### **Role of genetic;**

Cancer is a genetic disease that is cancer is caused by certain changes to genes that control the way our cells function especially how they grow and divide for example some cancer causing gene changes increase production of protein that make cell grow.

### **TNM ;**

Staging is a way of describing how much cancer has grown and spread. A common way of staging cancer is called TNM.

**T:** Stand for tumor how far the primary tumor has grown locally

**N:** Stands for Nodes if the cancer has spread to the local lymph glands

**M:** stands for metastasis if the cancer has spread to the other parts of the body.

**Q3) Explain structure of bacterial cell ? How antibiotic kill bacteria? What is 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 structural features are unique to bacteria and are not found among archaea or eukaryotes because of 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.

**Morphology:**

- Coccus (circle or spherical)
- Bacillus (rod like)
- Coccobacillus (between a sphere and rod)
- Spiral (cork screw like)
- Filamentous (Elongated)

**Cellwall;**

The cell envelope is composed of the plasma membrane and cell wall as in other organisms the bacterial cell wall provides structural integrity to the cell

In prokaryotes the primary function of cell wall is to protect the cell from internal turgor pressure caused by the much higher concentration of proteins

**The Gram positive cell wall:**

Gram positive cell walls are thick and peptidoglycan layer constitutes almost 95% of the cell wall in some gram positive bacteria and as little as 5 to 10 % of cell wall in gram negative bacteria the gram positive bacteria take up the crystal violet dye and are stained purple.

### **The Gram negative:**

The gram negative cell wall are much thinner than the gram positive cell wall and they contain a second plasma membran superficial to their thin pepidoglycan layer in turn adjacent to the cytoplasmic membrane

### **Plasma membrane:**

The plasma membrane or bacterial cytoplasmic membrane is composed of a phosplipid bilayer and thus has all of the general function of cell membran such as acting as permeability barrier for most molecules.

### **How antibiotics kill bacteria?**

**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 bacterias.

Antibiotics fight bacterial infections 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.

### **Antibiotic mode of action:**

An antibiotic is a type of antimicrobial substance active against bacteria and is the most important type of anti bacterial agent for fighting bacterial infections

Antibiotic medication are widely used in the treatment and prevention of such infections.

1. **Inhibitors of cellwall synthesis:** While the cells of human and animals do not have cellwall this structure is critical for the life and survival of bacterial species a drug that target cellwalls can therefore selectively kill or inhibit bacterial organisms **Example** pencillins, bacitracin.

- 2. Inhibitors of cell membrane function:** Cell membrane are important barriers that segregate and regulate the intra and extra cellular flow of substance A disruption or damage to this structure could result in leakage of important solutes essential for the cell survival because this structure is found in both eukaryotic and prokaryotic cell **Example** Polymixin B and colistin.
- 3. Inhibitors of protein synthesis:** Enzymes and cellular structure are primarily made of protein. Protein synthesis is an essential process necessary for the multiplication and survival of all bacterial cells and several types of antibacterial agents target bacterial protein synthesis by binding to either the 30s or 50s subunits of the intracellular ribosomes this activity then results in the damage of normal cellular metabolism of the bacteria and consequently leads to the death of organism **Examples** aminoglycosides, macrolide, lincosmide.
- 4. Inhibitors of nucleic acid synthesis:** DNA and RNA are keys to the replication of living forms including bacteria some antibiotics work by binding to components involved in process of DNA or RNA synthesis which cause interference of the normal cellular processes **Example** quinolones, metronidazole.