Paper medical microbiology

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**Q#1: what do you know about parasites explain endo and ecto parasites in detail?**

**ANS: introduction to parasiteology**

**Parasites is defined as an animal or plant that lives in or upon another organisms host and draws its nutrient directly from it**

**EG include bacteria, virus, fungi ,protozoas etc**

**Study of parasites is known as parasitology .**

**Medical parasitology is the study of animal parasite that infect and produce diseases in humans**

**CLASSIFICATION OF PARASITES**

**There are two types of parasites.**

**1:ECTO PARASITES.**

**The parasites that live on the outer surface or in the superficial tissue of the host are called ecto parasites.**

**Infection caused by these parasites is called infestation eg lice.**

**2: ENDO PARASITES**

**The parasites that live within the host are called endo parasites. Invasion by such parasites is called infection eg leishmania**

**TYPES OF ENDOPARASITES**

**1 )OBLIGATE PARASITES**

**The parasites that cannot exist without host are called obligate parasites eg toxoplasma gonodii.**

**2) FACULTATIVE PARASITES**

**The parasites that live a parasitic or free living existence when an oppurtuity arises are called facultative parasite eg naegleria, fowleri**

**3) ACCIDENTAL PARASITES**

**The parasites that attack an unusal host are called accidental parasite eg echinococcus granulosus**

**4) ABERRANT PARASITES**

**The parasites that during migration in the host reach a site where they cannot live or develop further are called aberrant parasites eg toxocara types .**

**Q#2**

**ANS 2: PROTOZOA**

**The word protozoa is come from greek protozoon word meaning (first animal )**

**The protozoa are unicellular (may be multicellular )eukaryotic micro organisms**

**Protozoa constitute a large group of about 65,000 species. Most of which are harmless free living and inhabits water and soil**

**A few species are pathogenic in nature parasitize human and other animal causing hundred of millions of infection in a year around the world**

**CHARACTERISTICS**

**\* mostly unicellular organisms with fully functional cell**

**\* live freely may be parasitic or symbiotic**

**\* protozoa are chemo –hetrotrops**

**\* they are motile have locomotive organelles eg flagella and cilia for movements**

**MORPHOLOGY**

**\* protozoa are eukaryotic resemble to animal cell , contan major cell organelles including nucleus , mitochondria )**

**\* their organelles are highly specialized for feeding reproduction and movement**

**\* the cytoplasm of protozoa are divided into in outer layer called ectoplasm and an inner layer is called endoplasm**

**\* ectoplasm helps in movement,feeding and protection**

**\* endoplasm houses nucleus, mitochondria and food**

**\* some protozoa have special appendages flagella and cilia that help in their movement**

**\* fresh water protozoa have contractile vacuoles to pump oute excess water**

**\*their shape may remain constant (specially in ciliates )or change constantly (as seen amoeba.**

**CLASSIFICATION OF PROTOZOA**

* **Protozoa are classified on the basis of their motility and method of reproduction.**
* **They are classified into 4 main types.**

**1 Flagellates**

**2 Ciliates**

**3 Sarcodina**

**4 Sporozoates**

 **FLAGELLATES**

* **Flagellates move by help of flagella (a tail like structure ) the movement is whip like.**

**Example of flagellates are**

**1 Trypnosoma, Leishmenia (blood pathogen )**

**2 Giardia(intestinal parasite )**

**3 Trichomonas(reproductive tract pathogen )**

 **CILIATES**

* **Ciliates protozoa have movement through cilia (fine hair like structure attached with their body.)**
* **Some protozoa have special kind of cilia for feeding and attachment.**
* **Most are harmless.Only one species balantidium coli is pathogenic for human causes a rare and server form of Dysentery.**

 **SARCODINA**

* **Major loco –motor organelles in sarcodina is pseudopodia(pseudo means false, podia means foot )**
* **Common example of sarcodina is amoeba**
* **Most species are harmless**
* **Enaeomba is a parasitic for human causes intestinal disease.**

 **SPOROZOITES**

* **Sporozoites are the only non- motile form of protozoa.**
* **Sporozites have well developed sexual and asexual stages.**
* **Entire group is parasitic in nature and are harmful.**
* **Some common example of sporozoites and their infection are**
* **Plasmodium (causative agent of Malaria causes 100 to 300 million infection world wide )**
* **Toxoplasma gondii (causes Toxoplasmosis )**

**Q3#**

**ANS 3# these are many organelles which present in paramacium and euglena**

1. **CYTOPLASM**

 **Homogenous show color (green, brown; blue, purple due to pigment**

* **Has submicroscopic protein fibrils**
* **Arrange in parallel**
* **Divided into two portion ectoplasm and endoplasm.**
* **Ectoplasm more gel like and endoplasm is voluminous and fluid.**

**FUNCTION**

 **Support the internal structure and shape and concisency of the cell.**

 **ANAL PORE (FECES SECRETION )**

 **FOOD VACOULE (digest the food )**

 **ORAL GROOVE (food intake through cilia)**

1. **NUCLEUS**

**Eukaryotic nucleus have chromosomes the nuclear substance the nuclear membrane nucleoplasm.**

**One or many**

**Some have two.**

1. **Macronucleus**

**Large in size the control the metabolic activity and regeneration process.**

1. **Micronucleus**

**Small in size concerned with reproductive activity.**

 **FEEDING STRUCTURE**

* **Pseudopedia in amoeba**
* **Tentacular feeding tubes in suctorians**
* **Mouth in cilliates**

**Q#4?**

**ANS: ANTIBIOTICS**

* **Produced by microorganisms (bacteria or fungi )**
* **Inhibit the growth or kill of other microorganisms.**
* **At a very low concentration**
* **Not affecting the host cell.**

 **Example: ciprofloxacin,Erythromycin**

**ANTIBIOTIC RESISTANCE**

**Antibiotic resistance occurs when an antibiotic has lost its ability to effectively control or kill bacterial growth in other words the bacteria are ‘resistant ‘’ and continue to multiply in the presence of therapeutic level of an antibiotic.**

**MECHANISM OF ANTIBIOTIC RESISTANCE**

**DENIED ACCESS :Antibiotics wants to pass the bacterial cell membrane becomes impermeable for antibiotic eg: Imipenem**

**ANTIBIOTIC MODIFICATION: In second step antibiotic becomes modified by the help of bacterial enzyme eg: beta lactamase inactivates pencillin**

**ALTERED TARGET SITE: Antibiotic cannot bind to its intended target because the target it self has been modified**

**PUMPING OUT: The antibiotic faster than it gets in eg:Tetracylines**

**ALTERNATIVE TARGET:( Typically enzyme )eg alternative pencillin binding protein (PBP2a) in MRSA**

**CAUSES OF ANTIBIOTIC RESISTENCE**

**Poor quality of antibiotics:**

* **Expired and fake antibiotics.**
* **Due to lack of quality compliance and monitoring.**

**Poor hygiene and sanitation:**

* **In some areas waste water from hospitals are poorly filtered wich allows resistant bacteria to escape.**
* **The bacteria spreads when people drink the water.**

 **SOLUTION TO THIS RESISISTANCE**

**Only use antibiotic when priscribed by a certified health professional.**

**Never demand antibiotic if your healthworker says you don,t need them .**

**Never use left over antibiotic .**

**Make information available on the impact of antibiotic resistance.**

**Q#5?**

**ANS:**

 INTRO DUCTION

\*a pathogen is a microorganism that is able to cause disease in a plant ,animal or insect.

\* PATHOGENICITY is the ability to produce disease in a host organism.

\* microbes express their pathogenicity by means of their virulence,a term which refers to the degree of pathogenicity of the microb.

\* DETERMINANTS OF VIRULENCE of a pathogen are any of its genetic or biochemical or structure feature that enable it to produce disease in a host .

\* the relationship b\w a host and a pathogen is dynamic ,since each modifies the activities and function of the other .

\* the outcome of such relationship depend on ;

\* the virulence of the pathogen

\* the relative degree of resistance or susceptibility of the host , mainly due to effectiveness of host defense mechanisms.

 MECHANISM OF BACTERIAL PATHOGENICITY

1# invasiveness; the ability to invade tissue.

 \*encompasses mechanisms for

 \* colonization (adherence and initial multiplication)

\* produce of extracellular substance which facilitate invasion

\* ability to by pass or overcome host defense mechanisms

2#TOXIGENESIS;

 Ability to produce toxins

* Bacteria may produce two types of toxins

1# exotoxins

2# endtoxins

* EXOTOXINS

 Are release from bacterial cell and may act at tissue sites remove from the site of bacteria growth.

* Endotoxins are cell associated substance (classic sense)its refer to lipopolysaccharide component of outer membrane of gram negative bacteria
* Endotoxin may be release from growth bacteria cell and that are lysed as a results of effective host defense eg lysozyme
* Some bacteria toxin may also act as the site of colonization and play a role invasion

MAIN TWO BACTERIA DISEASE

1# BRONCHITIS.

Bronchitis is an inflammation in the lungs that some people call a chest cold .

SYMPTOMS

* Fatigue
* Wheezing sound when breathing
* Tightness or dull pain in chest
* Shortness of breath
* Production of mucus (sputum) which can be clear, white yellowish gray or green in color rarely it may be streatked with blood

CAUSES

* Viruses usualy
* Air pollution
* Dust
* Cold
* Flu

TYPHOID

It is a bacteria disease caused by salmonella typhi.

\*transmitted through ingestion of food or drink contaminated by feaces or urine of infected people

 SYMPTOMS

* Headache\anorexia
* Abdominal discomfort
* Lethargy
* Diarrhea
* Chest congestion
* Vomiting
* Slow heart beat
* Soft palpable spleen
* Hepatomegaly

CAUSES

* Contact with chronic asymptomatic typhoid carrier
* Water is contaminated with sewerage system .