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**Final-Term Examination 2020**

Course Title: ,Medical microbiology DT 4<sup>th</sup>

Instructor: Muhammad sohail

**Time: 6 hours**

**Total Marks: 50**

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Name: ..... ID.....

Q1. What do you know about parasites explain endo and ecto parasites in details

Q2. Explain protozoa, its characteristics and morphology, also classify protozoa on the basis of motility and reproduction into its types

Q3. Write down names of organelles and its functions present in paramecium and euglena

Q4. What is antibiotic resistance? Explain the mechanism of bacterial resistance. Its causes and solutions to the problem

Q5. Explain the mechanism of bacterial pathogenicity. Write down at least two bacterial diseases in detail.

*QNO:01.*

ANS: Parasites is define as an animal or plant that lives in or upon another organism (host) and draws its nutrient directly from it.

E.g include becteria, Viruses, fungi, protozoas and helminthes.

Study of parasitology.

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

## **CLASSIFICETION OF PARASITES**

1) ECTOPARASITES

2) ENDOPARASITES

### **1)ECTOPARASITES :**

The parasites that live on the outer surface or in the superficial tissues of the host are called ectoparasites. Infection caused by these parasites is called infestation.

E.g lice

### **2)\_ENDOPARASITES**

The parasites that live within the host are called endoparasites. Invasion by such parasites is called infection.

E.g leishmania

## **TYPES OF ENDOPARASITES**

### **A) OBLIGATE PARASITES**

The parasites that cannot exist without a host are called obligate parasites.

E.g toxoplasma gonodii

### **B) FACULTATIVE PARASITES**

The parasites that live a parasitic or free-living existence when an opportunity arises are called facultative parasites.

E.g naegleria fowleri

c) **ACCIDENTAL PARASITES** The parasites that attack an unusual host are called accidental parasites. E .g Echinococcus granulosus

d) **ABERRANT PARASITES**

The parasites that during migration in the host, reach a site where they cannot live or develop further are called aberrant parasites. E .g toxcara types.

## **QNO:2**

ANS: **PROTOZOA:**

The word protozoa is come from Greek protozoon word meaning “first animal”.

Protozoa are unicellular (may be multicellular) eukaryotic microorganism.

Protozoa constitute a large group of about 65000 species. Most of which are harmless free living and inhabits water and soil.

A few species are pathogenic in nature parasitize human and other animals causing hundreds of million of infections in a year around the world.

## **CHARACTERISTICS**

Most unicellular organism with fully functional cell.

Live freely, may be parasitic or symbiotic

Protozoa are chemo-hetrotrops

They are motile have locomotive organelles.

E.g Flagella and cilia for movement

## **MORPHOLOGY**

Protozoa are eukaryotic resemble to animal cell, contain major cell organelles (including Nucleus, Mitochandria)

They are microscopic in size less than 50 m.

Their organelles are highly specialized for feeding, reproduction and movement

They cytoplasm of protozoa are divided into an outer layer called ectoplasm and an inner layer called endoplasm.

Ectoplasm helps in movement, feeding protection

Endoplasm houses Nucleus, mitochondria and food

Some protozoa have special appendages Flagella and Cilia that helps in their movements

Freshwater protozoa have contractile vacuoles to pump out excess water

Their shape may remain constant (specially in ciliates) or change constantly ( as seen in Amoeba)

### **CLASSIFICATION OF PROTOZOA**

Protozoa are classified on the basis of their motility and method of reproduction

They are classified into four types

- 1) Flagellates
- 2) Ciliates
- 3) Sarcodina
- 4) Sporozoates

### **REPRODUCTION IN PROTOZOA**

Protozoa can reproduce their off spring by both sexual and asexual methods

a) Asexual methods of reproduction are:

- . BUDDING
- . BINARY FISSION
- . SCHIZOGONY OR MULTIPLE FISSION

B) Sexual Methods

- . CONJUGATION
- . GAMETOGONY

**QNO: 3.**

**ANS: 1) CYTOPLASM:**

Homogenous shows colours ( green, brown, blue, purple, due to pigment.

.has submicroscopic protein fibers

.Arranged in parallel

.Divided into two protein endoplasm and ectoplasm

Ectoplasm, more gel like and endoplasm is voluminous and fluid.

**2) NUCLEUS:**

. eukaryotic nucleus have chromosomes, the nuclear substance, the nuclear membrane nucleoplasm

.one or many

.some have two

a) **MACRONUCLEUS:**

Large in size the controls the metabolic activity and regeneration process.

B) **MICRONUCLEUS:** small in size concerned with reproductive activity.

**FINDING STRUCTURE:**

.Pseudopodia in amoeba

.tentacular feeding tubes in suctorians.

.mouth in ciliates

.oral groove an indentation in the provide

.peristome this an oral groove with membrane

.cytopharynx it is an region through which the food must pass and is enclosed in the food vacuole.

**QNO:4**

## **ANS: 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 levels of an antibiotic.

## **MECHANISM OF ANTIBIOTIC RESISTANCE**

### **DENIED ACCESS :**

Antibiotics want to pass the bacterial cell membrane but membrane becomes impermeable for antibiotic: e.g. Imipenem

### **ANTIBIOTIC MODIFICATION:**

In second step antibiotic becomes modified by the help of bacterial enzyme. E.g. beta lactamase inactivates penicillin

### **ALTERED TARGET SITE:**

Antibiotic cannot bind to its intended target because the target itself has been modified.

### **PUMPING OUT:**

The antibiotic faster than it gets in: e.g. tetracyclines

### **ALTERNATIVE TARGET:**

(typically enzyme): e.g. alternative penicillin binding protein (PBP2a) in MRSA.

## **CAUSES OF ANTIBIOTIC RESISTANCE**

### **OVER PRESCRIPTION OF ANTIBIOTICS**

1. Physicians prescribe medicine without detecting the pathogen.
2. Prescribe broad spectrum antibiotics when narrow spectrum is actually needed.

### **PATIENT NON-COMPLIANCE**

1. Antibiotics are prescribed in a specific dose regimen.
2. Patient forget to take medicine on right time .
3. Unable to afford full course.

## **OVER DOSE OF ANTIBIOTICS**

- . Antibiotics taken as OTC drug.
- . Retail drug store present a chaotic situation during drug distribution.
- . Patients demand for antibiotics for normal cold, fever.

## **USE OF ANTIBIOTICS ON DOMESTIC ANIMALS**

- . A good chance for antibiotics to develop resistance.
- . Spreading of resistance microbes through water and food.

## **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 which allows resistant bacteria to escape.
- . The **bacteria spreads when people drink this water.**

## **SOLUTION TO THIS RESISTANCE**

- 1) Only used to antibiotic when prescribe by certified health professional
- 2) Never demand antibiotic if your health worker say you need them
- 3) Never used left antibiotic
- 4) Never share antibiotic with other
- 5) Make information available on the infect of antibiotics resistance

**QNO: 05**

**ANS: PATHOGENICITY**

Is the ability to produce disease in a host organism

**MECHANISMS OF BACTERIAL PATHOGENICTY**

**1) INASIVENESS:**

The ability to invade tissues.

- . encompasses mechanisms for
- . colonization (adherence and initial multiplication)
- . production of extracellular substances which facilitate invasion (invasions) and
- . Ability to bypass or overcome host defense mechanisms.

**2) TOXIGENSIS:**

Ability to produce toxin.

. bacteria may produce two types of toxins.

- i) Exotoxins and
- ii) Endotoxins.

**Exotoxins:**

Are released from bacterial cells and may act at tissue sites removed from the site of bacterial growth.

**Endotoxins:**

Are cell-associated substance. (classic sense, endotoxin refers to the lipopolysaccharide component of the outer membrane of Gram-negative bacteria).

Endotoxin may be released from growing bacterial cells and cells that are lysed as a result of effective host defense (e.g. lysozyme) or the activities of certain antibiotics (e.g. penicillins and cephalosporins).

Hence bacterial toxins both soluble and cell associated. May be transported by blood and lymph and cause cytotoxic effects at tissue sites.

Some bacterial toxins may also act at the site of colonization and play a role in invasion.



## **BACTERIAL DISEASES**

### 1) BRONCHITIS

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

#### SYMPTOMS AND CAUSES

##### **SYMPTOMS:**

- . Fatigue
- . wheezing sounds when breathing
- . tightness or dull pain in the chest
- . shortness of breath
- . production of mucus (sputum), which can be clear, white, yellowish-gray or green  
In color –rarely, it may be streaked with blood.

##### **CAUSES**

Viruses usually

air pollution

dust

cold

flu

##### **COLD:**

Chronic obstructive pulmonary disease, is a lung disorder that makes it hard to breath

##### **SYMPTOMS**

###### *PRIMARY SYMPTOMS*

Shortness of breath in everyday activities

Wheezing

Chest tightness

Constant coughing

Producing a lot of mucus

Feeling tired

Frequent colds or flu

**SECONDARY SYMPTOMS:**

Swollen legs or feet from fluid buildup

Weight loss

Less muscle strength and endurance

A headache in the morning

Blue or grey lips or fingernails (due to low oxygen levels)