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Subject: Clinical mycology and parasitology

Q1: Write down the life cycle of Enterobius vermiculaires.

Answer:

Enterobius vermiculaires :

This disease caused by pinworm infection Enterobiasis.

Life cycle:

- The life cycle is confined to humans.
- At night, the female migrates from the anus and releases thousands of fertilized eggs on the perianal skin and into the environment.
- Within 6 hours, the eggs develop into embryonated eggs and become infectious.
- Reinfection can occur if they are carried to the mouth by fingers after scratching the itching skin.
- The infection is acquired by ingesting the worm eggs.
- The eggs hatch in the small intestine, where the larvae differentiate into adults and migrate to the colon.
- The adult male and female worms live in the colon, where mating occurs.

Pathogenesis & Clinical Findings

- Perianal pruritus is the most prominent symptom.
- Pruritus is thought to be an allergic reaction to the presence of either the adult female or the eggs.
- Scratching predisposes to secondary infection.

Laboratory Diagnosis

- The eggs are recovered from perianal skin by using the Scotch tape technique and can be observed microscopically.
- Unlike those of other intestinal nematodes, these eggs are not found in the stools.
- The small, whitish adult worms can be found in the stools or near the anus of diapered children.

Q2: Describe pathogenesis of Ascaris.

Answer:

Pathogenesis of Ascaris:

- Ascaris pneumonia with fever, cough, and eosinophilia can occur with a heavy larval burden.
- Abdominal pain and even obstruction can result from the presence of adult worms in the intestine.
- The major damage occurs during larval migration rather than from the presence of the adult worm in the intestine.
- The principal sites of tissue reaction are the lungs, where inflammation with an eosinophilic exudate occurs in response to larval antigens.
- Because the adults derive their nourishment from ingested food, a heavy worm burden may contribute to malnutrition, especially in children in developing countries.
- Most infections are asymptomatic.

Laboratory Diagnosis:

- Diagnosis is usually made microscopically by detecting eggs in the stools
- Occasionally, the patient sees adult worms in the stools.

Q3: Explain the transmission and life cycle of Entamoeba histolytica in detail.

Answer:

Transmission of Entamoeba histolytica:

- Transmission of Entamoeba histolytica from man to man is effected through the ingestion of these cysts.
- Fecal of contamination of drinking water, vegetables, and food are then primary causes.
- Eating of uncooked vegetables and fruits which have been fertilized with infected human feces has often lead to occurrence of disease.
- Transmission through fecal-oral routes, sexual transmission can also occur.

Life cycle of Entamoeba histolytica:

1. **Cysts:** Cysts comes to the stomach. The cysts are resistance to the stomach environment and passes to the small intestine.
2. **Small intestine:** Each cysts divide to produce 8 trophozoites in the small intestine.
3. **Trophozoites:** these trophozoites will then move to the "colon" of the "large intestine" these trophozoites will start colonization.
   - Now, they can cause two types of infections,
   - Two types of infections

I. Invasive infections:

- Occurs 10%
- Serious condition

II. Non- invasive infection:

- Occurs 90-% of the time
- Not severe

4. Now, in case of non-invasive infection.
   - **Histolytica trophozoites:** Will just go on the surface on the mucus layer and can multiply by binary fusion, colonized at the surface of mucus membrane and will form new cysts.
     - Trophozoites-----→binary fission-------→New cysts
     - Trophozoites just produce a lot of cysts. It is called non-invasive infection do not invade the colon cells.
     - The cysts will out of the body with stools and now this cysts can infect new human by contamination of drinking water or unhygienic food.
     - So essentially, in non-invasive infection these trophozoites will live in human body asymptomatically as cause mild diarrhea, abdominal discomfort.
5. **Amoebic dysentery**
   - The trophozoites will invade and colonize the colonic epithelial cells.
   - And this will cause the epithelial cells to lyse (to dic) which will create "ulcers" with in the large intestine.
   - Neutrophils will response to the invasion and will cause further damage through lysing →leads to "ulcers".
   - The epithelium will start creating ulcers with in the large intestine after the damage to colon cells and mucus membrane, the trophozoites will move toward the blood stream.
6. **Extra intestinal amoebiasis**
   - After entering the blood the trophozoites can target other organs.
   - So, in invasive infection, through the blood stream trophozoites can infect other sites such as live, lungs, brain.

Q4: How will you diagnose Trypanosoma Cruzi inside a laboratory?

Answer:

Laboratory Diagnosis

- Acute disease is diagnosed by demonstrating the presence of trypomastigotes in thick or thin films of the patient's blood.
- Both stained and wet preparations should be examined, the latter for motile organisms.
- Because the trypomastigotes are not numerous in the blood, other diagnostic methods may be required, namely,
  (1) a stained preparation of a bone marrow aspirate or muscle biopsy specimen (which may reveal amastigotes);
  (2) Culture of the organism on special medium.

Q5: Enlist Leishmania species names. Summarize the clinical findings of all species of Leishmania.

Answer:

Name of Leishmania species:

1) Leishmania donovani
2) Leishmania tropica
3) Leishmania mexicana
4) Leishmania braziliensis

1). Leishmania donovani clinical finding:

- Symptoms begin with intermittent fever, weakness, and weight loss
- Massive enlargement of the spleen is characteristic
- Hyperpigmentation of the skin is seen in light-skinned patients (kala-azar means black sickness)
- The course of the disease runs for months to years
- Initially, patients feel reasonably well despite persistent fever
- As anemia, leukopenia, and thrombocytopenia become more profound, weakness, infection, and gastrointestinal bleeding occur
- Untreated severe disease is nearly always fatal as a result of secondary infection

2).Leishmania tropica, 3).Leishmania mexicana, 4).Leishmania braziliensis clinical findings:

- The initial lesion of cutaneous leishmaniasis is a red papule at the bite site, usually on an exposed extremity.
- This enlarges slowly to form multiple satellite nodules that coalesce and ulcerate.
- There is usually a single lesion that heals spontaneously in patients with a competent immune system.
- However, in certain individuals, if cell-mediated immunity does not develop, the lesions can spread to involve large areas of skin and contain enormous numbers of organisms.
- Mucocutaneous leishmaniasis begins with a papule at the bite site, but then metastatic lesions form, usually at the mucocutaneous junction of the nose and mouth.
- Ulcerating lesions destroy nasal cartilage but not adjacent bone.
- These lesions heal slowly.

The End