PARASITOLOGY 3 & 4 – HELMINTHS

Date: Monday, January 7, 2019 8:30 and 9:30 AM


EDUCATIONAL GOALS AND OBJECTIVES

After completing the assigned readings and attending the lectures related to the helminths, you will be able to a) identify the blood and the tissue helminths; b) classify them as nematodes, trematodes and cestodes; and, for each of them, c) describe the clinical manifestations.

To achieve the goal of the lecture you will be able to:

1. Define life cycle and list the reasons why life cycle might determine: 1) geography of helminth infections and 2) the length of time a person who leaves an endemic area remains infected.

2. Identify the mechanism of transmission for each of the helminth infestations covered in these lectures
   a. Know the names of the relevant vectors.

3. List the intestinal nematodes that migrate through the lung and cause pulmonary symptoms.
   a. List the means by which human acquire each of the infections.

4. Name the one nematode and the one cestode that can complete their life cycles in the human and, through autoinfection, cause lifelong infection.

5. List the intestinal nematodes that acquired by fecal oral route, mature in the intestine and do not migrate to the lung or other organs.

6. Describe the three clinical phases of trichinosis--intestinal, migration and recovery.

7. From a photomicrograph of an ovum recovered from a stool sample of an infected person, identify agent as Trichuris trichiura.

8. Given a clinical description:
   a. Identify Ascaris lumbricoides as the cause of a patient’s passing an earthworm-sized worm in a stool.
   b. Identify hookworm as a possible cause of microcytic anemia in a child from rural Bolivia who has helminth ova in the stool.
c. Identify *Enterobius vermicularis* as a possible cause of protracted perianal itching in two- and three-year-old siblings in Berwyn and indicate what test you would do to prove the diagnosis.
d. Identify *Trichinella spiralis* as a possible cause of an illness consisting of high fever, severe myalgias, periorbital edema and palpitations in a Polish immigrant who makes pork sausage at home.
e. Identify *Strongyloides stercoralis* as a possible cause of septicemia, severe diarrhea, pneumonia and eosinophilia in a young African person who was neutropaenic after three cycles of chemotherapy for non-Hodgkin’s lymphoma.
f. Identify *Trichuris trichiura* as the likely cause of abdominal pain, diarrhea, weight loss and rectal prolapse with tiny visible worms seen in the exposed rectal mucosa in a three year old child from rural Brazil.

9. List three tissue nematodes whose microfilariae circulate in the bloodstream of man.

10. Identify the tissue nematode in which the microfilariae circulate in the subcutaneous tissues and eye of man.

11. Given a clinical description:
   a. Identify *Wuchereria bancrofti* or *Brugia malayi* as a cause of lymphangitis and lower body swelling in a middle aged man from the tropics.
   b. Identify *Onchocerca volvulus* as a cause of blindness and sagging areas of skin in an African man.
   c. Identify *Loa loa* as the cause of an infected person’s seeing the adult filarial worm in the bulbar conjunctiva when in front of a mirror.

12. Identify *Dracunculus medinensis* as the thin thread like structure seen in the ulcer on the lower leg after a blister had ruptured in a person living in Somalia.

13. List four tapeworms that develop to adult stage in the human intestine.

14. Identify the cestode in which man, the definitive host, may, after ingesting ova from another man’s feces, support larval development of the cestode resulting in cysts in the brain and other tissues.

15. Identify the food source for the following tapeworms: *Taenia saginata, Taenia solium, Diphyllobothrium latum*.

16. Identify the test used to diagnose infection with the following tapeworms: *Taenia saginata, Taenia solium, Diphyllobothrium latum, Hymenolepis nana*.

17. Given a clinical description:
   a. Identify *Diphyllobothrium latum* as a cause of Vitamin B12 deficient anemia in a person with tapeworm ova in the stool.
b. Identify \textit{Hymenolepsis nana} as the cause of severe diarrhea in a person with tapeworm ova in the stool and explain why intestinal symptoms are more likely to occur with \textit{Hymenolepsis nana}.

c. Identify the larval form of \textit{Teania solium} as a cause of seizures in a patient with a compatible brain MRI (image to be shown).

18. Describe the mechanism of transmission in echinococcal disease.

19. Given a clinical description, suggest echinococcosis as the likely cause of an enlarged liver with a complex liver cyst, daughter cysts and calcifications disclosed on an MRI image in a person from Bulgaria.

20. Describe the mechanism by which the three schistosome species infect humans and how they cause disease in the liver and urinary tract.

21. Identify the form (adult, cercaria, miracidium or ovum) of the schistosome parasite that elicits the inflammation and fibrosis which characterizes chronic schistosomiasis.

22. Given a clinical description and a photomicrograph of an ova of \textit{Schistosoma mansoni}, diagnose \textit{Schistosoma mansoni} as the likely cause of physical signs of portal hypertension, ascites and stools positive for the ova in a person from Africa.

23. Given a clinical description and a photomicrograph of a urine sample containing ova of \textit{Schistosoma haematobium}, diagnose \textit{Schistosoma haematobium} as the likely cause of dysuria, frequency, hematuria and urine positive for the ova in a person from Africa.

24. What animal serves as the intermediate host for the three schistosomes?

25. Identify the mechanism by which man acquires an infection with \textit{Clonorchis species}, the biliary fluke, and with \textit{Paragonimus westermani}, the lung fluke.

26. Diagnose \textit{Paragonimus westermani} as the cause of a six week illness characterized by fever, weight loss, productive cough, chest pain, chest x-ray disclosing right pleural effusion with a thick walled cavity seen in the right lung and operculated ova identified in the sputum in a young man recently immigrating from Myanmar.

27. Name the helminthic infection associated with an increased incidence of cholangiocarcinoma, with squamous cell cancer of the urinary bladder.