

# WORM MANIFESTATIONS

- diagnosis of parasitic infections: a thorough history of the patient's illness.
- Epidemiologic aspects of the illness are important
- the risks of acquiring many parasites are closely related to occupation, recreation, or travel to areas of high endemicity.

## HELMINTHIC INFECTIONS:

- hookworm,
- ascariasis,
- enterobiasis,
- strongyloidiasis,
- Cestodiasis.
- Mostly not associated with clearly defined manifestation of disease,
- can cause significant pathology.
- factor determining the pathogenicity: population density.
- high risk populations:
  - recent immigrants from Southeast Asia, the Caribbean, Mexico, and Central America.
  - institutionalized patients (both young and elderly),
  - preschool children in day care centres,
  - homosexual individuals.
- Certain conditions and drugs (fever, corticosteroids, and anaesthesia)
- Immunocompromised hosts
- infection of the small intestine
- caused by either *Ancylostoma duodenale* or *Necator americanus*.
- The life cycles of both species of hookworm are similar.

- The adult worms live in the small intestine attached to the mucosa.
- mucosal injury is usually caused by mechanical and lytic destruction of tissue.
- The females liberate eggs, which are eliminated in the feces and develop into larvae.
- Infective larva enter the host in contaminated food or water
- or penetrate the skin, where a papular eruption with localized edema and erythema can result.
- The loss of blood can lead to anemia and hypoproteinemia
- Stool should be examined for eggs and the rhabditiform larvae.
- Eosinophilia (30% to 60%) may be present in patients during early infection.
- **Mebendazole**, an oral synthetic benzimidazole, is the agent of first choice.
- It is also effective against ascariasis, enterobiasis, trichuriasis.
- The adult dose for treatment of hookworm infestation is 100 mg twice daily for 3 days.
- Pediatric patients older than 2 years of age should receive the same dose as adults.
- **Albendazole** is an alternative agent.
- caused by the giant roundworm *Ascaris lumbricoides*.
- Female worms range from 20 to 35 cm in length.
- more commonly found in areas where sanitation is poor.

### **Clinical Manifestations:**

- During migration of the larvae through the lungs, patients can present with pneumonitis, fever, cough, eosinophilia, and pulmonary infiltrates.
- Other symptoms: abdominal discomfort, abdominal obstruction, vomiting, and appendicitis.
- Diagnosis is made by demonstrating the characteristic egg in the stool.

- In both adults and pediatric patients older than 2 years of age, the treatment for ascariasis is mebendazole 100 mg twice daily for 3 days.
- An alternative drug for ascariasis : albendazole 400 mg as a single dose.
- pinworm infection
- caused by *Enterobius vermicularis*.
- The pinworm is a small, thread-like, spindle-shaped worm about 1 cm in length.
- The majority of those infected are children.
- The most common problem with enterobiasis is cutaneous irritation in the perianal region, made by the migrating females or the presence of eggs.
- other complications: appendicitis and intestinal perforation
- The intense pruritus and scratching can cause dermatitis and secondary bacterial infections.
- In children, the itching can cause loss of sleep and restlessness.
- The most effective method of diagnosing pinworm infections is by the use of perianal swab using adhesive Scotch tape.
- The common agents for treatment include pyrantel pamoate,
- mebendazole, or albendazole.
- The dose of pyrantel pamoate is 11 mg/kg (maximum 1 g) as a single dose that can be repeated in 2 weeks.
- The dose of mebendazole for adults and children older than 2 years of age is 100 mg as a single dose; this may be repeated in 2 weeks.
- The dose of albendazole for adults and children older than 2 years of age is 400 mg, and should be repeated in 2 weeks.
- Following treatment, all bedding and underclothes should be sterilized by steaming or washing in the hot water cycle of a regular washing machine; this will eradicate the eggs.

- Bathroom rugs and toilet accessories also should be cleaned in a similar way.
- caused by *Strongyloides stercoralis*,
- primarily seen among institutionalized populations (mental homes, mentally disabled children's homes) and immunocompromised
- individuals (patients with human immunodeficiency virus)
- patients with hematologic malignancies.
- The worm is usually found in the upper intestine where the eggs are deposited and hatch to form the rhabditiform larvae.
- The rhabditiform larvae (male and female) migrate to the bowel where they may be excreted in the feces.
- If excreted in the feces
- the larvae can evolve into either one of two forms after copulation:
  - (a) free-living non-infectious rhabditiform larvae or
  - (b) infectious filariform larvae.
- The filariform larvae can penetrate host skin, travel to the lungs via the bronchi and glottis and make their way to the small intestine.
- At times, the filariform larvae may not pass out in the feces but instead migrate to the lungs and produce progeny, a process called autoinfection.
- This can result in hyper infection (i.e., increased number of larvae in intestine, lungs and other internal organs), especially in immunocompromised hosts.
- Symptoms with acute infection may appear with localized pruritic rash but heavy infestations can produce eosinophilia, diarrhoea, abdominal pain and intestinal obstruction
- Administration of corticosteroids or other immunosuppressive drugs to an infected individual can result in hyper infections and disseminated strongyloidiasis.
- Diagnosis of strongyloidiasis is made by identification of the rhabditiform larvae in stool, sputum, duodenal fluid, and

cerebrospinal fluid, by small bowel biopsy specimens, or by antigen testing (ELISA assay).

- The drug of choice for strongyloidiasis is oral ivermectin 200 mcg/kg/day for 2 days
- the alternative is albendazole 400 mg twice daily for 7 days.
- In a patient with hyperinfection or disseminated strongyloidiasis, immunosuppressive drugs should be discontinued and treatment initiated with ivermectin 200 mcg/kg/ day until all symptoms are resolved (duration: 5 to 14 days).
- Patients should be tested periodically to ensure the elimination of the larvae.
- Individuals from endemic areas, who are candidates for organ transplantation, must be screened for *S. stercoralis*.
- Tapeworm infection caused by *Taenia solium*
- *result of ingestion* of poorly cooked pork that contains the larvae or cysticercus.
- Cysticercus, when released from the contaminated meat by host digestive juices, matures into the adult tapeworm and attaches to the host jejunum.
- Cysticercosis is a systemic disease caused by the larva of *T. solium* (*oncosphere*) and is usually acquired by ingestion of eggs in contaminated food or by autoinfection.
- The larvae can penetrate the bowel and migrate through the bloodstream to infect different organs including the central nervous system (neurocysticercosis).
- The larvae matures in about 8 weeks and remain as a semitransparent, oval-shaped, fluid-filled bladder in tissues.
- Cysticercosis in most tissues may not produce major

## symptoms

- usually manifest as subcutaneous nodules, primarily in the arms, legs, and chest.
- penetration of the larval stage (cysticercus) into the central nervous system can produce hydrocephalus, intracranial hypertension, stroke, and seizure activity.
- Epileptic seizures may be the presenting symptoms in patients with neurocysticercosis
- Clinical presentation, primarily seizure history, together with radiographic demonstration (CT and MRI) of the cysticercus within the bladder or calcified cysts in the central nervous system, is diagnostic for neurocysticercosis.
- Serologic diagnosis is made by the use of an enzyme- linked immunoelectrotransfer blot assay, which is considered highly sensitive and specific for cysticercosis
- Cysticercosis (excluding neurocysticercosis) is normally not treated.
- The management for neurocysticercosis include surgery, anticonvulsants (neurocysticercosis- induced seizures), and antihelminthic therapy.
- Antihelminthic therapy, if one decides this is an option, is albendazole 400 mg twice daily for 8 to 30 days.
- The dose and duration of therapy with albendazole is not clearly defined.
- The paediatric dose of albendazole is 15 mg/kg (maximum: 800 mg) in two divided doses for 8 to 30 days.
- The doses for both adults and paediatric subjects may be repeated if necessary.
- Praziquantel is an alternative therapy.