

Intestinal Helminths

Intestinal helminth infestations most commonly affect travelers, migrant laborers, refugees, children of foreign adoptions, and the homeless. Parasitic infections may be associated with day care centers and overseas travel.

I. Clinical Evaluation

- A. Intestinal helminths are usually asymptomatic, but serious infections may cause symptoms ranging from abdominal discomfort to severe pain. Anorexia, nausea, diarrhea, pruritus, rectal prolapse, bowel obstruction, and death may occur.
- B. Allergic manifestations, such as hives and eosinophilia, may develop. The worms may sometimes spontaneously exit the body through the anus.
- C. **Stool Examination**
 - 1. Examination of the stool for ova and parasites is the most important test for helminthic infection.
 - 2. Stools are collected using plastic wrap under the toilet seat. A spatula is then used to collect samples, preferably portions with visible mucus or blood. Fresh stool may also be obtained by rectal examination.

II. Enterobiasis

- A. Pinworms (*Enterobius vermicularis*) are the most common helminth. Pinworms present as anal pruritus in irritable, sleepless children, and they are most common in temperate regions.
- B. Many patients are asymptomatic. Heavier infections may cause insomnia, restlessness, vulvovaginitis, loss of appetite, and intractable anal itching.
- C. Pinworms are about 10 mm in length. The female worm has a pin-shaped tail.
- D. At night, worms migrate through the anus, then deposit their eggs and die on the perianal skin. Microscopic eggs infest clothing, bedding, and other surfaces, often spreading to the entire family.
- E. Pinworms are best diagnosed by examining the perianal skin. The stool is usually negative for ova and worms. To obtain the eggs, a tongue blade covered with a segment of clear tape is placed sticky-side down over the unwashed perianal skin in the morning. Several specimens are collected on three separate mornings, then taped to glass slides and taken to a laboratory for examination.
- F. The elongate, colorless eggs measure 50 to 60 μm and are flattened on one side.
- G. Glistening adult worms may also be detected if the anus is examined with a flashlight.

very late at night or early in the morning.

H. Treatment

1. Mebendazole (Vermox), one 100-mg tablet orally, is safe and effective, except in pregnant women. A second dose is given 10 days later. The entire family is treated.
2. Infested clothing and bedding are washed, fingernails are kept trimmed, and the perianal area should be kept clean. Dogs and cats do not spread this infection.
3. Relapses are common.

III. Ascariasis

- A. Roundworms (*Ascaris lumbricoides*) measure up to 18 inches in length. The infection is fairly common in the rural southeastern United States and is frequent among immigrants. *A. lumbricoides* only infests humans.
- B. *Ascaris* eggs reach the soil in feces, and they may persist in the soil for more than a decade until they are accidentally consumed.
- C. In the gut, adult worms may aggregate, causing intestinal obstruction at the ileocecal valve. Sometimes worms occlude the biliary tree, causing biliary colic, hepatitis, pancreatitis, or peritonitis. Fever, illness or even spicy foods may cause the worms to exit the body through the mouth, nose, or rectum. However, most patients experience only vague abdominal discomfort or nausea.
- D. **Treatment**
 1. Roundworms are eradicated with mebendazole (Vermox), 100 mg bid for three days.
 2. A follow-up examination of stool for ova and parasites should be performed in two months because treatment may fail. Family screening is necessary.

IV. Trichuriasis

- A. Whipworm (*Trichuris trichiura*) infestation is less common than *Ascaris* infestation, occurring in the southeastern states and in foreign immigrants.
- B. Whipworm eggs incubate in the soil. When swallowed, they travel to the colon.
- C. Adult whipworms are 30-50 μm in length, with a thread-like anterior portion. They can live in the intestine and produce eggs for several years. The anterior "whip" portion of these worms burrows into the intestinal lining, causing mild chronic blood loss and symptoms similar to proctitis and inflammatory bowel disease. Rectal prolapse, diarrhea, loss of appetite, and hives may occur.
- D. Treatment of trichuriasis is the same as for ascariasis.

V. Less Common Parasites

- A. Hookworms, strongyloidiasis and tapeworms are much less common in the United States but are significant in immigrants from tropical regions. These infections tend to be

persistent.

B. Hookworms

1. Hookworm juveniles develop in the soil from eggs in feces. The larvae are capable of penetrating the skin (usually the bare feet) and causing a pruritic rash. The larvae eventually reach the small intestine.
2. Adult hookworms are about 10 μm in length, with a hooked anterior end that they use to consume 0.03-0.15 mL of blood per day. They may live for 10 to 15 years.
3. Clinical manifestations include iron deficiency anemia, chronic fatigue, geophagia, failure to thrive, and depression.
4. Treatment consists of mebendazole and iron supplementation for anemia.

C. Strongyloidiasis

1. Filariform larvae are capable of penetrating intact skin. It may persist for 40 years or more in the small intestine, and it can also be spread as a sexually transmitted disease. Persistent unexplained eosinophilia in a patient from a region where *Strongyloides* infection is endemic should prompt serologic testing because this infection may occur with negative stool specimens.
2. Symptoms of strongyloidiasis are usually absent but may include pruritus, pneumonia, abdominal cramping, and colitis.
3. Treatment requires thiabendazole (Mintezol).

D. Tapeworms

1. The most common tapeworm in adults is *Taenia saginata*, the beef tapeworm, which is transmitted through consumption of inadequately cooked beef. *Cysticerci* rapidly develop into large tapeworms, 10 to 15 feet in length, in the gut. Diagnosis is made on the basis of active or passive passage of ribbon-like tapeworm segments from the rectum or by the discovery of the eggs in a stool.
2. The related *Taenia solium*, or pork tapeworm, is far more dangerous than *T. saginata* since its eggs can cause cysticercosis, the invasion of human tissue by developing larval forms. In severe cases, the larvae may invade the central nervous system, causing neurocysticercosis.
 - a. *T. solium* is found in Central and South America and in immigrants from these regions. Patients with neurocysticercosis frequently present with seizures.
 - b. This diagnosis should be considered in the evaluation of a patient from Central or South America with a new-onset seizure disorder.
3. The fish tapeworm, *Diphyllobothrium latum*, is occasionally transmitted through the consumption of undercooked fish, especially fish from the Great Lakes region. It can

grow up to 30 feet long, and occasionally causes megaloblastic anemia.

4. The dwarf tapeworm, *Hymenolepis nana*, is the most common tapeworm in the U.S. This tapeworm is 1 inch in length, and it may continually autoinfect the patient through fecal-oral contact. Mice also serve as a reservoir, and ingestion of food contaminated with mouse droppings may spread the infection. *H. nana* infection may cycle in immigrant children for years.
5. Treatment of all tapeworms consists of praziquantel (Biltricide) or niclosamide (Niclocide). §