Pinworm

Maya Mundkur Greer, MSN, APRN, BC

The pinworm, or *Enterobius vermicularis*, is a parasite that commonly infects the intestines of humans. The male is 2 to 5 millimeters long and lives in the lower gastrointestinal tract. Females can be twice as long as males. Eggs take 1 to 2 months to mature in the gastrointestinal tract and become large enough to migrate. Pregnant females typically migrate to the rectal area to lay eggs, often during the night. Pinworms may also deposit their eggs along the perineum and even in the vagina. The females usually die after depositing their eggs.

Humans are the only known natural hosts; pinworms do not live in dogs and cats.

Clinical Course

Pinworm infection can cause intense itchiness in the perianal region. Persistent scratching can produce an excoriated rash. The discomfort from pinworms usually results in restless sleep. Thankfully, the infection is self-limited, and serious complications are rare.

Prevalence

Pinworm infection occurs worldwide and is very common. Prevalence rates are higher among pre-school and school-aged children. Up to 50 percent of institutionalized persons may be infected. While infection in adults is far less common, children with pinworms often infect parents and other household members.

Variables that increase risk of infection include: age (5–10 years old); presence of other children in the living area or living in an institution; sharing beds; and living in a warm, moist climate.

Transmission

Pinworm infection can be spread in several ways, most commonly by direct contact with the eggs. People can continually reinfect themselves by scratching the perianal area and touching their mouths or touching objects that are then eaten or placed in the mouth.

Pinworms also spread through indirect contact when someone touches clothes, underwear, or bedding that contain eggs. These eggs can then spread to food, toys, or other objects that often go into children's mouths. Eggs can also be dispersed around a room when contaminated articles are shaken, causing the eggs to settle into dust. In ideal conditions, the eggs can live up to 3 weeks on bedding, clothing, and dust; however, less than 1 out of 10 eggs will be alive after 2 days at room temperature.

Pinworm Eggs. These eggs of the human parasite Enterobius vermicularis, or "human pinworm", have been captured on cellulose tape. Photo courtesy of the CDC

A third mode of transmission is "retro-infection". This happens when the pinworms reinfect the host by hatching in the perianal region and then migrating back into the rectum.

Diagnosis

Perianal and perineal itching, especially at night, and a rash coupled with insomnia are the most common complaints of pinworm infection. However, many pinworm infections are entirely without symptoms.

The presence of pinworms can be confirmed in one of two ways. The first is direct observation of the adult worms around the anus, perineum, or entrance to the vagina. The optimum time to see the worms is 1 to 2 hours after a child has gone to bed or on awakening in the morning. A flashlight will help with the search. A second test is to observe the eggs, which are about the size of the head of a pin, under a microscope. A 2-inch strip of scotch tape can be applied to the child's perianal area in the morning before the child awakens. The tape may then be transferred to a glass slide for examination.

Pinworms can be identified about 50% of the time after a single attempt at one of these tests. These tests should be repeated over 3 to 5 consecutive mornings before accepting a negative result. Pinworm infection usually runs in families, and a diagnosis in one person calls for the examination of all family and household members.

Treatment

Most people in single family households will get rid of pinworms without treatment. Unfortunately, larger group settings such as shelters and day care centers facilitate transmission and persistent infection. Breaking the cycle of reinfection through direct and indirect contact can be very difficult. Early treatment and thorough examination of family members and close friends will increase the chances of eradication. If children in different families are diagnosed with pinworms within a short time, the entire shelter or day care facility may require treatment.

Pyrantel pamoate (Antiminth™) kills pinworms at dosages of 11 mg/kg to a maximum dose of 1 gram. Antiminth™ can be used in people of all ages and is not contraindicated in pregnant women. Some people develop headaches and stomach pains when taking the drug, but these side effects are uncommon. Antiminth™ is currently available without a prescription. Brand names include "Pin-X" and "Reese's Pinworm Medication".

Mebendozole (Vermox™) is an antihelminthic that comes in chewable tablets of 100 mg and has few side effects. Available by prescription, this medication is not recommended for pregnant women or children under two years of age.

Albendazole (Albenza™) is a pinworm medication available by prescription that is usually reserved for infections that are not cleared by the other preparations. A single 400 mg tablet is given by mouth. Once again, this medication is not recommended for pregnant women or children under the age of two.

Treatment with a second dose of medication (Vermox™, Antiminth™, or Albenza™) 14 days after the first dose has a cure rate of 90 percent. In rare circumstances 4 to 6 treatments may be necessary to get rid of the infection.

Vaseline™ and other over the counter creams or ointments can help relieve the itching caused by pinworms when applied to the perianal area.

Prevention and Control

The control of pinworms calls for personal and environmental hygiene. Staff must be particularly sensitive to an individual's feelings of guilt or embarrassment. Pinworms can infect the cleanest household. When discussing hygiene, staff should emphasize the ease of transmission and frequency of reinfection. Pinworms can spread easily to a whole family and throughout an entire family shelter unless the source is treated.

During treatment for pinworms, the linens, bedclothes, underwear, and toys of infected individuals should be washed in hot (131°F/55°C) soapy water. If washing is not possible, then the articles should be thoroughly vacuumed. Before cleaning, you can avoid dispersing the eggs into the air by handling every article with minimal shaking. Staff and guests should damp dust, damp mop, and/or vacuum the living space of infected guests and common rooms daily for several days after treatment to reduce the number of eggs that may reside in dust.

If the entire shelter needs treatment, all linens, bedclothes, and living space should be considered infected. Guests and staff should clean all articles and spaces as described above.

The following measures also help to reduce transmission:

- discourage scratching in the anal area;
- the use of gloves and close fitting bed clothes can be helpful;
- trim nails to minimize biting;

- wash hands with warm, soapy water before preparing, serving, or eating food and after using the toilet or changing diapers.
- avoid shaking or fanning the bedding.

Summary

Pinworms are tiny worms that live in a person's intestines. Female pinworms crawl to the rectal area at night to lay eggs, causing the infected person to itch and to sleep restlessly. While uncomfortable, pinworms rarely cause serious complications. However, they are easily spread among people who live or play closely together, particularly children. When a child scratches, the eggs of pinworms can get on the hands and under the fingernails. The child can then put his or her hands into the mouth or onto objects such as toys or food. The eggs are also easily spread around a room when infected linen or clothing is shaken.

When one person in a family is found to have pinworms, the entire family needs to be examined. When the infected person and close contacts are treated early, there is little risk to the rest of the shelter. If several cases happen in different families, the entire shelter may need treatment.

Pinworms reappear easily, but careful hygiene reduces the prospect of reinfection during treatment. You should consult the local board of health and caregivers for specific control measures regarding this infection. ■

Pinworm Medication List

Generic	Brand Name	Cost
albendazole	Albenza	$$$
mebendazole	Vermox	$
pyrantel pamoate	Antiminth (Pin-X, Reese's Pinworm Medication)	$

References

Pinworm infection. In: Pickering LK, et al., eds. *2000 Red Book: Report of the Committee on Infectious Disease.* Elk Grove Village, IL: American Academy of Pediatrics; 2000:449-451.

Bundy DAP, et al. Nematodes limited to the intestinal tract (Enterobius vermicularis, Trichuris trichuira, and Capillaria phillippinensis). In: Strickland GT, ed. *Hunter's Tropical Medicine and Emerging Infectious Diseases.* Philadelphia: WB Saunders; 2000:719-726.

Drugs for parasitic infection. *Medical Letter on Drugs and Therapeutics* 1998;40(1017):1-12.

Enterobiasis (Pinworm disease). In: Benenson AS, ed. *Control of Communicable Disease in Man.* Washington D.C.: American Public Health Association; 1990:157-159.

Hearns VL. Pinworms. In: Rakel RE, ed. *Saunders Manual of Medical Practice.* Philadelphia: W.B. Saunders; 2000.

Nelson JD, Bradley JS. *Nelson's Pocket Book of Pediatric Antimicrobial Treatment.* Lippincott Williams and Wilkins; 2000.

Pinworm infestation. In: Berkow R, ed. *The Merck Manual.* Rahway, New Jersey: Merck and Company; 2000: 2363-2364.

Owen RL. Parasitic diseases. In: Sleisenger MH, Fordtran JS, eds. *Gastrointestinal Disease: Pathophysiology, Diagnosis, and Management.* Philadelphia: W.B. Saunders Company; 1989.

Urbach AH. Pinworms. In: Burg FD, et al., eds. *Gellis and Kagan's Current Pediatric Therapy.* Philadelphia: WB Saunders Company; 1999.