Enterobius Vermicularis: Pinning Down the Problem

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Worldwide, more than a billion people are infected with intestinal parasites. While most are more common in the tropics and subtropics, particularly in regions with poor sanitation, October's **Bug of the Month**, *Enterobius vermicularis*, or the pinworm, are more common in temperate countries and are estimated to infect > 10% of children.

What are pinworms?

The helminth parasite, *Enterobius vermicularis*, is an intestinal nematode commonly known as the pinworm. Pinworms can cause perineal irritation and may cause sleep disturbances. Pinworm infestations are common in young children and are usually seen in the perineal regions, especially at night or early in the morning. Sometimes a pinworm may be observed on the surface of a freshly passed stool. Pinworms do not cause any serious health problems; however, they can cause itching and irritation of the perineal region. This can lead to sleep disturbances and irritability in young children.

The adult female pinworm has a long pointed tail and is approximately 8 mm to 13 mm in length; while, the adult male is shorter, at about 2.5 mm in length and is distinguished by a blunt tail. The adult worms survive for approximately two months in the bowel lumen. The gravid female worm migrates nocturnally out into the perianal region and releases up to 10,000 immature eggs which become infective within hours. Transmission occurs by hand-to-mouth passage of the infective eggs. The larvae hatch and mature entirely within the intestine. The intense itching that is reported in the perineal area results from the transfer of parasite in and out of the anus and on to the surrounding skin.

How are pinworms transmitted?

Pinworm infection is caused by ingesting pinworm eggs. The ease of person-to-person spread results in pinworm infections commonly found among family members and institutionalized populations. Self-infection/auto inoculation, results from perianal scratching and transport of infective eggs on the hands or under the nails to the mouth. Pinworms are usually spread from child to child. Eggs can stay on the skin for several hours and survive for two weeks on fomites. After being ingested, pinworm eggs stay in the upper part of the intestine until hatching, after which the worms move down the length of the intestine and then out the anus where they lay eggs. Pets do not spread pinworms directly, but may carry eggs temporarily if in recent contact with an infected person.

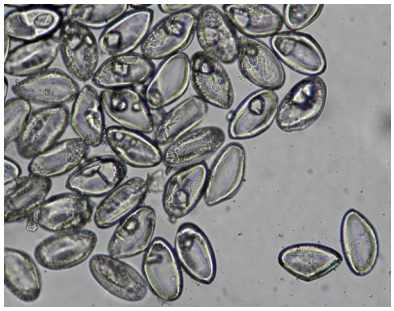

Figure 1. Pinworm eggs demonstrating characteristic appearance, one rounded and one flat edge.

When should infection with pinworms be suspected?

Perianal pruritus is the cardinal symptom of pinworm infections; however, in most cases, patients are asymptomatic. As a result of the nocturnal migration of the female worms, the itching (which is often worse at night) may lead to excoriation and bacterial superinfection. Abdominal pain and weight loss have been claimed to be caused by heavy infections. On rare occasions, pinworms invade the female genital tract, causing vulvovaginitis and pelvic or peritoneal granulomas. Pinworm infection rarely results in eosinophilia or elevated levels of

serum IgE, as this parasite is essentially an intraluminal organism which does not have systemic dissemination or manifestations thereof.

How are pinworms diagnosed?

Itching or irritation of the anal area could signal a pinworm infection; however, many individuals get itching in this area just from washing the area too frequently or too vigorously with soap. Examine the area around the anus searching for one-quarter-inch, white, threadlike worms that move. Since pinworm eggs are not usually released in the bowel, the diagnosis cannot be made by looking for eggs in the feces. Instead, eggs deposited in the perianal region are detected by the application of clear cellulose acetate tape to the perianal region in the morning. Low-power microscopic examination will reveal the characteristic pinworm eggs after the tape is transferred to a slide. Pinworm eggs are oval, measuring 55 µm by 25 µm and are flattened along one side (Figure 1).

Who is at risk?

In the US, it is estimated that 40 million people are infested with pinworms. School children account for a disproportionate number of cases. A case-control study from Taiwan reported significant factors associated with pinworm infection, including:

- playing on the floor,
- nail biting,
- failure to wash hands before meals and
- living in non-apartment dwellings.

Girls were at a higher-risk than boys; however, the risk difference between genders was not statistically significant. The study concluded that inadequate personal hygiene increases the risk for pinworm infection.

How are pinworms treated?

All affected individuals should be given an oral dose of:

- mebendazole (100 mg once), or
- albendazole (400 mg once), or
- pyrantel pamoate (11 mg/kg base once; maximum, 1 g).

The same treatment should be repeated once after 10 days to 14 days. The rationale for this dual treatment is that these agents only eradicate living parasites and not the parasites in the eggs. The secondary treatment will address the parasites that have recently hatched. To eliminate asymptomatic reservoirs of potential reinfection, all household members should also be treated. Household linens should be washed in hot water, these include all:

- sheets,
- blankets,
- towels and
- clothing.

Furthermore, everyone's fingernails (which may harbor pinworm eggs) should be clipped short and carefully cleaned. Rigorous attention to hand washing, particularly cleaning beneath the nail, is critical when attempts are being made to eradicate pinworms from the household.

What to tell patients

Hygiene measures can help to reduce the chances of pinworm reinfection or new infections in other people. Parents of an infected child should be instructed to have the child scrub his or her hands and fingernails thoroughly before each meal and after each use of the toilet. Eggs can collect under the nails, so the infected child's fingernails should be cut short and thumb-sucking and nail biting should be discouraged. Eggs scattered on the floor are infectious for one week to two weeks so vacuuming or wet mopping the child's entire room once a week can reduce the chance of reinfection. Machine-washing clothing or bed linens in warm water will kill any eggs present.

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