Threadworms

This is a very common nematode infection which occurs throughout the world. It is also known as pinworm or enterobiasis, as it is caused by infection with *Enterobius vermicularis*. The male threadworm is about 4 mm long and is rarely seen. The female is bigger at 1 cm long and a little under 1 mm in diameter. It is white and pointed at each end. It may be seen at night emerging from the anus to lay eggs. It does not appear to have any natural host other than humans and so family pets are not to blame. In the image below shows two female pinworms next to a ruler. The markings on the ruler are 1 mm apart.

Female threadworms lay an average of 11,000 tiny eggs, which are invisible to the naked eye. She lays these eggs outside the anus, or, in girls, around the vagina and urethra. Eggs are usually laid at night whilst the child sleeps. The eggs are accompanied by an irritant mucus, which causes intense pruritus and scratching. The eggs get on to the hands and from there to the mouth to re-infect. Eggs must be swallowed and exposed to digestive juices in the upper intestinal tract. Infection or re-infection can occur by directly swallowing, or by inhaling and then swallowing, the eggs. Occasionally, infection may occur when the eggs hatch on the mucosa and the larvae migrate back up the rectum.

Following ingestion of the eggs, the larvae hatch in the small intestine and establish themselves in the colon, reaching maturity in approximately two weeks. Adult worms live for up to six weeks.

Epidemiology

This is the most common helminthic infection in the UK. An average GP practice of 10,000 patients would expect about 40 consultations a year for threadworms but many more simply buy medication from a pharmacist. It tends to affect family groups or institutions. Poor hygiene and overcrowding are aggravating factors.

Prevalence is highest between the ages of 5 and 9 years but all ages may be affected.

Presentation

The presenting feature is often pruritus ani or pruritus vulvae, especially at night. Loss of sleep can cause behavioural problems. Girls presenting before puberty with vaginal discharge, urinary tract infection, or nocturnal enuresis should be checked for threadworm. Do not immediately assume sexual abuse.

Worms can be easily missed and may not move much, simply looking like flakes of skin. A parent may have seen something like a tiny piece of white cotton moving in the anal or vulval region. This are best seen at night or when the person is resting and so is less likely to be seen in the surgery.

Worms may be seen in the absence of symptoms or the presentation may be disturbed sleep.

Differential diagnosis

- **Perianal itching** may be due to irritation by deodorants, tight nylon underclothes, haemorrhoids, or perianal eczema. Deodorants and haemorrhoids are rather more a problem of adults than of children.
- A number of skin diseases may cause pruritus. Psoriasis is said not to itch but it may in the anogenital region.
- **Neurotic excoriation**.
- In some cases the possibility of sexual abuse must be considered but if this possibility is seriously entertained, the doctor's skills are greatly taxed. On the one hand, raising unfounded suspicion may jeopardise the relationship with the family. On the other hand, if it exists it must be recognised and stopped. Hence, the doctor needs to have enough grounds to make a decision and yet should not delve too deeply into history and examination. This has to be performed by an expert and, if the inexpert tries it before the duly appointed person, he or she may be 'trampling over the evidence'.
Investigations

Often the diagnosis is clear and no investigation is required. If there is a report of something like a tiny piece of cotton moving, there is no need for further investigation. A simple and useful test is the adhesive tape test for eggs. Transparent wide hypo-allergenic adhesive tape is applied to the perianal skin first thing in the morning, before wiping or bathing. It does not have to be left on overnight. The tape is then placed on a slide or put in a specimen container for later examination. Microscopy may be performed either in the local laboratory or in the surgery. Many tiny eggs are seen adherent to the tape.

Stool examination for eggs is more unpleasant and is positive in only 5% of cases.

Management

- Drug treatment is not mandatory. Attention to hygiene for six weeks will lead to the adult worms dying without having had the chance to re-infect. This may be useful if there is any objection to medication as in pregnancy.
- Hygiene measures include:
  - Wear tight underwear at night.
  - Have a bath or shower each morning and wash around the anus.
  - Change and wash underwear, nightwear, and, if feasible, bed linen and towels each day. Do not shake them as this spreads eggs. Do not share towels.
  - Keep fingernails short and clean. Wash hands and scrub under the nails first thing in the morning, after using the toilet or changing nappies, and before eating or preparing food.
  - Put toothbrushes in a closed cupboard, and rinse them well before use.
  - All the family should be treated together if possible as asymptomatic infection is common, and transmission may occur through handling of contaminated food, clothing, and bed linen.
  - Mebendazole is the drug of choice in adults and in children older than 2 years. It is given as a single oral dose, and is best repeated after two to three weeks in case re-infection has occurred. Mebendazole kills the worms.
  - Other possible drugs include albendazole and pyrantel pamoate.\(^2\)
  - The drugs do not harm threadworm eggs, which may remain viable for up to two weeks. To avoid re-infection it is important to clear the living environment of viable worm eggs on the day that drug treatment is started. The cleaning blitz in bedrooms and bathrooms must be followed by a continued routine of good hygiene.
  - Children with threadworm do not need to be kept off school or nursery but good hygiene within these establishments should be encouraged.

Complications

From the infection

- Scratching of the perianal skin may cause inflammation, laceration and secondary infection.
- Persistent or very heavy infestation can cause loss of appetite, weight loss, insomnia, enuresis, and irritability.
- Ectopic lesions means infestation outside the alimentary tract. Occasionally worms are found in the female genital organs.\(^3\) More rarely, they are found in the ears and nose. Rarely, worms invade the abdominal cavity, causing granulomas of the liver, ovary, kidney, spleen, and lung.\(^4\) Chronic pelvic peritonitis and ileocolitis have been described.

From treatment

There is no evidence that these drugs are harmful in pregnancy or breast-feeding but they are best avoided at that time with attention to hygiene. The same is true under 3 months of age and the drugs are not licensed. Changing the nappy at least every three hours is recommended.

Prognosis

Re-infection is common.

Prevention

Prevention relies on good hygiene, especially washing of hands before eating or preparing food. Sucking fingers or biting nails is to be discouraged. Treatment should be effective and it should be repeated to assure complete eradication.

Further reading & references

- Parasites A-Z; Centers for Disease Control and Prevention