

# Ascariasis

**Ascariasis**, or **roundworm** infection of the intestines, is common throughout the world in both temperate and tropical areas where sanitation and hygiene are poor. In those areas, everyone may be harboring the parasite. Ascariasis is one of the most common human parasitic infections. An estimated 1.4 billion people worldwide have ascariasis, and the disease is most common in **children between the ages of 3 and 8**. According to the World Health Organization, ascariasis causes approximately 60,000 deaths annually worldwide.

## Causes

Ascaris infection is caused by a parasitic roundworm called "*Ascaris lumbricoides*". This worm resembles the common earthworm. Ranging in length from 6 to 13 inches, the female worm may grow to be as thick as a pencil. *A. lumbricoides* is a parasite grouped with other helminthes or worms. There are three groups (or phyla) of Helminths:

- Cestodes: which include blood parasites or flukes
- Trematodes: segmented worms like tape worms
- Nematodes: roundworms like Ascaris.

Common parasitic roundworms apart from *A. lumbricoides* include: the pinworm, the hookworm, and the whipworm. Up to one hundred worms could potentially infect a single patient.

## Transmission

Almost more than any other parasitic disease, **inadequate personal hygiene** leads to Ascaris infection. Human feces found in fields, streets, and back yards are a major source of infective eggs in heavily populated areas. The eggs do not infect humans when first excreted by the roundworm. They usually are transmitted by **hand to mouth**. The use of human feces as fertilizer may also permit transmission of infective eggs through food that is grown in the soil and eaten without being thoroughly washed. The eggs are resistant to extremes of temperature and humidity. The eggs require several weeks to develop and become infective. After the eggs are swallowed, they pass into the intestines where they hatch into larvae and then begin their journey through the body. Once through the intestinal wall, the eggs reach the lungs by means of the bloodstream or lymphatic system.

- In the lungs, they pass through the air sacs, are carried up the bronchial tree with respiratory secretions and into the throat.
- After they arrive in the throat, the eggs are swallowed, then return to the small intestine where they grow, mature, and mate.

The worms become mature in about two months.

## Symptoms

If only a few roundworms are in the intestines, there may not be any symptoms. If symptoms exist, they are usually mild (vague or sporadic feelings of abdominal pain). The first sign of infection may be the **presence of a live worm in the vomit or stool**. If the larvae have migrated to the **lungs**, an illness resembling pneumonia with wheezing, cough, and fever may occur. This stage of the disease precedes the intestinal phase by weeks, and the symptoms are difficult for a healthcare provider to diagnose. If a heavy infection of worms is present, there may be a partial or complete **blockage of the small intestine**. The following symptoms may be present:

- Severe abdominal pain
- Vomiting
- Restlessness
- Disturbed sleep

The heavier or greater the worm infection, the more severe the symptoms. The pancreas may become inflamed. Serious infections, especially those causing blockages, can be fatal.

## Diagnosis

Once mature female roundworms are in the intestines, a healthcare provider can diagnose the infection by finding the **eggs (or live worms) in the stool**. Lung infection is more difficult to diagnose, but can be confirmed by finding evidence of the larvae in lung or stomach fluids. Microscopic identification of eggs in the stool is the most common method for diagnosing intestinal ascariasis. The recommended procedure is as follows:

- Collect a stool specimen.
- Fix the specimen in 10% formalin.
- Concentrate using the formalin-ethyl acetate sedimentation technique.
- Examine a wet mount of the sediment.

Where concentration procedures are not available, a direct wet mount examination of the specimen is adequate for detecting moderate to heavy infections. Larvae can be identified in sputum or gastric aspirate during the pulmonary migration phase (examine formalin-fixed organisms for morphology). Adult worms are occasionally passed in the stool or through the mouth or nose and are recognizable by their macroscopic characteristics.

## Treatment

Anti-parasite (anti-helminthic) medications are the primary treatment for ascariasis. The most common are mebendazole, albendazole and pyrantel pamoate. These medications kill the adult worms.<sup>[1]</sup> Although each medication can be taken as a single dose, and is very effective at killing adult worms, multiple doses are needed to cure ascariasis. In cases of heavy infestation, surgery may be necessary to repair damage the worms have caused and to remove worms. Intestinal obstruction or perforation, bile duct obstruction and appendicitis are complications that may require surgery.

### Holistic and alternative treatments

Some old "Mother's Remedies" for ascariasis are Sage tea, Tansy leaves and peach leaf tea. Sage tea is a laxative and an antiseptic. Tansy leaves may be crushed and put in whisky or dried and crushed with sugar. A tea made of tansy leaves must be used carefully as it is strong and never given to pregnant women. Half an ounce of dried peach leaves may be infused in a pint of boiling water and a tablespoonful given for a dose three times a day.<sup>[2]</sup>

### Complications

Complications related to typical ascariasis are rare. However, heavy infestations can cause complications. These complications include nutrition deficiencies, allergic reactions, pneumonitis from lung involvement and even intestinal blockage. In children, nutritional deficiencies can result due to loss of appetite and insufficient absorption of digested foods in ascariasis. In heavy ascariasis infestation, a mass of worms can block a portion of the intestine, causing severe abdominal cramping and vomiting.

## Epidemiology

### Prevalence

Ascariasis plagues more people in the world than any other parasitic infection. Up to 10% of the population of the developing world is infected with intestinal worms – a large percentage of which is caused by *Ascaris*. Worldwide, severe *Ascaris* infections cause approximately 60,000 deaths per year, mainly in children.<sup>[3]</sup> There are an estimated 4 million *Ascaris* infections in the United States, mostly in the poor.<sup>[4]</sup> Ascariasis tends to occur more commonly in places where sanitation is minimal and human feces is used to fertilize crops. As a result, the majority of *Ascaris* infections are concentrated in the developing world. Children are more likely to be infected and have higher levels of worms. *Ascaris* is found all over the world. However, it is most prevalent in warm, tropical climates, where eggs can survive the longest in the soil. It is less common in places that are arid and seasonal. Concentration of *Ascaris* seems to fall most heavily in South-East Asia with less cases in Africa and Latin America. As many as 1.4 billion people worldwide are infected with *Ascaris*, roughly a quarter of the world's population.<sup>[5]</sup>

## Animal Ascariasis

Pets, especially puppies and kittens, are also susceptible to Ascariasis infection. They can transmit their infection to humans who handle animal feces.

## References

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