

GIARDIASIS

What is giardiasis?

Giardiasis is an intestinal infection caused by a single-celled parasite, *Giardia lamblia*. *Giardia* is a cosmopolitan parasite, but like many other intestinal infections, is much more prevalent in tropical areas of the world and travelers to the tropics are especially prone to infection. However, in the developed world, *Giardia* is a well known parasite too: in the USA, it is the number one parasitic gut infection reported from laboratories. In the USA, Europe and Australia, *Giardia* is responsible for several water-borne outbreaks of diarrhoea. It is a frequent cause of diarrhoea and tummy upsets in young children attending day-care centers, crèches and kindergarten schools. It also spreads easily amongst homosexual men.

Who gets infected?

In a country such as Kenya, *Giardia* is endemic, particularly in urban and rural communities where families live close to their neighbours. Up to 90% of children between the ages of 2 to 4 can become infected at least once. In such communities, the parasite induces an immune response so that as the child grows, his or her chances of getting the infection diminish. However, any visitors to the same area are very susceptible to infection and can develop symptoms within a few days of becoming infected. Adventurous travelers in the tropics are prone to giardiasis, along with any new residents to an endemic area.

What is the appearance and life cycle of *Giardia*?

Seen under the microscope in freshly passed diarrhoea, the organism moves delicately like a falling leaf, with face-like features and long, hair-like projections. This moving stage of the parasite is called the trophozoite and is not infectious if swallowed. The infective stage is the oval-shaped cyst, which measures about ten thousandths of a millimeter in length and can survive outside the host for months on end, especially in water.

Transmission of giardiasis is through swallowing the cysts in food or water contaminated with infected faeces. Humans are not the only hosts of *Giardia*. There are several species of *Giardia* found in birds, reptiles, amphibians and mammals and there is still some controversy about which ones can or cannot infect humans. In North America and Canada, the beaver is thought to be a reservoir host for water-borne giardiasis. This mammal builds its elaborate home of sticks in the middle of rivers where its waste contaminates the water. Other mammals, particularly dogs, cats and ungulates, can be hosts to the *Giardia* parasite. It is thought, however, that most human infections originate from other infected humans.

Once the cysts are swallowed, they pass through the stomach and hatch into motile trophozoites in the small intestine, normally in the duodenum, where they continue to

multiply by simple division. The trophozoites pass out with loose stools and quickly die outside the body but others form cysts which also pass out in stool and remain infective. The trophozoites have a sucking disc on their surface which enables them to attach to the wall of the small intestine. The parasite appears to cause mechanical damage to the intestinal wall which may be the reason why they reduce the host's absorption of essential nutrients, mainly fats and carbohydrates but also vitamins and proteins. Infection with Giardia can lead to malabsorption, weight loss, and, in young children, failure to thrive.

What are the symptoms?

Once the infection is established, many persons will remain asymptomatic. Others may develop symptoms which range from mild diarrhoea with cramps and flatulence to prolonged diarrhoea and malnutrition. Typically, an infected person will pass foul-smelling loose stools which tend to float in the toilet bowl because digestion of fats has been impaired. The stools may be pale and frothy. The infection does not normally cause fever but there is abdominal discomfort, especially in the upper abdomen, with smelly belches and loss of appetite. Some people complain of a bad taste in their mouth. General fatigue is a common complaint. Loss of five to ten kilos of body weight is not uncommon.

Who is most prone to infection?

While all age groups can be infected, young children of between one and five are the most susceptible. In even the most clean-conscious kindergarten schools, giardiasis is a potential problem and often causes unnecessary panic. Little children are more likely to acquire the infection directly from faecally contaminated fingers of their friends or from faecally contaminated objects or toilet bowls. On the other hand, travellers and adults tend to become infected from faecally contaminated food and drinks. Campers who drink untreated water from streams and lakes are at risk. Whatever the mode of transmission, the infection has the potential to be symptomatic especially when the host has no immunity.

How is Giardia diagnosed?

Diagnosis of giardiasis is mainly from the microscopic diagnosis of fresh faeces, although serological techniques are being developed. The cysts are shed in the faeces erratically so if Giardia is suspected based on clinical findings, several stools may need to be examined on different days to rule out infection. However, the combination of good microscopy with different methods to examine faeces is usually sufficient to detect the parasite. More invasive methods are not normally necessary. If someone suspects he may be suffering from giardiasis, a stool test is a mandatory first-step test.

How is Giardia treated?

Several drugs are available to treat giardiasis and combination therapies of at least two drugs taken simultaneously are recommended.

Prevention of giardiasis

Prevention is better than cure, but there is no vaccination or prophylactic drug to prevent giardiasis. The best method of prevention when traveling is to avoid eating or drinking food or water which may be faecally contaminated, such as green salads, fruit salads, freshly-squeezed fruit juices and untreated water. The importance of frequent hand-washing and general hygiene should be stressed to child caretakers in home and day-care settings. Remember, if your stools float and your wind is smelly, think of Giardia.