





Giardia Lamblia

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Introduction

Giardia lamblia (also known as *Giardia intestinalis* or *Giardia duodenalis*) is an intestinal protozoan parasite. It has a worldwide distribution, with many developing countries considered endemic areas due to poor sanitary conditions and limited water-treatment facilities. Approximately 280 million people are affected annually. Giardia may cause epidemic or sporadic disease. Infants, children, immunocompromised patients and travellers are considered high-risk groups.

Transmission and pathogenesis

The routes of transmission include consumption of contaminated water and food, as well as person-to-person transmission through the faecal-oral route. Person-to-person transmission is common in day care centres where outbreaks of giardiasis may occur.

The life-cycle of Giardia involves two stages, namely the cyst and trophozoite stages (see Figure 1). The cyst stage is the infectious stage and humans become infected after the ingestion of as few as 10 - 25 cysts. These cysts develop into trophozoites after excystation. Trophozoites attach to the duodenum and jejenum via a ventral disk, but do not invade the mucosal epithelium. The small intestine is the primary site for structural and functional abnormalities leading to the clinical manifestations of diarrhoea and malabsorption. Trophozoites revert back to the infectious cyst form in the large intestine, and are excreted in the stool.



(Image: reference 2)

Clinical manifestations

The clinical spectrum consists of asymptomatic infection, acute diarrhoea and chronic infection. Symptomatic infection occurs only in 25 - 50% of cases. The onset of symptoms occurs 1 - 2 weeks after the ingestion of cysts, and may last for 2 - 4 weeks. Most acute symptomatic infections are self-resolving, and patients present with diarrhoea, abdominal cramps, bloating and flatulence. Patients often complain that their stool is foul-smelling and greasy, and tends to float. Some patients develop a chronic syndrome of diarrhoea, malabsorption and weight loss. Cases of post-giardia irritable bowel syndrome has been documented. Approximately 20 - 40% of patients may develop lactose intolerance, with recovery over several weeks, despite clearance of the parasite.

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Diagnosis

Examination of stool samples for the presence of cysts or trophozoites is the standard method used for the diagnosis of giardiasis. As cyst excretion is intermittent, multiple stool samples (at least 3 samples collected on separate days) are required before giardiasis can be excluded. Giardia antigen tests may be performed on stool samples, and have good sensitivity (85 – 98%) and specificity (90 – 100%). These are in the format of immunoassays such as ELISAs (enzyme-linked immunosorbent assays) or rapid tests (immunochromatographic tests). The detection of Giardia specific genes by PCR may be more sensitive than microscopy or immunoassays, but is not routinely offered in most clinical laboratories. Other methods for difficult to diagnose cases include the string test, duodenal biopsy or duodenal aspiration. There is usually no leucocytosis or eosinophilia present on full blood count testing.



Figure 2. Cyst



Figure 3. Trophozoite

(Images: reference 5)

Treatment and Prevention

Supportive therapy includes fluids and rehydration. The treatment of choice is metronidazole for 5 to 7 days, with an efficacy of 80 – 95%. Adverse effects include a metallic taste, nausea, dizziness and headache. Tinidiazole is an alternative option that is administered in a single dose with fewer side-effects. Albendazole or mebendazole may also be used, however cure rates are variable. Patients should avoid lactose-containing food for a few weeks post-infection. Treatment failures have been reported, and these cases may require treatment with a drug from a different class, or combination therapy.

Giardia cysts may be resistant to chlorine used in water treatment facilities, therefore sedimentation or filtration systems are required.

References

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