Giardiasis

Giardia lamblia, also known as Giardia intestinalis and Giardia duodenalis, is an important cause of persistent diarrhoea or malabsorption. It is a flagellated, anaerobic protozoon.

Epidemiology and transmission[1, 2]

Giardial infections occur worldwide, including in developed countries. It is more common with:

- Poor sanitation.
- Travel to endemic areas.
- Reduced immunity - malnutrition, immunocompromise or cystic fibrosis.
- Institutions - eg, children in nurseries, and their carers.
- Those having ano-oral sex - eg, sexually active gay men.

3,624 cases were reported in England and Wales to the Health Protection Agency (now part of Public Health England) in 2013.[3]

Worldwide prevalence: it occurs at any age but is common in young children, (estimated around 20% prevalence in young children in developing countries).[4]

Transmission

- Transmission of Giardia spp. is via the faeco-oral route. The incubation period is 1-2 weeks.[5] Giardial cysts are resistant to standard chlorination.
- Transmission is usually via contaminated drinking water.
- Other possible sources are ingested food, contaminated swimming pools and direct contact with infected people, animals or contaminated objects.
- In the UK, many cases are associated with recent foreign travel.[3]
- Many animals are host to the organism, including pets, livestock and wild animals but it is not clear if they are a source of infection for man. Beavers may be an important reservoir host (in Canada, giardiasis is nicknamed 'beaver fever').[6]

Presentation

Suspect giardiasis in scenarios such as:

- Acute diarrhoea lasting for over one week.[3]
- Traveller's diarrhoea with symptoms lasting more than ten days, symptoms that begin after return, and associated weight loss.
- Diarrhoea in immunocompromised or palliative care patients.[2]

Symptoms:[2]

- Acute or chronic diarrhoea.
- Malabsorption, weight loss and, in children, failure to thrive.
- Abdominal pain, anorexia, flatulence, bloating and nausea.
- Vomiting and fever are uncommon.
Signs:

- Generally, there are few or no physical signs.
- In acute or severe cases, signs of dehydration or malnutrition.
- Physical examination generally is unremarkable.
- Abdominal examination may reveal nonspecific tenderness.

Unusual presentations:

- Rarely, it may present with complications (see 'Complications and prognosis', below).

Investigations

Stool microscopy is the usual test:

- Ensure the laboratory request has a full history and a request for ova, cysts and parasites (OC&P). Note that the routine microbiological examination of a stool sample looks only for Campylobacter spp., E. coli O157, Salmonella spp., Shigella spp. and Cryptosporidium spp. Testing for other pathogens may be carried out depending on the clinical history.

- If parasitic infection is suspected, send three fresh specimens (5 ml each) 2-3 days apart, as OC&P are shed intermittently.

Other tests for giardiasis are:

- Stool antigen tests which are available and may be the best test.
- DNA probes for Giardia spp. - improve the detection rate.
- Other tests: duodenal samples for microscopy, which can be obtained using the 'string test' (swallowing a gelatin capsule on a string) or duodenal biopsy, although the routine use of diagnostic biopsy is not supported.
- A simple test using methylthioninium chloride (methylene blue) staining to detect Giardia spp. trophozoites.

Differential diagnosis

- Other causes of gastroenteritis, including cryptosporidiosis.
- Other causes of malabsorption - eg, coeliac disease.
- Inflammatory bowel disease.
- Irritable bowel syndrome (if other problems have been excluded).

Management

General points:

- In areas where there is contamination of the water supply the treatment of asymptomatic patients is of dubious value, as they will become re-infected.
- Treatment is required where there are symptoms, or where there is risk of infection of others who are at special risk. Some authors suggest that in non-endemic areas everyone should be treated if found to be carrying the organism.
- Giardiasis may be caused by food poisoning and therefore can be a notifiable disease.

Drug treatment:

- Rehydration, if required.
- Metronidazole is the drug of choice for treating giardiasis - but note cautions with pregnancy and breast-feeding.
- Tinidazole is an alternative.
- The other drug recommended by the British National Formulary (BNF) is mepacrine (unlicensed).
- Mebendazole also has some effect against Giardia spp.
- Metronidazole resistance is becoming an increasing problem. Treatment failures are reported in up to 20% of cases and this has led to the search for alternatives. Auranofin, an antirheumatic agent, has shown promising results.
- Development of new drugs based on modification of 5-nitroimidazole, the core structure of metronidazole and other molecular targets of Giardia spp. is ongoing.

Complications and prognosis

Prognosis

- The prognosis is usually good.
- Resistance to treatment or re-infection can occur.

Possible complications

- Failure to thrive (children) or malabsorption.
- Its contribution to debility and malnutrition in developing countries, especially in children.
- Lactose intolerance.
Occasionally, infective gastroenteritis may unmask other conditions, such as coeliac disease or inflammatory bowel disease, so persisting symptoms should be investigated.\[20, 21\]

Rare complications include cholecystitis, reactive arthritis, pancreatitis, retinal arteritis and iridocyclitis.\[22\]

Death from giardiasis. This is rare - usually from dehydration in those at high risk.

## Prevention

- Handwashing and hygiene around infected people and in institutions.
- UK tap water is very unlikely to be contaminated with *Giardia* spp. but the same cannot be said for water from rivers and lakes. When camping, water from these sources should be boiled before use.
- Swimming pools and other recreational facilities can become contaminated. It should not be assumed that chlorinated water is safe.
- Travellers to endemic areas should avoid eating uncooked foods.
- Breast-feeding is protective.
- People who frequently engage in anal sex are at higher risk of acquiring giardiasis. This can be minimised by washing the hands after touching the anus of another person or after touching a condom that has been used for anal sex, and by avoiding oro-anal contact.

## Further reading & references

2. Gastroenteritis; NICE CKS, July 2015 (UK access only)
3. *Giardia*: guidance and data; Public Health England
11. Giardiasis; Department of Health, Australia, 2007
12. Amoebiasis and giardiasis; World Health Organization, 2013
13. British National Formulary (BNF); NICE Evidence Services (UK access only)
22. Parasite Summary Tables; Efhomeed

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