

Phylum: Sarcomastigophora

Subphylum: Mastigophora (Flagellates)

Class: Kinetoplastida

Order: Trypanosomatidae

- Flagellates are protozoa that bear one to several long, delicate, thread-like extensions of the cytoplasm. These are known as flagella (singular flagellum). These arise from blepharoplasts and are organelles of locomotion

-A central supporting rod known as axostyle, and an undulating membrane supported at its base by basal fibre are observed

-According to their habitat the Flagellates are classified into two broad groups:

1- Intestinal, oral, and genital flagellates.

2- Blood and tissue flagellates.

Intestinal, oral, and genital flagellates

Giardia lamblia

Giardia is a flagellated, teardrop-shaped parasite with only two life forms, the trophozoite and the cyst. Trophozoite measure 9-21 μm in length. 5-15 μm in width contains four sets posteriorly directed flagellae, which aid in the parasites movement. The most prominent feature of trophozoite is the ventral disc. which may help Giardia to attach to intestinal epithelial cells. There are two apparently equal nuclei which, on stained preparations. create the characteristic face-like image. Cyst: Trophozoite are transformed into cyst under unfavorable conditions. The cyst is: Oval, 8 to 14 μm x 6, contains 4 nuclei usually lying

at one end. remnants flagellae and margins of sucking disc lie inside cytoplasm, they passed in stool, and it is the infective form.

Transmission and epidemiology

Giardia is a parasite found in all parts of the world and in a large number of mammals, including humans, pets, wild life and aquatic animals. Several recent reports have also described G. intestinalis in various birds and even fish The prevalence of Giardia in humans varies in and between countries and it is higher in areas where environmental hygiene is low , about 200 million people , have symptomatic giardiasis , and around 500,000 new cases occur each year . **The routes of transmission** include

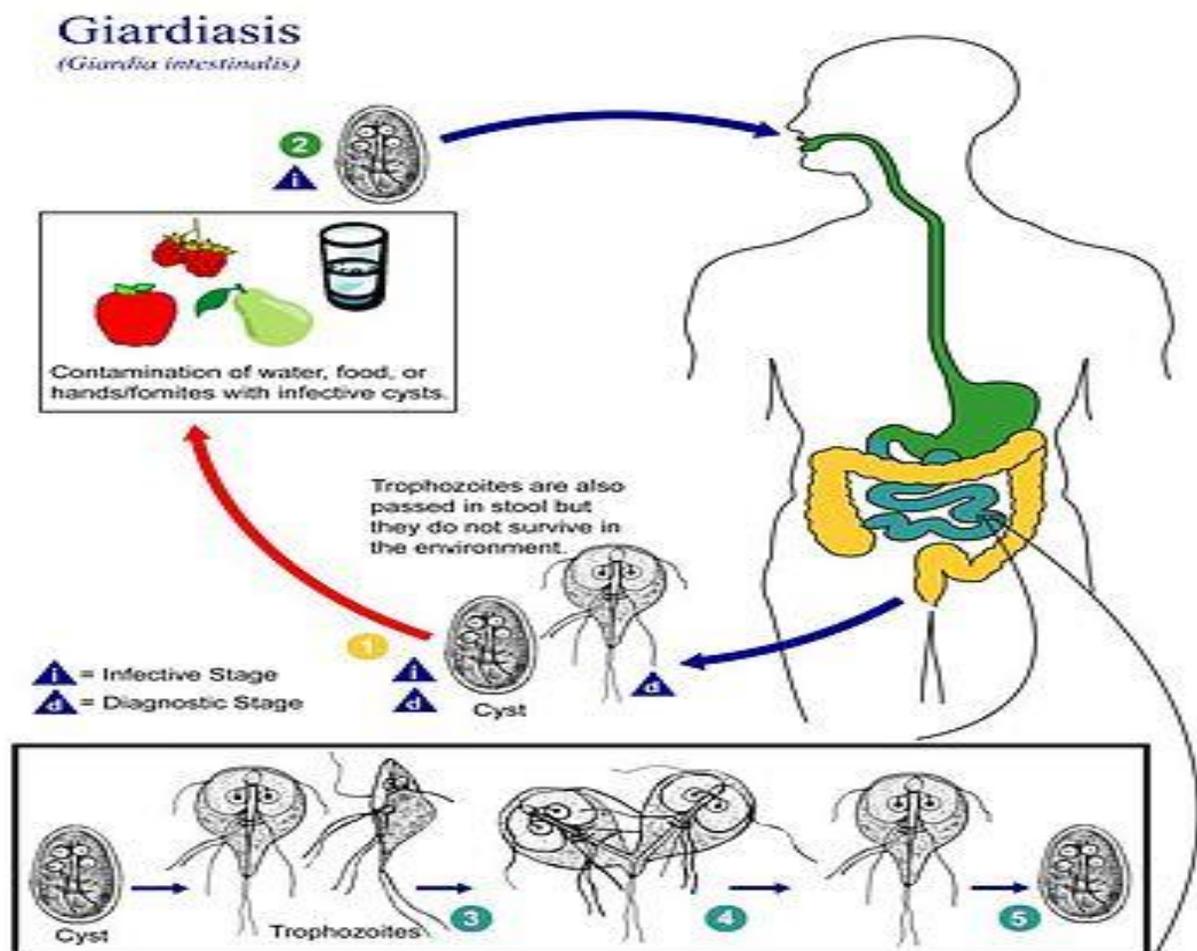
- Contaminated food and water.
- Person to person contact
- eating uncooked food .

Life cycle

Cysts are resistant forms and are responsible for transmission of giardiasis. Both cysts and trophozoites can be found in the feces (diagnostic stages) .

- 1- The cysts are hard and can survive several months in cold water. Infection occurs by the ingestion of cysts in contaminated water, food, or by the fecal-oral route (hands or fomites).
- 2- In the small intestine, excystation releases trophozoites (each cyst produces two trophozoites).

- 3- Trophozoites multiply by longitudinal binary fission, remaining in the lumen of the proximal small bowel where they can be free or attached to the mucosa by a ventral sucking disk.
- 4- Encystation occurs as the parasites transit toward the colon . The cyst is the stage most commonly found in nondiarrheal feces .
- 5- Because the cysts are infectious when passed in the stool or shortly afterward, person-to-person transmission is possible . While animals are infected with Giardia , their importance as a reservoir is unclear.



Pathogenesis: The majority of infections are asymptomatic. In symptomatic individuals or in **acute** infection, patients may experience nausea, chills, low grade fever, epigastric pain, malabsorption and sudden onset of watery steatorrheal diarrhea is often explosive and presents a foul smell without the presence of blood, gas, bloating, and mucus, most infections resolve spontaneously within six weeks.

Chronic infections can occur and chronic diarrhea leads to dehydration, malabsorption, weight lost and impaired pancreatic function, infections can last from months to years. G. lamblia are usually found in the upper small intestine, but can be found in the gall bladder and in biliary drainage during infection of Giardia trophozoites colonize the proximal small intestine and adhere to the apical surface of enterocytes, so in heavy infection Giardia may attack The coat of the microvilli causing atrophy of villi and the gall bladder can become infected leading to jaundice. It is not fatal but can be extremely discomforting.

Laboratory Diagnosis

- * Demonstration of cyst in the stool microscopically
- * Demonstration of trophozoites in duodenal aspirate
- * Immunological techniques like ELISA.

Treatment

Metronidazole, quinacrine, furazolidone, and tinidazole may be effective.

Giardia intestinalis (G. lamblia)

Life cycle

