

# GIARDIASIS

## ORO - INTESTINAL - UROGENITAL FLAGELLATES

- 1. Oro-intestinal**
- ✓ *Trichomonas tenax*
  - ✓ *Giardia intestinalis*
  - ✓ *Chilomastix mesnili*
- ✓ *Trichomonas hominis*
- ✓ *Dientamoeba fragilis*
- ✓ *Embadomonas intestinalis*.
- ✓ *Enteromonas hominis*.

**2. Uro-genital** - *T. vaginalis*

**3. Haemo-somatic**

### General Characters:

- Infection occurs in the buccal cavity, intestine/ uro-genital tract.
- The infective stage is either the vegetative or the cystic form.
- Transmission of infection is direct one.

## GIARDIA LAMBLIA

Geographical distribution: world-wide.

- main cause of diarrheal outbreaks from contaminated water supplies
- important cause of traveller's diarrhea
- opportunistic and nosocomial parasites.

### Morphology:

Tow forms can be visualized microscopically.  
Trophozoite & Cyst

## MORPHOLOGY

TROPHOZOITE	Shape	CYST
pear-shaped with an anterior rounded & posterior tapering parts. bilaterally symmetrical.		Oval double-colourless wall
12 x 6 μ	Size	15 x 8μ.
<ul style="list-style-type: none"> <li>✓ convex dorsal surface</li> <li>✓ flat ventral one which is modified in its anterior part forming a sucking disc acting as an attachment organ.</li> <li>✓ Two vesicular nucleus.</li> <li>✓ Two median bodies (curved rods) lie posterior to the sucking disc called parabasal bodies.</li> <li>✓ Four pairs of flagella.</li> <li>✓ The intracytoplasmic part (axonemes) of posterior two flagellae (axostyle) extend through the body dividing it and become free posteriorly.</li> </ul>	Cytoplasm	<ul style="list-style-type: none"> <li>• Cytoplasm is often retracted at one side</li> <li>• contains four nuclei usually gathered at one pole.</li> <li>• Remnants of the flagellae, median bodies and axostyle are clearly seen.</li> </ul>

## LIFE CYCLE

Definitive host	Reservoir hosts	Infective stage
Man is the natural host	Many animals (dogs, rodents, monkeys, pig) <i>Giardia</i> is a zoonotic disease.	Mature quadrinucleated cyst.

### Habitat

In the upper part of small intestine (duodenum & upper jejunum).  
Trophozoites:

- stick closely to the mucosa & may penetrate the crypts of mucosa
- found in the gall bladder & bile ducts.

Cysts: free in the lumen.

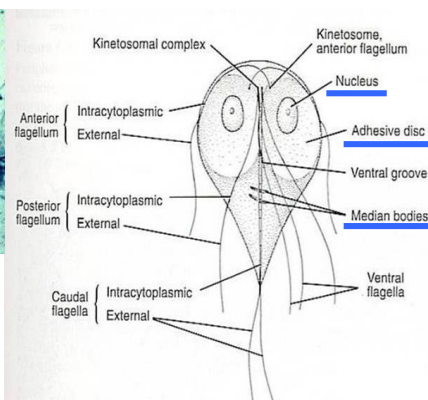
### Predisposing factors to symptomatic giardiasis:

1. Achlorohydria, hypogammaglobinaemia, blood group A & relative ↓ secretory IgE.
2. Young age (infants and children).
3. Bacterial colonization ↑ damage by *Giardia* trophozoites.

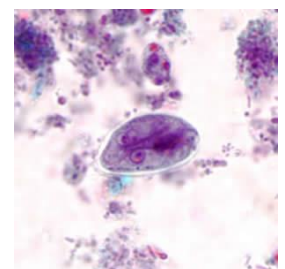
### Mode of infection

is atypical faeco-oral transmission cycle.

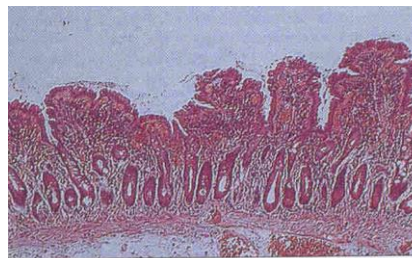
- Cysts may be ingested with contaminated food & water/ transmitted by house flies, cockroaches.
  - Person to person transmission occurs especially among school children, prisoners & in nurseries.
  - Autoinfection by hand-to-mouth transmission.
- 1) Trophozoites replicate by longitudinal binary fission.
  - 2) Excystation occurs in upper part of the small intestine stimulated by alkaline pH there.
  - 3) Cyst → two trophozoites.



### CYST (INFECTIVE)



Thug's



### PATHOGENECITY AND CLINICAL PICTURE

- Trophozoites live closely to intestinal mucosa attached by their sucking discs → mechanical irritation.
- Attachment is facilitated by a parasite secreted lectin which is activated by duodenal secretion → derangement of normal villous architecture.
- Shortening, blunting of villi up to total atrophy.
- Inflammatory foci in crypts and lamina propria.

### RESISTANCE TO GIARDIASIS

- It is indicated by spontaneous cure of the disease that may occur after about 40 days.
  - Lymphocytes, macrophages and secretory IgA are important for resistance.
  - Human Milk is able to kill *Giardia* trophozoites via lipase and IgA, so it can afford protection to breast fed babies.
- The prepatant period is 10-36 days.
- The disease may be asymptomatic in many cases.

### SYMPTOMS

1) Diarrhea, flatulence, distension, epigastric pain, crampy abdominal pain, anorexia and weight loss.

2) Malabsorption syndrome

- ↓ absorption of carotene, folate and vit B12
- ↓ activity of lipase
- ↓ secretion of disaccharidases, lactose & other enzymes → Lactose intolerance.

3) Steatorrhea (fatty diarrhea)

→ greasy, pale yellow, frothy foul smelling & bulky stool may occur due to:

- Physical occlusion of mucosa by attached parasites.
- Enterotoxin secretions by the parasite.
- Deconjugation and consumption of the bile salts.
- Villous atrophy.

### SEVERE SYMPTOMS: (in immunocompromized)

- Persistent steatorrhea.
- Hypoproteinaemia
- Fat-soluble vitamins deficiency.
- Cholangitis and cholecystitis → jaundice & biliary colic

### DIAGNOSIS

1) Clinical diagnosis: C/P of the disease.

2) Laboratory diagnosis:

#### A- Direct:

1. Stool examination
  - by direct smear- concentration methods.
  - Repeated ex. for 3 times must be done (due to intermittent shedding of the parasite).
2. Examination of duodenal fluid which may be taken by duodenal aspiration or by Enterotest (string-test).

#### B- Indirect:

- Serological tests: IFA and ELISA.
- Detection of copro-antigen by ELISA.

### TREATMENT

1. Fasigyn as a single dose.
2. Metronidazole (Flagyl).
3. (Not given to pregnant women: teratogenic)
4. Albendazole.

### PREVENTION AND CONTROL

- Environmental sanitation as: anti-fly measures, proper sewage disposal and safe water supply.
- Faeces must not be used as fertilizer.
- Health education for: washing of green vegetables, fruits and hands before eating.
- Treatment of cases especially the carriers.

Enterotest capsule

