E. Coli E. histolytica

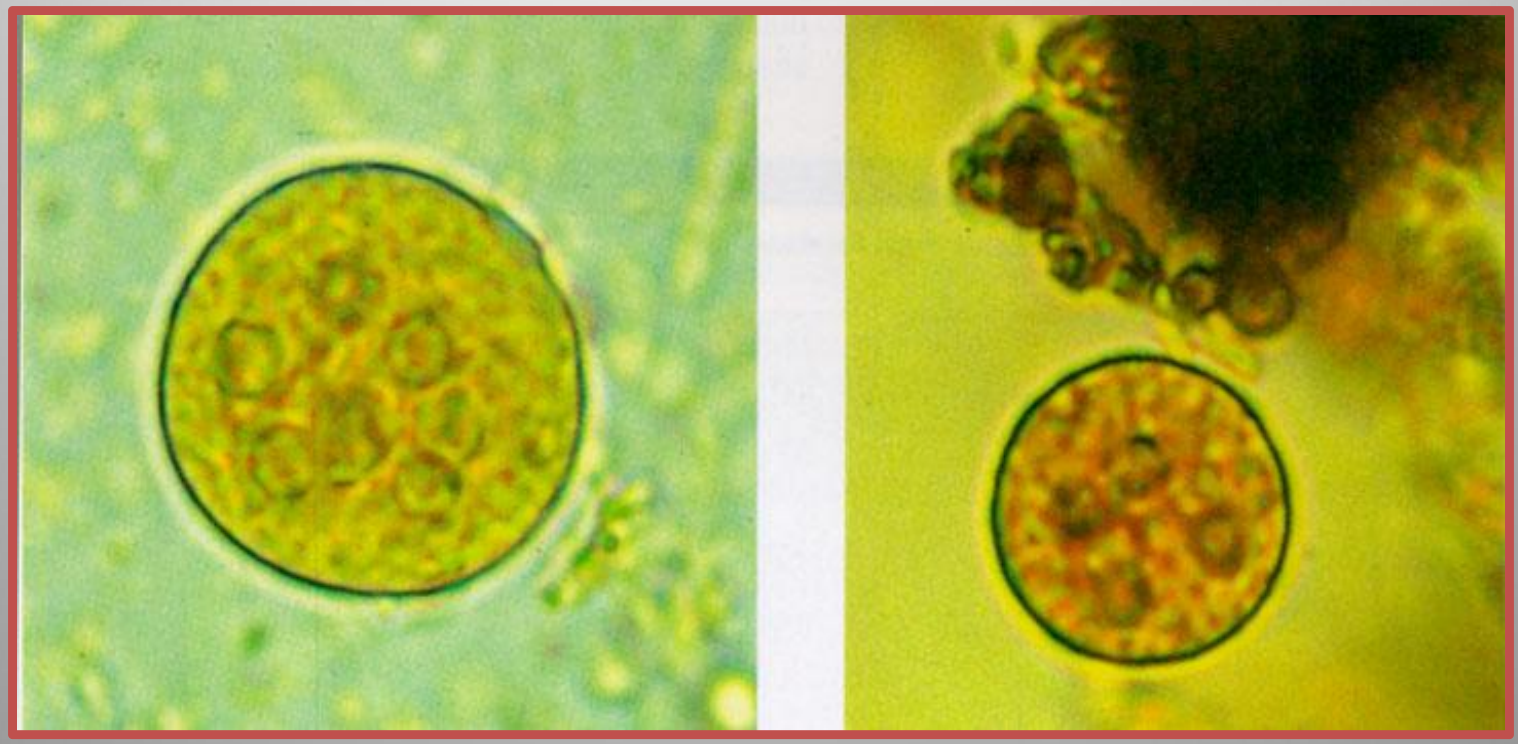


Table 3.1. Differences between amoebic and bacillary dysentery

Character	Amoebic dysentery	Bacillary dysentery
Macroscopic		
Number	6–8 motions a day	Over 10 motions a day
Amount	Copious	Small
Odour	Offensive	Odourless
Colour	Dark red	Bright red
Reaction	Acidic	Alkaline
Consistency	Not adherent to the container	Adherent to the container
Microscopic		
RBCs	In clumps	Discrete, sometimes in clumps due to rouleaux formation
Pus cells	Few	Numerous
Macrophages	Few	Numerous, many of them contain RBCs hence may be mistaken for *E. histolytica*
Eosinophils	Present	Scarce
Charcot-Leyden crystals	Present	Absent
Pyknotic bodies	Present	Absent
Ghost cells	Absent	Present
Parasites	Trophozoites of *E. histolytica*	Absent
Bacteria	Many motile bacteria	Few or absent

	E. histolytica	*E. coli*
Trophozoite		
Size	20–30 µm	20–50 µm
Motility	Active, unidirectional, purposeful motility. They extend pseudopodia only along one plane.	Sluggish, nonpurposeful motility. They extend pseudopodia in multiple planes and "wander" aimlessly in one direction then the other.
Cytoplasm	Clearly defined into ectoplasm and endoplasm.	Not defined.
Cytoplasmic inclusions	Red blood cells, leucocytes and tissue debris but no bacteria.	Bacteria and cellular debris but never red blood cells.
Nucleus	Central karyosome, the nuclear membrane is delicate and is lined by fine chromatin granules. It is not visible in unstained preparations.	Eccentric karyosome, the nucelar membrane is thick and is lined by coarse chromatin granules. It is visible in unstained preparations.
Precyst	Oval with a blunt pseudopodium, 10–20 µm in diameter. Nucleus shows characteristics of that of its trophozoite.	20 µm in diameter, resembles in shape with that of *E. histolytica*. Nucleus shows charcteristics of that of its trophozoite.
Cyst		
Size	Spherical, 10–15 µm in diameter.	Sperical, 15–20 µm in diameter.
Number of nuclei	1–4	1–8
Chromidial bars	Rounded	Filamentous

FLAGELLATES

FLAGELLATES

Flagellates are protozoa.

They posses cytoplasmic extensions known as flagella.

Flagella arise from blephroplasts.

CLASSIFICATION OF FLAGELLATES

Group	Parasites	Habitat
Intestinal, oral and genital flagellates	*Giardia lamblia*	Duodenum and jejunum
	Trichomonas vaginalis	Vagina and urethra
	T. tenax	Mouth
	T. hominis	Caecum
	Chilomastix mesnili	Caecum
	Enteromonas hominis	Colon
	Retortamonas intestinalis	Colon
	Dientamoeba fragilis	Caecum and colon
Blood and tissue flagellates	*Leishmania* spp.	Reticuloendothelial cells
	Trypanosoma brucei	Connective tissue, brain and blood.
	T. cruzi	Reticuloendothelial cells and blood.

GIARDIA LAMBLIA

(Synonym with G. intestinalis, G. duodenalis)

History

It was discovered by Leeurwenhoek in 1681 in his own stools.

GEOGRAPHICAL DISTRIBUTION

Cosmopolitian in distribution.

More prevelant in children than adults.<IO years

More common in warm climates.

DISEASE

Giardiasis

Most common pathogen in water borne diarrheal illness. Most outbreaks are related to untreated or inadequately purified water.

HABITAT

Duodenum, upper part of the jejunum.

MORPHOLOGY

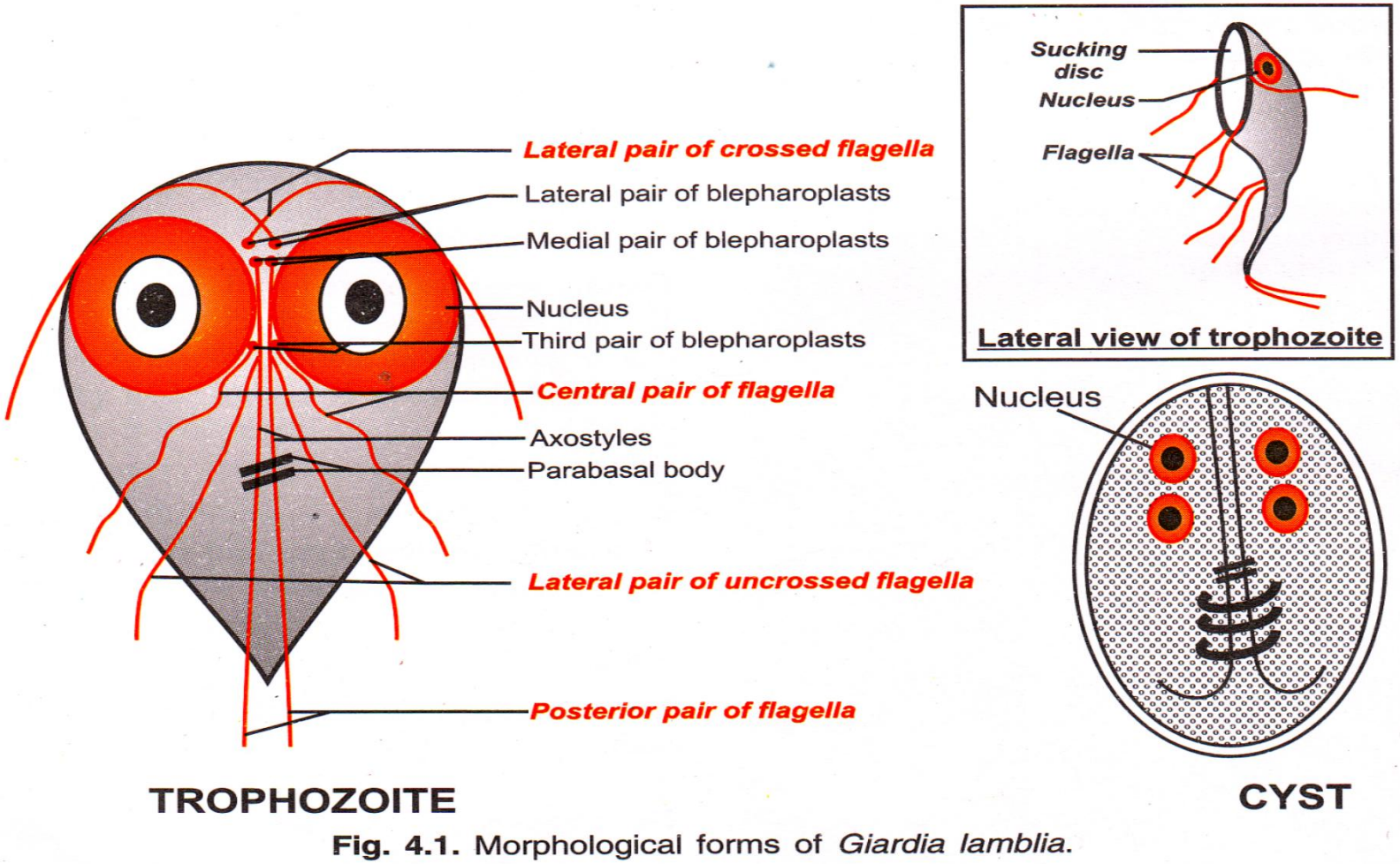


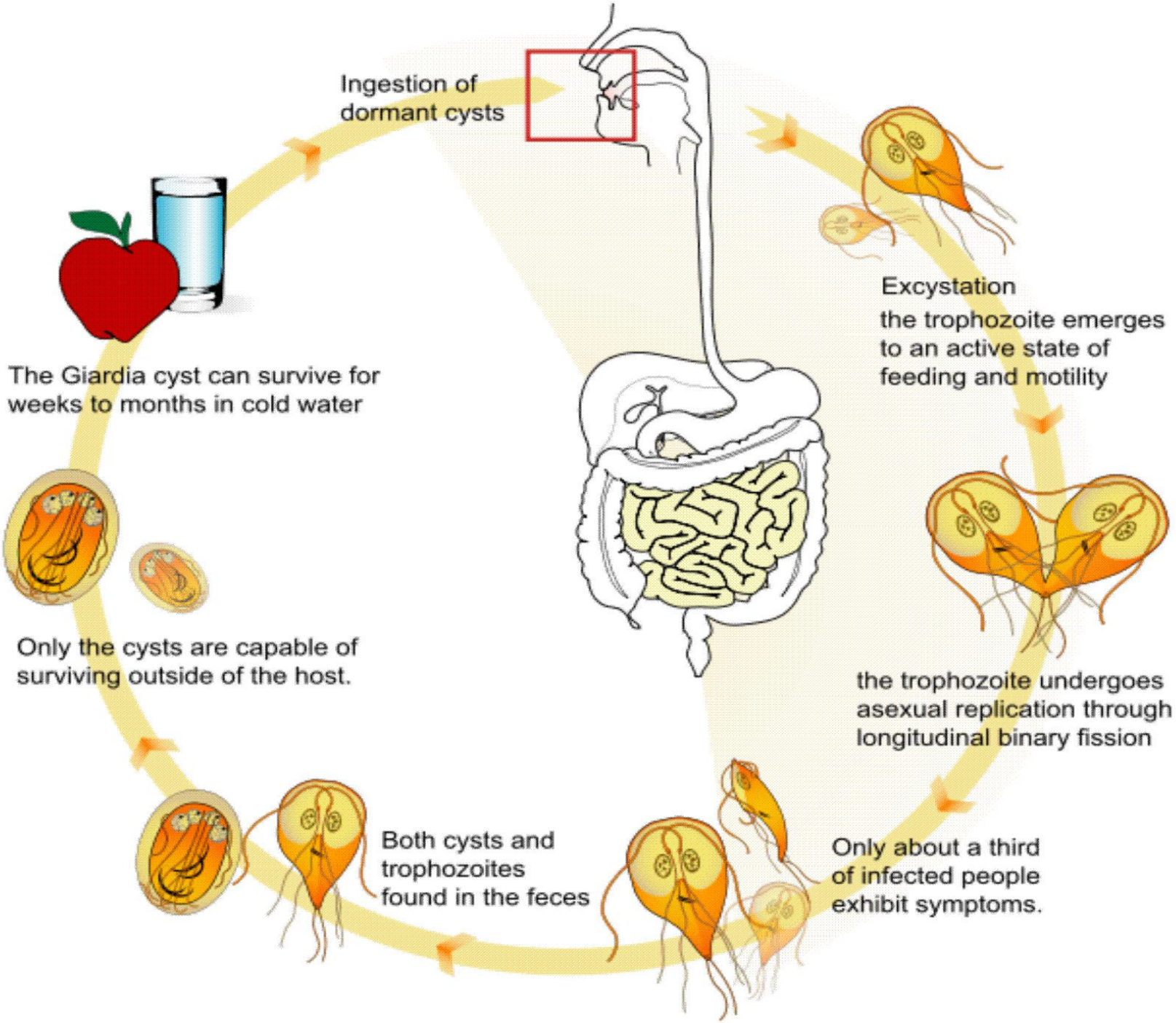
Fig. 4.1. Morphological forms of *Giardia lamblia*.

MODE OF INFECTION

By ingestion of water & food contaminated with cysts

By anal-oral sexual practices

LIFE CYCLE


Ingestion of dormant cysts
Excystation
the trophozoite emerges to an active state of feeding and motility
the trophozoite undergoes asexual replication through longitudinal binary fission
Only about a third of infected people exhibit symptoms.
Both cysts and trophozoites found in the feces
Only the cysts are capable of surviving outside of the host.
The Giardia cyst can survive for weeks to months in cold water

LIFE CYCLE

With in 30 minutes of ingestion excystation occurs in duodenum.

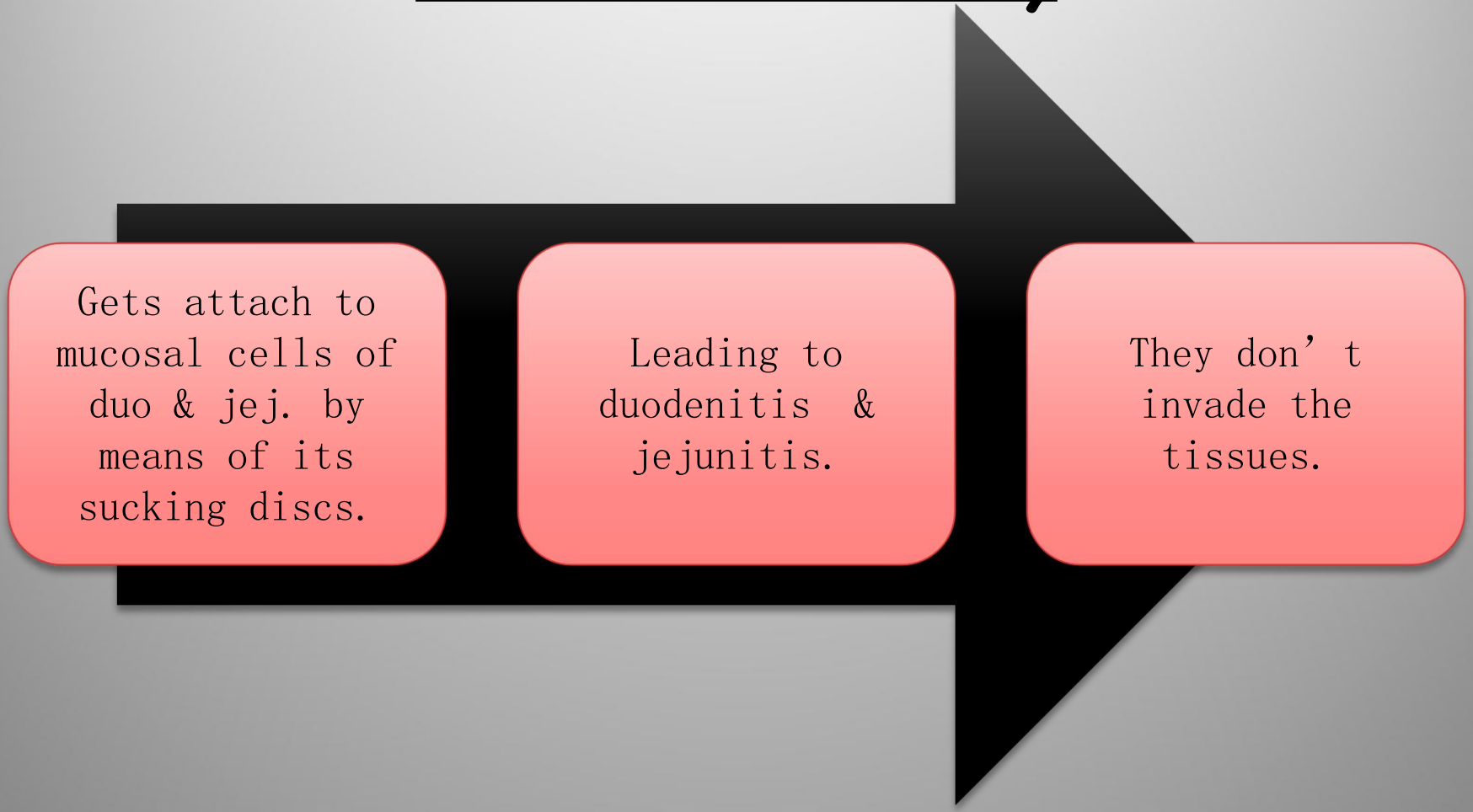
After multiplication trophozoites colonize in duo. & upper part of jejunum.

Trophozoites are found in frankly diarrhoeic stools.

Encystation occurs in colon.

PATHOGENICITY

(AT LEAST 10 CYSTS ARE SUFFICIENT TO CAUSE INFECTION)



PATHOGENESIS

Following steps lead to malabsorption

- ✓ ***First;*** atrophy of brush border leads to deficiency of disaccharidase.
- ✓ ***Second;*** increased epithelial cell turn over leads to immature enterocytes.
- ✓ ***Third;*** decreased bile salt concentrations, ↓ pancreatic lipase activity→ impaired solubilization of fats.
- ✓ ***Fourth;*** Giardia lamblia infection inhibits trypsin.

Case 11, Figure 2 Case Studies in Infectious Disease (© Garland Science)

- ***Various conditions associated with Giardiasis in compromised people are,***

✓Hypo gammaglobulinemia.

✓Protein /caloric malnutrition.

✓Gastric achlorhydria.

✓Reduced gastric IgA levels in gut.

✓Patients with HIV have also been found to have giardiasis.

CLINICAL FEATURES

- ✓ May range from asymptomatic carriers to fulminant diarrhoea.

  In acute giardiasis symptoms start after incubation period of 1to 3 weeks with a minimum of 5days.

- ✓ Dull epi- gastric pain, flatulance, chronic diarrhoea of steatorrhoea type, stool is voluminous foul smelly and contains large amount of mucus and fat but no blood.

- ✓ Symptoms associated with malabsorption, chronic cholecystis and jaundice.

COMPLICATIONS

- ✓Urticaria.
- ✓Reactive arthritis.
- ✓Biliary tract disease.
- ✓Pancreatitis.

LABORATORY DIAGNOSIS

- ✓ Giardiasis can be diagnosed by;

i. Identification of cysts in formed stools.

ii. Identification of trophozoites in diarrhoeal stools by normal saline & iodine preperations.

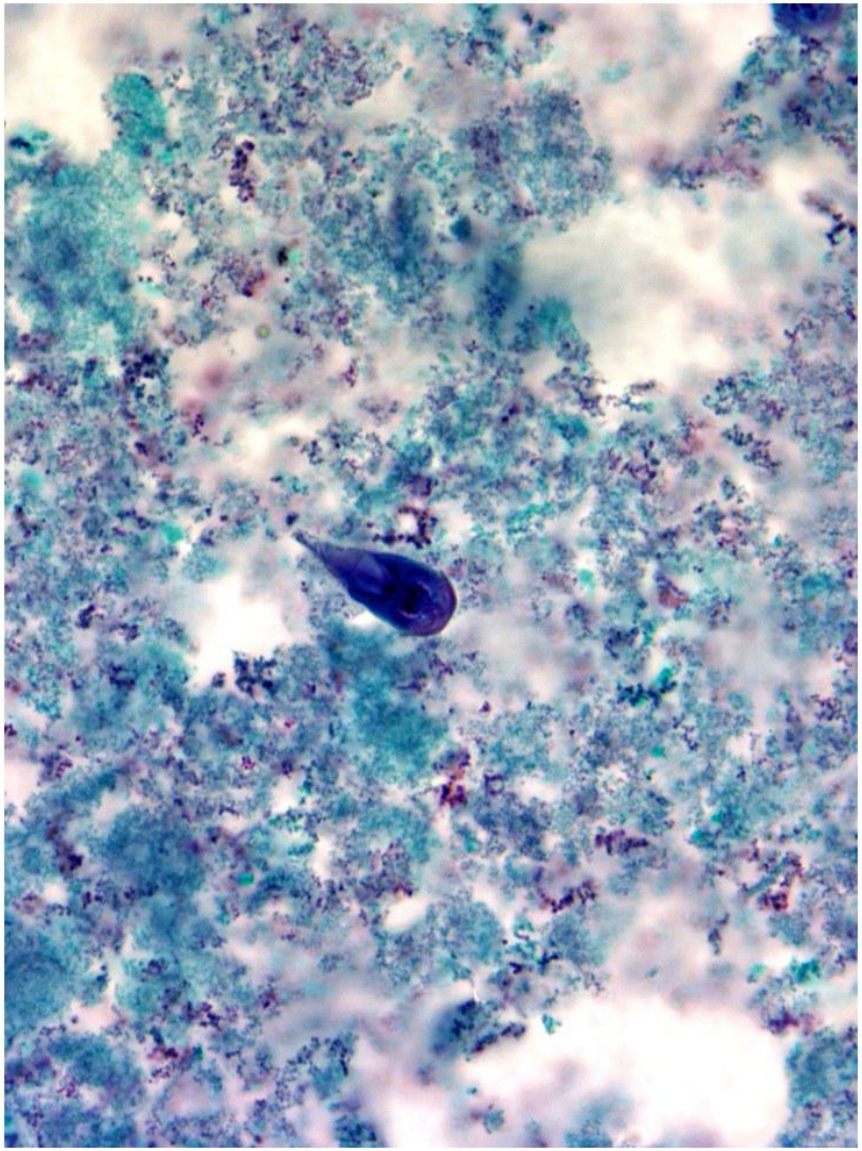
iii. Enterotest.

iv. ELISA test.

v. Biopsy from multiple duodenal & jejunal sites (Touch preperations)

Cysts are resistant to chlorination

Case 11, Figure 3 Case Studies in Infectious Disease (© Garland Science)



Case 11, Figure 4 Case Studies in Infectious Disease (© Garland Science)

Stool Examination

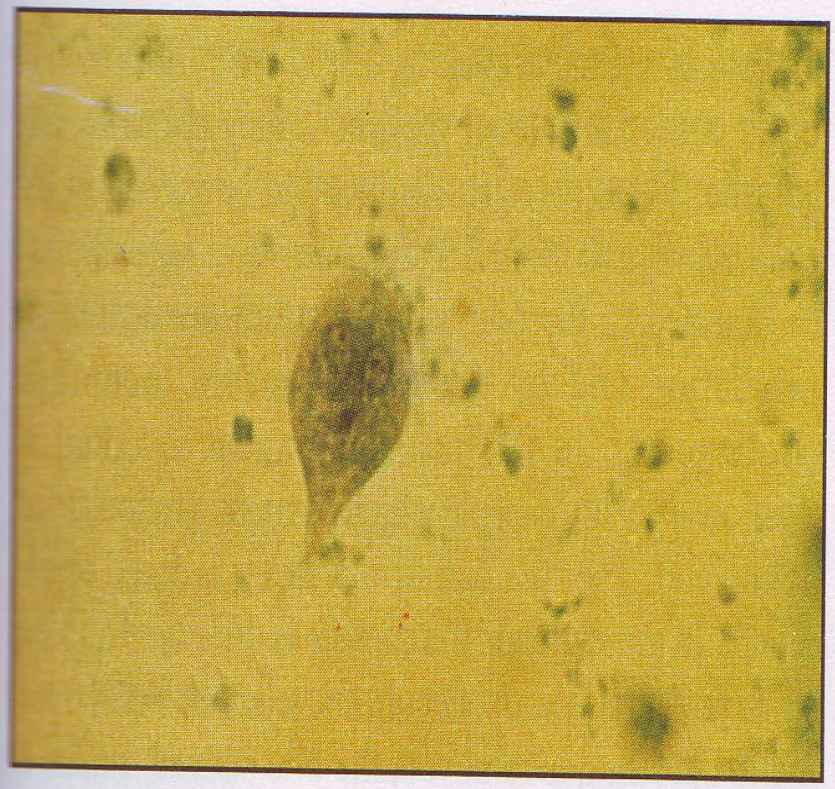


Fig. 4.2. Trophozoite of *Giardia lamblia* in stool.

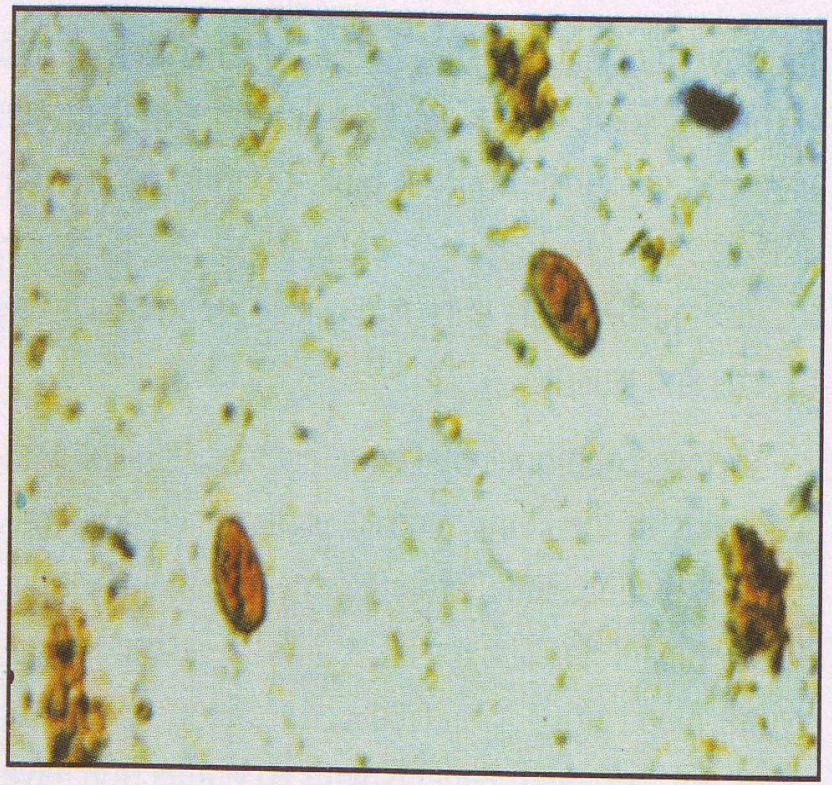


Fig. 4.3. Cysts of *Giardia lamblia* in stool.

Treatment

- ✓Metronidazole is very effective.
- ✓Tinidazole as a single dose is more effective then metronidazole.
- ✓Furazolidone is given in children.

PREVENTION

- ✓ Improved water supply.
- ✓ Proper disposal of human excreta.
- ✓ Improved personal hygiene.
- ✓ Routine hand washing.
- ✓ Proper storage of food & water.
- ✓ Control of insects which may come in contact with stools.
- ✓ No vaccine is available.

TRICHOMONAS

TRICHOMONAS

- Genus Trichomonas contains 3 species;
  - T. tenax
  - T. hominis
  - T. vaginalis

TRICHOMONAS

- Important features;

➢ They exist only in trophozoite stage.

➢Cystic stage is absent.

TRICHOMONAS VAGINALIS

- It is a flagelate.
- In a wet mount preperation trophozoite has a jerky movement.
- It is an obligate parasite.