



Lecture – 8

Intestinal Protozoa



Microbiology Team 430

Done By

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PROTOZOA

Features:

- Unicellular
- Single cell for all functions

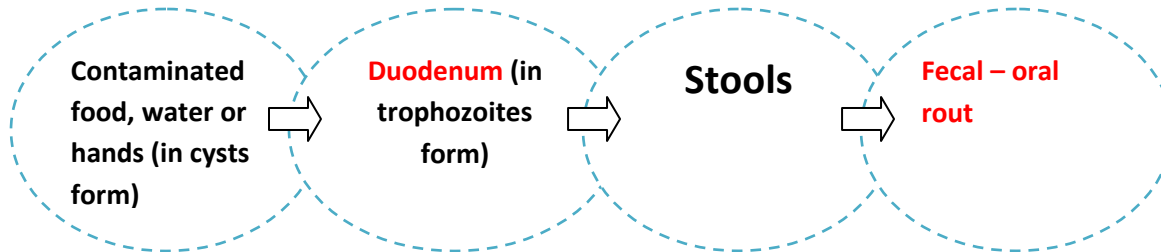
Types:

1. Amoebae: move by pseudopodia.
2. Flagellates: move by flagella.
3. Ciliates: move by cilia
4. Apicomplexa(Sporozoa)→ tissue

Giardia lamblia:

- Giardia Cyst → in the external environment → diagnostic & infective stages
- Giardia Trophozoites → in the body only → diagnostic stage

Life cycle:



❖ Clinical picture:

- Asymptomatic infections (majority)
- Symptomatic Infections:
 - ✓ Typical picture: IP 1-2 wks followed by diarrhea for about 6 wks,
 - ✓ Atypical : Severe diarrhea , malabsorption especially in children

❖ Laboratory diagnosis:

- Stools examination :
 - ✓ Light Microscopy for Cysts or Trophozoites (Trophozoites can be found in stools but it only survive inside the body)
 - ✓ Detection of Giardia antigens in stools
- Examination of duodenal contents : trophozoites

❖ Treatment (chemotherapy):

- Drug of choice: Metronidazole

Intestinal amoebae

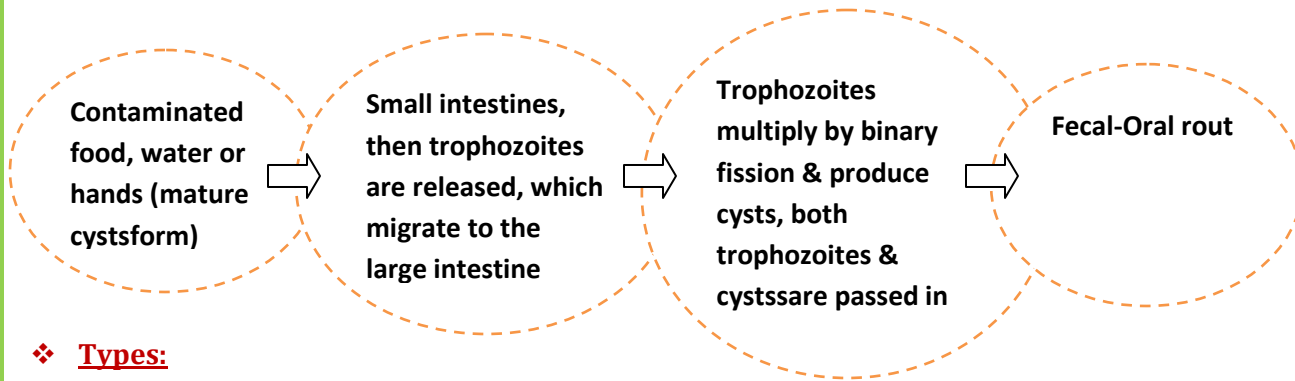
There are 6 species of intestinal Entamoeba → **E.histolytica**, E.dispar, E.hartmanni, E.coli, E.gingivalis & E.polecki

Entamoeba Histolytica :

- Entamoeba histolytica → amoebae that are **pathogenic** → **invasive**
- E. dispar → **non-invasive form**.

The 2 amoebae **can't be distinguished** by microscopic observation.

Life cycle: "explained later with more details"



❖ Types:

➤ Trophozoite:

- ✓ **Vegetative stage** (in this stage, the trophozoite will divide and increase in number)
- ✓ **Diagnostic phase**
- ✓ **Must encyst** (become a cyst) to survive in the environment
- ✓ It is a **fragile structure**.

➤ Cyst:

- ✓ **Infective stage**
- ✓ **Diagnostic stage**
- ✓ Resist to the harsh (hard) conditions of the environment

❖ Features:

- Worldwide distribution
- It is a **water-borne infection** (pathogenic microorganisms which are directly transmitted when contaminated fresh water is consumed)
- Lesions are found in the **large intestine** (cecum, colon and appendix) and, **may disseminate to other organs** (Extra – intestine) such as liver, brain and lungs.
- The infective dose can be as little as 1 cyst → that means one cyst can cause disease
- The incubation period can be from few days to few weeks depending on the infective dose.
- Cysts can survive for weeks at appropriate temperature and humidity.
- **Diagnostic stage** → in Trophozoite or Cyst forms

❖ **Mode of infection:**

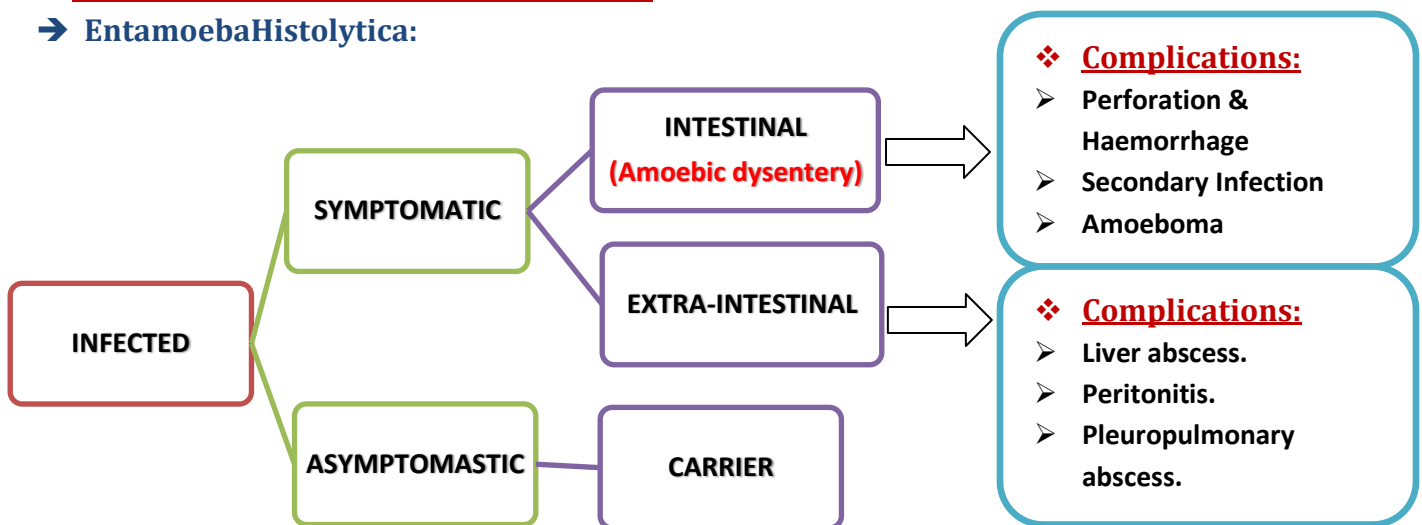
- ✓ **Fecal – oral rout**
- ✓ **Flies can act as vector**
- ✓ **Can be sexually transmitted person -to -person contacts**
- ✓ **Not a zoonosis “only in humans”**

❖ **Pathogenesis:**

- Ingested contaminated food or water → **mucosa of large intestine** → **hydrolyze host tissues** with their active enzymes present on the surface membrane of the trophozoite → **lesions (flask -like ulcers)** are found in the cecum , colon ,or appendix (**intestinal**) → **may invade other layers of large intestine until reach to blood vessels** → **By portal circulation go to liver or may be disseminated to other organs such as brain or lungs (extra – intestinal)**.

❖ **The Clinical Outcomes of Infection With**

→ **EntamoebaHistolytica:**



Laboratory Diagnosis of Amoebiasis:

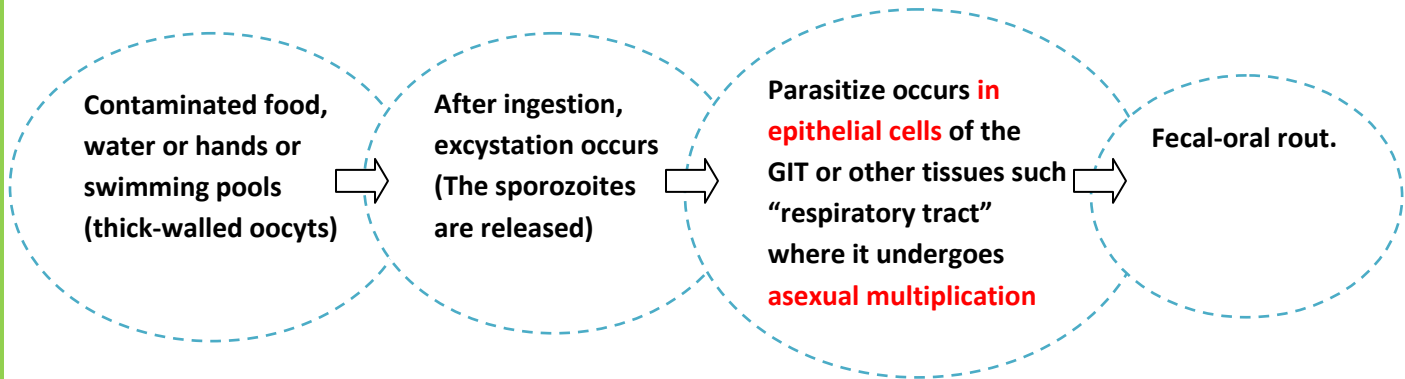
Intestinal	Extra-intestinal
<ul style="list-style-type: none"> • Stools examination : <ul style="list-style-type: none"> – Wet mount (cysts and trophozoites) – Concentration methods (only cysts) • Serology (mainly for invasive infections): IHA , ELISA 	<ul style="list-style-type: none"> • Extra-intestinal: <ul style="list-style-type: none"> – Serology: IHA , ELISA – Microscopy of tissues or fluids

Main Drugs for Treatment of Amoebiasis :

Intestinal	Extra-intestinal
<ul style="list-style-type: none"> • Asympromatic (cysts only): diloxanidefuroate (Furamide) • Symptomatic(cysts and trophozoites): metronidazole 	<p>Metronidazole</p>

Cryptosporidium Parvum

Life cycle:



❖ Features:

- Fecal – oral route
- Individuals who are most at risk are the **immune suppressed**, infants, children, the elderly, cancer patients, organ-transplant recipients and people who are HIV positive or have AIDS.

❖ Laboratory Diagnosis:

- By use certain stains to indicate the organism → acid-fast stain, safranin
- Serology :IFAT(is immunofluorescence test)

❖ Treatment:

- **Self-limited in immunocompetent patients**
- **In AIDS patients : paromomycin**

Summary

- Giardia lamblia are found in Cyst form in the external environment (which is diagnostic & infective stages), and in Trophozoites form in the **duodenum** (diagnostic stage)
- We can diagnose Giardia lamblia infection by **Stools examination** where we can find both cyst and trophozoites or we can do examination of **duodenal contents looking for trophozoites**. Then treat it with Metronidazole
- There are 6 species of intestinal Entamoeba. The invasive form and the one that cause amoebiasis is E.histolytica where E. dispar specie is harmless and non-invasive.
- Entamoebahistolytica: goes into two forms :
 - **Trophozoite**: which is the **active form** and it only found in the small intestine and the **large intestine** (where it multiply). it goes under **Vegetative stage “ in large intestine “** and the diagnostic phase
 - **Cyst**: is the form that is necessary to survive the environment. It goes under **Infective stage and Diagnostic stage**
- E.Histolytica is a water-borne infection with Fecal – oral rout & found only in humans
- As Giardia lamblia, E.Histolytica infection **starts** from contaminated food or water as **mature cysts**. And become Trophozoites at the small intestine. When it reach the mucosa of large intestine as Trophozoites it multiply and hydrolyze host tissues and cause flask -like ulcers lesions
- Lesions which are caused by E.Histolytica infection can be found in the cecum , colon ,or appendix (**intestinal**) and **cause Amoebic dysentery** or invade & reach to blood vessels and then by portal circulation go to liver or to other organs such as brain or lungs (**extra – intestinal**).
- In order to diagnose E.Histolytica infection we use Stools examination for intestinal one and Serology “IHA , ELISA” for both intestinal (if its invasive) and extra intestinal
- Symptomatic patients with Amoebiasis are treated with Metronidazole as for the Asympromatic (cysts only): **Diloxanidefuroate (Furamide)**
- Cryptosporidium Parvum can be ingested from swimming pools then excystation occurs in epithelial cells of the GIT or others tissues then it undergoes asexual multiplication
- **Cryptosporidium Parvum** , usually occurs in immune suppressed patients, infants, children and the elderly ones.
- We can **diagnose C.parvum** by using certain **stains** (acid-fast stain, safranin) or Serology (IFAT)
- C.parvum is Self-limited in immunocompetent patients but in immune suppressed patients (AIDs) we use paromomycin
- Giardislamblia , C.parvum & E.histolytica have an Fecal-oral rout
- **C.parvum**, Parasitize occurs in **epithelial cells of the GIT** or other tissues such “respiratory tract” where it undergoes **asexual multiplication**.