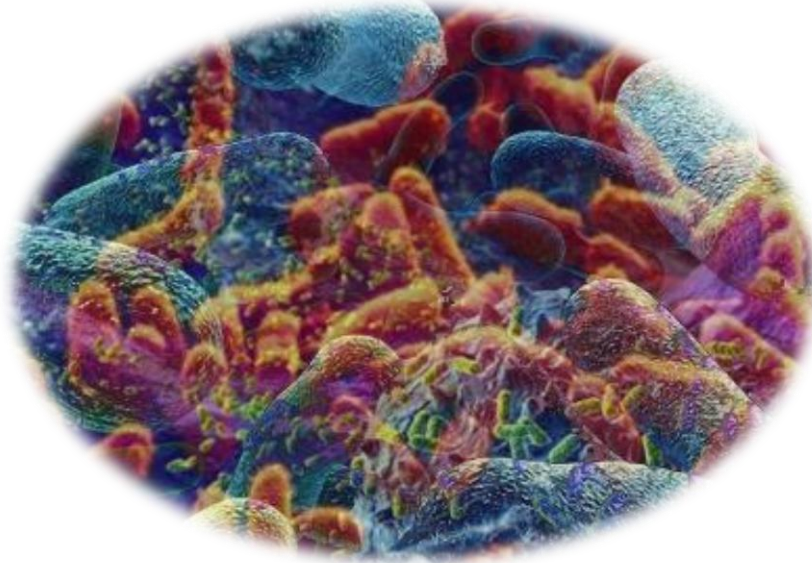


431
Microbiology Team

Intestinal Protozoa

GIT & HAEMATOLOGY BLOCK



Leaders:

Faisal Al Rashid , Eman Al-Shahrani

Done by:

Saud Al Omair , Maymonah Al Abdaly

Protozoa

Unicellular Organisms; Single cell for all Functions. Amoeba move by pseudopodia, Flagellates by Flagella, Ciliates by cilia. We Have 3 main organisms in this Lecture:

- 1- Giardia Lamblia.
- 2- Entamoeba Histolytica.
- 3- Cryptosporidium Parvum.

Giardia Lamblia

Life Cycle:

1. It starts from passed cysts and trophozoites from an infected individual to contaminate food, water and hands.
2. When these cysts are ingested they become trophozoites, this will trigger the symptoms of Giardiasis.
 1. Infective Stage: Cysts.
 2. Diagnostic Stage: both Trophozoites and Cysts can be found in the stool.

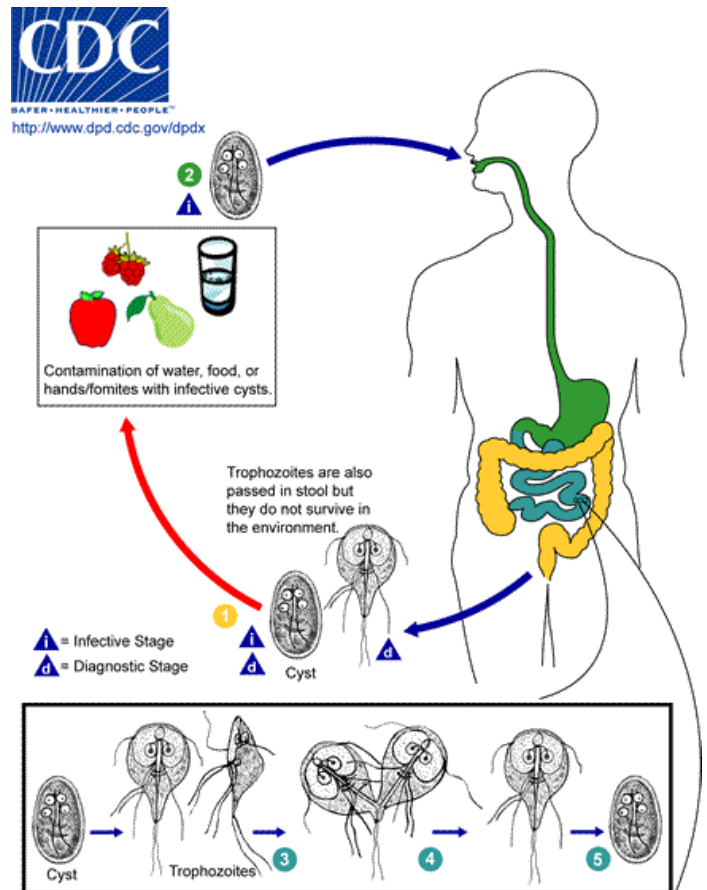
Clinical Picture:

Asymptomatic infections (majority)

Symptomatic Infections:

- Typical picture: IP 1-2 weeks followed by diarrhea for about 6 weeks.
- Atypical: Severe diarrhea, malabsorption especially in children.

Drug of choice: Metronidazole



Lab Diagnosis	Stools examination	Microscopy for cysts or trophozoites Detection of Giardia antigens in stools
	Examination of duodenal contents	Trophozoites

Intestinal Amoeba

- There are many types of amoeba, all of them are harmless except Entamoeba Histolytica, and it is the only pathogenic one.
- 500 million people are infected. 100,000 deaths per year. Worldwide distribution. It is a waterborne infection.
- E. dispar cannot be distinguished from E. Histolytica under the light microscope (dispar is harmless).

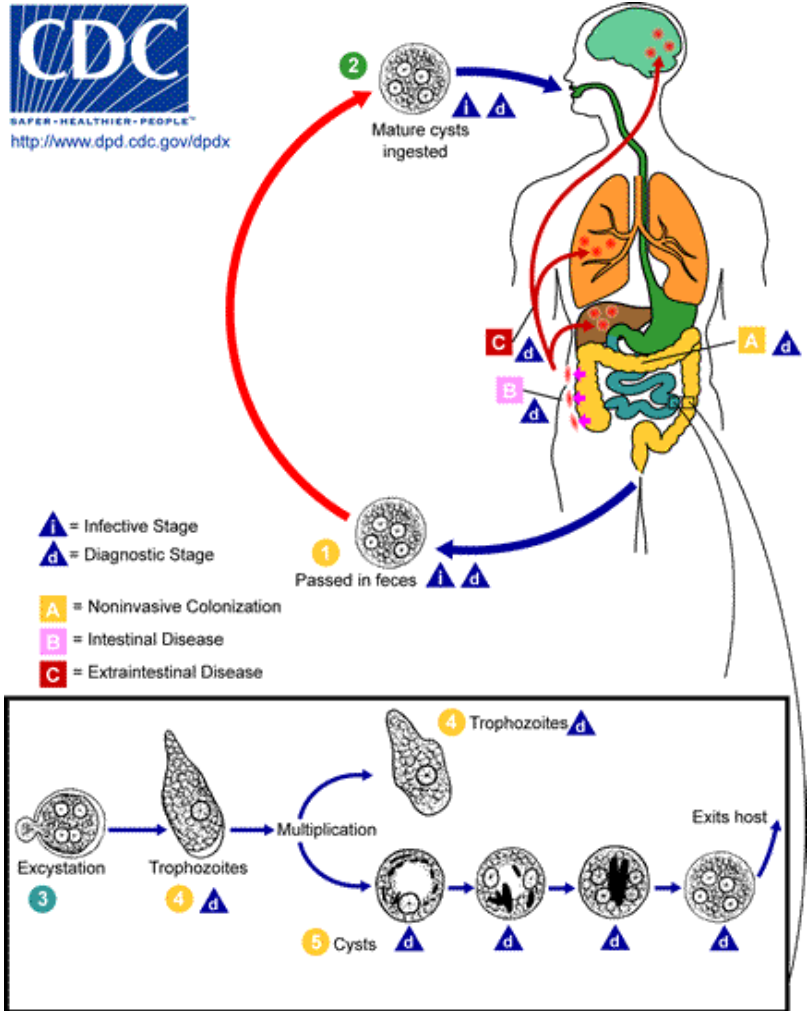
Life Cycle:

3. Passed cysts in feces (because they can resist harsh environment) are the **infective and diagnostic Stage** of the Disease.
4. The Mature cyst if ingested then it transforms to trophozoites in the large intestine which cause Amoebiasis or Dysentery.

- Trophozoite: vegetative stage, must encyst to survive in the environment. It is a fragile structure.

Mode of infection:

- Water, food.
- Flies can act as vector.
- Can be sexually transmitted person to person contacts (Esp. Homosexuals).
- Not a zoonosis (No intermediate host).
- ✓ The infective dose can be as little as 1 cyst.
- ✓ 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.



PATHOLOGY

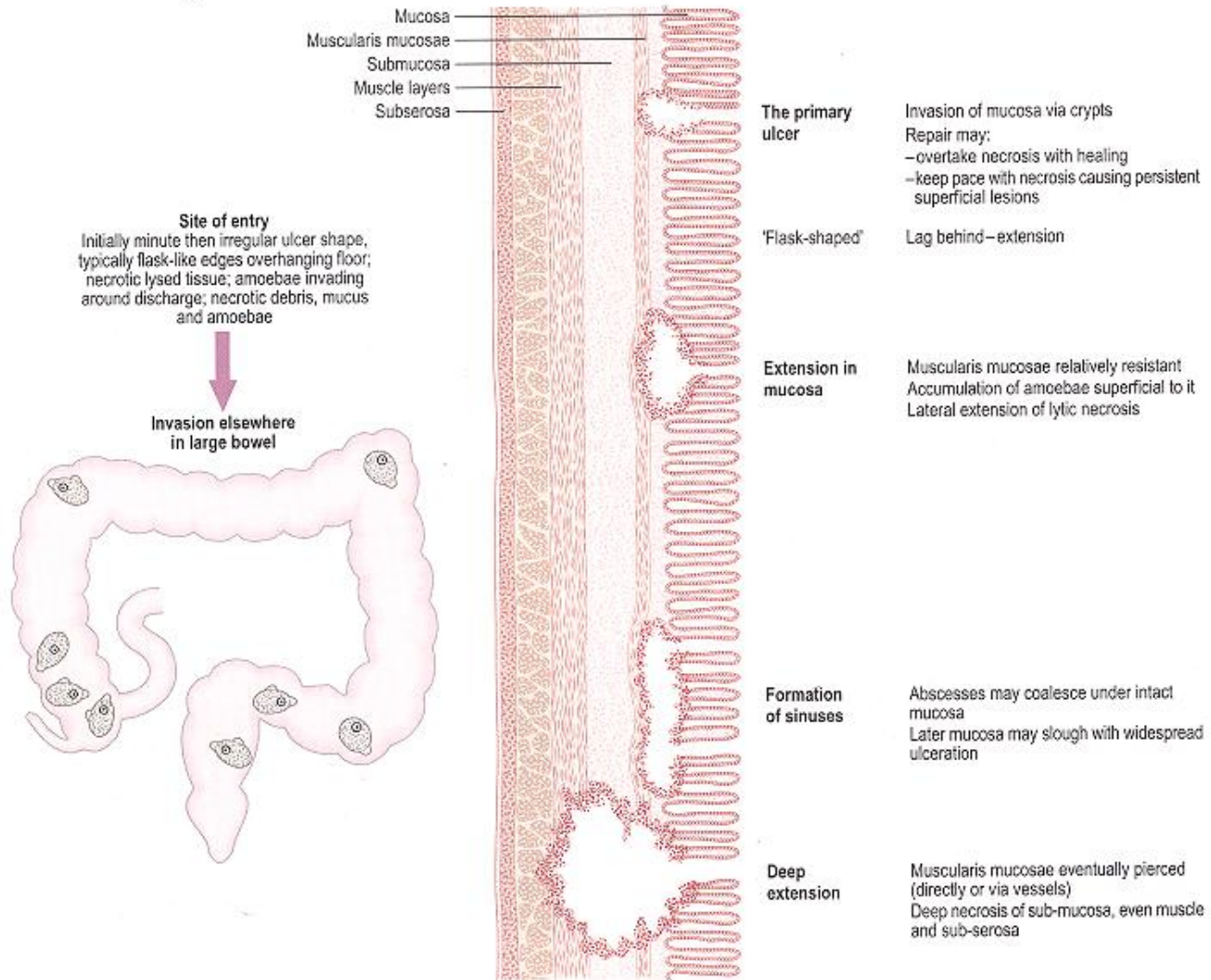
Intestinal Amoebiasis:

- Ability to hydrolyse host tissues with their active enzymes present on the surface membrane of the trophozoite. (Thus, Called Histolytica). Microscopically, It can be seen with ingested erythrocytes in mucosa.
- Lesions are found in the cecum, appendix, or colon.
- They may heal. If perforation of the colon occurs, this may lead to peritonitis that can lead to death.
- Amoeboma: Granulomatous mass obstructing the bowel (can be mistaken with malignancy).

Extra Intestinal Amoebiasis:

- **Direct Extension:** Trophozoites penetrate the mucosa, and reach the Liver through the veins and then form an Abscess. Then it may extend to the Lungs through sub diaphragmatic abscess.
- It also can reach the lung and other organs through **hematogenous Spread**.

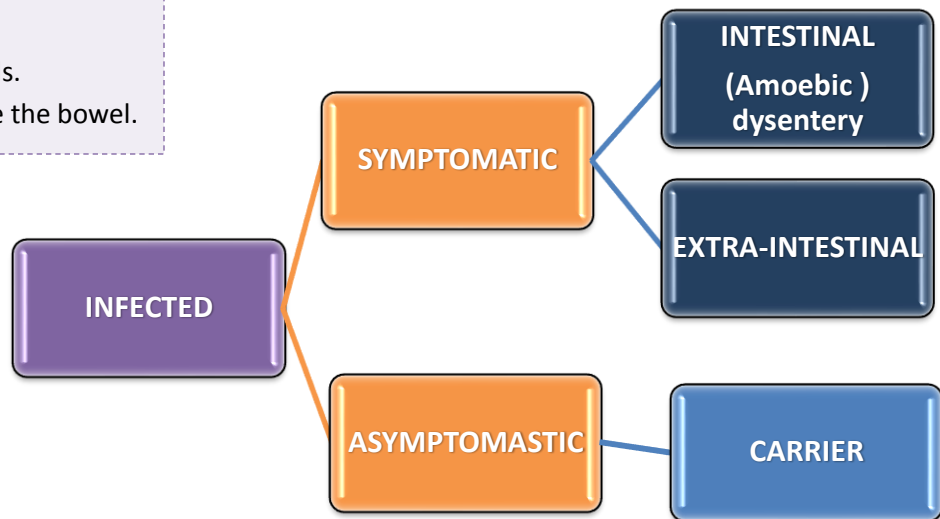
Invasion of the large intestine



Complications

- Perforation and Hemorrhage.
- Secondary infection.
- Amoeboma.
- Invasion of Blood Vessels.
- Direct extension outside the bowel.

Clinical Outcomes



Lab Diagnosis	Intestinal	Stool	Wet mount (cysts and Trophozoites) Concentration methods (only cysts)
		Serology	mainly for invasive infections IHA - ELISA
	Extra Intestinal	Serology: IHA , ELISA Microscopy of tissues or fluids	

Treatment	Intestinal	Asymptomatic (cysts only)	Diloxanide Furoate (Furamide)
		Symptomatic (cysts and trophozoites)	Metronidazole
	Extra Intestinal	Metronidazole	

Cryptosporidium Parvum

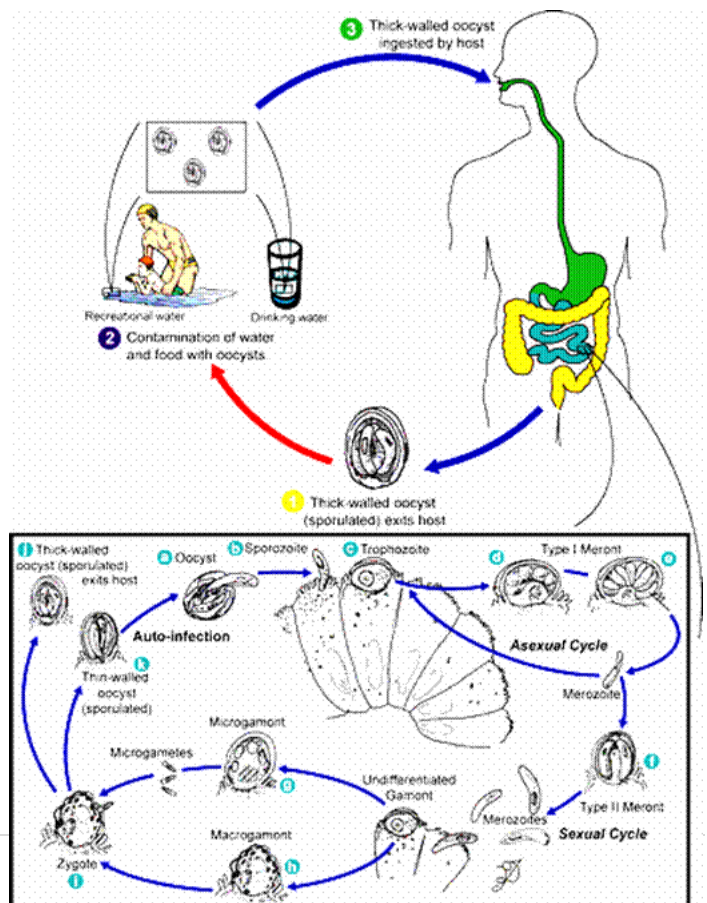
Life Cycle:

1. Thick Walled Oocyst exits host.
2. Contamination of water and food with oocysts.
3. Oocyst ingested by host.

- Not detected by normal screening, because it **needs special stains** to appear.
 - Acid Fast stain.
 - Safranin.
 - Crypto-Giardia FAT.

Treatment

- Self-Limiting in Immunocompetent Patients.
- Immunocompromised: **Paromomycin**



Summary

- Clinical Picture for Amoebiasis: diarrhea for two weeks with fever of 39° C, nausea, vomiting, malaise and right upper abdominal pain with hepatomegaly. CT scan reveals a **Hypodense mass** in the liver.
- Intestinal protozoa are unicellular organisms and we have three main organisms: Giardia lamblia, Entamoeba histolytica, and Cryptosporidium parvum .
- A person gets infected with giardia lamblia through cysts and trophozoites from infected individuals (food, water, and hands) then cysts when ingested become trophozoites then trigger symptoms of giardiasis .
- The majority of giardia lamblia infections are asymptomatic but there are symptomatic infections, IP: 1-2 weeks followed by diarrhea (2weeks) this is typical and the atypical in children shows severe diarrhea and malabsorption .
- Lab Diagnosis is examination of the stool for cysts and trophozoites and detection of giardia antigens. Also we can examine duodenal contents for trophozoites .
- The drug for treating giardiasis is metronidazole .
- The second organism is Entamoeba histolytica .It is the only pathogenic type of Amoeba cannot be distinguished from E.despar which is harmless.
- Trophozoites must encyst to survive environment .
- Cyst (infective dose) and infective dose can be 1 cyst.
- Can be transmitted through water, food, flies (vector), and sexual transmission, not a zoonosis IP: few days to few weeks(depends on infective dose)
- Lesions of Entamoeba histolytica are found in cecum, appendix, or colon (can hydrolyze host tissues with enzymes on surface membrane) .
- A serious complication is perforation of colon lead to peritonitis then death. Also amoeboma which is a granulomatous mass obstructing bowel
- Extraintestinal ameobiasis is when trophozoites penetrate mucosa and reach liver (abscess) through veins then it may extend to lungs.
- E.histolytica in mucosa shows numerous trophozoites ingested with erythrocytes.
- Drugs to treat amoebiasis –asymptomatic (cysts only): diloxanide furoate(furamide) –symtomatic(cysts and trophozoites): metronidazole and extraintestinal: metronidazole
- Lab diagnosis : stool examination
Wet mount: cysts and trophozoites
Concentration methods (only cyst)
 - Serology is done for invasive infections IHA, ELISA, microscopy of tissues and fluids.
 - Cryptosporidium parvum is the third organism needs special stains to appear
 - Acid-fast stain
 - Safranin
 - Crypto-gardia-FAT
 - Cryptosporidiosis treatment:
 - Self limited in immunocompetint hosts .
 - In AIDS patients: paromomycin .

Questions

1-Which intestinal protozoa needs special stains to appear under microscope:

- A-Entamoeba histolytica**
- B-Giardia lamblia**
- C-Cryptosporidium parvum**

2-What is the drug for treating Giardiasis:

- A-Paromomycin**
- B-Metronidazole**
- C-Streptomycin**

3-Which type of amoeba cannot be distinguished from Entamoeba histolytica under the microscope:

- A-E.hartmanni**
- B-E.coli**
- C-E.polecki**
- D-E.dispar**

4-Which intestinal protozoa its incubation period can vary from days to weeks depending on infective dose:

- A-Entamoeba histolytica**
- B-Giardia lamblia**
- C-cryptosporidium parvum**

Answers:

- 1- C**
- 2- B**
- 3- D**
- 4- A**