Done by Razan fawwaz	Balantidium coli	Giardia (opportunis
Habitat	Large intestine (caeum & rectosegmoid region).	Small intestine (du jejunu duct and g
D.H	Man.	Μ
R.H	Pigs and rats.	
Mode of infection	 1- Ingestion of food or drink contaminated with mature cyst directly or indirectly by flies. 2- Handling food by infected food handlers as cookers and waiters. 3-Autoinfection (hand to mouth infection). 	Angestio 1. Contaminate 2. Feco-oral (a <u>Same Bala</u>



Giardia lamblia

Disease: Giardiasiş

infection with G. lamblia .Hypogammaglobulinaemia .Low level of secretory lgA in the gut .Achlorhydria (decreased HCL) .Malnutrition

1. Mucosal factor: direct attachment of the trophozoites mucosa leads to: A. Atrophy of duodenal microvilli and hyperplasia of the crypts > malabsorption syndrome for .A. Lact0se..... lactose intolerance .B. Glucose and amino acids C. Fat... steatorrhea (light coloured fatty & .stool) Fat soluble vitamins (A,D,E,K) and vitamin B12 2. Luminal factors: A- Decrease luminal bile salts uptake of bile salts by Giardia lamblia trophozoite during its growth impaired absorption of fat- and fat-soluble vitamins and vitamin B12

leading to steatorrhea B- Inhibition of digestive enzymes such as .lipase and trypsin maldigestion

C- Bacterial overgrowth mucosal damageand bile salts deconjugation impaired absornDtion of fat steatorrhoea

Pathogenesis



balantidial dysentery In *heavy infection*, the mucosa and submucosa of the large intestine are invaded and destroyed by the multiplying .organisms This is *helped by the boring action of the cilia and the proteolytic* secretion the formation of small abscesses that leads to flask shaped ulcers with red .undermined edges Infection is severe in *immunocompromised* patients

Disease: Balantidiasis or

Cryptosporidium species

Predisposing factors for the development of

The parasite is in the brush border of the epithelial cells of the small intestine (*intracellular but extra cytoplasmic*) damage to the microvilli where it attaches.

Balantidium coli

trophozoites remain in the intestinal **lumen** feeding as Commensal without tissue invasion (Asymptomatic patient known healthy as carrier and cyst carrier)

1-Asymptomatic infection Most common

2-Symptomatic infection

Acute balantidialdysentery Fever, abdominal pain, tenderness, tenesmus & frequent motions of **loose stool** containing mucus, blood and trophozoites.

Chronic infection

low grade fever, recurrent episodes of diarrhea alternates with constipation. Only cysts are found in stool

3.Complication

- •Haemorrhage
- Appendicitis.
- Intestinal
- perforation &
- peritonitis.

1-Asymptomatic infection: Most common. The *trophozoites remain in the intestinal lumen* feeding on surrounding nutrients and mucus without causing manifestations (Asymptomatic patient known as a healthy carrier). 2. Acute Giardiasis: Common in children and travelers to endemic areas. <u>Symptoms</u>: Fever, abdominal colic, epigastric pain, anorexia, flatulence, vomiting, watery diarrhea with excess mucus (no blood) but later steatorrhea. dehydration and loss of weight. Trophozoites are found in the stool in this case. Invasion to gall bladder > cholecystitis, jaundice and biliary colics.

In immunocompetent, giardiasis is self-limiting. *In immunodeficient*, IgA secretion in the gut is decreased > severe infection with persistent diarrhea, steatorrhea, malabsorption syndrome and weight loss.

3. Chronic giardiasis: - Common in adults. The patient suffers from anorexia, epigastric pain, dyspepsia, nausea, vomiting & diarrhea alternating with constipation. Only cysts are found in stool. 4. Complications: 1- Retardation of growth & development in infant and young children. 2- Malnutrition and malabsorption syndrome. **3- Biliary tract disease**

Clinical manifestation



Giardia lamblia

Cryptosporidium species

1. Immunocompetent: Acute self-limited watery diarrhea that can last for a few weeks with abdominal cramps, low fever, nausea, vomiting, malabsorption and dehydration.

2. immunocompromised: The disease is more severe with cholera like diarrhea 团 severe malabsorption and weight loss. The diarrhea is chronic and last for 2 months or more (cholera-like watery diarrhea). **Respiratory tract infection**

Jaundice and biliary colic especially in AIDS patients

Balantidium coli

a) <u>Direct</u>

•Macroscopic:Offensive loose stool mixed with mucus and blood.

• Microscopic:

1-**Stool examination**: Reveals either trophozoites (in <u>loose stool</u>) or cysts (in formed stool) by direct smear, iodine stained.

2-**Sigmoidos copy**:To see the ulcer or the trophozoites in aspirate or biopsy of the ulcer.

3-**X-ray after barium enema**: to see the ulcer, deformities or stricture.

b) <u>Indirect</u>

-Serological tests: CFT, IHAT,IFAT, ELISA and GDPT (gel diffusion precipitin test).
N.B. These serological tests are positive only in case of invasion to intestinal mucosa but negative in asymptomatic carriers.

1. <u>Direct</u>:

Macroscopical: Stool is bulky, offensive, loose, and <u>greasy mixed with mucus</u> and usually float on the water surface in toilet. *Microscopical*:

 Stool examination: Reveals either trophozoites (in loose stool) or cysts (in formed stool) by: direct smear or concentration methods.
 Endoscopic biopsy from duodenum for trophozoites & pathological changes in mucosa

2. <u>Indirect</u>: -Serological tests.
-Faecal antigen ELISA: Immunologic test for detection of *G. lamblia antigen* in the stool.
It is a sensitive & specific test.
-PCR: For detection of DNA of G. lamblia

treatment

1-Tetracycline.
 2- Metronidazole (Flagyl).

Metronidazole (Flagyl).
 Nitazoxanide

Diagnosis

Giardia lamblia

Cryptosporidium species

1. *Direct*:

Stool examination for detection of oocysts by: Direct smear & concentration floatation methods. Smear stained with **modified Ziehl** Neelsen stain or acid fast stain. 2. <u>Intestinal biopsy</u> stained with hematoxylin and eosin for detection of oocysts attached to the brush border.

3. <u>Serological tests</u>: For detection of antibodies.

 Antigen detection in the stool by using: DFAT, ELIZA, IFAT.
 PCR.

3. For biliary cryptosporidiosis: Ultrasonography and endoscopy.

 Supported treatment: Fluid + antidiarheal treatment つends wwith spontaneous recovery.
 Drugs: Nitazoxanide and Spiramycin.