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Amoebiasis

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Entamoeba histolytica, amoebiasis, amoebic dysentery, pathogenic protozoan.

ABSTRACT

Amoebiasis is a disease caused by Entamoeba histolytica parasite, which considered one of the first three parasites of causing death worldwide. Infection rate became more common in non-endemic regions. Despite the majority of persons infected with this parasite, but they keep asymptomatic, some patients show amoebic colitis. This review outlines the current knowledge related to Entamoeba histolytica.

1. Introduction

Amoebiasis, or amoebic dysentery, is a disease result from intestinal parasite called Entamoeba histolytica, it may produce no symptoms in most infections, moderate, or severe symptoms, that may include abdominal pain, watery or bloody diarrhea, weight loss, colonic ulcerations [1]. It was evaluated that 50 million persons are infected with this parasite. It is causing death for more than 100,000 cases per annum, [2] and death cases are results from serious complications regarding intestinal or extra intestinal disease [3]. Young individuals, recipients of corticosteroids, malnourished persons, and pregnant women are more susceptible to infect with amebic colitis [4].

2. Morphology of Entamoeba histolytica

Entamoeba species has four stages in life cycle, which are trophozoite, precyst, cyst, and metacyst. The commonly stage that recognized in the feces is trophozoite, which colonize cecum and colon of the large intestine.

Trophozoites stage or vegetative forms are the motile stage that moves by pseudopodia, it has irregular shape with a diameter about 15 and 30 µm. The active trophozoite has a finely granular endoplasm and clear ectoplasm, pseudopodia are broadly fingerlike, the nucleus is spherical surrounded by nuclear membrane, karyosome locate in the center of nucleus, chromatin granules regular in distribution in the inner nuclear membrane, and food vacuoles digest red blood cell [5]. As shown in Figure 1.

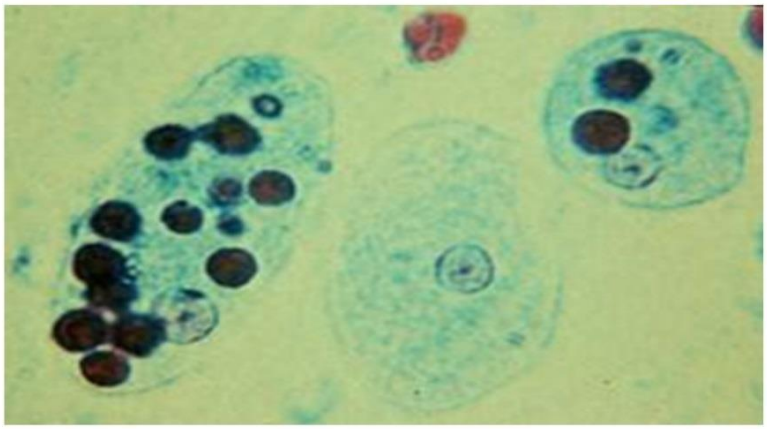

Figure 1. Trophozoites of *E. histolytica* stained with Trichrome (www.dpd.cdc.gov.DPDx).

While cyst stage is the non-motile form, infective, mature cysts are spherical and have 4 nuclei, with a diameter of 20 µm, contains glycogen vacuoles and ribosomes that are often have dark bars, and can be shedding in the stool [6]. Figure 2.

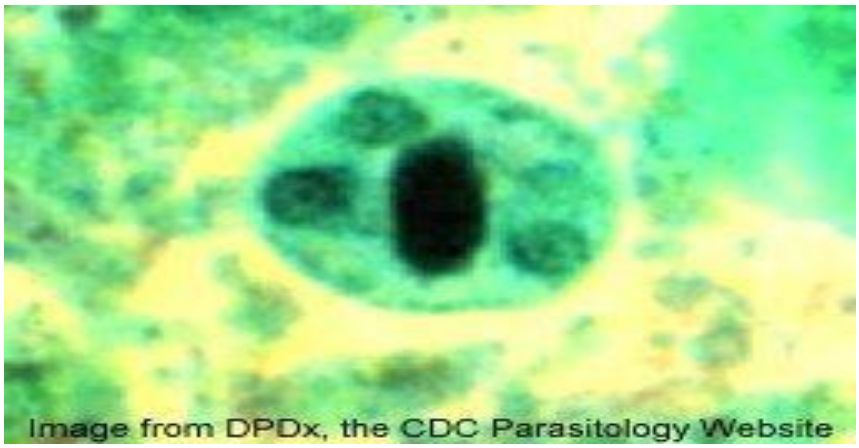

Figure 2. Cyst of *E. histolytica* stained with Trichrome (www.dpd.cdc.gov.DPDx).

3. Life Cycle of Entamoeba histolytica

This parasite life cycle is carried out in one host only (man) [7] as shown in Figure 3.

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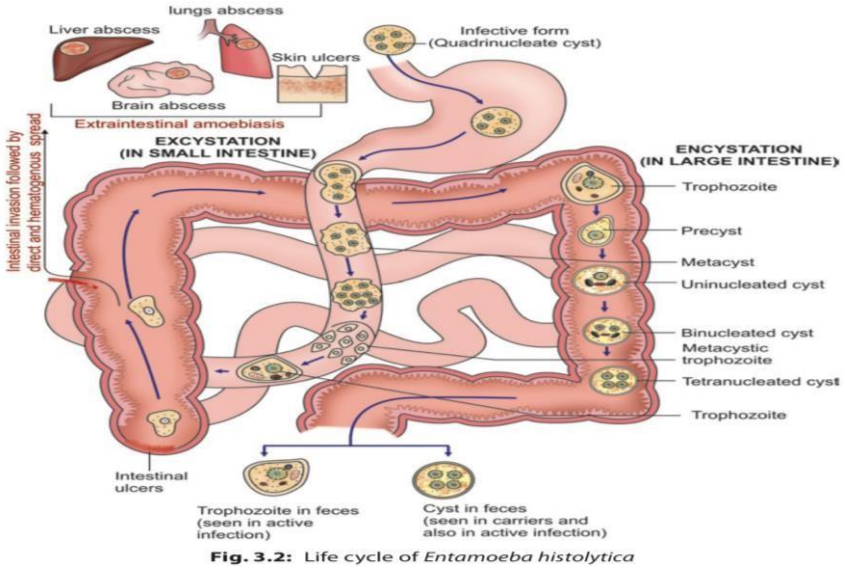

Figure 3. Life Cycle of Entamoeba histolytica (www.dpd.cdc.gov.DPDx).

4. Transmission of Entamoeba histolytica

By ingestion of contaminated food or water with amoebae cyst (infective stage) [8].

5. Incubation period

It can take about 14 to 28 days [9].

6. Pathogenesis of Entamoeba histolytica

It could be primarily (intestinal amoebiasis), [10] or secondarily (extra-intestinal amoebiasis) occur in liver, [11] lungs which are the second most common extra intestinal affected organ [12] brain, and genito urinary [13].

Symptoms of amoebic colitis can be moderate diarrhea to serious dysentery, with pain in the abdomen and bloody or watery diarrhea [10]. Complications includes ameboma, toxic megacolon, ulceration in the perianal region, acute fulminant colitis, peritonitis, and amoebic stricture (usually in the anus, rectum or sigmoid colon) [14]. While pathogenesis of extra intestinal amoebiasis in the liver, the parasite release toxin and making damage to the parenchymal liver, leading to necrosis of parenchyma and formation of abscess, tenderness in right hypochondrium, and pain in right shoulder. Its complications are hepato bronchial fistula, pleural effusion, rupture of the abscess into peritoneal cavity, and pericardial cavity [15].

Pulmonary amoebiasis can occur by direct spread by lymphatic or from intestinal lesions [16]. Symptoms are hemoptysis, right upper quadrant pain, fever, bronchohepatic fistula, pulmonary abscesses, and empyema can occur [12].

7. Diagnosis of Entamoeba histolytica

Microscopic examination: This test is less dependable method of identifying Entamoeba species than other tests [17].

Culture Method: It is important for isolation of Entamoeba species [18].

Detection Tests for Antigen: Studies have been used ELISA for detection antigens in stool samples [19].

DNA-based diagnostic tests: Methods of DNA Extraction are conventional PC, [20] and Real-Time PCR [21].

8. Treatment of Entamoeba histolytica

Noninvasive amoebiasis can be treated by paromycin (luminal agent), which is antiparasitic drug for cysts, whereas invasive colitis and secondarily amoebiasis, can be treated with nitroimidazoles such as metronidazole, which is active only against trophozoite stage, or nitroimidazoles like ornidazole, secnidazole, and tinidazole. To prevent relapse, nitroimidazole course or paromycin course, must be used after 10 day to make assure that luminal parasites are disappeared. The second line luminal agents include diloxanide furoate and diiodohydroxyquin, [22] as shown in Table 1.

Condition	Drug	Adult dosing
Asymptomatic	Paromomycin	25 to 35mg/kg/day PO in three divided doses x 7 days
	iodoquinol	650 mg PO TID x 20 days
	or diloxanide furoate (luminal agent only)	500 mg PO TID x 10 days
Intestinal disease (mild to moderate)	Metronidazole	500-750 mg PO TID x 7-10 days
	or tinidazole (followed by luminal agent as above)	2g PO daily x 3 days
Liver abscess or severe intestinal disease	Metronidazole	750 mg PO IV TID x 10 days
	or tinidazole (followed by luminal agent as above)	2g PO daily x 5 days

9. Prevention and control of Entamoeba histolytica

Amoebiasis is a disease results from contamination of water and food. Prevention and control depend on having good environmental sanitation, especially in controlling quality of drinking water, early detection of infection, education of people about health on observance of good food, environmental, and personal hygiene [23].

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