Amoebiasis: A major threatening disease

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ABSTRACT

Amoebiasis is a dangerous disease which is caused by the parasite *Amoeba*, belonging to Protozoa. This parasite is present globally and can affect multiple species causing intestinal problems termed as amoebic dysentery. Proper prevention and control measures should be taken to eradicate this disease.

Introduction

Amoebiasis is a protozoan infection characterized by acute and chronic colitis that results in dysentery or persistent diarrhea. It is commonly seen in people and nonhuman primates but can also be seen in cats and dogs, rare in the case of other mammals. In mammals, several species of amoeba are found but the most known pathogen is *Entamoeba histolytica*. People are naturally infected with this species, and they become the source of transmission to other domestic animals. Mammals carry the infection through contaminated food and water. The disease is prevalent worldwide in tropical and subtropical areas. *E. histolytica* and *E. polecki* are of zoonotic aspect [1]. *E. dispar* is a nonpathogenic amoeba that is morphologically identical to *E. histolytica* but molecularly distinguishable. *E. invadens* which is reported in reptiles is also morphologically identical to E. histolytica but not transmitted to mammals [2].

The important reservoir of *E. histolytica* infection is the man. Transmission of *Amoebiasis* is through food and water contaminated with fecal matter. Moreover, flies carry the infective cyst and could act as vectors [3].

Life cycle

E. histolytica infection starts with the ingestion of mature cysts. Cysts and trophozoites are typically found in formed stool and diarrheal stool respectively. After ingestion cysts go to the small intestine where excystation occurs and trophozoites are released which then migrate to the large intestine. In the large intestine, trophozoite multiplication occurs by binary fission, and cysts are produced [4]. Then both trophozoites and cysts pass in feces. Cysts are responsible for the transmission of infection as they survive days to a week in the environment, whereas once trophozoites come outside the body is rapidly destroyed. Trophozoites remain confined to the intestinal lumen in asymptomatic individuals and source of infection to others. However, in some individuals, intestinal mucosae are invaded by trophozoites and cause intestinal disease. In extra-intestinal disease, trophozoites damage sites like the liver, brain, and lungs, resulting in pathological manifestation.

Clinical signs

E. histolytica infection occurs in non-human primates. The disease is also reported in cattle, swine, rats, dogs, and cats. *E. polecki* has been isolated from swine. The disease is characterized by colitis and liver abscess. In most cases, infection remains asymptomatic. There are two possibilities of infection. The first parasite may live in the intestine and cause no or mild infection. This form is characterized by watery diarrhea, abdominal distress, and stomach pain. Sometimes it leads to amoebic dysentery [5]. The second possibility is rare as the parasite may reach the liver, resulting in liver abscess.

Diagnosis

Definitive diagnosis depends upon the demonstration of the parasite (trophozoites or cysts) from feces. Direct saline smears or affected stained colonic tissue is best for visualization of trophozoites. Trophozoites are motile, having single vesicular nuclei or ingested RBCs, and usually >20µm in diameter [6]. Ulceration biopsy and colonoscopy with scraping is a more efficient method for the diagnosis of amoebic colitis than fecal examination. Feces should be examined rapidly because trophozoites die rapidly once come outside the body. Fecal leukocytes may be confused with amoeba; Therefore, identification is assessed easily by using specific trichrome, iodine, periodic acid-Schiff reaction, or iron hematoxylin staining techniques [7]. Cysts may be identified by zinc sulfate flotation or by iron, iodine, and iron hematoxylin staining techniques. Mature cysts consist of four nuclei whereas immature may have one or two nuclei. The identification of parasites is based on *E. histolytica*-specific antigen detection and the detection of DNA in a stool sample. The advanced diagnostic methods for the identification of parasites are comprised of the detection of DNA in stool samples and the detection of *E. histolytica*-specific antigens. Differentiation of *E. histolytica* and *E. dispar* is done by using conventional and real-time PCR.

Treatment

Limited information is available on treatment in animals. However, Metronidazole at a rate of 10-25 mg/kg, PO, BID for 1 week or Furazolidone at a rate of 2-4 mg/kg, PO, TID for 1 week has been recommended. Trophozoite shedding may persist after therapy. Drug of choice in symptomatic intestinal or extra-intestinal infection in people includes Metronidazole or Tinidazole and followed by iodoquinol, paromomycin, etc. instantly. And for asymptomatic infection drug of choice is iodoquinol, puromycin, etc. [8].

Prevention and Control

Your Infection is prevented by avoiding contamination of food and water with fecal matter and through personal hygiene. Properly wash fruits and vegetables before eating and cooking. We should drink boiled and filtered water. In nonendemic areas, the disease can be prevented by early treatment of carriers.

Conclusion:

Amoebiasis is an intestinal protozoan infection caused by *E. histolytica* and is commonly seen in people and nonhuman primates. The disease is prevalent worldwide and has great zoonotic aspects. Humans are the main reservoir and source of infection in others. It is transmitted through food and water contaminated with fecal matter. It is characterized by colitis that results in dysentery and persistent diarrhea. Proper measures must be taken to eradicate this disease.

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