SECTION 18 PROTOZOAL INFECTIONS

247 Amebiasis and Infection with Free-Living Amebas

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AMEBIASIS

DEFINITION

Amebiasis is an infection with the intestinal protozoan *Entamoeba histolytica*. About 90% of infections are asymptomatic, and the remaining 10% produce a spectrum of clinical syndromes ranging from dysentery to abscesses of the liver or other organs.

LIFE CYCLE AND TRANSMISSION

E. histolytica is acquired by ingestion of viable cysts from fecally contaminated water, food, or hands. Food-borne exposure is most prevalent and is particularly likely when food handlers are shedding cysts or food is being grown with feces-contaminated soil, fertilizer, or water. Besides the drinking of contaminated water, less common means of transmission include oral and anal sexual practices and—in rare instances—direct rectal inoculation through colonic irrigation devices. Motile trophozoites are released from cysts in the small intestine and, in most patients, remain as harmless commensals in the large bowel. After encystation, infectious cysts are shed in the stool and can survive for several weeks in a moist environment. In some patients, the trophozoites invade either the bowel mucosa, causing symptomatic colitis, or the bloodstream, causing distant abscesses of the liver, lungs, or brain. The trophozoites may not encyst in patients with active dysentery, and motile hematophagous trophozoites are frequently present in fresh stools. Trophozoites are rapidly killed by exposure to air or stomach acid, however, and therefore cannot transmit infection.

EPIDEMIOLOGY

About 10% of the world's population is infected with *Entamoeba*, the majority with noninvasive *Entamoeba dispar*. Amebiasis results from infection with *E. histolytica* and is the third most common cause of death from parasitic disease (after schistosomiasis and malaria). Invasive colitis and liver abscesses are sevenfold more common among men than among women; this difference has been attributed to a disparity in complement-mediated killing. The wide spectrum of clinical disease caused by *Entamoeba* is due in part to the differences between these two infecting species. *E. histolytica* has unique isoenzymes, surface antigens, DNA markers, and virulence properties that distinguish it from other genetically related and morphologically identical species, such as *E. dispar* and *E. moshkovskii*.

Most asymptomatic carriers, including men who have sex with men (MSM) and patients with AIDS, harbor *E. dispar* and have self-limited infections. In this respect, *E. dispar* is dissimilar to other enteric pathogens such as *Cryptosporidium* and *Cystoisospora belli*, which can cause self-limited illnesses in immunocompetent hosts but devastating diarrhea in patients with AIDS. These observations indicate that *E. dispar* is incapable of causing invasive disease. Unlike *E. dispar, E. histolytica* can cause invasive disease, as demonstrated in recent reports from Korea, China, and India that suggest higher prevalences of amebic seroconversion, invasive amebiasis, and amebic liver abscesses among HIV-positive than HIV-negative patients. In another study, 10% of asymptomatic patients who were colonized with *E. histolytica* went on to develop amebic colitis, while the rest remained asymptomatic and cleared the infection within 1 year.

The potential of *E. moshkovskii* to cause diarrhea, weight loss, and colitis was recently demonstrated in a mouse model of cecal infection. However, the pathogenic potential of this species is not clear. A prospective evaluation of children from the Mirpur community of Dhaka, Bangladesh, found that most children who had diarrheal diseases associated with *E. moshkovskii* were simultaneously infected with at least one other enteric pathogen.

Areas of highest incidence of *Entamoeba* infection (due to inadequate sanitation and crowding) include most developing countries in the tropics, particularly Mexico, India, and nations of Central and South America, tropical Asia, and Africa. In a 4-year follow-up study of preschool children in a highly endemic area of Bangladesh, 80% of children had at least one episode of *E. histolytica* infection and 53% had more than one episode. Naturally acquired immunity did develop but was usually short-lived and correlated with the presence in the stool of secretory IgA antibody to the major adherence lectin galactose *N*-acetylgalactosamine (Gal/GalNAc). The main groups at risk for amebiasis in developed countries are returned travelers, recent immigrants, MSM, military personnel, and inmates of institutions. Data from the GeoSentinel Surveillance Network, which come from tropical medicine clinics on six continents, showed that, among long-term travelers (trip duration, >6 months), diarrhea due to *E. histolytica* was among the most common diagnoses.