

Review

A review of sexually transmitted diseases (STDs) of parasitic origin: The case of giardiasis

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Giardiasis is an acute form of gastroenteritis caused by the parasite *Giardia lamblia*. An increase in the incidence and frequency of the disease in the last few years in the developed world has brought to the fore a now recognized mode of transmission – sexual contact. This in turn has led to giardiasis being classified as a sexually transmitted disease by the Centre for Disease Control and Prevention (CDC) in the United States. This review identifies its occurrence mainly in homosexual populations of the developed world especially in the United States and the possible spread of the disease through the family setting and even heterosexual relationships.

Key words: Giardiasis, STDs, parasitic.

INTRODUCTION

Sexually transmitted diseases (STDs) is a term used to describe more than 20 different infections that are transmitted through exchange of semen, blood and other body fluids or by direct contact with the affected body areas of people with sexually transmitted diseases (STDs) (Haggerty, 2006). The Centre for Disease Control and Prevention (CDC) in the United States has reported that 85% of the most prevalent infectious diseases in the United States are sexually transmitted (Haggerty, 2006). Some of the most common and potentially serious STDs include syphilis, HIV/AIDS, gonorrhoea, chlamydia, human papilloma virus (HPV) and genital herpes, which are of bacterial and viral origins. Those of parasitic origin though less common but no less important include trichomoniasis, amoebiasis, cryptosporidiosis, giardiasis and ecto-parasites like pubic (crab) lice and scabies mite. As early as 1996, WHO estimated that more than 1 million people were being infected daily by STDs (WHO, 1996). STDs can have very painful long-term consequences as well as immediate health problems. They can cause birth defects, blindness, bone deformities, brain damage, cancer, heart disease, infertility and other abnormalities of the reproductive system, mental retardation and death (Haggerty, 2006).

INCIDENCE AND PREVALENCE OF GIARDIASIS

Giardiasis is an acute form of gastro-enteritis caused by the protozoan parasite, *Giardia lamblia*. It is also known

as flagellate diarrhea and travellers' disease because tourists and other travelers sometimes contact the disease while on journeys (especially to disease-endemic areas). The majority of patients with giardiasis are asymptomatic but can intermittently shed the cysts of the organism in faeces as carriers (Danciger and Lopez, 1975) resulting in a protracted period of communicability and spread of the disease. When symptoms present, they typically include diarrhoea, abdominal pain and cramps. Giardiasis is diagnosed by identifying cysts or motile trophozoites in a stool specimen. The parasite is single-celled and is found as a parasite in a variety of species of animals including man, rodents, rabbits, dogs, birds and amphibians. The disease is transmitted through the faeco-oral route and this is most prevalent in impoverished areas where living conditions are overcrowded and sanitation is poor.

Giardiasis is a major diarrhoeal disease found throughout the world. The flagellate protozoan *Giardia lamblia*, its causative agent, is the most commonly identified intestinal parasite in the United States and the most common protozoal intestinal parasite isolated worldwide (Ellis et al., 1993, Andre, 2008). The infectious dose is low and humans can be infected with as few as 10 cysts (Furness et al., 2000). Generally, protozoan infections like giardiasis are often considered to be characteristic of underdeveloped countries where sanitary conditions are poor and insect and animal populations are uncontrolled (Gilman et al., 1988 and Mahmud et al., 1995). Interestingly, *Giardia* is the most commonly diagnosed

intestinal parasite in public health laboratories in the United States (Furness et al., 2000). *Giardia* infects approximately 2% of the adults and 6 to 8% of the children in developed countries worldwide (Gardner and Hill, 2001) and is currently responsible for the largest number of waterborne outbreaks of diarrhea in the United States (Roach et al., 1993; Kramer et al., 1996). Its incidence has also been reported in daycare centres (Sealy and Schuman, 1983; Thompson, 1994), recreational centres like swimming pools (Harter et al., 1984; Greensmith et al., 1988), the keeping of domestic animals (Belosevic et al., 1983) and sexual practices (Stuart et al., 2003).

The prevalence of the disease varies between 2 and 5% in the industrialized world and up to 20 - 30% in the developing world (Farthing, 1993). During 2003 - 2005, the total number of reported cases of giardiasis in the United States remained relatively stable. Reporting increased from 20,084 for 2003 to 20,962 for 2004 and then decreased to 20,075 for 2005 (Yoder and Beach, 2007). A total of 49 jurisdictions reported giardiasis cases; the number of areas reporting >15 cases per 100,000 population increased from four areas in 2003 to seven in 2005. Compared with other age groups, a greater number of case reports were received for children aged 1 - 9 years and for adults aged 30 - 39 years. Incidence of giardiasis was highest in northern states. Peak onset of illness occurred annually during early summer through early fall (Yoder and Beach, 2007). In recent years, there may not have been a marked increase in the incidence and frequency of giardiasis in the United States probably due to improved surveillance of the disease but the same cannot be said of the developing countries especially in Africa where living conditions have continued to be poor and many parts being ravaged by war, famine and disease. Unfortunately, there is a dearth of information on the incidence and frequency of the disease in Nigeria and Africa as most times, the disease is simply reported as gastro-enteritis.

TRANSMISSION OF GIARDIASIS THROUGH SEX

Established and more common routes of transmission of giardiasis include food-borne transmission (Bean et al., 1996; CDC, 2007; Andre, 2008), infection among children and staff at daycare centres (Polis et al., 1986; Steketee et al., 1989; Rauch et al., 1990) and infection through recreational centres like swimming pools, (Porter et al., 1988; Kramer et al., 1996; Levy et al., 1998). Some of the waterborne outbreaks have occurred even where water has been subjected to routine filtration and chlorination procedures, which goes on to show the relative resistance of the cysts to these water treatment procedures and such outbreaks have been documented (Wallis et al., 1998; Levy et al., 1998). One of the earliest documented reports of transmission of giardiasis by sexual contact was by Meyers et al (1977). Later reports include Schmerin

et al (1978), Birkhead and Vogt (1989), Esfaridiari (1997), Thompson (2000), Stuart et al (2003) and Andre (2008). Most of these incidents were recorded in the United States, a few in Canada but generally in homosexual populations except for isolated heterosexual cases. This has made it expedient for giardiasis to be classified as a sexually transmitted disease (STD) by the Centre for Disease Control and Prevention (CDC) in the United States (Haggerty, 2006). The transmission is usually through the faeco-anal-oral route and transmission among heterosexuals is also likely when similar sexual practices as homosexuals are engaged in. These homosexuals are very likely to constitute a fraction of the adult population affected by giardiasis especially the age range of 30-39 identified by Yoder and Beach (2007) in the 2003 - 2005 surveillance. Homosexuals can also be asymptomatic carriers shedding the cysts intermittently in stool as infected persons are reported to shed $\leq 10^8 - 10^9$ cysts/ milliliter of stool per day and excrete cysts for months (Danciger and Lopez, 1975; Pickering et al., 1984) and spreading the parasite through defective sanitary practices after defecating. This can spread in a family setting or in the place of work. A relationship has also been established between HIV/AIDS and parasitic infections like giardiasis (Esfaridiari et al., 1997; Gundel and Hermann, 2002). This shows that it also occurs as an opportunistic infection in immuno-compromised hosts who get exposed either through sexual practices or other means. It therefore means that areas with high homosexual populations are very likely to have high incidents of giardiasis and constitute major health significance despite more popular and established routes of transmission.

CONCLUSION

Drinking water still constitutes a significant route of transmission due to a number of reasons, which include defective water filtration systems, resistance of the *G. lamblia* organisms to routine chlorination procedures, the low infectious dose of the organism and the unavailability of any vaccine for the disease. It is now obvious that an increasingly common route though more prevalent in the industrialized nations like the United States due to their homosexual populations is by sexual contact. Therefore, the classification of giardiasis as a re-emerging and sexually transmitted disease (STD) is apt and justified. This must be taken into consideration along with other such parasitic infections, however lightly, especially with HIV/AIDS pandemic ravaging the African continent.

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