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INTRODUCTION

Giardiasis is a condition that causes diarrhea and is caused by a parasite called *Giardia duodenalis*, which is shortened to "Giardia" for short. Giardia is a parasite that, once it has infected a person or animal, resides in the intestines and is excreted in the stool (poop). Giardia can sometimes live outside of the body for weeks or even months after it has been expelled. There is evidence that Giardia can be discovered in every single region of the United States, as well as in the rest of the world.

An intestinal infection caused by the bacterium Giardia can cause cramping in the stomach, bloating, nausea, and periods of diarrhea that is watery. An infection with Giardia is brought on by a minute parasite that can be found all over the world, but is more common in regions with inadequate sanitation and hazardous water.

Giardia parasites can be found in virtually all countries and continents across the globe. Countries with poor sanitation, such as developing countries, tend to be the ones that struggle with this issue the most. On the other hand, it is available virtually everywhere. Giardiasis is the most frequent form of intestinal parasite illness that can be seen in people living in the United States.

Infection with the bacterium Giardia, often known as giardiasis, is one of the leading causes of waterborne disease in the United States. The parasites are not only present in wells and wells, but also in public water supplies, swimming pools, whirlpool baths, and streams and lakes located in the wilderness. Infection with Giardia can be passed from person to person as well as through the consumption of contaminated food.

More than 50 million trips were taken outside of the UK by citizens of the UK in 2012¹, and the number of trips taken outside of the country is growing. However, there have only been a handful of studies that look at the occurrence of tropical diseases like giardiasis and strongyloidiasis among travelers who have recently returned from their trips. Giardia infection can happen anywhere in the world, and the prevalence of giardiasis is estimated to be between 20 and 30 percent in developing countries. There are approximately 4,000 new cases per year across England, Wales, and Northern Ireland combined.

MAIN BODY

The morphological forms of *Giardia lamblia* are known as the cyst and the trophozoite, respectively. Trophozoites are multi-flagellated parasite forms that have the ability to divide via asexual binary fission. They have the shape of pears and have two nuclei. This particular type is the active, motile feeding stage that was responsible for the disease that occurred in the small intestine. The cyst forms are phases that are non-motile, resistant, and stable, and they do not cling to the surface of the mucosa. Kayser et al. state that trophozoites are the agents that are responsible for disease development in humans. Trophozoites are thought to attach themselves to the lining of the small intestine, after which they undergo rapid growth. Cysts, which are a common kind of parasites, are not infectious in their natural state and are primarily responsible

for the spread of disease. The cyst stage can survive exposure to various chlorine concentrations, including those that are utilized in water treatment plants. There is an infection induced by the cyst stage in fifty percent of people who have symptoms of carriage, which reserves the infection in its endemic form [7].

During a microscopic examination of feces, the identification of trophozoites or cyst formations as *G. lamblia* provides conclusive evidence of the presence of this parasite. At a macroscopic level, the stool is typically foul-smelling, viscous, light in color, free of blood, mucoid (fatty), or watery [8]. Giardiasis, which affects people, is characterized by a wide variety of symptoms. It's possible that some people will have no symptoms at all, while others could develop acute or chronic diarrhea that could linger for several months and be accompanied by malabsorption, cholecystitis, and weight loss.

The most common ways in which an infection can be contracted are through the ingestion of contaminated water that has not been adequately treated, the consumption of contaminated vegetables or fruits that have not been thoroughly cooked or washed, and the transmission of the infection from one person to another through the fecal-oral route. The prevalence rate is high in regions with poor sanitation and ranges from 2% to 5% in affluent countries to 20% to 30% in underdeveloped countries. In wealthy countries, the prevalence rate is between 2% and 5%. The variation in prevalence may be attributable to factors such as the geographical region, whether the society is located in an urban or rural setting, the age group composition, and the socio economic status of the study subjects. The majority of *G. lamblia* infections are brought on by consuming or drinking contaminated water or food. Poor living conditions, overcrowded housing, inadequate environmental sanitation, unclean personal habits, hazardous water supply, and low socioeconomic status are all additional causes.

The majority of *G. lamblia* infections are more severe in children than they are in adults. This is because malnutrition, growth retardation, and improper care contribute to the severity of *G. lamblia* infections in children. Children in schools bear the brunt of the associated morbidity because of their poor personal hygiene, unsanitary toilet practices, consumption of unwashed fruits and vegetables that have not been properly cooked, and drinking and eating of polluted water and food. In the educational institutions of Ethiopia, the infection caused by *G. lamblia* is one of the most common parasitic diseases. Giardia is one of the most prevalent non-viral causes of diarrhea, affecting around 280 million people each year. It is found all over the world and is probably the protozoon that causes intestinal disease in children and adults more frequently than any other. This parasitosis was included to the Neglected Disease Initiative of the World Health Organization in 2004 due to the increasing worldwide burden that it causes as well as the negative developmental and socioeconomic effects that it has on those who are infected with it. Giardiasis has a life cycle that is among the most straightforward of all parasite diseases. There are only two stages: the trophozoite, which is found freely within the small bowel, and the cyst, which is expelled into the environment. Both stages can be found in the same individual. Orally consuming the cyst causes it to rupture in the stomach and duodenum, so releasing the trophozoite inside. In the small intestine, trophozoites reproduce by a process known as longitudinal binary fission. In an in vitro culture setting, their doubling time might range anywhere from 9 to 12 hours. 8° 147 The process of encystation takes place when trophozoites reach the lower intestine, and the resulting cysts are released into the environment, where they can infect the next host. Giardiasis is of great public-health concern due to its high frequency

among young children in underdeveloped countries, its significant effects on stunting and wasting, and the persistent repercussions of early childhood diarrhea and malnutrition. School health programs and health education for children and parents focused at reducing the prevalence of intestinal parasite infection in children may have good impacts on child growth and development, even though the repercussions of giardiasis are diverse. Better diagnostic tools, especially for asymptomatic individuals, and more efficient treatment and control measures are urgently needed to lessen the devastating effects of this illness on human civilizations and the agricultural sector. The possibility for zoonotic transmission of *G. lamblia* cysts from animals to people remains difficult to evaluate, but it has been observed that companion animals emit *G. lamblia* cysts in their feces. Using epidemiological data and molecular approaches, TRAUB et al.⁴² showed evidence of zoonotic transmission between humans and dogs in the same community. The odds of having a child infected with *G. lamblia* increased by 1.26 for every extra cat in the household, even though we did not test the feces of the companion animals in our research sample. There is a lack of knowledge on the zoonotic significance of feline giardiasis^{13,19,27,38,39}. In New Zealand, *G. lamblia* infection prevalence was at 5.2%; in Central New York, it was at 7.3%; and in the United Kingdom, it was at 35.0%.^{34,41,43} *G. lamblia* was found in the feces of 6.1% of stray cats in Rio de Janeiro³², although there has been little research done in Brazil to evaluate the prevalence of these intestinal parasites in cats. Companion animals like dogs and cats appear to pose the highest danger for zoonotic transmission of *G. lamblia*; nevertheless, the frequency and conditions of such transmission have not yet been completely characterized⁴⁰.

While we conducted an epidemiological investigation, we did not use molecular methods to characterize our *G. lamblia* isolates. This suggests that either zoonotic risk factors exist for this protozoal parasite, or that other factors, such as hygiene or diet, may be the causal factor, as giardiasis was more common among diarrheic children who had resided or were living in a farm within six months prior to the interview. Post-infectious irritable bowel syndrome (IBS) and functional dyspepsia have been associated to *G. duodenalis* infections in recent years, especially since the 2019 giardiasis outbreak in Bergen, Norway. Several investigations have found that hyperplasia of enterochromaffin cells, mast cells, and lymphocytes may have a role in inducing motility dysfunction and visceral hypersensitivity; however, this hypothesis is still hotly debated^[117]. Taken together, the evidence strongly suggests that multiple factors contribute to the development of post-infectious consequences in giardiasis. Post-infectious consequences from giardiasis are similar to those from other bacterial enteropathogens such *C. jejuni*, *E. coli*, and *Salmonella* spp. The part played by acute alterations of the host microbiota in the start of delayed immune-mediated illness is one area of considerable attention in this study. Therefore, deciphering the common pathways leading to the extra-intestinal and post-infectious manifestations of giardiasis requires a deeper understanding of the mechanisms responsible for them.

Since its inclusion in the WHO's Neglected Diseases Initiative in 2004, interest in studying *Giardia* infection has increased. A similar bibliometric study of scientific output on giardiasis reports 6964 papers between 1971 and 2010 available in PubMed, written in 27 different languages, consisting of original articles (78.5%), reviews (8.6%), case reports (6.9%), and letters to the editors (3.6%), demonstrating a constant increase in literature devoted to *Giardia* and its infection over the 40 years analyzed. The significance of this infection as a persistent

source of patient discomfort and suffering and, by extension, its impact on health and quality of life has been emphasized.

Unfortunately, giardiasis is not a health priority due to a lack of political will, funding, or interest from the scientific community; therefore, it is important to remember that this infection is prevented by a scrupulous personal hygiene, proper sewage disposal, removal or killing of cysts from water supplies, and prevention of contamination of food and water.

There is a need to conduct studies that estimate the problems in terms of cost, days lost due to disability, and quality of life because it is difficult to determine the global burden of chronic giardiasis due to lack of diagnostic tools, lack of definition, and difficulty quantifying the impact of an infection that causes an acute or chronic one, principally symptomatic illness.

Despite this, significant advances have been achieved in our understanding of the range of symptoms caused by giardiasis. Giardia's potential anti-inflammatory function is demonstrated by its preventive impact against other forms of diarrhea. However, more research into the etiology of the disease is required to identify therapies that might be used to prevent the severe sickness.

Conclusion

Those who were unaware of the *G. lamblia* infection transmission and prevention method were more likely to be infected with the parasite than those who were aware of the parasite; however, in this study, there was no statistically significant association observed between awareness about the *G. lamblia* infection and the prevalence of the *G. lamblia* infection. As a result, this study represents the first attempt to identify the prevalence of *G. lamblia* infection as well as the parameters related with it in a particular area. As a result of this, it is required to enhance general sanitation standards by installing sufficient sewage treatment and disposal facilities, as well as providing a supply of potable water, in order to fulfill the pre-requisites for successfully preventing and controlling the disease. In addition to the establishment and ongoing maintenance of a network for the treatment of *G. lamblia* infection, the provision of a health education program in primary schools, and the establishment of health initiatives or clubs in schools, the primary emphasis should be placed on the prevention of primary diseases. The transmission of *G. lamblia* and treatment options need to be brought to the attention of students and the parents of those kids. The local health sector and any other bodies that are concerned should work together with school health programs to deliver health education. The goal of this collaboration is to increase the knowledge, attitude, and practices of school children in order to reduce or prevent the transmission of this parasite infection and potentially eliminate this problem.

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