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Prevalence of *Giardia Lamblia* in Children with Diarrhea in Tirana

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Abstract: ***Giardia lamblia is one of the most common intestinal parasites of humans. The current study aimed to determine the prevalence of G. lamblia in children less than 10 years old with diarrhea in Tirana district in 2013. This cross sectional study was conducted on children less than 10 years old with diarrhea referred to public health microbiological laboratory of Tirana district from January to December 2013. Of the total of 678 stool 301 (44.4%) were females, and 377 were males (55.6%) (fig.1). Among the cases' age groups, the lowest positivity rate was detected in children 1-2 years old. In contrast, the highest percentage of positive cases were detected in children aging 4-6 years of age (7.6%), followed by those between 6 and 8 years of age (9.8%). the highest rate of positive cases was recorded in February (12%), while the lowest cases were recorded in July (1.7%). No drug or vaccine can prevent giardia infection. But common-sense precautions can go a long way toward reducing the chances that you'll become infected or spread the infection to others.***

Keywords: *Giardia lamblia*, children, diarrhea, prevention

1. Introduction

The intestinal protozoan Giardia duodenalis (synonym of Giardia intestinalis and Giardia lamblia) .It is a flagellate protozoan of small intestine, frequently found in diarrhoeal disease and it is broad worldly distributed, being detected in both developing and developed countries (1). G. lamblia recognized as the most common intestinal pathogen, with an estimated number of 2.8x10 infecting per year in humans (2). It is the most commonly reported human intestinal parasite, with prevalence rates reaching 2 to 7% in the developed countries. The prevalence rates may reach 20 to 60 % in some areas in the developing countries. G. lamblia is usually pointed as one of the causes of childhood diarrhea. It is also been associated with diarrheal illness among campers, swimmers and those travelling abroad, usually to less developed countries (3). The symptoms of giardiasis in humans are extremely variable. Some people may present asymptomatic form, other an acute or chronic diarrhea that can last for several months with malabsorbation syndrome and weight loss (4). G. lamblia also causes children's retorted growth and development (5). G.lamblia spreads from person to person and from animals to humans through faeco-oral route. It has an incubation period of 3 to 25 days with median of 7 to 10 days (6) It is a cosmopolitan parasite with an overall prevalence rate of 20-30% in developing countries, higher numbers of infections are seen in the late summer months. Children, seniors, and people with long-term illnesses may be more prone to contracting the infection as the risk of transmission is higher in day care centres and seniors' residences and in hypogammaglobulinemia patients; which makes it an opportunistic infection (7). Clinical manifestations are usually diarrheal, abdominal cramps, nausea, bloating and loss of appetite. In chronic and complicated cases, cholecystitis and malabsorption may be observed (8). The current study aimed to determine the prevalence of *G. lamblia* in children less than 10 years old with diarrhea in Tirana district in 2013.

2. Material and Methods

This cross sectional study was conducted on children less than 10 years old with diarrhea referred to public health microbiological laboratory of Tirana district from January to December 2013. Stool samples were collected after receiving written informed consent from the parents and filling out the questionnaire. All specimens were examined microscopically for the presence of parasite cysts and other Giardies through microscopic examination with / without coloring, and using the technique of flotation concentration of zinc sulphate (ZnSO4). Every preparation has been seen for at least for 10 minutes before being considered negative for the presence of eggs or other pests. Part of fresh faecal is maintained at -20^{0}C and later tested by the method according to EIA data instructions from the firm.

3. Results

Of the total of 678 stool 301 (44.4%) were females, and 377 were males (55.6%) (fig.1). Among the cases' age groups, the lowest positivity rate was detected in children 1-2 years old. In contrast, the highest percentage of positive cases were detected in children aging 4-6 years of age (7.6%), followed by those between 6 and 8 years of age (9.8%) (table 1).

As shown in figure 2, the highest rate of positive cases was recorded in February (12%), while the lowest cases were recorded in July (1.7% of total cases). It is also noted that in January only males were positive, while in July a single female was found to be *Giardia* positive. *Giardia* has a worldwide distribution, occurring in both temperate and tropical regions. It continues to be the most frequently identified human protozoal enteropathogen. Prevalence rates vary from 4-42%. In the industrialized world, overall prevalence rates are 2-5%. In the developing world, *G intestinalis* infects infants early in life and is a major cause of epidemic childhood diarrhea. Prevalence rates of 15-20%

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in children younger than 10 years are common (9). *Giardia* is the most common gut parasite in the United Kingdom, and infection rates are especially high in Eastern Europe. Prevalence rates of 0.94-4.66% and 2.41-10.99% have been reported in Italy (10). A 2005 study demonstrated a *Giardia* infection rate of 19.6 per 100,000 population per year in Canada (11). While the yearly incidence of the disease was stable, a significant seasonal variation was observed, with a peak in late summer to early fall, which correlates with the pattern found in the United States (12). New Zealand reports more than 30 cases of giardiasis per 100,000 population every year, which is one of the highest among the industrialized countries (13). In the current study, the prevalence of giardiasis was higher in male children (55.6%) than in females (44.4%), which is in agreement with the other studies (14).This is probably due to the higher activity of male children and more contact with environment outdoors, compared to females. The occurrence and prevalence of giardiasis varied among the ages. In the present study, it was observed that 6-8 years group was mostly infected with giardiasis, and this was closely followed by 4 - 6 years age group. This may be explained by the increasing activity of these children, being at school and playgrounds more than younger children, and also, lacking the personal hygiene than older children. This finding is in accordance with previous studies that reported that the highest risk was seen in the young children, with a decreasing risk in older children and adults (15)**.** In contrast, the lower prevalence observed in the 1 to 2 years group may be explained by the fact of prolonged breast feeding of children. a 5-fold protective effect against giardiasis thanks to exclusive breastfeeding was demonstrated compared with no breast-feeding among infants 0–18 months old. A hospital based surveillance study reported that breast-feeding was protective against *Giardia* infections for infants up to 6 months of age (16). This protection, however, may be independent of the role of mother's milk protective antibodies. An in vitro study has shown that certain components of nonimmune milk are capable of destroying *Giardia* trophozoites. Giardiasis accounts for a relatively small percentage of traveler's diarrhea. It is more likely to be found as the cause of diarrhea that occurs or persists after returning home from travel to developing regions of the world due to its relatively long incubation period and persistent symptoms. *Giardia* has been identified as the causative agent in a large percentage of cases among travelers to the region of St. Petersburg, Russia, where tap water is the primary source. The highest prevalence of *G intestinalis* reached 73.4% in Western Nepal. In Bangladesh, a disparity between health prevention and health spending is observed. The Dhaka study performed within the urban areas had identified *G intestinalis* in 11% of diarrheal stool specimens. In Ethiopia, the prevalence has been reported to range from 2.0% to 11.4%. Prevalence of *G intestinalis* has been reported 13.9% in Côte d'Ivoire (17).

4. Conclusion

No drug or vaccine can prevent giardia infection. But common-sense precautions can go a long way toward reducing the chances that you'll become infected or spread the infection to others. Ingestion of fecally contaminated food or water is the main mode of transmission. Thus, reducing this contamination is the best method of prevention. Filtering or purifying drinking water (iodine or boiling) in endemic areas is important as is the washing of fruits and vegetables that may have been contaminated. Children easily spread cysts if poor sanitation is used. Proper handwashing can help to break the cycle of transmission. Exclude people with Giardia infection from childcare, preschool, school and work until there has been no diarrhoea for 24 hours. If working as a food handler in a food business, the exclusion period should be until there has been no diarrhoea or vomiting for 48 hours. Infants, children and adults with giardia infection should not swim until there has been no diarrhoea for 24 hours. Follow good hand washing procedures. Water suspected of contamination should be boiled before drinking. Babies and small children without diarrhoea who are not toilet trained should wear tight fitting waterproof pants or swimming nappies in swimming pools and be changed regularly in the change room. When faecal accidents occur, swimming pools should be properly disinfected. Treatment of infected people reduces spread.

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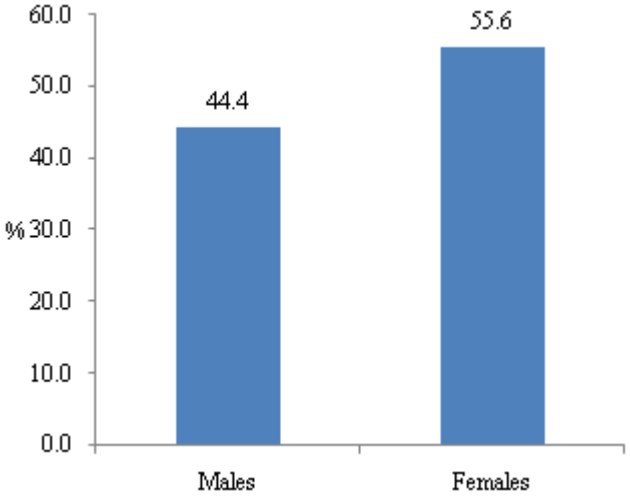

Figure 1: Distribution of children by gender

Table 1: Distribution of *Giardia* positive cases by age group

Age group	No. of patients	No. of positive cases	%
1-2	188	1	0.7
2-4	126	8	6.2
4-6	144	11	7.6
6-8	92	9	9.8
8-10	129	9	7.2
Total	678	38	5.6

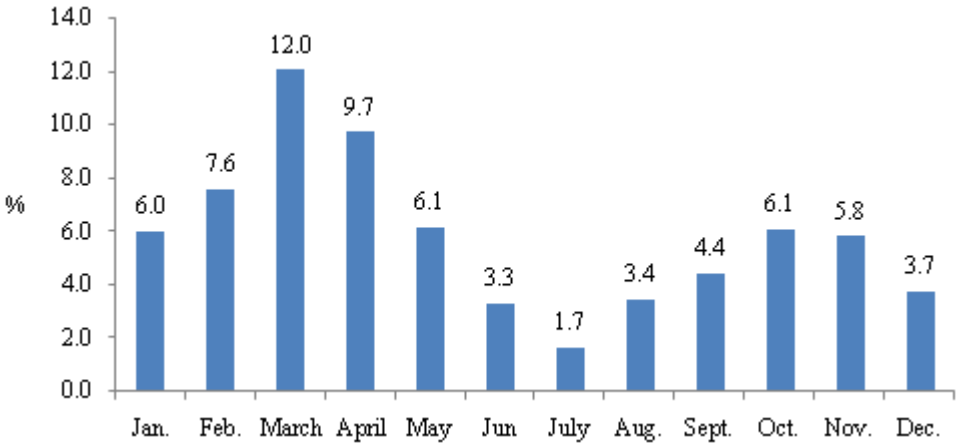

Figure 2: Monthly prevalence of *Giardia*

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