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Frequency of giardia lamblia infection in children presented with acute diarrhea to tertiary care hospital

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Abstract---Background: Giardia lamblia was the most common parasite-caused gastrointestinal ailment in the United States by the late 1980s, and it is now a significant global public health issue. Giardiasis is an infectious condition that may have both short-term and long-term effects. Objective: To assess the frequency of giardia lamblia infection in children presented with acute diarrhea to tertiary care hospital. Methodology: The current Descriptive Cross Sectional study was carried out at the Department of Paediatrics, Hayatabad Medical Complex, Peshawar from 21 July, 2019 to 22 January, 2020. The overall Sample Size in the current study was 114. After performing the stool concentration technique using the formol-ether concentration method, trophozoites and cysts of Giardia lamblia were detected using direct microscopy of the smear in saline (0.90% w/v NaCl solution) and Lugols iodine. Data was entered in SPSS version 23.0. Results: In the current study, totally 114 patients were enrolled. Mean and SDs for age was 4.13+1.566. Mean and SDs for weight was 13.21+2.598. Mean and SDs for BMI was 24.93+0.890. Mean and SDs for duration of disease was 7.02+1.540. 43 (37.7%) patients were females and 71 (62.3%) patients were males. As per frequencies and percentages for giardia lamblia infection, only 16 (14%) patients were

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recorded with giardiasis lamblia infection. Conclusion: The prevalence of Giardia Lamblia in children suggests a potential role for this parasite in acute diarrhea.

Keywords---frequency, giardia lamblia infection, children.

Introduction

Giardia lamblia was the most common parasite-caused gastrointestinal ailment in the United States by the late 1980s, and it is now a significant global public health issue (1). Giardiasis is an infectious condition that may have both short-term and long-term effects, such as recurring stomach discomfort, weight loss, and persistent diarrhoea with or without dehydration and intestinal malabsorption (1). Conventionally, G. lamblia is divided into eight genotypically different assemblages, each with a specific host range; assemblages A or B account for the majority of human Giardia infections. Unlike to certain other enteric infections, clinical Giardia isolates lack a single marker that may be used to determine their propensity for virulence (2). In a previous research, the frequency of G. lamblia infections in children with and without diarrhoea was 5.8% and 5%, correspondingly (P>0.5). In our investigation, however, only 16 (14%) patients were found to have giardia lamblia infection. Giardia lamblia assemblage B was verified by sequence data to be the prevalent genotype in instances of diarrhoea and non-diarrhoea. There was no evidence that G. lamblia infection was linked to any of the studied demographic factors (3).

The frequency of "G. lamblia, Cryptosporidium spp, and E. histolytica/dispar was 15.65%, 9.56%, and 4.35%" in children with diarrhoea and 1.74%, 5.21%, and 1.74% in those without it, respectively. These findings were comparable to the ones found in this investigation, in which only 16 (14%) patients were documented as having giardia lamblia infection. Males had greater rates of infection with Cryptosporidium spp. and E. histolytica/dispar (10.81% and 5.4%, respectively) than did females (7.32% and 2.43%, respectively). Infection with G. lamblia was more common in females (29.27%) than in males (8.11%). Infection with Cryptosporidium spp. was more prevalent in children under 4 years old (53.84%). Between the ages of 10 and 13, a significant difference (7.69%) was observed. E. histolytica/dispar was found to be more common in children aged 5 to 9 (85.71%) than in children under 4 (14.28%) (4).

In another study, prevalence of giardia infection was 5%. Just 16 (14%) of the children in this research had giardia lamblia, compared to the 6.4% of preschoolers who are most often affected by Giardia infection (5). 90% of children with giardia infections were underweight. Every child who had a Giardia infection had stomach discomfort and diarrhoea for more than seven days. Eighty percent of children were from lower socioeconomic classes, and the majority of them had Giardia infection. 90% of people had municipal water supplies, while 10% had access to alternative water sources. 90% of people employ no water filtration techniques (5).

Since 2004, giardiasis has been a part of the World Health Organization's campaign to combat neglected diseases. It accounts for around 2.5 million instances of diarrhoea and nutritional deficits in children living in underdeveloped nations. Compared to adults, it is more common in children, notably those aged 1 to 5 (4–42%), those from underdeveloped nations, and those who are malnourished. Estimated prevalence rates for G. lamblia range from 20–30% in underdeveloped nations to 2-5% in wealthy nations (6). The purpose of this study is to assess the frequency of giardia lamblia infection in patients presented with acute diarrhea to tertiary care hospital will help understand this disease in detail and we will be able to draft standard operating procedures for minimizing incidence of this infection in our children at khyber pukthtunkhwa.

Materials and Methods

The current Descriptive Cross Sectional study was carried out at the Department of Paediatrics, Hayatabad Medical Complex, Peshawar from 21 July, 2019 to 22 January, 2020. The Sample Size was 114 keeping 6.4%[5] proportion of G. Lamblia infection in preschool children with acute diarrhea with 95% confidence interval 95% and 4.5% margin of error using WHO Sample Size Calculator.

Inclusion Criteria

- Children having age between 1 to 10 years.
- Children with acute diarrhea presented with complaint of watery stool (>4 episodes/24h) confirmed on stool concentration technique by formol-ether concentration method showing presence of trophozoites.
- Children of either gender.

Exclusion Criteria

Children without diarrhea: Proper approval was taken from the ethical and research committee of CPSP. The purpose and benefits of the study was explained to the patient and a written informed consent was obtained. All patients meeting inclusion criteria were inducted into this study. Clinical history, anthropometric examination using standard weighing and height scales and laboratory examinations were carried out. Microscopy and culture reports of stool were also documented. The consistency, presence of mucus and blood, and colour of stool samples were all macroscopically examined. After performing the stool concentration technique using the formol-ether concentration method, trophozoites and cysts of Giardia lamblia were detected using direct microscopy of the smear in saline (0.90% w/v NaCl solution) and Lugols iodine. All the above information such as age, weight, gender, residence, socio economic status and frequency of giardia lamblia was recorded in a proforma attached to this synopsis. Data was entered in SPSS version 23.0.

Mean and SD was calculated for numerical variables like age, weight, height, BMI and duration of disease. Frequencies and percentages was calculated for gender, residence and socio economic status and giardia lamblia infection. G. Lamblia Infection was stratified with regard to age, weight, gender, educational status, duration of disease, BMI, residence and socio economic status in order to see

effect modifications. Post stratification chi square test was applied keeping P value < 0.05 as significant.

Results

In the current study, totally 114 patients were enrolled. Mean and SDs for age was 4.13+1.566. Mean and SDs for weight was 13.21+2.598. Mean and SDs for BMI was 24.93+0.890. Mean and SDs for duration of disease was 7.02+1.540. (Table No. 1). 43 (37.7%) patients were females and 71 (62.3%) patients were males. (Figure 1). As per frequencies and percentages for giardia lamblia infection, only 16 (14%) patients were recorded with giardia lamblia infection. (Figure 2)

Table 1
Descriptive Statistics of enrolled patients

	N	Minimum	Maximum	Mean	Std. Deviation
Age	114	2	8	4.13	1.566
Weight	114	9	20	13.21	2.598
Height	114	34	387	46.25	56.311
BMI	114	24	26	24.93	.890
Duration of Disease	114	3	9	7.02	1.540
Valid N (listwise)	114				

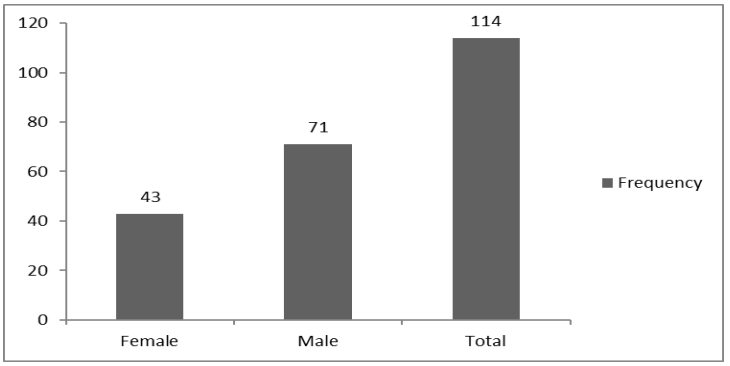

Figure 1. Gender wise distribution of patients

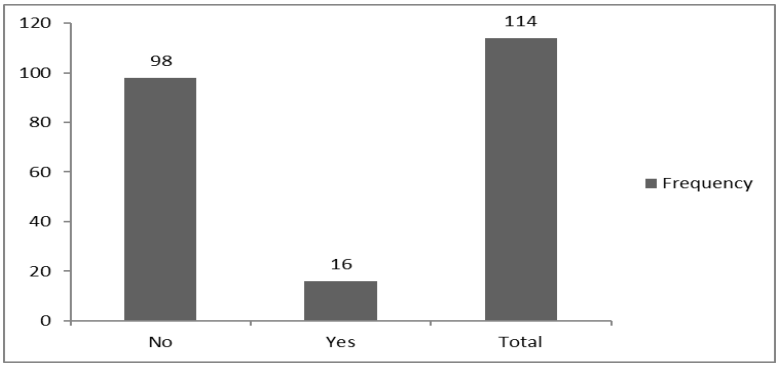

Figure 2. Frequency of giardia lamblia infection in children presented with acute diarrhea

Discussion

Giardia lamblia was the most common parasite-caused gastrointestinal ailment in the United States by the late 1980s, and it is now a significant global public health issue (1). Giardiasis is an infectious condition that may have both short-term and long-term effects, such as recurring stomach discomfort, weight loss, and persistent diarrhea with or without dehydration and intestinal malabsorption (1). In this study, mean and SDs for age was 4.13+1.566. Mean and SDs for weight was 13.21+2.598. Mean and SDs for BMI was 24.93+0.890. Mean and SDs for duration of disease was 7.02+1.540. 43 (37.7%) patients were females and 71 (62.3%) patients were males. As per frequencies and percentages for giardia lamblia infection, only 16 (14%) patients were recorded with giardia lamblia infection.

In a previous research, the frequency of G. lamblia infections in children with and without diarrhea was 5.8% and 5%, correspondingly (P>0.5). In our investigation, however, only 16 (14%) patients were found to have giardia lamblia infection. Giardia lamblia assemblage B was verified by sequence data to be the prevalent genotype in instances of diarrhea and non-diarrhea. There was no evidence that G. lamblia infection was linked to any of the studied demographic factors (3). The frequency of "G. lamblia, Cryptosporidium spp, and E. histolytica/dispar was 15.65%, 9.56%, and 4.35%" in children with diarrhea and 1.74%, 5.21%, and 1.74% in those without it, respectively. These findings were comparable to the ones found in this investigation, in which only 16 (14%) patients were documented as having giardia lamblia infection. Males had greater rates of infection with Cryptosporidium spp. and E. histolytica/dispar (10.81% and 5.4%, respectively) than did females (7.32% and 2.43%, respectively). Infection with G. lamblia was more common in females (29.27%) than in males (8.11%). Infection with Cryptosporidium spp. was more prevalent in children under 4 years old (53.84%).

Between the ages of 10 and 13, a significant difference (7.69%) was observed. E. histolytica/dispar was found to be more common in children aged 5 to 9 (85.71%) than in children under 4 (14.28%) (4). In another study, prevalence of giardia infection was 5%. Just 16 (14%) of the children in this research had giardia lamblia, compared to the 6.4% of preschoolers who are most often affected by

Giardia infection (5). 90% of children with giardia infections were underweight. Every child who had a Giardia infection had stomach discomfort and diarrhea for more than seven days. Eighty percent of children were from lower socioeconomic classes, and the majority of them had Giardia infection. 90% of people had municipal water supplies, while 10% had access to alternative water sources. 90% of people employ no water filtration techniques (5). Since 2004, giardiasis has been a part of the World Health Organization's campaign to combat neglected diseases.

It accounts for around 2.5 million instances of diarrhea and nutritional deficits in children living in underdeveloped nations. Compared to adults, it is more common in children, notably those aged 1 to 5 (4–42%), those from underdeveloped nations, and those who are malnourished. Estimated prevalence rates for G. lamblia range from 20–30% in underdeveloped nations to 2-5% in wealthy nations (6). The majority of the patients in this research had cyst infections. Patients that have these parasites regularly excrete the cyst stage in their faeces, which serves as a source of infection in the parasites' life cycle (7). While carriers are asymptomatic, the infection may become acute by excystallizing cysts in the gut, which causes the primary symptoms of giardiasis, including abdominal discomfort, steatorrhoea, and weight loss (8). In the summer, when Peshawar's high temperature ranges between 35 to 40 degrees Celsius, a greater percentage of samples tested positive. The infectious cysts are destroyed by the cold (9). There may be other behavioural variables at play, such as increased summertime water, beverage, and food intake that might lead to illness (10).

Giardiasis has had huge outbreaks that have been caused by the pollution of municipal water sources with human waste. The water supply is a significant risk factor for the disease (11). Due to the low quality of the water and malfunctioning sewage systems, drinking polluted water is an issue that affects the whole nation of Pakistan. The issue is more severe in rural regions without a municipal sewage or water network (12). Giardia spp. contamination of drinking water has been acknowledged as a source of human water-borne infections more and more during the last ten years (10). In several places of the globe, water sources have been found to contain Giardia cysts (10,11). The age range of 6 to 10 years had the greatest infection rate. This may be due to the fact that children at this age are completely independent when using the restroom and are more likely to engage in outside activities that might spread Giardia (12). The current findings are consistent with research on intestinal parasitosis conducted in Saudi Arabia and Senegal (13, 14). We discovered that the infants with giardiasis had several clinical traits with other research (16, 17), which are quite particular to this illness. They include nausea, stomach distension, bloating and gas, anorexia, and weight loss.

Conclusion

The prevalence of Giardia Lamblia in children suggests a potential role for this parasite in acute diarrhea.

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