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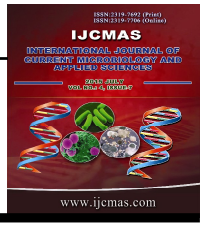


**Original Research Article**

# Prevalence of Giardia infection in paediatric age group

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Giardia lamblia, Malabsorption syndrome, Childhood diarrhoea, Microscopic examination

**A B S T R A C T**

Giardia lamblia is the most frequent pathogenic intestinal protozoan infection in man but also an important cause of diarrhoeal disease accompanied by malabsorption in children and adults throughout the world. It has been currently related to chronic fatigue post infectious irritable bowel syndrome, poor cognitive function and failure to thrive in childhood, all of these factors have lead to an increasing attention of Giardia protozoan infection in the recent years. This study is conducted to know the the prevalence of Giardia in paediatric age group and associated factors that contributes to its transmission. Total 300 children (up to 12years) admitted to the paediatric ward, Tertiary care hospital, Gujarat, India with complains of diarrhoea were included in this study. Their clinical history, clinical presentation and laboratory investigations were recorded. Prevalence of giardia infection of present study is 5%. 6.4% of preschool children are most commonly affected with Giardia infection. 90% of children infested with giardia had reduced weight. All children with Giardia infection had duration of diahorroea >7 days with abdominal pain. 80% of children were from lower socio economical class and most of them were affected with Giardia infection. 90% had water supply from municipality 10% had from other water sources. 90% do not uses any method of water purification. Only 10% were using water purification by filtering or boiling. Giardia lamblia has now become a major worldwide public health problem. Infection is also associated with complications in early childhood if not treated. So early diagnosis and treatment is required for better management of the patients. Water supply should be of high quality complying with drinking water standards, hand hygine, health education, safe sanitation should be given priority to minimize such infections.

## Introduction

By the late 1980s, Giardia lamblia had become the number one parasite-caused gastrointestinal disease in the united states and has now become a major worldwide public health problem.[1] It is not only most frequent pathogenic intestinal protozoan infection in man but also an important cause of diarrhoeal disease accompanied by malabsorption in children and adults throughout the world. Infection is usually

perceived as mild and self limiting, symptoms generally subside within 2-3 weeks in otherwise healthy individuals.[2] Giardiasis is infectious disease may have both immediate and long-term consequences including chronic diarrhoea with or without dehydration and intestinal malabsorption, recurrent abdominal pain, and weight loss.[3] Additionally, it has been currently related to chronic fatigue post infectious irritable bowel syndrome and particularly, in early childhood, poor cognitive function and failure to thrive, all of these have attracted an increasing attention to this protozoan infection in the recent years.[4,5,6] Although worldwide distribution of it, prevalence of Giardia is more common in developing countries ranges from 20% to 30% compared to 2% to 5% in developed countries.[2,3]

Giardia is a flagellated, binucleated protozoan, discovered by Van Leeuwenhoek in 1681. Giardia spp. are parasites of mammals and other animals. Giardia has a characteristic morphology, the vegetative trophozoites are approximately 15 mm in length, teardrop shaped with two anteriorly placed nuclei.The parasite has a ventral adhesive disc made of microtubules and four pairs of flagella. Giardia is transmitted by the cyst form that is 10–12 mm long. In the encysted stage the organism is relatively resistant to chlorination and ozonolysis and can remain viable for several weeks, especially in cold surface water. Giardiasis occurs most commonly through ingestion of the cyst in contaminated water, but person-to-person spread is common, particularly in settings of poor fecal–oral hygiene. Foodborne transmission and mechanical transmission by flies occurs less commonly.[1,7] This study is conducted to know the prevalence of Giardia in paediatric age group and associated factors that contributes to its transmission.

## Materials and Methods

Total 300 children admitted to the paediatric ward, Tertiary care hospital, Gujarat, India with complains of loose stool (Passage of 3 or more loose or watery motions per 24 hours and recent change in the consistency of the stools) were included in this study. Their clinical history, clinical presentation and laboratory investigations were recorded. Reports of stool for microscopy and culture were also recorded.

Inclusion criteria: All children up to 12yrs with diarrhoea except neonates.

Exclusion criteria: Neonates and all children without diarrhoea.

### Sample processing

Stool samples were examined macroscopically for consistency, mucus and blood, colour.

Direct microscopy of the smear in saline (0.90% w/v NaCl solution) and Lugol's iodine was performed for the detection of trophozoites, and cysts of *Giardia lamblia* after doing stool concentration techniqueby formol-ether concentration method.[1]

## Results and Discussion

Out of 300 children with diarrhoea, 15(5%) had infection with Giardia lamblia. Distribution of children presenting with diarrhoea are categorized according to their age groups shown in table 1.

Giardiasis is diagnosed by Microscopic examination in normal saline and lugol's iodine preparation after doing stool concentration by formol ether technique. In this study, Preschool children are most commonly affected with Giardia infection

6.4% (9/141) which is comparable with study done by Awasthi et al[11] in which 5.8% of preschool children were mostly affected. There is no significant association found of sex of patient and diarrhoea in this study. Only 30% patients have normal weight/age, while total 70% patients have protein-energy malnutrition. 90% of children infested with giardia had reduced weight ,this finding is similar to study done by Gupta et al [13].277(92.3%) children had duration of diarrhoea <7 days while 23(7.7%) had >7 days of diarrhoeal duration. 61% had history of vomiting and 40%had history of abdominal pain along with diarrhoea. All children with Giardia infection had duration of diahorroea >7 days with abdominal pain. These findings are similar to study done by Jain at al, Gupta et al, Awasthi et al, Singh et al.

The patients with diarrhea due to Giardia infection has prolonged history of illness compared to diarrhea due to viral or bacterial etiology. This finding is correlating with that of Tinuade O et al.[18] 80% of children were from lower socio economical class and most of them were affected with Giardia infection. People who generally reside in rural or lower socio economical class are more prone to the ingestion of infective parasites as compared to those who live in urban/suburban or well developed areas where sanitation is presumably better; hence possess a lower chance of infection.[15,16] 90% had water supply from municipality 10% had from other water sources (Bore well, hand pump, water tanker and well).

**Table.1** Distribution of children with diarrhea by age of patient

| Age group | No. of patients | No. of patients with Giardia Infection | % of the Giardia Infection |
|---|---|---|---|
| <12 month | 93 | 2 | 2.1 |
| 1 to 5 year | 141 | 9 | 6.4 |
| 6 to 9 year | 39 | 3 | 7.7 |
| 10 to12 year | 27 | 1 | 3.7 |

**Table.2** Comparison of prevalence of Giardia infection of present study with other studies

| Study | Prevalence of Giardia infection |
|---|---|
| Chatterji et al | 2.6% |
| Boeke et al | 4% |
| Shadma M et al | 25.3% |
| Singh et al | 16.13% |
| Deepesh et al | 24.13% |
| Present study | 5% |

90% do not uses any method of water purification. Only 10% were using water purification by filtering or boiling. No use of water purification process, lower socio-economical class, poor hygienic conditions, poor hand hygiene, water contamination by human or animal faecal matter these all explains the more prevalence of parasitic infection in community specially in slum areas. This notification is also brought in

light by shadma et al in which more than 50% of children are affected due to no use of water purification process. Prevalence of giardia infection of present study is 5%.Comparision of prevalence of Giardia infection of present study with other studies shown in Table 2. The differances in prevalence of Giardia infection in other studies may be due to sample size.

Prevalence of Giardia infection is more common in preschool children due to their poor bowel control, poor hygiene in hand washing. As this infection is mostly transmitted by contaminated food and water, Strategies such as better waste management, safe water treatment (make sure that Water purification filter is fine enough to trap the cysts and chlorination of water does not effect the cysts) ,health education of parents regarding hygiene of child should be made mandatory. Wash hands thoroughly with soap and water after using the toilet and before handling or eating food plays an effective role in control and transmission of infection. For the routine diagnosis of giardiasis, microscopic examination remains the key method. Concentration methods are always to be used whenever possible for parasite detection.

**Limitations:** We are not able to do serological and molecular methods that are gold standard for detection of Giardiasis.

## References


1.Koneman's Color Atlas and Textbook of Diagnostic Microbiology Elmer W. Koneman, Lippincott Williams & Wilkins, 2006 - Medical - 1565 page

2. Pedro Almirall,1 Angel A. Escobedo, Parental Perceptions of Giardiasis: A Study in an Outpatient Paediatric Hospital Setting in Havana, Cuba, ISRN Preventive Medicine Volume 2013, Article ID 364647, 9 pages

3. A. A. Escobedo, P. Almirall, L. J. Robertson et al., "Giardiasis: the ever-present threat of a neglected disease," Infectious Disorders - Drug Targets, vol. 10, no. 5, pp. 329–348, 2010.

4. K. Mørch, K. Hanevik, G. Rortveit et al., "Severity of Giardia infection associated with post-infectious fatigue and abdominal symptoms two years a□er," BMC Infectious Diseases, vol. 9, article 206, 2009.

5.K. Hanevik, V. Dizdar, N. Langeland, and T. Hausken, "Development of functional gastrointestinal disorders a□er Giardia lamblia infection," BMC Gastroenterology, vol. 9, article 27,2009.

6. K.-A. Wensaas, N. Langeland, K. Hanevik, K. Mørch, G. E. Eide, and G. Rortveit, "Irritable bowel syndrome and chronic fatigue 3 years a□er acute giardiasis: historic cohort study," Gut, vol. 61,pp. 214–219, 2012.

7.Giardia intestinalis, Syed A. Alia and David R. Hill a Current Opinion in Infectious Diseases 2003, 16:453–460

8. Chatterjee BD, Thawani G, Sanyal SN. Etiology of acute childhood
diarrhoea in Calcutta. Trop Gastroenterol 1989; 10:158–66.

9. Boeke CE, Mora-Plazas M, Forero Y, Villamor E. Intestinal protozoan infections in relation to nutritional status and gastrointestinal morbidity in Colombian school children. J Trop Pediatr 2010; 56:299–306.

10. Sangram Singh Patel1, Bhawna1, Prevalence of Giardiasis in Patients Attending Tertiary Care Hospital in Northern India, Int.J.Curr.Microbiol.App.Sci (2015) 4(5): 339-344

11. S. Awasthi and V.K. Pande, prevalence of malnutrition and intestinal parasites in preschool slum children in lucknow; indian pediatrics volume 34-july 1997
12. ChitraBagmar Jain and RafatNahri; Prevalence of Giardiasis in children from rural areas of Aurangabad, Maharashtra. Journal of Medicinal Chemistry and Drug Discovery ISSN: 2347-9027Special Issue
13. Gupta MC, Mehrotra M, Samantray JC,Arora S. Effect of giardia infection on nutritional status of preschool children. Indian J Med Res 1990; 92(B): 341-343.
14. Shadma Mumtaz, Hemna Siddiqui Frequency and risk factors for intestinal parasitic infection in children under five years age at a tertiary care hospital in Karachi, JPMA 59:216; 2009
15. Wongjindanon N, Suksrichavalit T, Subsutti W, Sarachart T: Current infection rate of Giardia lamblia in two provinces of Thailand. Southeast Asian J Trop Med Public Health 2005, 36(suppl 4):21-25.
16. Bernard N krumah and Samuel Blay Nguah Giardia lamblia: a major parasitic cause of childhood diarrhoea in patients attending a district hospital in Ghana, BMC Parasites & Vectors 2011, 4:163
17.Deepesh Kumar, Shivendra Mohan: Giardiasis: A Preliminary Study in a Tertiary Care Hospital of Uttar Pradesh; International Journal of Pharmaceutical Science Invention; Volume 2 Issue 8 August2013 PP.34-39
18. Tinuade O, John O, Saheed O, Oyeku O, Fidelis N, Olabisi D, Parasitic etiology childhood diarrhea Indian journal of Pediatrics 2006;73(12):1081-84.