

Original Research Article

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Burden of Intestinal Parasitic Infection in a Tertiary Care Hospital

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ABSTRACT

Intestinal parasites are considered as a major public health problem worldwide especially in developing countries. An estimated 3.5 billion people are affected and approximately 450 million individuals currently suffer from these infections, and of which most of them constitute children. The two categories of pathogenic and non-pathogenic parasites which include Protozoa and helminthes are responsible for gastrointestinal tract ailments. The current study was aimed to determine the prevalence of intestinal parasitic infections (IPI) in patients suffering from diarrhoea. In this retrospective study, 1872 stool specimens examined from January 2018 to December 2018 by saline and iodine mount were included. The negative samples were further screened using formol ether concentration technique. 114 (16.1%) out of 1872 specimens were positive for parasitic infection. *Giardia lamblia* was detected in 64(56%) cases followed by *Ascaris lumbricoides* in 24(21%) cases, and *H.nana* in 18 (15.7%) cases. Prevalence was more in outpatient 90(79%) compared to inpatients 24(21%). More parasitic infections were seen in age group 0-15 years (106 cases) compared to > 15 years(8 cases) with a maximum parasite distribution in the age group of 6-10 years (64 cases). It was seen that the parasites responsible were seen both protozoa and helminths, with a predominance of the first. Improvement in sanitation, personal hygiene, access to health services, deworming programs in schools would act as some of the important contributors in decreasing the prevalence rates of IPI's.

Keywords

Intestinal parasitic infections (IPIs),
Parasites, Diarrhoea

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Introduction

Intestinal Parasitic infections are endemic worldwide and are one of the major health problems in several developing countries including India. Poor Sanitation, low standards of personal hygiene, poverty, illiteracy, hot and humid tropical climate are some of the factors responsible for spread of IPIs²⁻⁴. These infections lead to clinical morbidity in 450 million people globally⁵. It is seen that age and sex of general population affects the frequency of these

infections⁶. These infections are more commonly seen amongst school age children in whom IPIs lead to nutritional deficiencies, anaemia, growth retardation and impaired learning abilities⁷⁻⁹. *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Trichuris trichura*, *Enterobius vermicularis*, *Entamoeba histolytica* and *Giardia lamblia* are some of the common parasitic infections reported worldwide^{3, 10-11}. Therefore, monitoring this problem from time to time and tackling it properly becomes important.

This study was undertaken to know the prevalence of intestinal parasitic infections in patients reporting to our tertiary care hospital located at Delhi, catering to many peripheral areas of other states nearby.

The current study was aimed to determine the prevalence of intestinal parasitic infections (IPI) in patients suffering from diarrhoea.

Materials and Methods

The study was conducted in the Department of Microbiology, Lady Hardinge Medical College, New Delhi from January 2018-December 2018. A total of 1872 stool samples from the patients suffering from diarrhoea attending outpatient department and indoor wards, irrespective of their age and sex status were received and processed as per physician request were included.

Samples were collected in wide mouth containers with no preservative and were transported to the laboratory within 2 hours. Naked eye physical and microscopic examination of normal saline as well as iodine preparation was carried out in each stool sample. Macroscopic examination was done for the presence of any blood, mucus, adult worm or any segments. Microscopic examination was done for presence of ova, cyst and trophozoites.

Results and Discussion

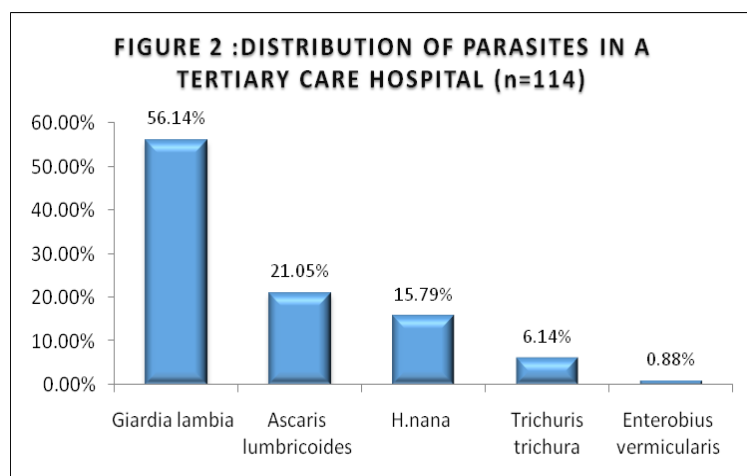
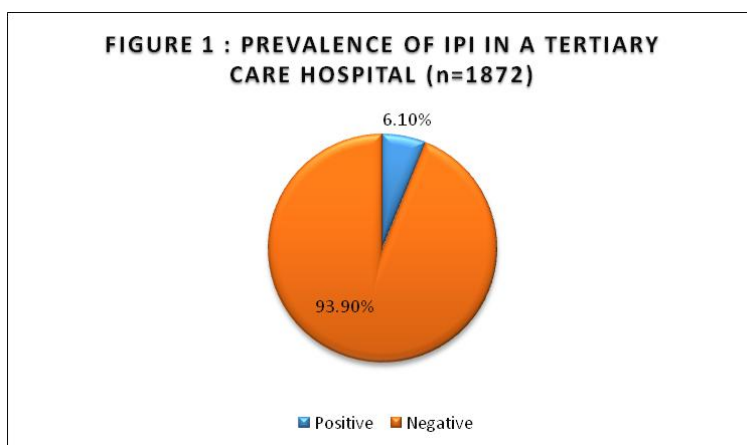
A total of 1872 stool samples were processed and studied in the present study out of which 114(6.1%) were positive either for Protozoal or Helminthic infections (Fig.1). *Giardia lamblia* was detected in 64(56%) cases followed by *Ascaris lumbricoides* in 24(21%) cases, and *Hymenolepsis nana* in 18 (15.7%) cases. *Trichuris trichura* and *Enterobius vermicularis* were detected in 7(6%) and 1(0.8%) cases respectively (Fig.2). A total of 974 males and 898 females included in the study showed the prevalence of parasitic infections to be nearly equal in males (49%) and females (51%). Prevalence was seen to be more in outpatients 90(79%) compared to inpatients 24(21%) (Fig.3). The prevalence of parasitic infections was seen to be more in the age group 0-15 years(106 cases) compared to > 15 years (8 cases) with a maximum parasite distribution in the age group of 6-10 years (64 cases) (Table 1 Fig.4). Our Study has shown the presence of parasitic infections in 114(6.1%) patients out of a total of 1872 patients. The studies carried out in various parts of India have reported different prevalence rates ranging from 6.63 to 46.7%^{6, 12-13}. A similar study done at our department 2 years back had showed the prevalence rate to be 10.37%¹⁴ (Table 2).

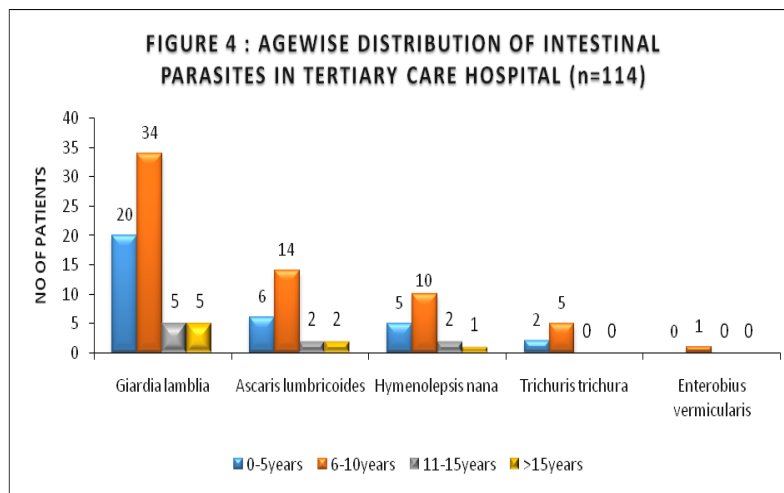
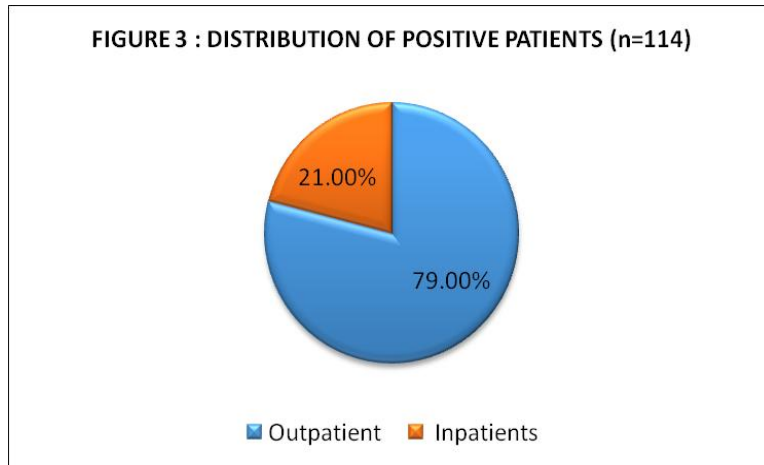
Table.1 Age wise Distribution of Intestinal Parasites in Tertiary Care Hospital (n=114)

Parasites	0-5years	6-10years	11-15years	>15years	Total
<i>Giardia lamblia</i>	20 (31%)	34 (53%)	5 (8%)	5 (8%)	64
<i>Ascaris lumbricoides</i>	6 (25%)	14 (59%)	2 (8%)	2 (8%)	24
<i>Hymenolepsis nana</i>	5 (28%)	10 (56%)	2 (10%)	1 (6%)	18
<i>Trichuris trichura</i>	2 (29%)	5 (71%)	0 (0%)	0 (0%)	7
<i>Enterobius vermicularis</i>	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1
Total	33	64	9	8	114

Table.2 Comparison of Various Studies Showing Parasitic Distribution

Authors of Various Studies	PLACE	PERCENTAGE
Yogita Rai, Ravinder Kaur, Gaurav Dhaka et al (2017)	Delhi	<i>Giardia lamblia</i> (58%), <i>E.histolytica</i> (9.8%), <i>A.lumbricoides</i> (24%)
Ragunathan, L.,Kalivaradhan, SK, Ramadass, S, Nagaraj, M, Ramesh, K. (2010)	Puducherry	<i>A.lumbricoides</i> (43.2%), <i>A.duodenale</i> (28.89%), <i>Trichuris trichiura</i> (10.8%), <i>H.nana</i> (7.6%), <i>Taenia</i> spp. (7.4%), <i>E.vermicularis</i> (1.9%)
Dongre, A.R.,Deshmukh, PR, Boratne, AV, Thaware, P, Garg, BS(2007)	Maharashtra	<i>Giardia lamblia</i> (7.6%), <i>Entamoeba histolytica</i> (4.2%), <i>Hymenolepis nana</i> (2.5%), <i>Ascaris lumbricoides</i> (1.7%), <i>Ancylostoma duodenale</i> (0.8%) and <i>Taenia</i> (0.8%)
Marothi Y, Singh B (2011)	Ujjain, MadhyaPradesh, India	<i>Entamoeba histolytica</i> (10.5%), <i>Giardia lamblia</i> (3.9%), <i>Ascaris lumbricoides</i> (2.8%)





Prevalence rate of our study is on lower side suggesting better awareness of personal hygiene and environmental sanitation in the study population in the capital city of India specially showing the effects of health education and other measures taken after earlier study at the same place.

Other reason for low prevalence in our study could be that we included only symptomatic patients attending our tertiary care hospital highlighting the fact that asymptomatic carriers of IPIs might be constituting the main bulk of the global burden. We did not notice any statistically significant difference in infection rates between different sexes was found although many previous studies have reported significant differences in infection rates in the two^{6, 15-16}.

The most common parasite detected in our study was *Giardia lamblia* 64 (56%) amongst protozoans and *Ascaris lumbricoides* in 24 (21%) amongst helminths. This finding is in accordance with many studies conducted previously in different places of the country which have shown the similar pattern^{14, 17-19} (Table 2).

Most common age group affected was 6-10 years with 64(58%) cases followed by 0-5 years with 33 (%) cases highlighting the fact that prevalence of IPIs are higher in children²⁰⁻²², who might be more exposed due to their lesser awareness.

In conclusion the present study showed the lower prevalence rate of IPIs compared to many other previous year studies in India.

Measures for decreasing intestinal parasitic infection include: mass education on hygiene practices, improving personal and public health conditions, and large-scale de-worming campaigns, along with efforts to develop effective vaccines against major intestinal parasites would go a long way in combating these conditions and reducing morbidity due to them.

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