

UNDERSTANDING THE PREVALENCE OF INTESTINAL PARASITIC INFECTIONS AMONG CHILDREN UNDER FIVE YEARS AT A TERTIARY CARE CENTRE

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Received : 14/12/2023
Received in revised form : 22/12/2023
Accepted : 30/12/2023

Keywords:

Parasitic infections, Children under five, Iodine wet mount.

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DOI: 10.47009/jamp.2024.6.1.177

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 899-902



Abstract

Background: In underdeveloped nations like India, intestinal parasitic infections are a leading cause of sickness and a burden on public health. Growth retardation and mental health-related illnesses are among the many health risks brought on by the diseases, particularly in children. Due to their underdeveloped immunity and their eating and inquisitive habits, children under the age of five are the most susceptible to infections. The aim is to study the prevalence of intestinal parasitic infections in children under five years old. **Materials and Methods:** This cross-sectional prospective study was carried out for six months, from April to September 2023, at MSD ASMC & MBH Bahraich, U.P. The study included 287 children who visited the hospital Paediatric Outpatient Department and were under the age of five. **Result:** Out of the 287 children included in the study, 62.37% were male and 37.63% were female. In the present study, the prevalence of parasitic infections was 18.11%. *Giardia lamblia* was the most common parasite detected, accounting for 19 (36.54%) of the cases. Next in order were *Entamoeba histolytica* 15 (28.84%), *Ascaris lumbricoides* 8 (15.38%), *Hymenolepis nana* 5 (9.62%), *Enterobius vermicularis* 3 (5.77%) and *Taenia spp* 2 (3.85%). **Conclusion:** In the study population, protozoa mostly *G. lamblia*, are responsible for the majority of intestinal parasite infections. This study recommends routine intestinal parasites screening in addition to health education programmes. Encouraging the deworming programme should be taken into consideration.

INTRODUCTION

A group of diseases known as intestinal parasitosis (IP) are of public health importance. They are brought on by various helminths and protozoan species and can cause significant morbidity and mortality around the World.^[1] Globally, intestinal parasitic infections are the most prevalent type of infections. An estimated 3.5 billion individuals are afflicted by these illnesses, with 450 million of them being sick, the most of them are children.^[2] IPIs prevalence in India varies from 16.5% to 66% overall.^[3] The prevalence of various intestinal parasites varies between nations and is affected by environmental, social, and economic factors like population density, poverty, malnutrition, personal and communal hygiene, lack of access to drinking water, inadequate sanitary facilities and hot, humid tropical climate.^[4] In general, tropical and subtropical regions tend to have higher rates of parasitic infections than temperate region.^[5] The presence of

gastrointestinal parasites can lead to chronic anaemia, malnutrition with subsequent stunting and malabsorption, all of which can impair a child's physical and mental development. Protozoa like *Entamoeba histolytica* and *Giardia lamblia*, as well as helminths like *Ascaris lumbricoides*, *Ancylostoma duodenale* and *Enterobius vermicularis* are frequently occurring intestinal parasites that cause a significant amount of morbidity in both children and adult populations.^[6]

One of the biggest obstacles in the fight against parasitic illnesses is the inability to prevent them through vaccination because there is currently no effective vaccine available. There is limited data related to prevalence of intestinal parasite from this area, therefore a prospective study was undertaken to determine the prevalence of parasitic infections in the children under five. Considering the high incidence of these illnesses among children in developing nations, this study will assist the paediatrician in diagnosing and treating the children suffering from

parasitosis, allowing them to take essential steps that are important for the public health.

MATERIALS AND METHODS

This prospective study was carried out in the department of Microbiology, MSD ASMC & MBH Bahraich U.P. Total 287 stool samples collected between April to September 2023 from children under five years, who were suffering from GIT infections and symptoms suggestive of parasitic infection were included in the study. Demographic data including name, age, sex and address was noted. Patients under recent anti-helminthic treatment were excluded from the study group. Samples were collected in properly labelled, wide-mouthed, screw-capped containers without preservative. Within one to two hours after collection, stool samples were transported to the Microbiology Lab and processed immediately thereafter. All faecal samples were subjected to routine macroscopic and microscopic examination. Macroscopic examination parameters included colour, consistency, pH, blood, pus, mucus, adult worms and parasitic structures including scolices and proglottids. For microscopic examination (saline & Lugol's iodine wet mount) and formalin ether concentration methods was used.^[7] The morphological characteristic of the parasites, trophozoite, cysts, adult, larvae and ova were recognised and recorded.

RESULTS

Total 287 children who were clinically suspected of having intestinal parasitic infections were included in the study. Of the 287 stool samples, 179 (62.37%) were collected from male children and 108 (37.63%) collected from female children. Maximum numbers of patients were in the age group of 4-5years (36.59%) followed by 2-3 years (25.43%), 3-4 years

(17.78%), 1-2years (10.80) and < 1rs (9.40%) [Table 1].

After 287 stool samples were analysed, 52 of them showed evidence of parasites, showing an 18.11% prevalence rate. Protozoan infection was found to be more common 34 (65.39%) than Helminthic infection 18 (34.61%) in our study. Two protozoan and four helminthic species, total six distinct parasite species, were identified. *Giardia lamblia* was the most prevalent protozoan parasite, accounting for 36.54% of all cases, followed by *Entamoeba histolytica* (28.84%). Among helminths, *Ascaris lumbricoides* was the most common (15.38%) followed by *Hymenolepis nana* (9.62%) and *Enterobius vermicularis* (5.77%). *Taenia spp.* was found in just two children [Table 2, Figure 1]. Most of the positive children were from rural area 31(59.61%), with the ratio of isolates from Rural to Urban area was 1.48:1.

Children between the ages of 4-5 years had the highest rate of intestinal parasitic infection (46.16%), followed by those between the ages of 2-3 years (28.85%), 3-4 years (15.38%), and 1-2 years (7.69%). The lowest rate of parasite isolation was seen in children less than one year of age [Table 3].

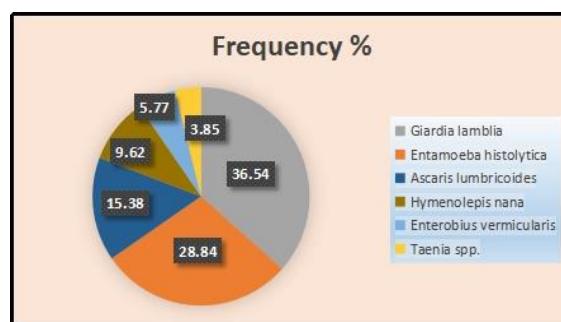


Figure 1: Distribution of parasites in positive stool samples (n=52)

Table 1: Age and Gender wise distribution of patients.

Age (year)	<1	1-2	2-3	3-4	4-5	Total (n %)
Male	17	9	54	28	71	179(62.37)
Female	10	22	19	23	34	108(37.63)
Total (n %)	27 (9.40)	31(10.80)	73 (25.43)	51 (17.78)	105 (36.59)	287(100)

Table 2: Distribution of parasites in positive stool samples (n=52)

Name of parasites	Frequency	Percentage
<i>Giardia lamblia</i>	19	36.54%
<i>Entamoeba histolytica</i>	15	28.84%
<i>Ascaris lumbricoides</i>	8	15.38%
<i>Hymenolepis nana</i>	5	9.62%
<i>Enterobius vermicularis</i>	3	5.77%
<i>Taenia spp.</i>	2	3.85%
Total	52	100%

Table 3: Parasites distribution in the study population according to age

Age(year)	<i>G.lamblia</i>	<i>E.histolytica</i>	<i>A.lumbricoides</i>	<i>H.nana</i>	<i>E.vermicularis</i>	<i>Taenia spp.</i>	Total (n%)
<1	0	1	0	0	0	0	1 (1.92)
1-2	1	2	0	1	0	0	4 (7.69)
2-3	8	3	2	0	2	0	15 (28.85)
3-4	3	1	2	1	1	0	8 (15.38)
4-5	7	8	4	3	0	2	24 (46.16)

Total	19	15	8	5	3	2	52 (100)
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DISCUSSION

For laboratory diagnosis of intestinal parasitic infections, stool testing for parasitic eggs, cysts, trophozoites and larvae continues to be the gold standard. Unaware of the prevalence of parasites in a certain region might cause IPIs to be misdiagnosed as appendicitis or other inflammatory bowel diseases. The stool samples from 287 children under the age of five who have clinical symptoms suggestive of parasitic infections were examined as part of this study. In the present study parasitic infection was seen in 52 cases out of the total 287 stool specimens examined. The overall prevalence of intestinal parasites among children under 5 was found to be 18.11% in this area. Our results are in line with previous studies conducted by Banerjee et al., who similarly found that 17% of children under five had intestinal parasitic infections.^[1]

In an Ethiopian study, 15.5% of children under 5 years old had intestinal parasitic infection (IPIs) according to Gebretsadik et al,^[8] Intestinal parasites was observed in 48.7% of children between the ages of 6 and 59 months in a study conducted by Tsegaye et al,^[9] which is contrary to our findings. A much higher prevalence (85.1%) of IPIs was reported in a study that has been conducted in Southern Ethiopia.^[10]

The intestinal parasites that were most prevalent in our study participants were *Giardia lamblia* (36.54%) and *Entamoeba histolytica* (28.84%), which was consistent with many studies.^[11,12] Poor personal hygiene, irregular hand washing practices, and contaminated drinking water sources are highly linked to *E. histolytica* infection. Furthermore, the ingestion of unclean fruit, raw vegetables, inadequate hand washing, and open field faeces were linked to *G. lamblia* infection.^[13]

Among the helminths, *Ascaris lumbricoides* (15.38%) was the most common intestinal parasite. These findings were consistent with those of previous studies on school-age children in Nepal.^[14,15] Low prevalence of helminths in this study can be attributed to the nationwide deworming programme launched by government of India in 2015. Under this programme all children between the ages of one and nineteen will be dewormed on a designated day known as Anganwadi and the school-based National Deworming Day. Every year on February 10th, National Deworming Day conducted in all states and territories, with a mop-up day on February 15th. Additionally, depending on the worm incidence in some state or UT, several states/UTs perform a bi-annual round on August 10. The prevalence rate of IPIs was higher among the rural population than urban, this finding is similar to the findings in the studies of Jayaram et al.^[16] This could be due to low socio-economic conditions and literacy rates prevailing in rural areas.

The age-specific prevalence profile of the study population indicates that the majority of intestinal parasitic infections were found in children aged 4 to 5 year, followed by 2-3 year and 3-4 year age group. The lowest rate of infection was seen in children younger than one year old. Children in 4-5 year age range are more likely to become infected due to the increasing frequency of playing outside and their unsanitary habits, such as eating soil and not washing their hands before eating. However, younger age groups are less exposed since they spend more time with their moms and other family members and less exposed to the outside world.^[17] Therefore, this study highlights the necessity of focused health education programmes in addition to routine screenings and specific treatment in order to effectively control intestinal parasitic infections.

CONCLUSION

The current study highlights the incidence and distribution of intestinal parasitic infections in children under five. The study suggests that the majority of intestinal parasitic illnesses in the population under investigation are caused by protozoal infections, mostly caused by *G. lamblia*. According to this study, intestinal parasitosis is more prevalent in rural area. The main cause of the rise in parasitic infestations is inadequate hygiene practices brought on by illiteracy and poverty. Our study suggests that in order to raise sanitary awareness in society, actions must be made to support health education and widespread deworming through campaigns in schools and the community.

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