

Original Research Article

TO ESTIMATE THE PREVALANCE OF HUMAN ENTERIC PARASITIC INFECTIONS IN A TERTIARY CARE HOSPITAL IN MORADABAD REGION, UTTAR PRADESH

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ABSTRACT

Background: Although developed countries have a lesser frequency of intestinal parasitic infections because of improved sanitation and better environmental conditions, in developing countries like India intestinal parasitic infections still remain one of the most important public health problem. The aim is to find the prevalence of human intestinal parasitic infections in a tertiary care hospital in Moradabad region, UP.

Materials and Methods: The Observational study was carried out from July 2024 to May 2025 in the Department of Microbiology, Teerthanker Mahaveer Medical College, Moradabad. Stool samples collected in sterile universal containers were transported to the laboratory. The stool specimens were first macroscopically examined and then microscopically examined by performing iodine and saline mounts.

Results: A total of 258 stool samples were processed, of these 40 samples tested positive for stool parasites with a prevalence rate of 15.5%. The highest prevalence was of *Giardia Lamblia* cyst (37.5%), followed by *Ancylostoma Duodenale* (Hookworm) (30%), *Entamoeba Histolytica* (12.5%), *H. nana* (10%), *Ascaris lumbricoides* (5%), *Giardia lamblia* trophozoite (2.5%) and *Rhabditiform* larvae of *Strongyloides* (2.5%). Mixed infections or more than one parasite in a single sample were seen among 5 patients (12.5%) of positive samples. Patient between 20-30 years were most commonly infected followed by <10 yrs age group. Least common age group infected was > 60 yrs. The prevalence of parasitemia was more among males (70%) as compared to females (30%).

Conclusion: Our study shows intestinal parasitic infections poses a significant health problem in region. Inadequate sanitation, water source and walking barefoot in fields are the major risk factors.

Keywords: Parasitic infection, Helminth, Protozoa, *E. histolytica*, hookworm.

INTRODUCTION

Although developed countries have a lesser frequency of intestinal parasitic infections because of improved sanitation and better environmental conditions, in developing countries like India intestinal parasitic infections still remain one of the most important public health problem. Several factors responsible for such infections are impoverishment, lack of education, tropical

climatic conditions and poor quality water supplies.^[1] And although mortalities are less common with such infections, these infections contribute significantly to morbidity of the patients affecting their health and nutritional status. It can also be a major cause for stunted physical and mental development in children. Abdominal cramps, vomiting, bloating, nausea, diarrhoea, loss of appetite, malabsorption, cough, itching are some of the commonly seen manifestations of intestinal parasites.^[2]

The WHO factsheet 2023 mentions nematode infections as the most common infection of around 24% in the world and have highest prevalence from sub-Saharan Africa, China, South America and Asia.^[3] According to the WHO 1987 report the most frequent parasitic infections described worldwide are *Ascaris lumbricoides* (20%), followed by Hookworm (18%), *Trichuris trichiura* (10%) and *Entamoeba histolytica* (10%).^[4]

The comprehensive prevalence of enteric parasitic infections ranges from 12.5- 67% in India pertaining to various researches conducted.^[5-7] A study from western UP has reported prevalence of helminth infections to be more common in the state.^[8]

The main objective of current study was to estimate the prevalence of enteric parasitemia in Moradabad region, where few studies have been conducted in the past. This study may help clinicians to know about the prevalent intestinal parasitic infection in this region and furthermore can help patients to learn the necessary preventive measures to avoid such infections.

MATERIALS AND METHODS

The observational study was carried out from July 2024 to May 2025 in the Department of

Microbiology, Teerthanker Mahaveer Medical College, Moradabad, UP, India.

Stool samples were collected in wide mouthed, clean, labelled containers and were transported to the laboratory. Processing of samples was done within one hour of sample acceptance. The stool specimens were first macroscopically examined for color, consistency, presence of any other abnormality or presence of any adult nematodes or proglottids.^[9] Then the samples were microscopically examined by performing saline and Lugol's iodine mount first at 10x objective and then at 40x objective to detect trophozoites, larvae, cyst and ova.^[10,11]

RESULTS

A total of 258 stool samples were processed, of these 40 samples tested positive for stool parasites with a prevalence rate of 15.5%.

Among all the positive samples, the highest prevalence was of *Giardia lamblia* cyst (37.5%), followed by *Ancylostoma duodenale* (Hookworm) (30%), *Entamoeba histolytica* (12.5%), *H.nana* (10%), *Ascaris lumbricoides* (5%), *Giardia lamblia* trophozoite (2.5%) and Rhabditiform larvae of *Strongyloides* (2.5%).

Table 1: Organism wise distribution of cases

Organism	No of organism(n=40)	%
<i>E. Histolytica</i>	5	12.5
Hookworm	12	30
<i>H.nana</i>	4	10
<i>Ascaris</i>	2	5
<i>Giardia</i> cyst	15	37.5
<i>Giardia</i> trophozoite	1	2.5
Rhabditiform larva of <i>strongyloides</i>	1	2.5

Table 2: Mixed Infections (5)

Parasites (n=5)	Sex	Age	%
Hookworm and <i>H.nana</i>	M	22 years	20
<i>Giardia</i> and <i>E.Histolytica</i>	M	2 years	20
<i>Giardia</i> and <i>H.nana</i>	M	6 years	20
<i>Giardia</i> , Hookworm and <i>E.Histolytica</i>	M	13 years	20
<i>Giardia</i> and Hookworm	M	32 years	20

Mixed infections or more than one parasite in a single sample were seen among 5 patients (12.5 % of positive samples). The various combinations observed were *Giardia* with *H.nana*, Hookworm and

E. histolytica and Hookworm with *Giardia*, and *Giardia*, Hookworm and *E.histolytica*.

Multiple parasitic infections were seen mainly in younger age group (>15 years) whereas 2 cases were seen in children less than 5 years.

Table 3: age wise distribution of cases(n=40)

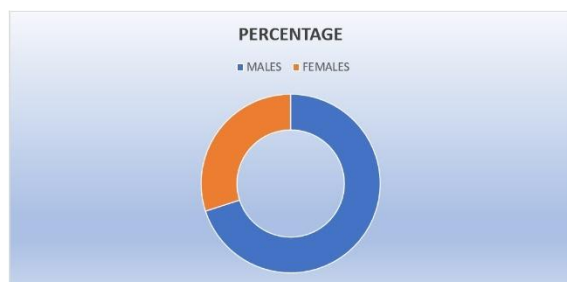
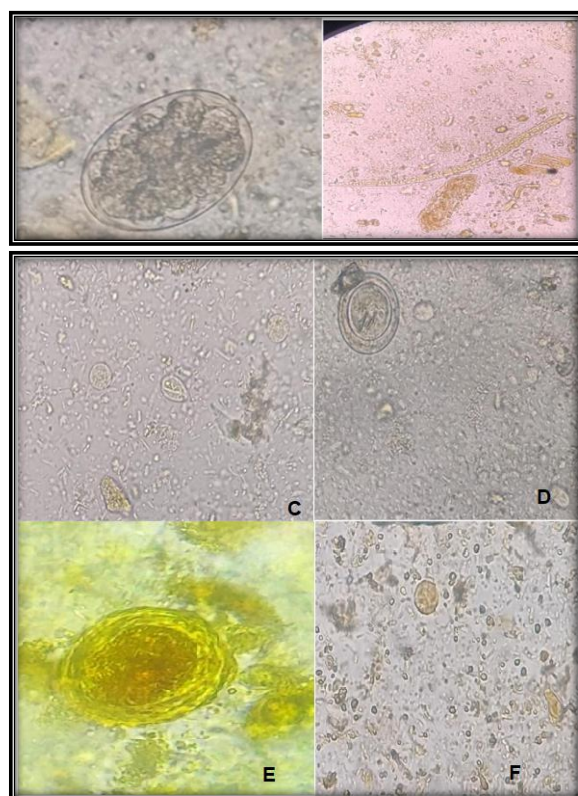
Age (in years)	Number(40)
<10 yrs	8(20%)
10-20	4(10%)
20-30	12(30%)
30-40	5(12.5%)
40-50	5(12.5%)
50-60	4(10%)
>60	2(5%)

In Age group wise distribution, patients between 20-30 years of age were most commonly infected

followed by <10 years' age group. Least common age group infected was > 60 years.

Table 4: Gender Wise Distribution Of Cases

Gender (N=40)	Positive	%
Male	28	70
Female	12	30

**Figure 1: The prevalence of parasitemia was more among males (70%) as compared to females (30%).****Figure 2: (a) Egg of *A. duodenale* (b) Rhabditiform larva of *S. stercoralis* (C) *Giardia* cyst and *E. histolytica* cyst, (D)*H.nana* with *Giardia* cyst (e)Egg of *Ascaris lumbricoides* (f) *E. histolytica* cyst**

DISCUSSION

The comprehensive prevalence of enteric parasitic infections over the period of 10 months was 15.5%. This was noted to be lower than previous reports.^[8,12] There are varied prevalence rates reported from all over India ranging from 11% to as high as 47%. Suneeta et al reported the prevalence of enteric parasitic infections to be 11.18% which is comparable to our study.^[13] The lower prevalence in our study could be because of lower behavioural risk factors such as unsafe drinking water supply, open site defecation and better hand hygiene practices.

In our study, the prevalence rate of *Giardia lamblia* cyst (37.5%) was found to be highest followed by hookworms (30%) among all other intestinal parasites, suggesting protozoan parasite infections to be more common as comparable to a study from Rohtak, in which *Giardia lamblia* (58.5%) and *Entamoeba histolytica* (32.0%) were mainly isolated.^[14] Another study from Rajasthan also reported maximum infection (23.66%) of protozoan parasites as compared to helminthes (14.73%).^[18] A study from Karnataka, reported *Entamoeba histolytica* (65.57%) as the most frequently detected parasite followed by *Ascaris lumbricoides* (12.68%).^[17] Whereas in a study done by Razia et al *Ascaris lumbricoides* followed by *Taenia* species was the commonest parasite observed.^[16]

The high prevalence of hookworm infestations could be related to the field works as most of the populations were farmers by occupation. Walking barefoot in the fields is notably a common practice among farmers.

In our study, male cases (70%) of intestinal infections were more than females (30%). The possible reason for this preponderance maybe due more movement of males out of the houses than females, causing exposure to soil transmitted helminths or difference in their eating habits. Hormonal and immunological difference between both genders owing to the level of circulating steroid hormones could also be a possible explanation for more parasitic infections in males compared to females as quoted by a study done by Klein SL et al.^[15]

In the present study highest number of cases was observed in the age group 20-30 years and lowest cases were seen in age group more than 60 years. This finding is consistent with an analysis by Razia Khatoon et al.^[16] Although a study by Parameshwarappa KD et al. has reported more number of cases in children between 5- 10 years' age and least cases in children <5 years.^[17] This maybe reflects the difference in the sample size collection in the present study.

Similarly, in a study by Davane et al. the utmost prevalence was seen in age group 11 to 20 years (18.6%) and lowest in age group 51 to 60 years (0%).^[19]

In our study, the prevalence of mixed infections was found to be 12.5% of the total positive samples and solely seen in males, most of which were in age groups >15 years (40%).

Similar to our study, Ira et al also reported multiple parasitic infections in 0.7 percent (164/22,864) of all positive samples with rare infections in children.^[20] In a study by SL Choubisa et al. reported that multiple infections were seen more in patients belonging to age group 11-15 years.^[17] This could be due to difference in the climatic conditions of the study area.

CONCLUSION

Our study shows intestinal parasitic infections poses a significant health problem in region. Inadequate sanitation, poor water sources and walking barefoot in fields are the major risk factors. In order to prevent such infections, people should be educated for good hygiene practices, proper cooking of food, people also should be made aware of the importance of avoiding to walk barefoot in the fields along with safe water consumption and periodic deworming practices should be followed in such prevalent regions.

Limitations of the study: Concentration methods were not used for stool specimen processing. This could have yielded more of soil transmitted helminthes.

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