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Original Research Article

Detection and Prevalence of Common Intestinal Parasites in Stool Samples at A Tertiary Care Hospital in North India

Singhal E.[1], Yadav D. S.[2]

[1,2]Department of Microbiology, Rajshree Medical Research Institute, Bareilly, Uttar Pradesh 243501, India

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Corresponding author: Dr. Singhal E.
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Abstract

Introduction: Intestinal parasitic infections remain a major health concern in developing countries, particularly in areas with inadequate sanitation, overcrowding, and unsafe water. Despite public health initiatives, these infections continue to affect children and low income groups.

Objectives: To determine the prevalence and spectrum of common intestinal parasites in stool samples processed at a tertiary care hospital in Western Uttar Pradesh.

Materials and Methods: This retrospective study was conducted from June 2023 to May 2025 in the Department of Microbiology. A total of 482 stool samples from both outpatient and inpatient departments were examined by direct saline and iodine wet mounts.

Results: Among 482 samples, 108 (22.41%) showed significant findings, and 45 (9.33%) were positive for parasitic forms. Entamoeba histolytica (5.80%) was the most common parasite, followed by Giardia lamblia (1.66%), Ascaris lumbricoides (0.62%), Ancylostoma duodenale (0.62%), Enterobius vermicularis (0.41%), and Hymenolepis nana (0.20%). Protozoan infections (7.46%) were more prevalent than helminthic infections (1.85%). The highest infection rate occurred in children aged 0–10 years (33.33%).

Conclusion: Protozoan infections predominated over helminthic infections, with E. histolytica as the leading pathogen. The results suggest a shifting trend in parasitic prevalence, likely due to improved hygiene and deworming programs. Continued surveillance, health education, and access to safe water are essential for controlling intestinal parasitic infections.

Keywords: Intestinal Parasites, Entamoeba Histolytica, Giardia Lamblia, Stool Microscopy.

Introduction

Stool examination remains a cornerstone diagnostic tool in microbiology laboratories for the detection of gastrointestinal parasites and related disorders. Parasitic infections continue to be a significant public health concern in developing countries, with their prevalence closely linked to poor sanitation, malnutrition, overcrowding, poverty, and tropical climatic conditions [1]. In particular, transmission is facilitated by poor personal hygiene, consumption of contaminated water, and unhygienic food handling practices [2].

Common intestinal parasites detected in stool samples include protozoan forms such as Entamoeba histolytica and Giardia lamblia (identified as trophozoites and cysts), and helminths like Ascaris lumbricoides, Ancylostoma duodenale, and Enterobius vermicularis [3]. Additionally, complete worms or proglottids of Taenia spp. and ova or larvae of Strongyloides stercoralis may also be encountered [4,5]. Stool examination is also useful for detecting occult blood in cases suggestive of peptic ulcers or gastrointestinal malignancies. Recent studies from Uttar Pradesh—such as those conducted in tertiary care hospitals in Lucknow, Gorakhpur, and Varanasi—have reported variable prevalence of intestinal parasitic infections, largely influenced by local environmental and socioeconomic factors. For example, Singh et al. (2022) reported a protozoan predominance, particularly E. histolytica, in pediatric stool samples in urban Lucknow [6].

Similarly, Kumar et al. (2023) documented a reduction in helminthic infections, attributing this decline to expanded government-led deworming programs and improved public awareness on hygiene in rural districts of eastern Uttar Pradesh [7]. These findings are aligned with a broader national trend indicating a shift in parasitic prevalence patterns, likely reflecting enhanced sanitation infrastructure and increased access to

health education [8]. Our hospital, a tertiary care center, primarily serves populations from lower socioeconomic strata, who remain vulnerable to parasitic infections due to multiple risk factors.

This region is characterized by a hot and humid climate that, along with overcrowding, poor sanitation, and limited access to clean drinking water, provides ideal conditions for the persistence and transmission of intestinal parasites [2]. Hence, this study was undertaken to evaluate the prevalence and spectrum of common intestinal parasites detected in stool samples processed at our microbiology laboratory over a two-year period.

Materials and Methods

This was a retrospective study conducted at a tertiary care hospital in Western Uttar Pradesh. The study included all stool samples received for parasitological examination in the Department of Microbiology from June 2023 to May 2025. A total of 482 stool samples from both outpatient and inpatient departments were included for analysis.

Stool samples were collected in wide-mouthed, clean, dry, and leak-proof containers and transported without delay to the microbiology laboratory [3]. Each sample was subjected to gross examination to assess color, consistency, and presence of mucus, frank blood and visible segments of parasites. Microscopic examination was performed within one hour of receipt. Wet mount preparations were made using both normal saline and Lugol's iodine. A small amount of stool was emulsified on a glass slide with a drop of saline or iodine, covered with a cover slip, and examined under low and high power objectives for identification of trophozoites, cysts, ova, and larvae [4]. In cases with clinical suspicion of parasitic infection, stool concentration was performed using the formalin-ethyl acetate sedimentation technique to increase detection sensitivity [5]. Samples were also examined for the presence of occult blood when clinically indicated, particularly in cases of gastrointestinal symptoms such as dysentery or unexplained anemia [9]. Standard operating procedures were followed in accordance with WHO and CDC parasitology diagnostic guidelines [10].

Results

A total of 482 stool samples were received and examined in the Department of Microbiology from June 2023 to May 2025. The age distribution of cases is presented in Table 1.

Table 1: Age-Wise Distribution of Stool Samples (n = 482):

Age Group (Years)	No. of Samples	Percentage (%)
0–10	148	30.70
11–20	64	13.28
21–30	80	16.60
31–40	54	11.20
41–50	52	10.79
51–60	42	8.71
61+	42	8.71

Of 482 samples, 108 (22.41%) exhibited significant microscopic findings, while the remaining 374 (77.59%) samples showed no pathogenic features. Liquid consistency with mucus was noted in 46 (9.54%) samples, and 19 (3.94%) also showed frank blood.

Among the 108 significant samples, 45 (41.67%) demonstrated parasitic morphological forms.

The remaining samples included 32 (29.63%) samples with abundant motile bacilli and pus cells, 17 (15.74%) with budding yeast cells, and 14 (12.96%) showing features of bacillary dysentery.

The pathogenic parasites detected were:

- Entamoeba histolytica cysts/trophozoites in 28 (5.80%) stool samples received.
- Giardia lamblia cysts/trophozoites in 8 (1.66%) samples.
- Ascaris lumbricoides ova in 3 (0.62%) samples.
- Ancylostoma duodenale in 3 (0.62%) samples.
- Enterobius vermicularis in 2 (0.41%) samples.
- Hymenolepis nana in 1 (0.20%) sample.

Non-pathogenic Entamoeba coli cysts were seen in 4 (0.83%) samples (Table 2).

Table 2: Frequency of Intestinal Parasites Detected (n = 482):

Parasite	No. of Cases	Percentage (%)
Entamoeba histolytica	28	5.80
Giardia lamblia	8	1.66
Ascaris lumbricoides	3	0.62
Ancylostoma duodenale	3	0.62
Enterobius vermicularis	2	0.41
Hymenolepis nana	1	0.20
Entamoeba coli (non-path.)	4	0.83

As in recent studies from Uttar Pradesh [6,7], protozoan infections were more prevalent than helminthic infections.

The most common parasite identified was Entamoeba histolytica, accounting for 62.22% of all parasitic cases. A slightly higher proportion of infections was observed in females (26/45; 57.78%) than in males (19/45; 42.22%) (Figure 1).

The highest number of parasitic infections occurred in the 0–10 years age group (15 cases; 33.33%) followed by the 21–30 years age group (10 cases; 22.22%) (Table 3).

These results align with regional studies that report a shift in intestinal parasitic prevalence toward protozoan dominance due to the success of school-based deworming initiatives [4,7,8].

Table 3: Age Distribution of Parasitic Infections (n = 45):

Age Group (Years)	No. of Cases	Percentage (%)
0–10	15	33.33
11–20	6	13.33
21–30	10	22.22
31–40	4	8.89
41–50	3	6.67
51–60	3	6.67
61+	4	8.89

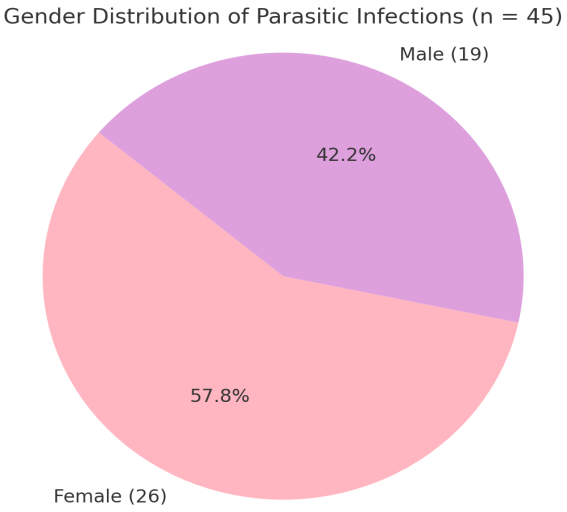

Figure 1: Gender Distribution of Parasitic Infections (n = 45)

Discussion

This retrospective study was conducted to assess the prevalence and distribution of common intestinal parasites in stool samples received over a two-year period at a tertiary care center in Western Uttar Pradesh. A total of 482 stool samples were included in the analysis. Gender distribution was nearly equal in our study, with a slightly higher proportion of infections in females than in males, a trend also observed in similar studies by Shobha M et al. [2] and Singh V et al. [6].

The 0–10 years age group contributed the highest number of samples (30.70%), consistent with several Indian studies on intestinal parasitosis [2,6,11]. This age group is known to be particularly susceptible to intestinal parasitic infections due to underdeveloped immune responses and increased exposure to contaminated environments, such as through playing on the ground or poor hand hygiene practices. This was followed by 21–30 years (22.22%), indicating a bimodal distribution of risk likely influenced by environmental exposure in children and occupational exposure or lifestyle-related hygiene practices in young adults. Of the 482 samples examined, 45 revealed the presence of parasitic morphological forms. The pathogenic parasites identified included Entamoeba histolytica (5.80%), Giardia lamblia (1.66%), Ascaris lumbricoides (0.62%), Ancylostoma duodenale (0.62%), Enterobius vermicularis (0.41%), and Hymenolepis nana (0.20%), while Entamoeba coli (0.83%) was noted as a non-pathogenic commensal. These findings closely resemble reports from Chandrashekar Vani [12] and Kumar et al. [7], where protozoan parasites predominated over helminthic forms. The most prevalent parasite isolated in our study was Entamoeba histolytica (28 cases), which accounted for 62.22% of all pathogenic parasitic cases (45 cases), making it the predominant protozoan identified. This observation

is in line with multiple studies conducted across India, including those by Singh V [6], Rituparna B [11], and Shobha M [2]. Giardia lamblia was the second most commonly isolated organism, consistent with findings from Marothi Y [13] and others.

Although protozoan infections predominated, helminthic infections were also observed. Notably, ova of Ascaris lumbricoides, Ancylostoma duodenale, Enterobius vermicularis, and Hymenolepis nana were detected, though in relatively lower frequencies. The presence of these helminths, particularly Ancylostoma duodenale and Hymenolepis nana, underscores the persistence of soil-transmitted helminthic infections in certain population subsets. Enterobius vermicularis is commonly associated with poor hand hygiene and crowding, particularly in children, and its detection further supports the need for targeted health education interventions. Recent regional studies also suggest a declining trend in helminthic infections, likely due to improved public health initiatives, including the National Deworming Programme [8] and increased awareness about hygiene and sanitation. This epidemiological shift, favoring protozoan dominance, further supports the findings of our study.

The predominance of protozoan over helminthic infections can be attributed to the fecal-oral route of transmission [1,3], particularly among children, and highlights the continued need for community education, clean water access, and regular deworming strategies. The comparative findings with other regional studies are summarized in Table 4 of this document.

Table 4: Comparative Summary of Recent Studies in Uttar Pradesh on Intestinal Parasitic Infections

Study Done By	Year	Age Group Most Affected	Most Common Parasite Isolated
Present Study (W. UP)	2025	0–10 years (33.33%)	Entamoeba histolytica (5.80%)
Singh et al., Lucknow	2022	Pediatric (urban children)	Entamoeba histolytica (7.41%)
Kumar et al., Eastern UP	2023	School-aged children	E. histolytica + helminths (6.80%)
Gorakhpur Study	2023	Not specified	Giardia lamblia (4.29%)

Conclusion

Intestinal parasitic infections continue to pose a significant health concern, particularly among children and individuals from lower socioeconomic backgrounds.

Among the 482 stool samples analyzed, Entamoeba histolytica emerged as the most frequently detected parasite, followed by Giardia lamblia. Protozoan infections were more prevalent than helminthic infections, reflecting a regional and national shift possibly attributable to improved sanitation, hygiene practices, and implementation of large-scale deworming programs.

The predominance of protozoan infections underscores the continued role of the fecal–oral route in transmission, emphasizing the need for safe water supply, proper waste disposal, and community education regarding hygiene and food handling.

Periodic stool screening and reinforcement of preventive strategies, particularly in school-aged children, remain essential for reducing the burden of parasitic diseases in the community.

Limitations

As this was a retrospective study, detailed clinical data, dietary habits, and socioeconomic variables of the patients could not be thoroughly assessed. The findings are based on samples from a single tertiary care hospital and may not fully represent the prevalence of intestinal parasites in the wider community or other regions of North India. Only conventional microscopy and concentration methods were used; advanced diagnostic tools such as ELISA, PCR, or antigen detection assays were not employed, which may have led to underestimation of certain infections. Seasonal or environmental influences on parasitic prevalence were not analyzed, which might affect the interpretation of infection patterns.

References

1. World Health Organization. Soil-transmitted helminth infections. WHO Fact Sheet. Geneva: WHO; 2020.
2. Shobha M, Ramakrishna BS, Mathan MM. Prevalence of intestinal parasitic infestations in southern India. Trop Parasitol. 2017;7(2):123–8.
3. Garcia LS. Diagnostic Medical Parasitology. 6th ed. Washington (DC): ASM Press; 2016.
4. Chatterjee KD. Parasitology: Protozoology and Helminthology. 13th ed. New Delhi: CBS Publishers; 2018.
5. Cheesbrough M. District Laboratory Practice in Tropical Countries. Part 1. 2nd ed. Cambridge: Cambridge University Press; 2009.
6. Singh V, Srivastava V, Verma A. Prevalence of intestinal parasitic infections in children in a tertiary care hospital of Lucknow. J Trop Med Parasitol. 2022;43(1):15–20.
7. Kumar N, Sharma A, Yadav S. Declining trend of helminthic infections among school-aged

children in eastern Uttar Pradesh: Impact of national deworming initiatives. Indian J Community Med. 2023;48(1):23–7.
8. National Health Mission (NHM), Government of India. National Deworming Day Reports. New Delhi: NHM; 2022.
9. World Health Organization. Basic Laboratory Methods in Medical Parasitology. Geneva: WHO; 1991.
10. Centers for Disease Control and Prevention (CDC). DPDx: Laboratory Identification of Parasites of Public Health Concern [Internet]. Atlanta (GA): CDC; 2020 [cited 2025 Oct 9]. Available from: https://www.cdc.gov/dpdx/
11. Rituparna B, Mukhopadhyay AK, Roy S. Intestinal parasitic infections in children: a hospital-based study. Indian J Med Res. 2018;147(5):478–82.
12. Chandrashekar V, Vani R. Prevalence of intestinal parasites in stool samples: a retrospective study. Int J Curr Microbiol App Sci. 2019;8(3):2174–80.
13. Marothi Y, Singh BR. Study of prevalence of intestinal parasitic infections among school children in rural areas of Chhattisgarh. J Commun Dis. 2016;48(2):13–7.