Section: Microbiology

Original Research Article

TRENDS IN INTESTINAL PARASITIC INFECTIONS IN A BUDDING TERTIARY CARE HOSPITAL: A HOSPITAL BASED THREE YEARS RETROSPECTIVE STUDY

Tonushyam Sonowal[1], Nayanjyoti Sarmah[2], Ranjita Khandait[2], Subhrendu S Sen[3]

[1]*Demonstrator, Department of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam, India*
[2]*Assistant Professor, Department of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam, India*
[3]*Professor & Head, Department of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam, India*

Received *: 05/08/2025*
Received in revised form *: 21/09/2025*
Accepted *: 09/10/2025*

Corresponding Author:
Dr. Tonushyam Sonowal,
Demonstrator, Department of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam, India.
Email: sonowaltonushyam@gmail.com

DOI: 10.70034/ijmedph.2025.4.352

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

Int J Med Pub Health
2025; 15 (4); 1966-1969

ABSTRACT

Background: Malnutrition, growth retardation, anemia, and vitamin deficiencies in early childhood are a few of the serious public health issues caused by intestinal parasite infections, particularly in developing countries like India. Therefore, the burden of intestinal parasite infections in society must be addressed at the appropriate moment in order to improve health and the nation's economic situation. Finding out the patterns of intestinal parasite infections in a tertiary care hospital in North Lakhimpur, Assam, was the aim of this study.

Materials and Methods: Over the course of three years, a retrospective study was conducted in the microbiology department of Lakhimpur Medical College and Hospital in North Lakhimpur, Assam. In order to identify parasite diseases in patients undergoing routine stool examinations in our hospital attended outpatient and inpatient departments.

Results: Over the course of three years, 347 stool samples were analyzed; 38 (10.9%) of these samples showed evidence of parasites. *Entamoeba spp*. (26.3%), *Ancylostoma duodenale* (23.6%), *Strongyloides stercoralis* (18.4%), and *Ascaris lumbricoides* (15.7%) were the most prevalent parasites found, followed by *Trichuris trichiura* (10.5%) and *Enterobius vermicularis* (5.2%). Five patients had mixed infections.

Conclusion: *Entamoeba spp*. (26.3%) infection was the most prevalent parasite found in our investigation. Due to the fact that these parasites are occasionally eliminated in stool samples, the incidence of these infections may still be higher. To better assess the burden of intestinal parasites in our community, it is essential to collect multiple samples from infected individuals and apply concentration techniques for improved detection.

Keywords: Budding tertiary care hospital, Intestinal parasitic infections, Retrospective study.

INTRODUCTION

Intestinal parasite infections impact an estimated 3.5 billion people globally, resulting in 450 million illnesses and more than 200,000 fatalities annually.[1] Intestinal parasite infections rank among the most prevalent ailments among persons in developing countries. In modern countries, gastrointestinal diseases are more often caused by protozoan parasites than by helminths.[2] The World Health Organization (WHO) estimates that 39 million disability-adjusted life years of sickness are caused by intestinal parasites, such as soil-transmitted helminths, which may infect about 21% of India's population.[3] Up to 60% of people worldwide may be infected with gut parasites, which significantly affect morbidity and mortality rates, especially in the pediatric population.[4] The protozoan parasite *Entamoeba* (*E. histolytica)* is responsible for intestinal amoebiasis, which is estimated to impact approximately 50 million individuals worldwide and is a major source of illness and mortality, after *Giardiasis* and Cryptosporidiosis, according to a WHO report.[5] The most common parasitic illnesses reported globally are *Ascaris lumbricoides* (20%), *Hookworm* (18%), *Trichuris trichiura* (10%), and *E. histolytica* (10%).[3]

For control measures to be implemented effectively, prevalence data are essential. Understanding age-related trends, temporal trends, and seasonality patterns may also help develop tailored prevention methods against intestinal parasite infections (IPIs). In order to ascertain the prevalence of intestinal parasite infections and identify any age-related or temporal trends among patients who attended Lakhimpur Medical College and Hospital, a newly established tertiary care facility in North Lakhimpur, Assam, India, over a three-year period, a retrospective analysis was conducted.

MATERIALS AND METHODS

Over the course of three years (January 2022 to December 2024), a retrospective study was conducted in the Department of Microbiology at Lakhimpur Medical College and Hospital in North Lakhimpur, Assam. During this time, routine stool examinations were performed to identify intestinal parasite infections in patients who had symptoms suggestive of parasitic infections and were attending various outpatient and inpatient departments of our hospital. In a well-labeled, wide-mouthed, dry screw-capped plastic container free of preservatives, 347 fresh feces samples were collected. Within one to two hours after being collected, stool samples were brought to the microbiology lab and processed immediately. Macroscopically, every sample was inspected for color, consistency, blood, mucus, adult worms, and parasitic features such as scolices and proglottids. For the purpose of detecting the presence of helminthic eggs or cysts, saline wet mount and Lugol's iodine wet mount were made for each sample and seen under a 40x microscope [Figure 1 &2]. The study did not use any concentration or sedimentation techniques. The parasite cysts' and ova's morphological characteristics were recognized and recorded. Additionally, the parasite dispersion was assessed based on the patient's age and sex. The study did not include the same patient's repeat samples.

RESULTS

Of the 347 stool samples examined during a three-year period, 30 (8.6%) contained parasites. There were 191 men and 156 women among these 347 patients. A total of thirty individuals tested positive for parasites, with twelve (40%) being female and eighteen (60%) being male [Table 1] The age group of 16–30 years old had the highest number of patients, followed by the 0–15 year old group [Table 2] Out of 30 positive cases, a total of 38 parasites were isolated. Patients in the 16–30 age range had the highest number of parasites isolated from them, followed by those in the 0–15 age range. A total of six (6) distinct parasites were found. The most prevalent parasites among those isolated were *Ascaris lumbricoides* (15.7%), *Trichuris trichiura* (10.5%), *Enterobius vermicularis* (5.2%), and Entamoeba spp. (26.3%), *Ancylostoma duodenale* (23.6%), and *Strongyloides stercoralis* (18.4%) [Figure 3]. Five of the thirty individuals who tested positive had mixed parasite infections.

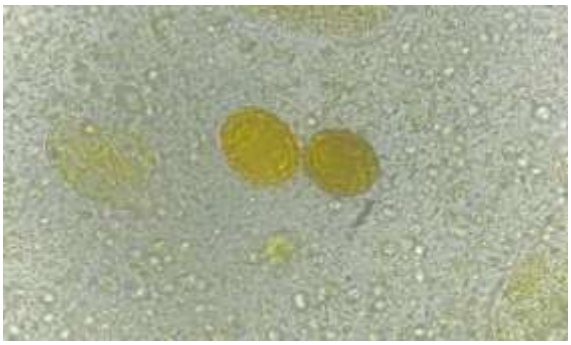

Figure 1: Normal saline mount showing egg of Ascaris lumbricoides under 40X

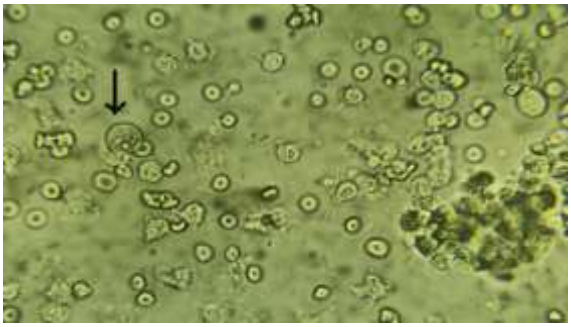

Figure 2: Normal saline mount showing cyst of Entamoeba spp. Under 40X

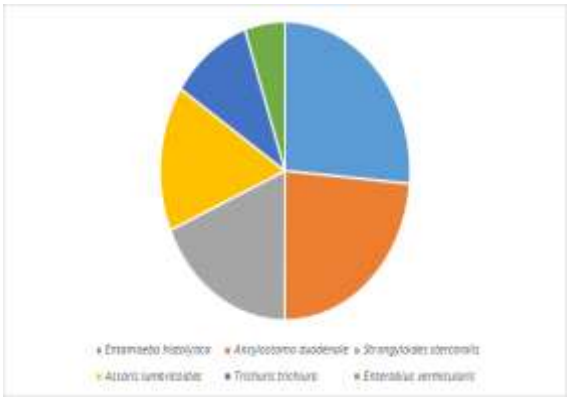

Figure 3: Pie diagram showing distribution of parasites among positive patients.

Table 1: Gender wise distribution of positive cases

Years	Total number of samples	Total number of positive samples		
		Total	Male	Female
2022	12	2	2	0
2023	153	12	7	5
2024	182	16	9	7

Table 2: Age and sex wise distribution of positive cases

Age/Sex	0-15 years	16-30 years	31-45 years	46-60 years	>60 years	Total
Male	4	8	3	2	1	18
Female	3	3	2	1	3	12
Total	7	11	5	3	4	30

DISCUSSION

Since before our earliest known history, helminths have afflicted people. There are intestinal helminth eggs in human feces that have been preserved for thousands of years.[6] The study estimates that more than 50 zoonoses, including bacterial, viral, and rickettsial diseases, cause 2.5 billion cases of human illness and 2.7 million deaths annually.[7] According to the effects on the health of humans and animals, 13 zoonotic illnesses have been identified.

According to a report by the International Livestock Research Institute (ILRI), Kenya, India ranks first among nations with a high frequency of zoonotic illnesses and is the seventh largest country in the world.[8] The prevalence of parasite infection in this study is 8.6%, which is consistent with findings by Davane et al. (2012) and Rajvir Singh et al. (2013), who identified a prevalence of 6.68%.[9,10] The most prevalent parasite among those isolated was *Entamoeba spp*. (26.3%), which was followed by *Ancylostoma duodenale* (23.6%). *Entamoeba histolytica* was more common in Rayan (25.3%) than *Giardia lamblia* (17.9%), according to several Indian research. *Entamoeba histolytica* was more common in Rameshwarppa KD (65.57%), followed by Ascaris lumbricoides (12.68%).[11] *Ascaris lumbricoides* is the most common parasite that infects humans, according to numerous research,[12-14] yet in our investigation, it was only 15.7%. Variability among communities, ethnic groupings, geographical regions, and seasons may all contribute to the disparity in the prevalence rate of specific parasites.[15] According to our research, male are more likely than females to have intestinal parasite infections. This was consistent with recent research by Sethi et al,[16] that found a higher frequency of parasite infection in males than in females. This is better explained by the fact that males in this area labor in the fields and with livestock, while women handle household chores. As a result, they are more likely to come into contact with polluted soil and water, which is a key risk factor for infection. According to the age-specific prevalence profile of our study population, intestinal parasite infections were most common in people aged 16 to 30 years, followed by children aged 0 to 15, which is consistent with study.[17] Children and young people are more likely to contract these diseases as a result of overcrowding, increased outdoor activity, and exposure to contaminated environments.[16] The current study's disadvantage was that only one stool sample from each patient was analyzed, which is insufficient, and the techniques used were not particularly sensitive. When compared to a single sample, the triple feces test could have multiplied the parasitic incidence frequency by several times. The inability to distinguish between *E. dispar* and *E. histolytica* cysts due to their comparable microscopic appearances and the fact that we only used microscopy for routine diagnostic testing was another drawback of our study. Additionally, we only used data from patients who visited our hospital for three years, which means that a smaller fraction of the total samples were used. Only microscopic methods were employed to identify the parasites, and no follow-up sample was collected following therapy. Due to the labor-intensive nature of microscopy and the fact that the diagnosis is dependent on the severity of the illness, the results may be underestimated. Another disadvantage of our study is that we haven't included molecular techniques like Polymerase Chain Reaction and other techniques like serology.

CONCLUSION

Infection by intestinal parasites is a serious issue, especially for developing countries. It is evident from our study's data that the burden of this virus is only the beginning. Due to the sporadic excretion of these parasites and the exclusion of repeat stool samples from the same patient, the prevalence may still be higher. Concentration techniques should be regularly used in parasitology labs to ensure that organisms that may be present in trace amounts are not overlooked. To check for the presence of *Cryptosporidium, Cyclospora*, and *Isospora* oocysts, modified acid fast staining should also be performed. Additionally, our study indicates that strict measures should be implemented to avoid intestinal parasitosis-related health harm in our region. Therefore, in addition to routine deworming programs, it is imperative to raise awareness about the consumption of clean drinking water, environmental sanitation, and personal hygiene in order to continuously control the spread of this infection.

REFERENCES

1. Feleke DG, Bisetegn H, Zewudu G, Alemu Y, Feleke ST. Intestinal parasitic infections and associated risk factors among food handlers of food and drinking establishments in Woldia Town, North-East Ethiopia: A cross-sectional study. J Trop Med 2023: 2831175. doi: 10.1155/2023/2831175.
2. Haque R. Human intestinal parasites. J Health Popul Nutr 2007; 25(4): 387-391.
3. Praharaj I, Sarkar R, Rao Ajjampur S, Roy S, Kang G. Temporal trends of intestinal parasites in patients attending a tertiary care hospital in south India: A seven-year retrospective analysis. Indian J Med Res 2017; 146(1): 111.
4. Langbang D, Dhodapkar R, Parija S, Premarajan K, Rajkumari N. Prevalence of intestinal parasites among rural and urban population in Puducherry, South India: A

community-based study. J Fam Med Prim Care 2019; 8(5): 1607.
5. World Health Organization. 2030 targets for soil-transmitted helminthiases control programmes. [Online] Available from: https://iris.who.int/ handle/10665/330611. [Accessed on 3 September 2024].
6. HotezPJ, BrindleyPJ, BethonyJM, KingCH, PearceEJ, JacobsonJ,etal. Helminth infections: the great neglected tropical diseases. JClin Invest.2008; 118(4):1311–21.doi:10.1172/JCI34261.
7. Salyer SJ, Silver R, Simone K, Behravesh B, C. Prioritizing Zoonoses forGlobalHealthCapacityBuilding-Themes fromOne HealthZoonoticDiseaseWorkshopsin7Countries.EmergInfect Dis 2017;23(13):S55–64. doi:10.3201/eid2313.170418.
8. Rajendran C, Satbigea AS, Kumar D. Review on Zoonotic Parasitic Diseases Clinical Features. of Northeast India-Epidemiology and Int J Curr Microbiol Appl Sci. 2019;8(2). doi:10.20546/ijcmas.2019.802.xx.
9. Singh R, Singla P, Sharma M, Aparna, Chaudhary U. Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital in Northern India: Five year retrospective study. Int J Curr Microbiol App Sci. 2013;2(10):112–7.
10. Davane MS,Suryawanshi NM, Deshpande KD. Aprevalence study of intestinal parasitic infections in a rural hospital. Int J Recent Trend Sci Technol. 2012;2(1):1–3.
11. Ibrahim AH. Prevalence of intestinal parasites among School Children in Dier-EL-Balah town in Gaza strip, Palestine, Ann Saudi Med, 2002;22(3-4):273-75.
12. Rameshwarappa KD, Chandrakanth C, Sunil B. The Prevalence of Intestinal Parasitic Infestations and the Evaluation of Different Concentration Techniques of the Stool Examination. Journal of diagnostic and clinical research. 2012;6(7):1188-91.
13. Choubisa SL, Choubisa L, Intestinal helminthic infections in tribal population of Southern, Rajasthan, India Journal of parasitic disease, 2006;30(2):163-167
14. D Silva NR, Jayapani VP, De Silva HJ. Socioeconomic and behavioral factors affecting the prevalence of geohelminths in preschool Children, South East Asian Journal of tropical medicine and public health, 1996;27(1):36-42.
15. Singh C, Zargar SA, Masoodi I, Shoukat A, Ahmad B. Predictors of intestinal parasitosis in school children of Kashmir : A prospective study. Tropical Gastroenterology 2010;31(2):105-107.
16. Sethi S, Sehgal R, Malla N, Dudey ML, Mahajan RC. Changing trends of intestinal parasitic infections in Chandigarh (Northern India): Hospital based study. Indian J Med Microbiol 2000; 18: 106-109
17. Ahmad W, Prakash V, Kumar R, Kumar S, Xess A. Prevalence of Intestinal Parasitic Infection in Patients Attending Tertiary Care Hospitals of Patna, Bihar. Scholars J Appl Med Sci (SJAMS). 2018;6(12):4977–81.