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Research Article

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Prevalence and Correlates of Soil Transmitted Helminthic Parasitic Infections among Patients in A Tertiary Care Centre in Dibrugarh, Assam

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ABSTRACT

Background: Helminthic infections are a major public health issue in developing countries, affecting millions of people worldwide. Previous studies have reported high prevalence rates of helminth infections, particularly in children and vulnerable populations.Helminth infections continue to pose a significant public health challenge in developing countries, particularly among children and vulnerable populations. **Materials and methods:** This cross-sectional study aimed to evaluate the prevalence and distribution of helminth infections in a population of 2200 individuals and investigate possible associations with gender, age inpatient and outpatient. **Results:** We found a helminth prevalence of 3.86%, with Ascaris *lumbricoides* being the most common parasite identified, followed by Ankylostoma *duodenale*, Trichuris *trichuria*, Strongyl oides *stercoralis*, and Enterobius *vermicularis*. Mixed infections were observed in 10.9% of the cases, with Ankylostoma *duodenale* and Strongy loides *stercoralis* being the most common combination. Males constituted 62.35% of the infected cases, and inpatient cases constituted 85.85% of the infected cases. The highest number of cases was found in the age group of 10-14 years. Our study highlights the significant burden of helminth infections in the population and underscores the need for effective prevention and control strategies. **Conclusion:** Our study highlights the significant burden of helminth infections in the population, particularly in developing countries. Effective prevention and control strategies, tailored to specific risk factors, are urgently needed to reduce the morbidity and mortality associated with these infections.

Key Words: *helminth infections, prevalence, distribution, gender, age.*

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INTRODUCTION

Soil-transmitted helminthic (STH) parasitic infections are a significant public health problem, particularly in developing countries where poor sanitation and hygiene practices are prevalent. According to the World Health Organization (WHO), an estimated 1.5 billion people, or about one-quarter of the world's population, are infected with STH parasites, with the highest burden of infection occurring in low-income countries (WHO, 2020). These infections are caused by nematode worms that were transmitted through contaminated soil, water, or food, and could lead to a range of health problems, including anemia, malnutrition, and impaired cognitive development [1].

In India, STH infections were common, particularly in rural areas, where poor sanitation and hygiene practices are prevalent. The most common types of STH parasites in India are Ascaris *lumbricoides*, Trichuris *trichiura*, and hookworms [2]. Studies had shown that the prevalence of STH infections varied significantly across different regions of the country. For instance, a study conducted in Tamil Nadu reported a prevalence rate of 36.3% among school children[3], while a study in West Bengal reported a prevalence rate of 48.7% among school children[4].

AIMS AND OBJECTIVES:

1. To find out the prevalence of soil transmitted helminthic infections among patients who attended Assam medical college and hospital.
2. To find out the most common helminthes causing infection and to determine the age wise distribution of the soil transmitted helminthic infections.
3. To stratify the data and compare prevalence of different soil transmitted helminthes in various groups like male, female; children, adults; indoor, outdoor patient.

MATERIALS AND METHOD:

Study design and setting:

This retrospective study was conducted over a period of 36 months from August 2019 to July 2022 at the Parasitology branch in the Department of Microbiology, Assam Medical College, Dibrugarh. The study aimed to determine the prevalence of soil-transmitted helminth infections among patients by examining their stool samples.

Sample collection and examination:

During the study period, a total of 2200 stool samples were received at the Parasitology branch. The samples were collected from patients attending the hospital's outpatient and inpatient departments for various medical conditions.
All the received stool samples were examined within two hours of collection using both wet mount and Lugol's iodine methods. The concentration (Formol-ether) technique was also employed to examine the samples.

Data analysis:

The data obtained from the stool sample examination are entered into a Microsoft Excel spreadsheet. The prevalence of soil-transmitted helminth infections was calculated as the proportion of positive samples out of the total samples examined. The data were analyzed using descriptive statistics such as frequency and percentages.

Ethical considerations:

The study was approved by the Institutional Ethics Committee of Assam Medical College, Dibrugarh, and was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Patient confidentiality was maintained throughout the study.

Results

Based on microscopic examination of 2200 samples, 85 samples were found to have helminths, resulting in a prevalence of 3.86%. The most common parasite found was Ascaris *lumbricoides*, with a prevalence of 29.36%, followed by Ankylostoma *duodenale* with a prevalence of 25.14%, Trichuris *trichuria* with a prevalence of 17.24%, Strongyloides *stercoralis* with a prevalence of 14.24%, and Enterobius vermicularis with a prevalence of 3.44% (Figure1)

Mixed infection was observed in 10.9% of the cases, out of which mixed infection with Ankylostoma *duodenale* and Strongyloides *stercoralis* accounted for 44.44%. Other mixed infections observed were Ankylostoma *duodenale* and Trichuris *trichuria*, as well as Ascaris *lumbricoides* and Trichuris *trichuria*, both with a prevalence of 22.2%. Triple infection with Ascaris *lumbricoides*, Ankylostoma *duodenale*, and Trichuris *trichuria* was observed in 11.11% of the cases.

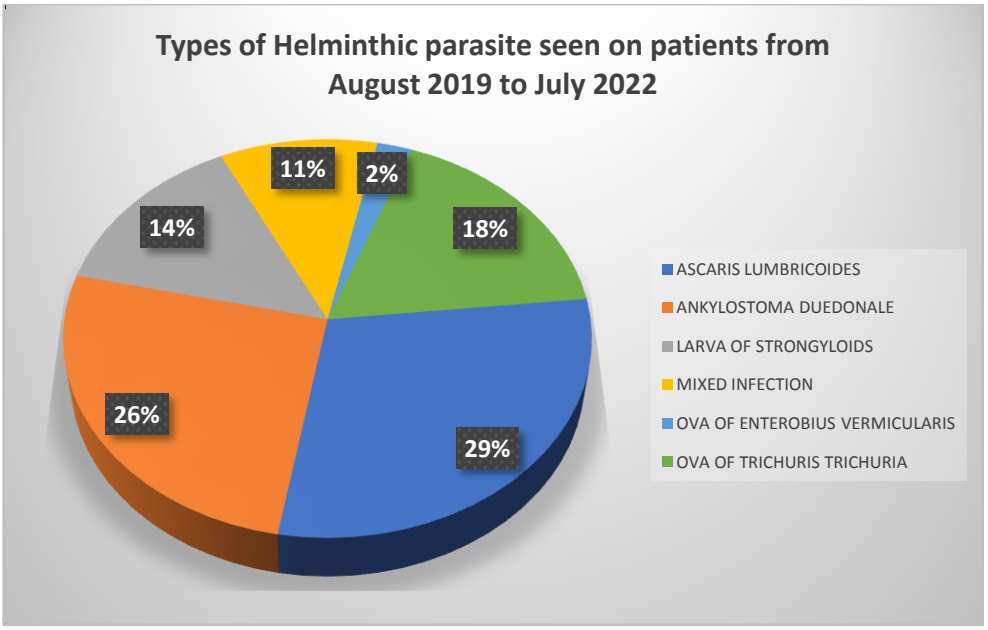


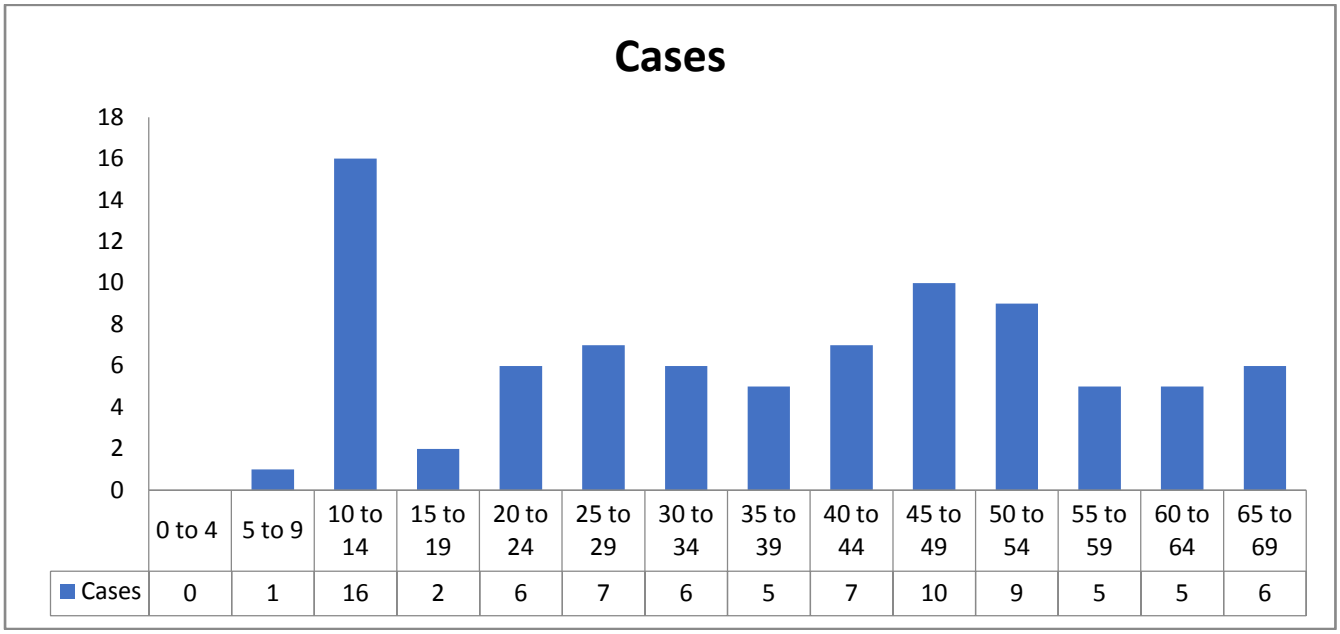
Figure 1: Types of Helminthic parasite seen on patients from August 2019 to July 2022

The Male constituted 62.35% and female constituted 37.65% of the infected cases. The inpatient constituted of 85.85% and outpatient cases of 14.2%. (Table 1)

Table 1: Gender and Patient Type Distribution

	N	%
Male	1364	62%
Female	836	38%
Inpatient	1892	86%
Outpatient	308	14%

In age-wise distribution highest number of cases 18.82% was in the age group of 10-14 yrs age group followed by 11.77% and 10.59% in the age group of 45-49 yrs age group and 50 to 54 yrs age group respectively.



	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69
Cases	0	1	16	2	6	7	6	5	7	10	9	5	5	6

Figure 1: Age wise distribution of the cases.

DISCUSSION

Helminth infections continue to pose a significant public health challenge worldwide, particularly in developing countries. Helminthiasis can have a significant impact on the overall health and well-being of individuals, particularly children and vulnerable populations. In this study, we aimed to evaluate the prevalence and distribution of helminth infections in a population of 2200 individuals, and investigate the possible associations with gender, age, and patient type.

Prevalence and Distribution of Helminths:

Our study revealed a helminth prevalence of 3.86%, with Ascaris lumbricoides being the most common parasite identified, followed by Ankylostoma*duodenale*, Trichuris *trichuria*, Strongyloides*stercoralis*, and Enterobius *vermicularis*. These findings are consistent with previous studies that have reported Ascaris *lumbricoides* and Ankylostoma*duodenale* to be the most common helminths worldwide [5,6] .

Yadav et al. [7] conducted a study in a rural area of northern India and found a prevalence of 4.3% for soil-transmitted helminth infections. Shivalli and Harsha Kumar [8] conducted a study in a rural area of southern India and found a prevalence of 4.7% for soil-transmitted helminth infections. Kaliappan et al.[9] conducted a study in a rural area of southern India and found a prevalence of 4.9% for soil-transmitted helminth infections. All of these studies report a prevalence of helminth infections that is consistent with our study's finding of 3.86%. It is important to note, however, that the prevalence of helminth infections can vary widely depending on the location and population being studied.

The prevalence of these parasites can vary significantly based on geographical location, population density, hygiene practices, and socio-economic factors. In our study, mixed infections were observed in 10.9% of the cases, with Ankylostoma *duodenale* and Strongyloides *stercoralis* being the most common combination. The high prevalence of mixed infections is consistent with previous studies by Addiss DG et al and Brooker's et al have suggested that mixed infections can have a more significant impact on overall morbidity and mortality rates than single infections[10,11].

Gender and Patient Type Distribution:

Our study found that males constituted 62.35% of the infected cases, while females constituted 37.65%. This gender distribution is consistent with previous studies that have reported higher prevalence rates of helminth infections in males than females[12]. The high prevalence of helminths in males can be attributed to the higher risk of exposure due to occupational and behavioral factors. Our study also revealed that inpatient cases constituted 85.85%, while outpatient cases constituted 14.2%. This finding is consistent with previous studyby Legesse M *et al.* have reported higher prevalence rates of helminth infections in hospitalized patients, particularly in developing countries[13].

Age Distribution:

Our study found the highest number of cases (18.82%) in the age group of 10-14 years, followed by 11.77% and 10.59% in the age group of 45-49 years and 50-54 years, respectively. These findings are consistent with previous studies that have reported higher prevalence rates of helminth infections in children and older adults[5,14]. This age distribution

can be attributed to the higher risk of exposure due to poor hygiene practices, poor sanitation, and socio-economic factors. Children are more susceptible to helminth infections due to their immature immune system and increased contact with contaminated soil and water. Older adults are at higher risk of infection due to their decreased immunity and decreased access to healthcare.

CONCLUSION

Our study highlights the significant burden of helminth infections in the population, particularly in developing countries. The high prevalence of mixed infections and the significant impact on morbidity and mortality rates underscore the need for effective prevention and control strategies. These strategies should include improved hygiene practices, access to clean water and sanitation, and the implementation of mass drug administration programs. Furthermore, targeted interventions should be developed to address the specific risk factors associated with gender, age, and patient type. Overall, the study aimed to provide valuable information on the prevalence of soil-transmitted helminth infections among patients in a tertiary care center in Dibrugarh, Assam. The findings of the study can help guide the development of appropriate interventions to reduce the burden of soil-transmitted helminth infections in the region.

LIMITATIONS

The study had some limitations. Firstly, the study was conducted in a single tertiary care center, and the results may not be generalizable to the general population. Secondly, the study relied on stool sample examination, which has limitations in detecting certain soil-transmitted helminths. Lastly, the study did not collect demographic and clinical data on the patients, which could have been useful in identifying risk factors associated with soil-transmitted helminth infections.

Declaration:
Ethical Clearance: Received from IEC, AMCH, Dibrugarh
Funding: Self
Conflict of Interest: None

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