



Article

Prevalence of Enteric Protozoan Parasites in Patients Visiting Al-Maimouna General Hospital based in Al-Maimouna District, Misan Governorate, Iraq

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Abstract: The purpose of this research paper was to assess the prevalence and incidence of intestinal infections among patients attending Al-Maymouna General Hospital in Al-Maymouna District, Misan Governorate, southern Iraq, during the first half of 2025, from January 2, 2025 to June 2, 2025. This study was conducted on 284 patients attending the hospital. After the stool samples collected from the consulting clinic arrived at the laboratory room, they were examined by preparing a slide of wet stool to diagnose the vegetative stage (trophozoite of parasites) for both *Amoeba histolytica* and *Giardia lamblia*. Ages were defined as less than 1 year and greater than 65 years. Of the 284 stool samples collected, 105 (36.97%) tested positive for intestinal parasites, as follows 88 (83.80%) were confirmed and diagnosed with *E. histolytica*, and 17 (16.20%) patients tested positive for *G. lamblia*. The study results indicated that there were no significant differences in the prevalence of intestinal parasite infections (*E. histolytica*) and (*G. lamblia*) between age groups at a significance level of $P \leq 0.05$. The Peak prevalence of parasites of gastrointestinal tract (*Entamoeba histolytica*) and (*Giardia lamblia*) was recorded within the 1-5 year age group, with 28 (31.82%) and 9 (52.94%), respectively. Through research, I found that infections with intestinal amoebiasis are more common than giardiasis. Diseases and many other public health problems remain challenging, requiring more and more effective treatments.

Keywords: Patients , Intestinal Protozoa, Prevalence, Amoebiasis, Giardiasis

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1. Introduction

Microscopic organisms such as parasites are among the most important causes of gastrointestinal infections and diarrhea Especially in warm climates and developing countries. As reported by WHO. It has been observed that many causes of intestinal diarrheal diseases, the most important of which are water contaminated with sewage and hard water, and poor water filtration [1], [2].

Infection with protozoa that causes diarrhea is common in many rich and developing countries. The methods of spread and transmission of these intestinal parasites vary from one place to another depending on the environment, climate, and geography.

The intestinal parasites examined and identified in stool samples the highest onset rate in this study [3].

This study aims to investigate and explore the number of people infected with intestinal parasites, their relationship to drinking water contamination, and the potential causes of transmission in Al-Maymouna District, Misan Governorate, Iraq [4], [5], [6].

2. Materials and Methods

This study was carried out on 284 patients who visited Al-Maymouna General Hospital in Al-Maymouna District, Misan Governorate, Iraq, during the first half of 2025, i.e. from 2/1/2025 to 2/6/2025.

2.1. Specimen collection and processing

In this study, 3-5 grams fresh stool samples were obtained from all patients according to their ages. These samples were placed in clean, sterile, wide-mouthed plastic containers free of any contaminants. The stool was kept free of urine, water, or any other contaminants, and all-important patient information, such as name, age, and sex, was recorded. Upon arrival at the laboratory, the samples were examined microscopically using a light microscope to identify the parasitic stages of *Entamoeba histolytica* and *Giardia lamblia*.

2.1.1 Direct Microscopic Examination of Stool

A direct stool smear examination technique was employed to was performing previously mentioned 2-5 drops of normal saline are mixed gently with few amounts of stool and put on cover slide at 45 degrees to avoid air bubbles and examined directly under the light microscope by using 4x – 40x power.

2.2 statistical analysis

Graph Pad Prism 10 software was used to process the data collected for this study. A statistical analysis was conducted using the chi-square test to examine the relationship between parasite infection rates and gender and age within the entire patient sample.

3. Results and Discussion

The age of patients attending Al-Maymouna General Hospital ranged from less than 1 to more than 65 years [7].

Of the 284 stool samples collected, 105 samples (36.97%) were positive for intestinal protozoan infection and 179 samples (63.03%) were negative, there were significant differences between positive and negative cases, with P values below the 0.05 threshold as presented in Table 1 [8], [9].

The distribution of parasites in the examined diarrheal stool samples was as follows 88 patients (83.80%) were positive for (*Entamoeba histolytica*) infection as shown in in the figure 1 , and 17 patients (16.20%) were positive for (*Giardia lamblia*) infection as shown in in the figure 2 . There were significant differences between positive and negative cases at a significance level of $P \leq 0.05$, as presented in Table 2.



Figure 1 : Cyst stage of *E. histolytica*



Figure 2: Cyst stage of *G. lamblia*

The present study also indicate a gender-specific frequency of gastrointestinal parasitic infections , with 50 male cases (47.61%) being less than 55 female cases (52.38%). However, no significant differences were observed in the prevalence of intestinal parasites via gender at a significance level of $P \leq 0.05$ threshold , as demonstrate in Table 3 [10].

Amoebiasis showed a greater incidence in females (46 cases (52.27%) than among males (42 cases (47.73%).

The incidence of giardiasis was also higher among females (10%) than among males (7%) (58.82% vs. 41.18%), respectively, as shown in Tables 4 and 6. These findings reached statistical significance at $P \leq 0.05$.

Tables 5 and 7 present data on the occurrence of intestinal protozoa among patients based on age groups [11], [12], [13]. The peak incidence of Intestinal protozoan parasites was (*Entamoeba histolytica*), with 28 cases (31.82%) among children aged 1-5 years, and (*Giardia lamblia*), with 9 cases (52.94%) among children aged 1-5 years. Variation according to age groups reached statistical significance ($P \leq 0.05$).

Table 1. total and positive cases

Negative sample		Positive sample		Total sample
Number	%	Number	%	284
179	63.03%	105	36.97 %	

$\chi^2 = 6.760^a$ calculated; df= 1 ; Sig. = 0.009 ; $P \leq 0.05$

Table 2. The distribution of parasites in the examined diarrheic stool specimens

% percentage	Parasite Positive	The scientific name of parasite	Intestinal parasites
83.80 %	88	<i>Entamoeba histolytica</i>	Protozoa
16.20 %	17	<i>Giardia lamblia</i>	
100%	105		Total

χ^2 is 46.240^a calculated; df= 1 ; Sig. = 0.000 ; $P \leq 0.05$

Table 3: Distribution of Intestinal Parasitic Infections According to Sex.

Percentage	Number	sex
47.61 %	50	Males
52.38 %	55	Females

$\chi^2 = 0.160^a$; df=1 Sig.= 0.689 ; $P \leq 0.05$

Table 4. Distribution of *Entamoeba histolytica* Infections Among Humans by Sex

Percentage	Number	sexes
47.73%	42	Males
52.27 %	46	Females

$\chi^2 = 0.160^a$; df=1; Sig.= 0.689 no significant differences at a significance level of $P \leq 0.05$

Table 5: Prevalence of (*E. histolytica*) among humans according to the age groups

Age group	Number	Percentage
< 1	15	17.05%
1 – 5	28	31.82%
6 – 10	5	5.68%
11 – 15	5	5.68%
16 – 20	3	3.41%
21 – 25	5	5.68%
26 – 30	3	3.41%
31 – 35	3	3.41%
40 – 45	4	4.55%
46 – 50	2	2.27%
51 – 55	2	2.27%

56 – 60	6	6.82%
61 – 65	2	2.27%
66 – 70	3	3.41%
Total	88	%100

$\chi^2 = 125.701^a$; $df = 13$; $Sig. = 0.000$; $P \leq 0.05$

Table 6. Prevalence of (*Giardia lamblia*) among humans according to the sexes

Percentage	Number	sexes
41.18%	7	Males
58.82%	10	Females

$\chi^2 = 3.240^a$; $df = 1$; $Sig. = 0.072$ no significant differences at a significance level of $P \leq 0.05$

Table 7: Prevalence of *Giardia lamblia* among humans according to the age groups

Age group	Number	Percentage
< 1	2	11.76%
1 – 5	9	52.94%
6 – 10	1	5.88%
11 – 15	1	5.88%
16 – 20	1	5.88%
21 – 25	1	5.88%
26 – 30	2	11.76%
Total	17	%100

$\chi^2 = 123.624^a$; $df = 6$; $Sig. = 0.000$; $P \leq 0.05$

This study found an increase in intestinal parasite infections in Al-Maymouna district. The most common parasites infected patients were *Entamoeba histolytica* and *Giardia lamblia*, which is attributed to the warm rural environment of Al-Maymouna district [14], [15]. This may be due to the ease of transmission is predominantly via the fecal–oral route, through the consumption of contaminated water or food, or through direct contact with infected persons.

It may also be due to the pollution of the Petra River water with heavy sewage from the center of Misan Governorate, which flows into this river without treatment.

The ages of patients visiting Al-Maymouna General Hospital ranged from less than 1 to more than 65 years [16], [17].

Out of 284 stool samples collected, 105 samples (36.97%) were positive for intestinal protozoan infection, and 179 samples (63.03%) were negative.

The distribution of parasites in the examined diarrheal stool samples was as follows 88 patients (83.80%) were positive for (*Entamoeba histolytica*), and 17 patients (16.20%) were positive for (*Giardia lamblia*) [18].

The most common intestinal parasitic infections by gender were among females, where the percentage was (52.38%) 55 distributed among (*E. histolytica*) 46 (52.27%) and the parasite (*G. lamblia*) 10 (58.82%) .

This result is consistent with the study in Dohuk Governorate, where the infection rate in females was 114 (55.6%), but it is consistent with the study in some years such as 2015, 2018 and 2019 in Iraq, and it is not consistent with the same study for the years 2016, 2017 and 2020, and it is also not consistent with the study in Basra and the study in Baghdad, and also does not agree with the study in Karbala, where the infection rate with intestinal parasites in males was 278 (14.1%) and females 209 (11.7%). It also does not agree with the study in Wasit, where the infection rate in males was higher than females with the (*E. histolytica*) parasite, where males were 58 (78.38%) and females 16 (21.62%), and with the (*G. lamblia*) parasite, the percentage of males was 52 (85.25%) and females 9 (14.75%) [19], [20].

4. Conclusion

The findings of the current study revealed the highest prevalence of infection with intestinal protozoa among patients according to age groups was for the *E. histolytica* parasite, as there were 28 infections (31.82%) within the 1–5 years age group, while (*G. lamblia*), 9 infections (52.94%) in the age group (1–5) years as well. This findings corresponds with the study of Iraq and the Investigation of Dhi Qar Governorate for the last 6 years and the study of in Baghdad where the infection rate with (*E. histolytica*) was 47.08% for the age group (2–3) years . It is not consistent with the study in Nineveh and is not consistent with the study in Karbala where the rate of the age group less than 5 is 253 (13.1%) and is not consistent with the study in Najaf on giardiasis, the infection rate was higher in males compared to females at most of the study years. It does not agree with study in Kufa, as the number of infection parasites were higher in males and lower in females.

The high prevalence of infection among this age group (1–5 years) is attributed to their lack of concern due to personal hygiene factors. children aged 1–5 years are more active and often engage in outdoor play, which increases their risk of exposure to contaminants and infection sources. In contrast, infection is higher among females than males. In addition to the above reasons, girls tend to work in cleaning vegetables and sometimes washing dishes, while older adults are often more prone to aware of maintain hygiene standards and take increased responsibility for their personal care. In conclusion, we suggest taking appropriate measures by implementing long-term intervention approaches aimed at promoting personal hygiene and upgrading environmental living standards and health environments, and preventing discharge of heavy sewage into the Petra River before treatment or finding an alternative outlet for wastewater disposal.

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