

Epidemiological study of human diarrhea-causing protozoa in Wasit governorate

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Abstract : The study and Laboratory examinations were performed between (January 2021 and April 2021). We conducted an epidemiological study of intestinal protozoa parasites in the Wasit governorate. The number of samples that collected 500 stool samples in the city center of Kut and Numaniah city. Samples were collected by container from both sexes male and female have the symptom of the infected protozoan parasite, and examined by microscopy with a wet smear method, use a light microscope to detect these protozoan parasites morphologically . We recorded the highest percentage of protozoan parasite infection *Entamoeba histolytica* (84%) and the lowest percentage of parasite infection *Giardia lamblia* (16%). The result of laboratory tests showed that males were infected with a higher rate (54%) and the lowest percentage of females (46%). Due to the importance of the intestinal protozoa parasites in the community, this study was encouraging due to the high infection rate.

Keys words: intestinal, Kut, *Entamoeba histolytica*, *Giardia lamblia*, and infection

1. Introduction

Intestinal parasites are a widespread pathogen worldwide. About 210 billion people are infected with an intestinal parasite, the majority of whom are children. (1) Intestinal protozoa parasites comprise two groups, the protozoa parasitic, which are unicellular. The second group is helminths parasitic, which are multicellular and have both body systems and means others enable it to survive parasitically. (2)

The prevalence of parasitic infections is widespread in tropical and subtropical regions due to their high prevalence of conditions. Climate is appropriate for the permanence and development of the stages that parasites go through during their life cycles, such as temperature, humidity, natural soil, and other environmental factors.

Parasites of the intestinal protozoa are more common in areas with lower socioeconomic status. The likelihood of infection increases in densely populated areas with subpar health and environmental services. Also, the lack of municipal service, unhealthy disposal of garbage, and the lack of suitable housing are some of the causes of the spread of intestinal protozoa parasites. (3)

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Diarrhea is a serious disease that results from intestinal parasitic infections. Over a hundred million young people under the age of twenty have lost their lives, mostly in developing nations. confirmed that one of the causes of diarrhea is amebiasis, which is considered one of the endemic diseases in countries. (4)

2. Materials and methods

Materials:

A-Slide.

B-Cover slide.

C-Distal water.

D-Stick wood.

E-Microscope.

Methods of works:

1-Sample collection

Collecting human stool

collected 500 samples of diarrhoea patients' faeces during hospital visits (Al-Sadrin health centre in Numaniya, Numaniya general hospital, Al-Karamah teaching hospital, Al-Zahra teaching hospital).

During the time period of January 1, 2021, through April 30, 2021, 300 faeces samples will be collected from men and 200 faeces samples will be collected from females. The ages of the participants will vary from less than a year to 90 years. We used brand new, never-opened 40ml plastic bottles for all of our sample collection. Information on the patient, including the parasite's name, the patient's medical history, the patient's sex, age, and location, is recorded.

2-Stool examination

A-Macroscopic examination

Using microscopy, the phenotypic traits of enterococci were identified from stool samples (color, texture, smell, mucus).

B-Microscopic examination

The wet smear technique of microscopy:

1-Using a matchstick, I scooped up some stool and placed it on a glass slide, where I mixed either a drop of distilled water or iodine colour.

2-Put the cup on the slide.

3-Instead of using 40x magnification, examine the slide at 10x.

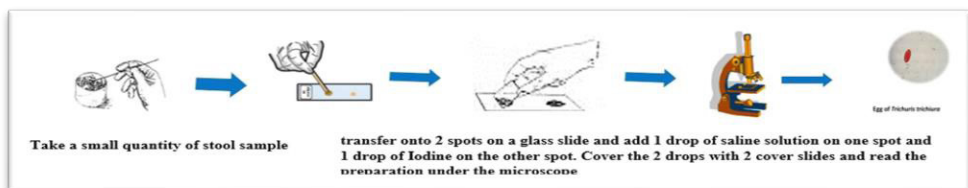


Fig (1) The use of a wet smear technique for microscopy

3. Result:

- **Incidence and prevalence of certain intestinal protozoa infections.**

Two protozoan parasites, *Entamoeba histolytica* and *Giardia lamblia*, were found to be responsible for human infections in the study of affected patients in the Wasit governorate. The parasite *Entamoeba histolytica* had the highest infection rate of any parasitic protozoan, with 56 percent of infected persons carrying the parasite and 280 people being infected overall; in comparison, just 64 cases of *Giardia lamblia* were reported (12.5 percent). See examples in tables 1a and 1b2.

Table 1a: Total infection rate of intestinal protozoa parasites and percentage incidence

Samples	Number of examined infected	percentage
500	344	68%

Protozoa in the intestines, number of infestations, and rate of occurrence over the research period are tabulated in table 1b.

Table 1b: Protozoa in the intestines, number of infestations, and rate of occurrence

Intestinal protozoa parasites	Type of parasite	number	percentage
Protozoa parasitic	<i>Entamoeba histolytic</i>	280	56%
	<i>Giardia lamblia</i>	64	12.5%

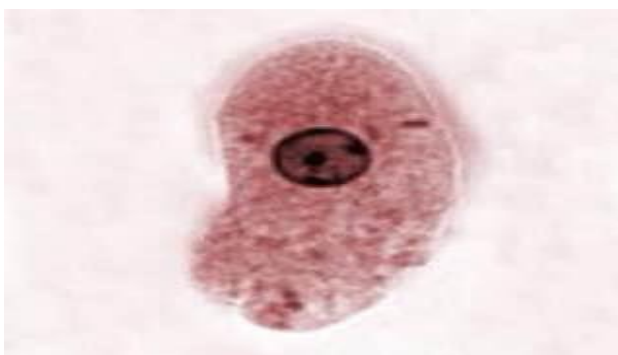


Fig (2) A trophozoite of the pathogenic *Entamoeba*



Fig (3): Histiocystic cyst of the *Entamoeba*



Fig (3) Trophozoite of *Giardia lamblia*



Fig (4) Cyst of *Giardia lamblia*

- **Gender differences in the spread of disease.**

According to the findings, male infections accounted for 83% of all infections, with 249 cases reported, compared to 95% of all infections among females, with 95 cases reported. Based on the data in table (2) below.

Table 2: gender disparity in the prevalence of intestinal protozoa infection.

Gender	Number of samples	Number of examined infected	percentage
Male	300	249	83%
Female	200	95	47.5%
total	500	344	68%

- **Intestinal protozoa parasites are spread out over the course of a month.**

As can be seen in Table(3), the proportion of people infected with intestinal protozoa parasites varies greatly from one month to the next, with March 2021 showing the highest prevalence of infection at 86.4%. In contrast, January 2021 exhibited the lowest prevalence at 0%. (41.6 percent). As shown in table (3) below.

Table 3: infection rates with intestinal protozoa parasites graphed by month.

Month	Number of samples	Number of examined infected	percentage
January 2021	125	52	41.6 %
February 2021	125	84	67.2 %
March 2021	125	108	86.4 %
April 2021	125	100	80 %
Total	500	344	68 %

- **Protozoa parasite infection rates in the digestive tract as a function of chronological age.**

Table(4) displayed the percentage of people infected with intestinal protozoa parasites by age range, with the highest rate of infection occurring in those between the ages of 0 and 10 (37.4%), followed by those between the ages of 10 and 30 (36.8%), those between the ages of 30 and 60 (23.4%), and those between the ages of 60 and 90 (2.5%). (2.4 percent). As shown in table (4) below.

Table 4: Protozoa infections in the intestine as a function of age.

Age /years	Number of examined infected	percentage
0-10	187	37.4%
10-30	184	36.8%
30-60	117	23.4%
60-90	12	2.4 %
Total	500	100%

- **Location-specific analysis of disease transmission rates.**

Percentages of intestinal protozoa parasite infections were shown in Table(5) for both study areas (Numaniah city and the city centre of kut), with a higher prevalence of infections in the latter (39 percent).

Table 5: proportion of people infected with protozoan parasites in the intestines, broken down by region.

The area of study	Number of examined infected	Percentage
Numaniah city	195	39%
The city center of kut	305	61%
Total	500	100%

4. Discussion:

Researchers found that *Entamoeba histolytica* and *Giardia lamblia* were the most common protozoan parasites found in sick individuals in the Wasit governorate (17). According to Al-(2005) Moussai's research, the parasite *Entamoeba histolytica* accounts for 84% of parasitic protozoan infections, with 42% of infected individuals having been exposed to this particular parasite. In contrast, only 16% of people who came into contact with *Giardia lamblia* were infected. Some parasites are more prevalent than others because of direct human-to-human transmission, most commonly through the consumption of tainted food and drink, with additional help from the flies that are thought to be vectors for the parasite (1)(8). According to the findings, male infections accounted for 83% of all infections, with 249 cases reported, compared to 95% of all infections among females, with 95 cases reported.

Since these diseases tend to proliferate in impoverished areas, effective long-term management can only be achieved by a combination of chemotherapy and enhanced water supply and sanitation bolstered by sanitation education. Economic growth is necessary in the long run to make possible the kind of permanent transmission management that is being discussed here. (11). Due to a lack of safe and efficient immunizations, chemotherapy is the only method now in use for treating individuals and decreasing transmission of protozoal infections, which grow fast in their hosts. (12,18). Metronidazole, iodoquinol, diloxanide furoate, paromomycin, chloroquine, and trimethoprim-sulfamethoxazole are some of the drugs now used to treat intestinal protozoan parasites.(13,19)

The results showed the percentage of intestinal protozoa parasites infection in both sexes at different ages, with the highest rate of infection within two age groups (10-30),(30-60) as the percentage of infection in them straight (34 percent), the percentage of infection in the age group(0-10) being (28 percent), and the percentage of infection in the age group(60-90) being (4%).

5. Conclusion

This study shows the high infection protozoa parasite in humans by *Entamoeba histolytica*, *Giardia lamblia* in different ages during the study period in Wasit Governorate. The result of laboratory tests showed that males were infected with a higher rate (54%) and the lowest percentage of females (46%). Due to the importance of the intestinal protozoa parasites in the community, this study was encouraging due to the high infection rate.

6. Highlights

The study examined 500 stool samples collected from both males and females with symptoms of protozoan parasite infection in the Wasit governorate. The highest percentage of infection was with *Entamoeba histolytica* (84%) and the lowest with *Giardia lamblia* (16%). Males had a higher infection rate (54%) than females (46%).

Ethical Considerations

Permission for the study and ethical approval was obtained from the Dentistry Department Kut University College – Iraq and College of Health and Medical Techniques / AL-Bayan University Iraq.

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