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Original Research Article

Prevalence of parasitic infections in Al-Kindy Teaching Hospital and Medical City Teaching Hospital

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Abstract: ***Background***: Intestinal parasitic infections including amoebiasis, blastocystosis, giardiasis, are all worldwide distribution with harmful effects, it is an important cause of morbidity and death rate in the poor countries. ***Objective***: This study was done to collect information of the frequency of these diseases in some regions of Baghdad. Our objectives are to detect the frequency of human pathogenic parasites in some regions of Baghdad in stool samples of patients who would attend to AL-Kindy Teaching Hospital, Medical City Teaching Hospital and to determine the most common age group affected. ***Materials and Methods***: Data were collected from Al-Kindy Teaching Hospital and Medical City Teaching Hospital, in the lab of parasitology from June 2021 to February 2022. The present study included (200) sample, which were collected from patients at different ages of both genders, samples of the study were selected randomly. ***Results:*** The results of epidemiological study showed that the total number infected with *Entamoeba histolytica* parasite was (129) positive samples with total percentage of (64.5%) in both of Al-Kindy Teaching Hospital and Medical City Teaching Hospital, Percentage of infective cases with this parasite in the two hospitals, were (93%, and 36%) respectively, followed by *Blastocystis hominis* with total number of (59) positive samples and a percentage of (29.5%). The percentage of infective cases with this parasite in the two hospitals, were (5%, and 54%) respectively, and then *Giardia lamblia* with total number of (12) positive samples, and a percentage of (6%). The percentage of infective cases with this parasite in the two hospitals, were (2%, and 10%) respectively. Males showed higher number and percentage of infection with *E. histolytica*, (85) case with percentage of (42.5%), while females were (44) case with percentage of (22%), while number and percentage of infection with *B. hominis* in males were (34) case with percentage of (17%), and females were (25) case with percentage of (12.5%), finally number and percentage of infection with *G. lamblia* in males (6) cases with percentage of (3%), equal females were (6) case with percentage of (3%). Infection highest percentage happened among age group (20-29) years with percentage of (28%), while the lowest percentage of infection occurred among age group (1-9) years, with percentage (1%), were detected in Medical City Teaching Hospital. ***In conclusions***: *Entamoeba histolytica* was the most frequent parasite in our study, followed by *Blastocystis hominis*, while *Giardia lambilia* was the least frequent one. Also males were more affected than females to parasitic infections, and the most common age group affected was (20-29) years.Health education, safety of food and water must get higher to increase the knowledge of community about diseases caused by intestinal parasites.Using permanent stains, culture, molecular methods, and serological methods for detection of parasites, also making more studies including increasing in number of samples.

Keywords: Parasitic infections, amoebiasis, blastocystosis, giardiasis, Al-Kindy Teaching Hospital, ,Medical City Teaching Hospital.

1. INTRODUCTION

Parasites of gastrointestinal tract are unicellular or multicellular parasites living inside host, the recurrence of these infections is highly various in the world, depending on different variables like malnutrition, humidity, high number of population, personal hygiene, lack of safety water, and sanitary facilities are not found [1], as a result obtain good

environment for development, transport, also increase the chance of infection with these parasites [2]. The main ways to transmit these parasites are by contamination of drinking water, food, and direct contact by fecal-oral route.

Vegetables contamination may have many parasites of protozoa such as *Entamoeba coli, Giardia lamblia, and Entamoeba histolytica* [3]. Crowded regions with poor health system are much probability for infection. The estimation of world's population infections with GIT parasites are about 60% [4], and these parasites causing many problems in Iraq, like malnutrition, anemia, and growth retardation [5], chronic blood loss, decrease in vitamin A [6], also low attendance to school, and decrease productivity of man [7], Published studies since 1980 reported that there were 1.87 million death cases each year as a result of diarrhea under5 years old [8]. In Iraq health system was neglected, and now this country has different infectious parasites [9]. The aim of this study is to detect the frequency of human pathogenic parasites in some regions of Baghdad in stool samples of patients who would attend to AL-Kindy Teaching Hospital, Medical City Teaching hospital and to determine the most common age group affected.

2. PATIENTS

Study included (200) recorded data , were collected from patients, their ages ranges between 1-70 year, study was done from June 2021 to February 2022. Patients were showed symptoms, obtained from those attended to Al-Kindy Teaching Hospital and Medical City Teaching Hospital. Ethical approval from Al-Kindy Medical College was obtained.

3. STATISTICAL ANALYSIS

Descriptive cross-sectional study (descriptive analysis). Data were analyzed by using statistical package for social sciences (SPSS) version 25.0. Excel. SPSS, tables for numbering and make a percentage for description. The associations between the frequencies of positivity for each parasite and the independent variables of age and sex were investigated using Chi square test, t test and the significance was defined at P value < 0.05.

4. RESULTS

4.1 Frequency of Intestinal Parasitic Infection

The results of epidemiological study showed that the most common detected parasite was *Endamoba histolytica*, the total number infected with *E. histolytica* was (129) positive samples with total percentage of (64.5%) in both of Al-Kindy Teaching Hospital and Medical City Teaching Hospital, Percentage of infective cases with this parasite in the two hospitals , were (93%, and 36%) respectively (Table 1).

The second detected parasite was *Blastocystis hominis* .The total number infected with this parasite was (59) positive samples, and the total percentage of infection was (29.5%), Percentage of infective cases with this parasite in the two hospitals, were (5%, and 54%) respectively, as shown in (Table 2).

The third detected parasite was *Giardia lamblia* with least number of (12) positive samples and total percentage of (6%), the percentage of infective cases with this parasite in the two hospitals , were (2%, and 10%) respectively (Table 3).

Table 1: Numbers and percentages of patients infected with *Entamoeba histolytica* within Al-Kindy Teaching Hospital and Medical City Teaching Hospital

Hospital	Total NO. of patients	NO. &% of infected patients with *Entamoeba histolytica*
Al-Kindy Teaching Hospital	100	93 (93%)
Medical City Teaching Hospital	100	36 (36%)
Total	200	129 (64.5%)

Table 2: Numbers and percentages of patients infected with *Blastocystis hominis* within Al-Kindy Teaching Hospital and Medical City Teaching Hospital

Hospital	**Total NO. of patients**	**NO. &% of infected patients with *Blastocystis hominis***
Al-Kindy Teaching Hospital	100	5 (5%)
Medical City Teaching Hospital	100	54 (54%)
Total	200	59 (29.5%)

Table 3: Numbers and percentages of patients infected with *Giardia lamblia* within Al-Kindy Teaching Hospital and Medical City Teaching Hospital

Hospital	**Total NO. of patients**	**NO. &% of infected patients with *Giardia lamblia***
Al-Kindy Teaching Hospital	100	2 (2%)
Medical City Teaching Hospital	100	10 (10%)
Total	200	12 (6 %)

4.2 The Distribution of Intestinal Parasitic Infection According to Gender

The association between the detected intestinal parasites and genders were listed in (Table 4, and Figure1). Males showed higher number and percentage of infection with *E. histolytica*, (85) case with percentage of (42.5%), while females were (44) case with percentage of (22%), and number and percentage of infection with *B. hominis* in males, (34) case with percentage of (17%), while females were (25) case with percentage of (12.5%), and finally number and percentage of infection with *G. lamblia* in males, (6) case with percentage of (3%), equal to females were (6) case, with percentage of (3%).

Table 4: Numbers and percentages of intestinal parasites between genders

Gender			**parasite**		
			E. histolytica	*B. hominis*	*G. lamblia*
Gender	1	Count	85	34	6
		% within parasite	42.5%	17%	3%
	2	Count	44	25	6
		% within parasite	22%	12.5%	3%
Total Count (200) % within parasite			129 (64.5%)	59 (29.5%)	12 (6%)

*Gender 1=male

*Gender 2=female

4.3 Distribution of Intestinal Parasitic Infection According to Age Groups

The results of the current study have shown that the highest incidence of intestinal parasitic infections occur in the age group (20-29) years with percentage of (28%), while the lowest percentage of infection occurred among age group (1-9) years, with percentage (1%), were detected in Medical City Teaching Hospital, as shown in (Table 5).

Table 5: Percentage of intestinal parasites among different age groups in Medical City Teaching Hospital

Age group (Years)	**NO. of infected patients**	**%**	**Valid %**
1-9	1	1%	1
10-19	10	10 %	10
20-29	28	28 %	28
30-39	22	22 %	22
40-49	16	16 %	16
50-59	14	14 %	14
60-69	5	5 %	5
7-79	4	4 %	4
Total	100	100 %	100

4.4 Examination of stool samples

In the current study, the most clinical signs and symptoms for amoebic dysentery includes abdominal pain, fatigue, nausea, vomiting, painful passing of stools, malodorous watery diarrhea, which contain blood, mucus, or pus.

Wet mount method by using normal saline and iodine has been the most commonly method used for the diagnosis amoebic dysenteryin microscopic examination, cyst stage has large, with thick cyst wall, and few nuclei appear (Figure 1).

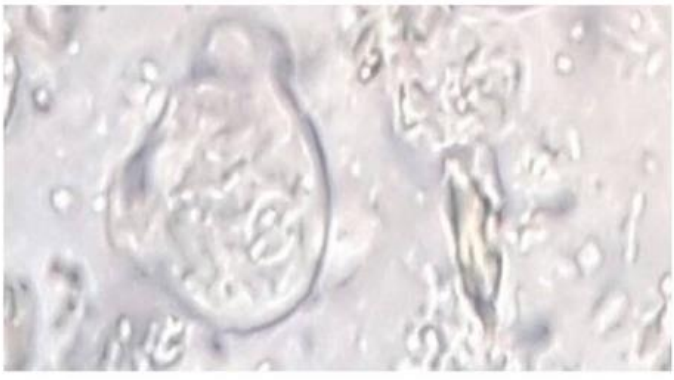

Figure 1: *Entamoeba histolytica* (Trophozoite stage), with normal saline (40x)

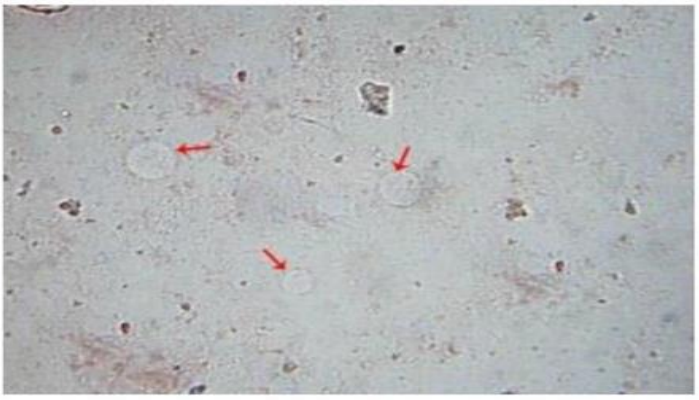

Figure 2: *Blastocystis hominis* (vacuolar form) with normal saline (40x)

Figure 3: *Blastocystis hominis* (vacuolar form) with iodine (40x)

While blastocystosis signs and symptoms was the most one abdominal pain. By using temporary stains, vacuole of the parasite appear to occupy most of the cell vacuolar form, cell membrane obvious and the presence of peripheral nuclei is clear (Figure 2, and Figure 3).

The clinical signs and symptoms of giardiasis included malaise, weakness, flatulence, abdominal cramps, anorexia, nausea,and stool consistency ranging from diarrhea and malodorous greasy stools. In microscopic examination, trophozoite appeared with pear shape and has flagellum, while cyst stage present ovoid with thick cyst wall (Figure 4).

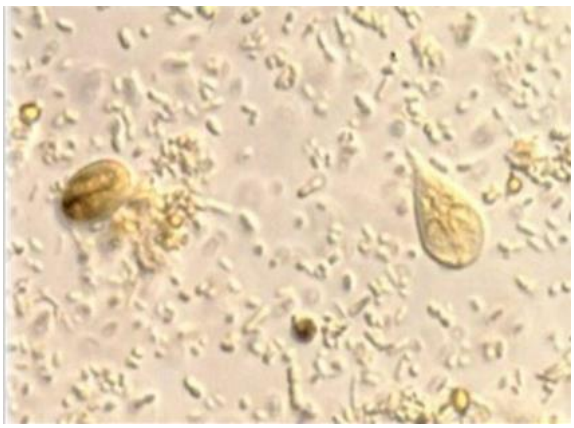

Figure 4: *Giardia* "trophozoites and cysts (from CDC)

5. DISCUSSION

As shown in the results, the detected parasites in this study in Al- Kindy Teaching Hospital and Medical City Teaching Hospital, were *Entamoeba histolytica*, *Blastocystis hominis* and *Giardia lamblia*, with a percentage of (64.5%, 29.5%, and 6%) respectively.

E. histolytica was much higher than *G.lamblia* and *B.hominis* in Baghdad, it was the most frequent parasite in this study, and this may be due to the resistant of its cysts in the environmental conditions and seasonal diversity, and can survive for days to weeks in the external environment [11], *Entamoeba histolytica* has the highest infection rate (64.5%). This finding was agreed with another study done in Iraq by Bushra *et al*., 2012 [12], who was found in her study that the most frequent parasites was *Entamoeb histolytica* , followed by *Giardialamblia* , and result agreed with AL-Sabbawi in his study in Iraq (2012) [13], Hegde and Patel 1996 in India reported that the most common protozoan was *E. histolytica* [14].

Results disagreed with Al-Mussawi [15], who reported that *G. lamblia* was the most frequency parasite followed by *Entamoeba histolytica*, and with other study done in Saudi Arabia[16], reported the most frequent infection of intestinal protozoan was *G. Lamblia*. Also another study done in Egypt found the most frequent intestinal parasite among children was *Giardia*[17]. For *Blastocystishominis* this finding disagreed with the finding of Raof and Abdul-Rahman (2011), who reported the percentage of *Blastocystis hominis* were (24.6%) in Baghdad city after examined (250) watery and loose stool samples from patients live in Al- Nahrawan, Al-Baladiyat Al-Ameen, and Al-Mashtal [18], and disagreed with (AL-Kaissi and AL-Magdi, 2009) who reported high percentage of this parasite (41%) in Baghdad from (200) stool samples of adult patients [19]. The result of present study revealed a highest occurrence of these infections was recorded in the age group (20-29) yeas with percentage of (28%), and it might be because of poor sanitary conditions and poor personal hygiene, or using of human stool as fertilizer.

Moreover contamination of drinking water and food by feces of sheep, cats, dogs, and rodents in the rural areasact as reservoir hosts for these intestinal parasites, while the lowest incidence of intestinal protozoa infections occurred in the age groups (1-9) years, with percentage of (1%), and this may be attributed to the lack of health awareness and lack of attention to personal hygiene children within that age group. Result agreed with Abdul-wahabb. Hussein [20] in Baghdad ,and Al-fahdawi [21]in Anbar , and Hamza [22] in Mosul , but disagreed with Al-Mayahi [23] in Diwaniya , who found that age group (2-4) is the highest category, as a result of playing in contaminated soil

In this study, gender was a crucial and significant factor influencing the frequency of intestinal parasites infection, from 200 total samples, (125 were males and 75 females) Frequency was higher in males (62.5%) than in females (37.5%). Males were more impacted by parasitic infection than females in this study, which was consistent with AL-Taie (2009) in Baghdad city [24], and previous investigations in local Iranian locations, including Tabas [25], Kerman [26], and Shahrekord [27], as well as data from a research in Nigeria [28], who stated that parasite infections affect males more than females. Differences are typically due to ecological factors, for example, males may work on farms and become infected by animal feces, also other activities that place males at a higher risk of infection. Population studies reported that females had a higher frequency of infection than males in some region of Iran [29, 30], and this could be due to environmental reasons, because of the work of women work in agriculture in this area than in other regions.

6. CONCLUSIONS

The epidemiological study in Al-Kindy Teaching Hospital and Medical City Teaching Hospital, showed that the most common intestinal parasitic infections were *Entamoeba histolytica*, *Blastocystis hominis*, and *Giardia lamblia*, *Entamoeba histolytica* was the most frequent parasite in this study (64.5%), while *Giardia lamblia* was the least frequent parasite (6%) in Al-Kindy Teaching Hospital and Medical City Teaching Hospital, Males were more affected with parasitic infections than females in this study regarding *Entamoeba histolytica* and *Blastocystis hominis*, the main percentage of infection with intestinal parasitic infections was observed in the age group (20- 29) years, while age group (1-9) years, had the lowest percentage, and this study revealed that these parasites are frequent because Iraq is a developing country and lacks of sanitation and poor hygiene especially in rural residents.

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