

# Prevalence of Intestinal Parasitic Infection in Baghdad City

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## Summary:

**Background:** Intestinal parasites are endemic in many developing areas (WHO report 1998), and they considered as one of the most common tropical disease in developing countries ranges between 30-60 % .

**Patients and Methods:** The present study is a survey to determine the prevalence of intestinal parasites in out and in patients of Al-karama hospital during the period from Jan 1999 to Nov. 2000. Stool samples examination was the test in establishing the results of the present study by direct microscopic examination. Q –square statistic test were used for evaluation the results.

**Results:** Results of the present study revealed that the most affected group of patients' with intestinal parasites, those with 11-20 years old (32%), protozoa percentage of infection were (18.56%) significantly more than helminthes with (2.45%). Males were more infected with intestinal parasites (44.18%) than females (28.96%). The highest infection rate with helminthes was recorded at the period between March and Jun.

**Conclusion:** Infection rate in Baghdad City 21.01, rotozoal 18.56%, which include E.histolytica 12.14%, G.lambilia 4.9 % While helminth infection rate, 2.45 % , include H.nana, 1.17 % Enter.vermicularis, 0.38 % , Asca.lumbricoidus 0.37 % . Femal infection rate 8.21 % more than male 4.01 % .

**Keywords:** Intestinal Protozoa, Helminthes, Prevalence, Baghdad,

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## Introduction:

Intestinal parasites are endemic in many developing areas (1), and they considered as one of the most common tropical disease in developing countries ranges between 30-60 % Hygienic conditions may be one of the most important factors responsible for higher prevalence of parasites in developing world (2). Wastewater reuse may lead to public health risk of Transmission of enteric diseases and Iraq endemic parasites that mostly strike children following consumption of raw vegetable (3). The extent of spreading of intestinal parasites in the world is shown by (4) as follows: 1000 million infections with *Ascaris lumbricoides*, 900 million infections with *Ancylostoma doudenale*, 500 million infections with whipworms. *Entamoeba histolytica* which is a unicellular parasite and causes amoebiasis and leads to severe diarrhea and is the second cause of death after Malaria. In an annual report of communicable disease report control center of Iraq (5), the rate of infection with intestinal parasites was (1.22%) of (1028640) stool specimens collected from all Iraqi governn rates, prevalence of infection was as follows: Basra (59.98%), Sulaimani (26.28%), Najaf (24.89%), Duhok (20.10%), Nassiryah (12.02%), and Anbar (7.08%). Infection rate with *G. lamblia* was the highest in Basra (39.28%), and the least in Tikirit (2.95%). (6) in Duhok found that a total infection rate of intestinal parasites among out patient suffering from gastroenteritis was (57.9%), the

most common parasites were *E. histolytica* (25.2%) and *G. lamblia* (17.6%), while the other less common infection were with *Blstocystis hominis* (6.3%), *H. nana* (2.7%), *E.vermicularis* (2.4%), *A. lumbricoides* (1.6%), *T. saginata* (1.3%) and *Cryptosporidium* spp. (0.8%). Epidemiology of intestinal parasites among population in Sulaimania district, was studied by (7), he found that total infection rate of intestinal parasites was (17.5%) and the higher infection rate was with *G. lamblia* (8%), and the least was with *E.coli* and *T..hominis* (0.2%).

## Material and methods:

Samples of the study: A total number of 3911 stool samples were examined during the period from January 1999– November 2000 at Al- Karama teaching hospital in Baghdad city. These samples were obtained from either out and in patients (of different sexes and ages attending the hospital, or from local and foreign food and transport workers. Patients were distributed into four groups according to their age, less than ten (scholar age); 11-20 years; 21-30 years; 31-50 years. Stool samples: Samples were collected in clean universal screw cap bottles, one gram of the feces was kept to be readily examined by direct smear method, and a drop of lugol's iodine solution was mixed with a fleck of the feces (approximately 0.2 gm) and spread by means of an applicator stick on a clean microscopic slide to suitable thickness. A cover slip is put on the smear and examined under low power objective lens (10x) suspected objects are examined using the high- dry objective lens (40x).

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**Results:**

Results of the present study revealed that the most affected group of patients' with intestinal parasites, those with 11-20 years old (32%), other wise the group with 31-50 were the less affected group (17%), and the groups, less than 10 years and 21-30 years old, were 23%, 28% respectively. Results showed in table (1) represent the rate of intestinal infection, for protozoa were (18.56%) significantly more than helminthes with (2.45%). In the term of protozoa, the Entambia histolytica was highest rate of infection as their were 475 p Ascaris lambricoidus ositive cases (12.14%) from total number of samples followed by Giradia lambilia, Trichmonous hominis, and Blastocystis hominis, 4.9%, 0.84%, 0.61% respectively. The infection rate with helminthes, including Hymenolipis nana, which showed the highest rate (1.17%); Enterobius vermicularis; Ascaris lambricoidus; Trichuris trichuri; Ancylistoma duodenali; Strongyloid stercoralis Schistosoma mansoni; and Taenia saginata were, (0.38%, 0.33%; 0.15%; 0.12; 0.12%; 0.10%; 0.055) respectively. Also the rate of infection with monilia was (3.5%).

**Table (1): Intestinal parasitic infection in 3911 individuals.**

Parasites		No. of positive samples	% from total positive	% from total no. of samples
Protozoa	Entambia histolytica	475	85.13	12.14
	Giradia lambilia	194	23.74	4.9
	Trichmonous hominis	33	4.03	0.84
	Blastocystis hominis	24	2.93	0.61
Total protozoal infection		726	89.10	18.56
Helminthes	Hymenolipis nana	46	5.63	1.17
	Enterobius vermicularis	15	1.83	0.38
	Ascaris lambricoidus	13	1.59	0.33
	Trichuris trichuri	6	0.73	0.15
	Ancylistoma duodenali	5	0.61	0.12
	Strongyloid stercoralis	5	0.61	0.12
	Schistosoma mansoni	4	0.48	0.10
	Taenia saginata	2	0.24	0.05
Total helminthes infection		96	11.75	2.45
Total parasites		817	85.63	20.88
Total intestinal infection		954		24.39

Results showed in table (2) represent the rate of intestinal parasitic infection in males and females. Males were more infected with intestinal parasites (44.18%) than females (28.96%). For protozoa showed an infection rate (37.48%) in males, as for the Entambia histolytica; Giradia lambilia; Trichmonous hominis; and Blastocystis hominis and monilia in females 8.21% more than males 4.01%.

**Table (2): Number and rate of infection (%), in males and females individuals.**

Parasites		Males (652)		Females (468)	
		No.	%	No.	%
Protozoa	Entambia histolytica	278	24.8	197	17.5
	Giradia lambilia	114	10.1	80	7.1
	Trichmonous hominis	19	1.69	14	1.25
	Blastocystis hominis	14	1.25	10	0.89
Total protozoal infection		425	37.84	301	26.74
Helminthes	Hymenolipis nana	34	3.03	12	1.07
	Enterobius vermicularis	5	0.44	10	0.89
	Ascaris lambricoidus	10	0.89	3	0.26
	Trichuris trichuri	6	0.53	0	0.0
	Ancylistoma duodenali	5	0.44	0	0.0
	Strongyloid stercoralis	5	0.44	0	0.0
	Schistosoma mansoni	4	0.35	0	0.0
	Taenia saginata	2	0.17	0	0.0
Total helminthes infection		71	6.29	25	2.22
Total parasites		496	44.18	326	28.96

Results in table (3) showed the infection rate with protozoa during a year. The highest rate of infection was caused by E. histolytica (65.4%), Giradia lambilia (26.7%); Trichmonous hominis (4.5%); and Blastocystis hominis (3.3%). Monthly infection rate with protozoa was the highest during Nov. (11.4%) and lowest during May (4.6%). In case of Entambia histolytica, Feb. showed the highest infection rate (78.7%), while other protozoa infection rate; Giradia lambilia; Trichmonous hominis; and Blastocystis hominis, showed the highest infection rate during July (40.4%); Oct. (14.55); Dec. (7.8%), respectively.

**Table (3) number & infection rate of paotozoa in 3911 individuals**

	Positive sample	E.histo-lytica	G. lambilia	T. hominis	Blastocystis hominis
month	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Jan.	59 (8.1)	36 (61)	18 (30.5)	2 (3.3)	3 (5)
Feb.	80 (11)	63 (78.7)	12 (15)	2 (2.5)	3 (3.7)
March	63 (8.6)	44 (69.8)	19 (30)	-	-
April	55 (7.5)	31 (56)	22 (40)	1 (1.8)	1 (1.8)
May	34 (4.6)	23 (67.6)	8 (23.5)	2 (5.8)	1 (2.9)
Jun	66 (9)	46 (69.6)	18 (27.3)	-	2 (3)
July	42 (5.7)	24 (57)	17 (40.4)	-	1 (2.3)
August	51 (7)	26 (50.9)	17 (33.3)	5 (9.8)	3 (5.8)
Sept.	67 (9.2)	35 (52.2)	21 (31.3)	9 (13.4)	2 (2.9)
Oct.	48 (6.6)	31 (64.5)	9 (18.7)	7 (14.5)	1 (2)
Dec.	76 (10.4)	55 (72.3)	13 (17.1)	2 (2.6)	6 (7.8)
Nov.	83 (11.4)	61 (73.4)	18 (21.6)	3 (3.6)	1 (1.2)
Total	726 (18.5)	475 (65.4)	194(26.7)	33(4.5)	24 (3.3)

The present study revealed that the highest infection rate with helminthes was during April (18.7%)( table-4). The highest infection rate with *H.nana*, was during August (80%); *Enterobius vermicularis* during Jun (33.3%) ; *Ascaris lambricoidus* during(60%) ; *Trichuris trichuri* during April(16.6%); *Ancylistoma dudenali* during March(14.4%); *Strongyloid stercoralis* during Nov.; (25%) *Schistosoma mansoni*during March (14.2%) ; and *Taenia saginata* during Oct. (20%).

#### Discussion:

The statistically non significant highest prevalence of infection with intestinal parasites in age group 11-20 years old in comparison with other age groups, because this is the school age and closely related and increased the susceptibility of infection , and represent the highest age group in population. In comparisons with intestinal parasitic rates in other Iraqi cities, higher prevalence rates of intestinal parasites were obtained in the studies carried out in some cities and areas of Iraq, in Baghdad (78%) (8) in Kirkuk;( 53%)( 9) and(40-43%) (10) and from annual report of center of control communicable diseases in Iraq (5) were shown (59.98%), (11) in kirkuk(23.2%), (12) in Basra(29.8%),Najaf (24.8%) , In Suliamina, (7)show (25%)among the school children ,(13)in Kirkuk(32.88%)but the rate of parasitic infection in our study (20.88%)was similar to the study by

(14)in Tikrit(19.8%). These differences in prevalence rate of infection between these studies and our is likely due to: date, Sampling technique, change in sanitary conditions, Economic practice. The difference also was distinct in the prevalence of intestinal parasites between middle and high socio-economic districts, the low socio-economic status and poor hygiene and sanitations conditions (15). The prevalence of infection with intestinal protozoa (18.56%) was much higher than intestinal helminthes this being (2.45%).The similar prevalence rate of infection was found by (16) ,intestinal protozoa (27.11%) and helminthes (7.14%) in Erbel also (13) recorded higher prevalence rate of intestinal protozoa than helminthes in kirkuk (19.15%) and (13.36%) respectively, while (3) reported higher prevalence of intestinal helminthes in their study (30.8%).Protozoa cysts are infectious when excreted , because protozoa multiply in the host ,ingestion of even a small inoculum can cause illness(130) .Among the protozoan infections *Entamoeba histolytica* exhibited the highest rate of infection(12.14%). Comparing with other studies detected in Baghdad by (8)(23%), (9)(21.8%) , (17) in Mosul(23.8%),(10)in Kirkuk (19.8%),(20)in Tikrit(23.3%) , (6)in Dohok(25.2%).and (16), (8.15%)in Erbil.This could be attributed to the faster transmission of the organism *E. histolytica* by ingestion of cysts that are transmitted primarily by oral-Fecal route in contaminated food and water. Housefly has important role in transmission of infections.The second common intestinal protozoan was *G. Lamblia* with prevalence rate of (4.9%) Sanitary condition, Personal hygiene and environmental factor responsible for such rate. Shortage of drinking water in schools and contamination of waters from pipes could be another factors.Higher rates in some other studies in Iraq was seen for example, in Baghdad by (8)(31%), (9) (15.9%), but in basra , (12) showed (15.9%)and communicable disease control (39.28%), (18)in Kirkuk (30.39%), (14)Tikrit (16.8), (6) in Duhok(17.6%)in sick patients, (16)(13.61%)and (18)in sulaimani(55%).There were one non-pathogenic protozoa detected in the study *Trichomonas hominis* in the prevalence rate (0.84%)their occurrence depending on the some epidemiological conditions of the other protozoan in community , but *Blastocystis hominis* showing (0.61%)and there is no previous studies refer to the prevalence of infection by this protozoa parasite in Iraq .But only (6) found the infection rate was (6.3 %). Intestinal helminthes in this study includes *Hymenolipis nana* was the highest prevalent rates of infections (1.17%) , which is need intermediate host or autoinfection for transmission of the parasites . In Iraq, recorded prevalence of *H. nana* infection by (13) and (6), (16), (4.97%), (2.71%) and (3.12%) respectively. *Enterobius vermicularis*

was the second common intestinal helminthes in the present study (0.38%) in compare with other studies in Iraq , (24) found higher prevalence rate in his study (5.3%) in removal appendices . (25) (11.8%), (10) (10.47%), (13) (4.7% (7) (4.4%) and (16) (3.85%).The eggs of Enterobius vermicularis are infectious immediately or shortly after excretion in feces (19). Ascaris lumbricoides: was recorded in our study (0.33%) and this was only found in low socio-economic level. Helminthes infections are associated with poverty and poor living conditions , in adequate sanitation and water supplies and poor personal and environment hygiene (5).In comparing with few studies carried out in Iraq, in Baghdad by (9)(0.6%), (13)in Kirkuk(1.87%), (7) in Sulaimani(0.5%) and (16),(0.17%).The other helminthic infections which recorded were Trichuris trichiura (0.15%) which is called whipworm , were not been reterred in other studies in Iraq,this result found in 6 out patient some of them are forgin person and others araban worker (Egypty). Beacause the eggs of most intestinal nematodes (Ascaris lumbricoides and Trichuris trichiura) require an extrinsic maturation period of days to weeks to be infective (20) .But hookworm (Ancylistoma duodenale) and Stroyloid stercoralis recorded with the same prevalence rate (0.12%) , In Baghdad , (21) recorded a higher infection rate with Ancylistoma duodenale(0.66%) .Individuals

exposed to mature filariform larvae of Stroyloid stercoralis which can penetrate intact skin could become infected. Although the larvae shed in stool typically are non infective rhabditiform larvae. Hyper infected persons can shed large numbers of larvae in respiratory secretion as well as in the stool, some of which might be infectious (19). The other parasites prevalent in this study were recorded Schistosoma mansoni(Trematod) and Taenia saginata (Cestod) (0.10%)(0.05%) respectively . In Iraq,(22) was recorded Taenia saginata (2.5%) in Egypty worker, (23)(0.16%), (21) found in Egypty worker in Baghdad city S. mansoni (3.06%) and T. saginata(0.05%)and(13)(0.24%) in T. saginata infection , (6) found T. saginata 1.3%.. Regarding sex distributions in both sexes there is no significant difference in prevalence at infections with intestinal parasites (44.18%) male and (28.96%) female. This study is similar with many results conducted previously, (14) (3), (25) in Mosul. (6) In Duhok, and Sai(16)in Eribile(34.9%) male and (33.48%)female. Seasonal factor has no effects on the prevalence of intestinal parasites infection rate in Baghdad city during the present study ,but there was increment of infection rate during Feb. to July, which might be depend on the number of individual who visited the hospital

**Table (4) number & infection rate of helminthes in 3911 individuals.**

Month	Positive samples		Ascaris lambricoidn		H.nana		E .vermicularis		St. stercoralis		Sch-mansoni		Ancy-dudonali		T.saginata		Tri.trichuri	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Jan.	4	4.1	1	25	3	75	-	-	-	-	-	-	-	-	-	-	-	-
Fab.	8	8.3	-	-	6	75	1	12.5	-	-	-	-	-	-	-	-	1	12.5
March	14	14.5	1	7.1	8	57.1	2	14.2	-	-	2	14.2	-	-	-	-	1	7.1
Aprile	18	18.7	2	11.1	6	33.3	4	22.2	-	-	1	5.5	1	5.5	1	5.5	3	16.6
May	14	14.5	2	14.2	3	21.4	3	21.4	3	21.4	1	7.1	1	7.1	-	-	1	7.1
Jun	12	12.5	1	8.3	7	58.3	4	33.3	-	-	-	-	-	-	-	-	-	-
July	8	8.3	-	-	4	50	1	12.5	1	12.5	-	-	2	25	-	-	-	-
August	5	5.2	1	20	4	80	-	-	-	-	-	-	-	-	-	-	-	-
Sept.	4	4.1	2	50	2	50	-	-	-	-	-	-	-	-	-	-	-	-
O Oct.	5	5.2	3	60	1	20	-	-	-	-	-	-	-	-	1	20	-	-
Dec.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov.	4	4.1	-	-	2	50	-	-	1	25	-	-	1	25	-	-	-	-
Total	96	2.45	13	13.5	46	47.9	15	15.6	5	5.2	4	4.1	5	5.1	2	2.0	6	6.2

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