

Distribution of intestinal parasitic infection in Erbil population

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Abstract:

A survey of prevalence of intestinal parasites among the Erbil citizen was performed during the year of 2011. The setting is a community in endemic area of parasites infections without the recent previous history of antihelminthic drug distribution. Stool specimen examined for 1505 (992 (65.9%) male and 513 (34.1%) female) were performed for the period of 12 months (January to December) in the year 2011 in the Erbil province. A total of 1009 samples gave positive diagnoses of parasitic infection, including 494 (63.0%) males, 513 (62.2%) females patients. The common parasites found namely were *Entamoeba histolytica*, *Giardia lamblia*, *Trichomonas hominis* and *Hymenolips*. While the percentage of infection with those parasites within the positive cases were 776 (76.9%), 226 (22.4%), 6 (0.6%), 1 (0.1%) respectively during the year.

Results showed no significant differences (P value ≥ 0.05) among the average parasitic infection in both sexes, while there were significant differences among months. An increase in the rates of most parasitic infection found in summer than other seasons and that explains the effect of high temperature in this season on increasing the parasitic growth. Highest degree of *Entamoeba histolytica* and *Giardia lamblia* seen in the 8th and 6th months respectively, while *Trichomonas hominis* and *Hymenolips nana* investigated in low rate during the year.

Keywords: Human parasite, Intestinal parasites, parasitic infections, Epidemiological study

Introduction:

Viruses, bacteria, parasites, or other pathogens organisms can cause infections in the stomach and small and large intestines, which often lead to gastroenteritis (1).

Intestinal parasites are one of the major health problems through their effects in causing malnutrition morbidity and incapacitation due to their activities especially in children (2). The parasitic infections were regarded as a major problem in the world especially in the communities whom suffering from poor

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sanitation and low personal hygiene such as primary schools pupils and rural communities (3).

Intestinal parasites distributed in various ages equally in both rural and civilian environments. The number of studies deal with the prevalence of intestinal parasites in Iraq is low relatively compared with the percentages of parasite distribution (4).

In Iraq few epidemiological studies have been carried out such as those that related to control the intestinal parasites, such as those study in Nainenawa province show the total percentage of the intestinal parasites was (70%) where including (19.5%) *Entamoeba coli*, (3.11%) *Entamoeba histolytica*, (11.9%) *Giardia lamblia*, (19.5%) *Hymenolepis nana*, (11.8%) *Enterobius vermicularis*, (2.95%) *Ascaris lumbricoides* and (0.6%) *Ancylostoma duodenale* in addition to presence a variation in basic blood component values in the infected and non infected individuals (5). Al-Dulaimi (6) conclude after his checking of 1086 stool specimens for intestinal parasites detection in Al-Anbar city the total infection was (37.2%) including (9.3%) *E. histolytica*, (25.7%) *G. lamblia* and (0.5%) *H. nana*.

In field study for intestinal parasites infection among Deiala city 6645 stool specimens were tested and reveal the total infection was 29.1% and many intestinal parasites were recorded such as *E. histolytica* (13.6%) , *E. coli* (1%), *G. lamblia* (11.1%), *H. nana* (0.6%), *E. vermicularis* (1.9%) and *A. lumbricoides* (0.2%) (7).

While another epidemiological study in Hilla City made by Al-Kubaiessy (8) where investigated 4537 patients from two children hospitals in Babil, he found the total parasitic infection was 47.1% including *E. coli* (10.9%), *E. histolytica* (10.3%), *G. lamblia* (8.3%), *T. hominis* (1.4%), *Chilomastix mesnili* (0.9%), *H. nana* (2.2%) , *Taenia saginata* (0.06%), *E. vermicularis* (10.4%) , *Trichuris trichiura* (1.6%), *A. lumbricoides* (0.8%) and *A. duodenale* (0.1%).

On this issue a study was carried out in Baghdad (Al-Jeser area), includes examination of stool specimens taken from people of different ages (1 year- to over 50 years). One hundred fifty one out of 255 persons were positive for infection with a total prevalence rate of 59.21% in the same area. They were concluded that the appearance of wastewater affects the health of the population (9).

So, the total intestinal parasites infections were recorded including *Entamoeba coli*, *Entamoeba histolytica*, *Giardia lamblia*, *Hymenolepis nana*, *Enterobius vermicularis*, *Ascaris lumbricoides*, *Ancylostoma duodenale* and *Trichuris trichiura*. Iraq is low relatively compared with the percentages of parasite distribution (10).

The aims of this study are to obtain some information about the prevalence of gastro- intestinal parasites among Erbil governorate populations and to explore

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the various epidemiological factors that are obtained through different ways of fecal analysis

Materials and methods:

The study population comprised 1505 (992 male and 513 female) stool specimens collected from people in Erbil province in period from January 2011 till December 2011 ages among (1- over 50) years old. Stool samples were collected in sterile containers attended to the main Erbil hospitals (Nasdare Bamerny, Nawrose, Resgary, Raparin, Kalk and Jamhoreya).

Examination of stool samples:

a -Examination by the naked eye:

Before microscopic examination of stool samples, the feces was examined by the naked eye for its characteristics such as its consistency, color, texture and also for the presence of larvae or adult of nematodes and/or segments of cestodes.

b- Microscopic examination:

1- Direct smear method : About 2 mg of feces were mixed with one or two drops of physiological saline (0.9 gm/dl) or Lugol's Iodine on a slide and covered with a cover-glass and examined microscopically by 10x objective with condenser iris closed sufficiently to give good contrast and then by 40x objective to identify detected parasitic objects (11,12).

2- Concentration techniques (Sedimentation technique):

About 1 gram of feces was added to 14 ml of normal saline (0.9 gram/dl) in a conical tube and the feces was broken by glass rod and mixed with normal saline. Then the conical tube was centrifuged at 500 in a centrifuge. The supernatant was discarded (about 3 times) till it was clear. The sediment was then mixed and mounted to a slide and covered with a cover-glass and examined under microscope firstly with 10x and then with 40x (13).

3-Statistical analysis:

The statistical analyses (two-way method (ANOVAs, Two-way for analysis of variance) were used for results data.

Results and discussion:

As the results of simple slide method in testing of 1505 patients stool samples were referred to major government hospitals laboratories and competence laboratories including both sex 992(65.9%) male and 513(34.1%) female for the period of 12 months (January to December) in the year 2011 in the Erbil province. A total of 1009(0.07%) samples gave positive diagnoses of parasitic infection.

Table (1) showed different types of diagnosed parasites which are common among both male and female patients among Erbil citizens namely *Entamoeba histolytica*, *Giardia lamblia*, *Trichomonas hominis* and *Hymenolepis nana*. While the rate of infection of the parasites were 776 (76.9 %) , 226(22.4 %) ,

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6(0.6%) , (0.1%) respectively during the year. Which means *Entamoebahistolytica* infections were more distributed among Erbil individuals.

Table (1): number and percentages of diagnosed parasites among people in Erbil

Parasites	Total no. of positives	% positive samples
<i>Entamoeba histolytica</i>	776	76.9%
<i>Giardia lamblia</i>	226	22.4%
<i>Trichomonas hominis</i>	6	0.6%
<i>Hymenolepis nana</i>	1	0.1%
Total positive samples	1009	67.04%

Furthermore, in comparison to the previous study, the average of parasitic infection between male and female individuals were compared throughout the year and statistically had been analyzed depending on P-value at the level (1) as showing in table (2). It was found that there are no significant differences (P. value ≥ 0.05) among the average *Giardia lamblia*, *Trichomonas hominis*, and *Entamoebahistolytica* infection in both sexes. Low parasitic infection with *Hymenolips* was not accepted statically. Also as presented in table (2) when comparing infection rates among patients over the months of the year, there were significant differences among months in infection regardless of their sex using two-way analysis method (ANOVAs, Two-way for analysis of variance).

Table (2): Infection rates over the months of the year among both sexes.

Months	<i>Giardia lamblia</i>		<i>Trichomonas hominis</i>		<i>Hymenolipis nana</i>		<i>Entamoeba histolytica</i>	
	F	M	F	M.	F	M.	F	M.
1	2(1.6%)	7(6.93%)	0(0.0%)	0(0.0%)	0(0.0%)	1(100%)	9(2.32%)	5(1.28%)
2	4(3.25%)	5(4.95%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	6(1.55%)	2(0.51%)
3	5(4.1%)	1(0.99%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4(1.03%)	6(1.54%)
4	3(2.4%)	3(2.97%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	8(2.06%)	6(1.54%)
5	7(5.69%)	4(3.96%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	21(5.42%)	14(3.59%)
6	52(42.27%)	37(36.63%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	56(14.47%)	27(6.94%)
7	11(8.92%)	7(6.93%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	55(14.21%)	52(13.36%)
8	13(10.56%)	11(10.89%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	61(15.76%)	73(18.76%)
9	5(4.1%)	7(6.93%)	1(3.33%)	0(0.0%)	0(0.0%)	0(0.0%)	27(6.97%)	36(9.25%)
10	7(5.69%)	6(5.94%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	37(9.56%)	57(14.65%)
11	7(5.69%)	7(6.93%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	52(13.43%)	52(13.36%)
12	7(5.69%)	8(7.92%)	2(66.66%)	0(0.0%)	0(0.0%)	0(0.0%)	51(13.17%)	59(15.16%)
Total	123	101	3	0	0	1	387	389

An increase in the rates of most parasitic infection found in summer than others seasons and that explains the effect of high temperature in this season on increasing the parasitic growth. Highest degree of *Entamoeba histolytica* and *Giardia lamblia* seen in the 8th and 6th months, respectively, while *Trichomonas hominis* and *Hymenolipis nana* investigated in low rate during the year. Both males and females infection average with parasites were compared through the year and had analyzed statistically depending on the P-value at the level (1).

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Results showed no significant differences (P .value \geq 0.05) among *Giardia lamblia*, *Trichomonas hominis* and *Entamoeba histolytica* average parasitic infection in both genders, whereas 494 (63.0%) males, 513 (62.2%) females were infected. Because of low parasitic infection with *Hymenolipis*, it was not accepted statistically. Similar parasites were found in highest rate of infection from total number of samples in a study that was done in Sulamani, but with *G.lamblia* 7.96%, followed by *E.histolytica* 4.05%, *E. vermicularis* 2.25%, and both *T.hominis* and *E.coli* 0.17% (1).

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انتشار الإصابة بالطفيليات المعوية في محافظة اربيل

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المستخلص

اجري في هذا البحث مسح لانتشار الإصابة بالطفيليات المعوية لمواطني محافظة اربيل خلال العام 2011. شملت عينة الدراسة شريحة من السكان دون الأخذ بنظر الاعتبار تداول الأدوية المضادة للطفيليات في المنطقة التي تستوطن بها الإصابات الطفيلية. تم إجراء الفحص المخبري لنماذج البراز لأشخاص والبالغ عددهم 1505 مواطن منهم 992 (65.9%) ذكور و 513 (34.1%) إناث ولفترة (12) شهر واعتبارا من شهر كانون الثاني إلى نهاية شهر كانون الأول من العام 2011 في محافظة اربيل. بلغ عدد النماذج التي أعطت كشفا موجبا للإصابة بالطفيليات المعوية 1009 نموذج منها 494 (63%) ذكور و 513 (62.2%) إناث.

تم في هذه الدراسة تشخيص الطفيليات الشائعة التالية لدى المصابين (*Entamoeba histolytica* ، *Giardia lamblia* ، *Trichomonas hominis* و *Hymenolips*) حيث كانت نسبة الإصابة بتلك الطفيليات (776 (76.6%) ، 226 (22.4%) ، 6 (0.6%) و 1 (0.1%) على التوالي . أظهرت النتائج عدم وجود فرق معنوي ($P. value \geq 0.05$) في نسبة الإصابة بالطفيليات باختلاف الجنس. بينما وجد فرق معنوي في معدل الإصابة باختلاف الأشهر وكانت أعلى نسبة للإصابة خلال فصل الصيف مما يفسر بتأثير درجات الحرارة العالية في هذا الفصل على نمو وتكاثر هذه الطفيليات. كما أوضحت نتائج الدراسة وجود مستويات مرتفعة من الإصابة بكل من الطفيليات *Entamoeba histolytica* و *Giardia lamblia* خلال شهري حزيران وأب على التوالي. غير إن نسبة الإصابة بكل من الطفيليات *Trichomonas hominis* و *Hymenolips* ضئيلة خلال أشهر السنة.