Intestinal Parasites among Patients attending General Central Public Health Laboratory in Erbil City-Iraq during 1998-2004

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الخلاصة

تم جمع البيانات الخاصة بنماذج البراز للمرضى الوافدين الى مختبر الصحة العامة المركزي في مدينة أربيل خلال السنوات 1998 – 2004، لتقدير و تعيين النسب المئوية للإصابة بالأنواع الطفيلية بالطريقة المباشرة . 1380 عينة براز من أصل 5768 نموذج تم فحصها، كانت مصابة بالطفيليات المعوية 23.9% .

من خلال التحليل الإحصائي للنتائج، وجدت فروق معنوية عالية بين الإصابات من جهة وكل من سنوات الدراسة و توزيع الأنواع الطفيلية نسبة الى جنس المرضى من جهة أخرى .

أعلى نسبة إصابة كان 42.4% في السنة 1998 و أقلها 5% في سنة 2004 وكانت إصابة الذكور أعلى منها في الإناث 60.2% و 39.8% على التوالي.

وظهرت الطفيليات التالية في الدراسة الحالية وهي : أميبا القولون *Entamoeba coli* والأميبا المحللة للنسيج *E. histolytica* *وبنسبة* 51.7% ، 51.2% و ٠.٦% ، ٠.٧% في الذكور والأناث على التوالي، و جيارديا لامبليا *Giardia lamblia* و المشعرة المعوية *Trichomonas hominis* و *بنسبة أصابة* 40.3% ، 39.9% و ٣.١% ، ٥.١% في الذكور والأناث على التوالي ، و دودة البقر الشريطية *Taenia saginata* وبنسبة اصابة ٠.٤% في كلا الجنسين، و الدودة الشريطية القزمة *Hymenolepis nana* ٣.٤% في الذكور و ٢% في الأناث، ودودة الأسكارس *Ascaris lumbricoides* والدودة الدبوسية أو المقعدية *Enterobius vermicularis* وبنسبة إصابة ٠.١%، ٠.٢% و ٠.٤% ، ٠.٥% في الذكور والأناث على التوالي.

تم تسجيل فقط 57 حالة من الإصابة المزدوجة بالطفيليات . وجدت نسبة عالية من خلايا القيح وكريات الدم الحمراء وفطريات المونيليا في عينات البراز للمصابين بالطفيليات المعوية الممرضة مثل *E. histolytica* ، *G. lamblia* ، *T. saginata* ، *H. nana* ، *A. lumbricoides* و *E. vermicularis* .

Keywords: Intestinal Parasites, Erbil.

Abstract

The data of general stool examination of the patients attending the general central public health laboratory in Erbil city were collected during years 1998-2004 to estimate and determine the percentage of infections with parasitic species by direct method. Out of 5768 stool samples, examined 1380 were infected with intestinal parasites 23.9%. Statistically, there were high significant differences between infections and each of studied years and distribution of the parasitic species in relation to the sexes of the patients. Highest infection rate was 42.4% in the year 1998, while the lowest was 5% in 2004, and the males were infected with intestinal parasites more than females which were 60.2% and 39.8% respectively.

The following parasites were detected in the present study: *Entamoeba histolytica and Entamoeba coli* with infection rates 51.7%, 51.2% and 0.6%, 0.7% in males and females, respectively, and intestinal flagellates, *Giardia lamblia* and *Trichomonas hominis* 40.3%, 39.9% and 3.1%, 5.1% in males and females, respectively. *Taenia saginata* 0.4% in each of males and females and *Hymenolepis nana* 3.4% in males and 2% in females, *Ascaris lumbricoides* and *Enterobius vermicularis* 0.1%, 0.2%, and 0.4%, 0.5% in males and females, respectively. Only 57 cases with double infections were recorded.

High percentages of pus cells, red blood cells and Monilia fungi were present in the infected stools with pathogenic intestinal parasites like *E. histolytica*, *G. lamblia*, *T. saginata*, *H. nana*, *A. lumbricoides* and *E. vermicularis.*

Introduction

Protozoan infections of the intestine cause a wide variety of clinical symptoms, ranging from asymptomatic carrier to severe disease associated with pathologic lesions in the gastrointestinal tract or other organs [1]. Parasitic helminthes are one of the major public health problems; they may not directly produce serious disease in the human but may indirectly rob the individual's energy, interfere with his nutrition and make him more susceptible to other diseases [2].

There are inadequate informations on the parasitic infestations of man in developing countries. Information from in-patient and out-patient sections of hospitals is most useful for the planning of meaningful public health programs, and surveys based on hospital records in Erbil city include those of [3], who studied the intestinal parasites among pediatric hospital patients and out-patients that had diarrhea, in a study performed by [4] among 33803 examined stool samples,7566 (22.4%) were infected, the prevalence of intestinal parasites were studied by [5] and a total of 1366 stool specimens of children aged from 4 months to 6 years were examined and of these, 837(61.27%) were positive for *E. histolytica* and *G. lamblia*. In a retrospective study recorded by [6], 4544 cases were positive (26.9%) for the presence of *G. lamblia* out of 16900 stool samples which were collected from patients of Endemic Disease Center [7] performed a study on the causative agents of diarrhea in regular patients of Maternity and Pediatric Hospital and found that 66.5% of cases were caused by different kinds of parasites.

In another studies which were carried out in Erbil city, 34 cases (29.6%) were found to be infected with one or more intestinal parasites among 115 examined stool specimens in some of the kindergartens [8], and the infection rate of the intestinal parasites was 50.4% among patients in Maternity and Pediatric Hospital [9], while a prospective study was conducted by [10] and revealed that the total rates of infection with intestinal parasites among foodhandlers and rural primary schoolchildren were 26.58% and 40.15% respectively, and [11] recorded a high rate of infection 32.29% among primary schoolchildren and the higher rate was detected among those in rural areas 33.42% in compare to urban 29.6%.

Several researchers studied the intestinal parasites in different regions in Iraq such as [12] in Ninevah governorate and [13] in Al-Taam'em province and they recorded the total percentages of infection among primary schoolchildren and foodhandlers 50.6%, 29.4% and 41.61%, 26.77% respectively. While [14] found that 44.53% was the infection rate of intestinal parasites among pupils of a number of primary schools and kindergarten children in the right side of Mosul city.

The prevalence of gastrointestinal parasites among population in Dohuk-Kurdistan region of Iraq was studied by [15] and they reported that the percentage of infection was (57.9%) out of 380 stool samples collected from patients attending the outpatient clinic of Azady Hospital and the private laboratories.

Materials and Methods

The data and information of general stool examination of 5768 patients attending to the general central public health laboratory in Erbil city during 1998-2004, were included in this study. The collected specimens were examined by using direct method for the parasites detection. General stool examination has performed using wet mount

technique, and then the results were analyzed statistically by using X^2 chi-square value according to [16].

Results and Discussion

Out of 5768 examined stool specimens, 1380 were positive for intestinal parasites, the infection rate was 23.9% – Table (1).

The result of the present study is much lower than the finding of [15] in Duhok 57.9% and slightly higher than that recorded by each of [3] 21.6% and [4] 22.4% in Erbil city.

The high parasitic prevalence in the current study may resulted from different factors such as lower standards of sanitation, the greater longevity of the infective stage of the parasite in a favorable environment, low level of personal hygiene and socioeconomic status and the immunity degree of the studied groups, inadequate drinking water supply [17], and also presence of asymptomatic carriers which are considered the main source of infection due to the excretion of the infective stages in their stools [15**].**

Table (1) also shows high significant differences were present among the infections during the studied years, the highest infection rate 42.4% was in the year 1998 which may be because the year (1998-1999) was characterized by drought and frequent dust in addition to the reduction in the rainfall rate in the region [13], and lowest rate 5% was in 2004 which is explained by the improvement in the level of environmental sanitation, socioeconomic status of the population, the water supply of the city, detection and evaluation of clinical importance of the disease in the patients and support and cooperation in community preventive measures which reduce the prevalence of various intestinal parasites.

Table (1): Distribution of intestinal parasites among patients attending General Central Public Health Laboratory in Erbil city during years 1998-2004.

Year	No. examined	No. +ve	%
1998	1112	472	42.4
1999	1090	341	31.3
2000	462	125	27.1
2001	1232	236	19.2
2002	427	108	25.3
2003	197	35	17.8
2004	1248	63	5
Total	**5768**	**1380**	**23.9**

Calculated X^2 = 508.42, Tabulated X^2 = 16.8, ($p < 0.01$) .

Table (2), revealed distribution of intestinal parasites according to the patient's sex; males were highly infected than females (60.2% and 39.8%) respectively, which indicate that females have hygienic habit and take care of their personal cleanlines more than males. The high rate of infection with intestinal parasites among males in this study is in agreement with other studies conducted in Iraq [8], [4], and [15].

Two of each of intestinal amebae and flagellates were investigated in the present study, which were (*E. coli* and *E. histolytica*, *G. lamblia* and *T. hominis)*, and two of each of cestodes and nematodes (*T. saginata*, and *H. nana*, *A. lumbricoides* and *E. vermicularis*).

Among the recorded parasites, *E. coli* and *T. hominis* are non-pathogenic parasites (commensals). There were 57 double infections in the current study, as indicated in Table (3), infection with more than one parasite may be mainly due to the exposure to multiple parasite infections or the response of the patient to the infection with one parasite may give an opportunity for another parasite to be established in the same host and at the same time [13].

G. lamblia 42 (73.7%) and *E. histolytica* 14 (24.6%) were the most frequent and predominant recorded parasites, and this widespread infection is a reflection of the sanitation level and water treatment, in addition, they have direct life cycles and transmission occurs by contaminated food and water by infected sewage, filth flies act as important mechanical vectors of the cysts or through the carriers (cyst passers) handling food that can infect others [17].

The high percentages of the pathological intestinal parasites explained strongly with the presence of the pus cells, red blood cells and Monilia (fungi) in the feces with pathogenic parasites- Table (4). In this study, *E. histolytica*, *G. lamblia*, *T. saginata*, *H. nana*, *A. lumbricoides* and *E. vermicularis* were the detected pathogenic parasites, and infection with *A. lumbricoides* revealed 100% of each of pus cells, RBCs and Monilia.

Many factors play important roles to determine the effects of the intestinal parasites such as the strain, number, size and the site of the parasite, in addition to the metabolic processes of the parasite particularly the nature of any waste products [17] and [11].

Table (2): Distribution of intestinal parasitic species in relation to the sex of the patients attending General Central Public Health Laboratory in Erbil city during years 1998-2004.

Parasite	Sex	1998		1999		2000		2001		2002		2003		2004		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Protozoa	♂	1	0.3	3	1.6	-	-	-	-	1	1.5	-	-	-	-	5	0.6
Entamoeba coli	♀	1	0.6	1	0.7	-	-	1	1	1	2.5	-	-	-	-	4	0.7
E. histolytica	♂	174	57.8	104	54.7	36	46.8	55	42	30	44.1	8	44.4	23	50	430	51.7
	♀	90	52.6	82	54.3	25	52.1	46	43.8	19	47.5	9	53	10	58.8	281	51.2
Giardia lamblia	♂	112	37.2	75	39.5	33	42.9	57	43.5	28	41.2	9	50	21	45.7	335	40.3
	♀	72	42.1	62	41.1	17	35.4	39	37.1	15	37.5	7	41.2	7	41.2	219	39.9
Trichomonas hominis	♂	2	0.7	2	1.1	3	3.9	14	10.7	4	5.9	-	-	1	2.2	26	3.1
	♀	3	1.8	4	2.6	6	12.5	13	12.4	2	5	-	-	-		28	5.1
Helminths	♂	1	0.3	-	-	1	1.3	1	0.8	-	-	-	-	-	-	3	0.4
A- Cestoda	♀	1	0.6	-	-	-	-	1	1	-	-	-	-	-	-	2	0.4
Taenia saginata																	
Hymenolepis nana	♂	8	1.7	5	2.6	4	5.2	4	3.1	5	7.4	1	5.6	1	2.2	28	3.4
	♀	2	1.2	2	1.3	-	-	3	2.9	3	7.5	1	5.9	-	-	11	2
B- Nematoda	♂	1	0.3	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1
Ascaris lumbricoides	♀	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2
Enterobius vemicularis	♂	2	0.7	1	0.5	-	-	-	-	-	-	-	-	-	-	3	0.4
	♀	1	0.6	-	-	-	-	2	1.9	-	-	-	-	-	-	3	0.5
Total	♂	**301**	**63.8**	**190**	**55.7**	**77**	**61.6**	**131**	**55.5**	**68**	**63**	**18**	**51.4**	**46**	**73**	**831**	**60.2**
	♀	**171**	**36.2**	**151**	**44.3**	**48**	**38.4**	**105**	**44.5**	**40**	**37**	**17**	**48.6**	**17**	**27**	**549**	**39.8**
Total Sum (♂ + ♀)		**472**		**341**		**125**		**236**		**108**		**35**		**63**		**1380**	

Calculate $X^2 = 57.61$, Tabulated $X^2 = 6.6$, ($P < 0.01$).

Table (3): Double infections among patients attending General Central Public Health Laboratory in Erbil city during years 1998-2004.

Parasite	*G. lamblia*	*E. histolytica*	*T. saginata*	Total
E. coli	1	3	-	**4**
E. histolytica	33	-	-	**33**
T. hominis	5	9	-	**14**
H. nana	3	2	1	**6**
Total	**42**	**14**	**1**	**57**

Table (4): Findings of general stool examination for pathogenic intestinal parasites among patients attending General Central Public Health Laboratory in Erbil city during years 1998-2004.

Parasite	Total						
	No. +ve cases	Pus cells	%	R.B.Cs	%	Monilia	%
E. histolytica	711	708	99.6	709	99.7	442	62.2
G. lamblia	554	507	91.5	466	84.1	451	81.4
T. saginata	5	4	80	3	60	1	20
H. nana	39	29	74.4	29	74.4	13	33.3
A. lumbricoides	2	2	100	2	100	2	100
E. vermicularis	6	3	50	2	33.3	2	33.3

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