

Prevalence and laboratory diagnosis of intestinal Protozoa in children under 10 years (Amoebiasis and Giardiasis) In Al-Mansor General Hospital for Pediatric/ Baghdad

دراسة التشخيص المختبري وانتشار الابدانيات المعوية في الاطفال دون سن العاشرة (المتحولة الحالة للنسيج والجيارديا اللامبليا) في مستشفى المنصور للاطفال/ بغداد

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Abstract

During the period from September 2007 till December 2007, a total of two hundred samples were collected randomly from children patient attended to Al-Mansour General Hospital for Pediatric in Baghdad to determine the prevalence of intestinal protozoa (*E. histolytica* and *G. lamblia*) among patients with diarrhea or abdominal symptoms referred from the out patients. General stool examination was performed for all individuals included in the study. The direct smear method by normal saline 0.9% NaCl and iodine-lugol solution staining method was used. Also complete blood picture test was performed for all patients to evaluate, PCV, total white blood cell count, differential white blood cell count. It was found that the total prevalence rate of (*E. histolytica* and *G. lamblia*) infection was (34.5%) of which *E. histolytica* patients was (27.5%) and *G. lamblia* patients was 7% *E. histolytica* was significantly more common (45%) in school age children (6-10) years, while *G. lamblia* was more frequent 53.3% in preschool age 1-5 years. Mean of haemoglobuline level 10.36 for *E. histolytica*, while mean of haemoglobuline level 9.73 for *G. lamblia*. As a result, infections with intestinal protozoa dose not lead to anemia in great percentage, but in low percentage. Bloody stool was associated with positive stool for *E. histolytica* trophozoites and cyst, while isolation of *G. lamblia* had no association with bloody stool.

Key wards: intestinal protozoa, Amoebiasis, Giardiasis,

الملخص

خلال الفترة من ايلول 2007 الى كانون الاول 2007 تم تجميع مائتان نموذج عشوائي من خروج الاطفال المرضى الوافدين الى مستشفى المنصور للاطفال في بغداد لتحديد انتشار الطفيليات (الابدانيات المعوية) (*E. histolytica* and *G. lamblia*) لجميع المرضى الذين لديهم اسهال او يشكون من الام في البطن المرسلين من العيادة الاستشارية في المستشفى. ان فحص الخروج العام اجري لكل المرضى المشمولين بالدراسة وبطريقة المسحة المباشرة بواسطة المحلول الملحي 0.9% NaCl وطريقة صبغة محلول الايودين المخفف. كذلك اجري فحص صورة الدم الكاملة لجميع المرضى لتقدير نسبة الهيموغلوبين، حجم كريات الدم المضعوطة، العد الكلي لكريات الدم البيضاء، العد التفريقي لكريات الدم البيضاء. لقد وجد ان وبائية المرض بصورة عامة ل (*E. histolytica*, *G. lamblia*) كانت 34.5% (*E. histolytica* 27.5% *G. lamblia* 7%) ان الاصابة ب (*E. histolytica*) كانت اكثر انتشارا في عمر المدرسة (6-10) سنة بينما نسبة الاصابة ب (*G. lamblia*) اكثر انتشارا في عمر قبل المدرسة (53.3%) (1-5) سنة. ان متوسط قيمة الهيموغلوبين بالنسبة للمصابين ب (*E. histolytica* 10.36) بينما متوسط قيمة الهيموغلوبين بالنسبة للمصابين ب (*G. lamblia* 9.73). وبالنتيجة فان الاصابة بالابدانيات المعوية لا تؤدي الى حصول فقر دم بنسبة كبيرة بل بنسبة ضئيلة. ان وجود الدم في فحص الخروج يكون ايجابيا للطور المتغذي والطور الكيسي ل المصابين ب (*E. histolytica*) بينما عزل (*G. lamblia*) ليست ذات صلة بالتغوط الدموي.

الكلمات المفتاحية: الابدانيات المعوية، المتحولة الحالة للنسيج، جيارديا اللامبليا

Introduction

Intestinal protozoal diseases are among the most common infections worldwide, more prevalent in the poorest communities in the developing countries [1]. These infections are regarded as serious public health problems, the majority being children [2]. Protozoa found in oceans, fresh water, and soil. They are generally microscopic size and consist of single cell with one or more nuclei, the protozoa more prevalent in warm climates, tropical and subtropical area[3].the most important pathogenic protozoa are *Entamoeba histolytica*, *Giardia lamblia*, these organisms are transmitted by fecal, oral rout, fecal-oral transmission involves the ingestion of food or water contaminated with a mature cyst[4]. *Entamoeba histolytica* infection "Amoebiasis" is one of the most parasitic infections world wide, approximately 10% of the world's population is infected by *E. histolytica* [5]. *Giardia lamblia*, infection Giardiasis specially occurs in children, the prevalence of *G. lamblia* ranges from 2-7% in the industrialized countries and 20-60% in developing countries [6]. The majority of protozoal infections are probably asymptomatic, but

some are associated with sub acute or chronic diarrhea and intestinal irritation [8], which contribute to mal absorption and nutritional deficiency especially in children[9].

Materials and Methods

Spreading of intestinal protozoa has been scanned among the attendants in Al-Mansour General Hospital For Pediatrics in Baghdad, 200 samples were collected in this study during the period from 15/9/2007 to 15/12/2007 from children aged (1 month-10 years)from both sexes (males and females). Every patient was reported though a specifically prepared questionnaire which included gender, age and address for every patient, apparently healthy individuals were served as control group.

A. Stool samples

The stool samples were collected in clean plastic container, and each container was labeled by a special number [10].

B. Blood samples

Blood samples 3ml were collected by vein puncture or capillary skin puncture, using disposable syringes, then it was put on a clean plastic tubes containing EDTA, and each tube was labeled by a special number from all patients as well as control group[11].

Laboratory examinations

Includes the following

A-General stool examination

1-Macroscopic examination:-

The feces were examined by eye investigating color, consistency, blood, mucus and smell [12].

2-Microscopic examination

A-Direct physiological normal saline smear

The feces were examined by putting a small amount of feces 0.5 gm which taken by a wooden stick from different spots ,especially blood and mucus from feces ,then it was put on a slide, by adding one drop of normal saline and mixed thoroughly and then put the cover slide and examined under 20x,40x.... to discover the trophozoites and cyst of the intestinal parasites[13].

B-Direct iodine-lugol solution smear

The iodine is used as a suitable stain especially for the cyst, this is because of the simplicity in diagnosing the content, cytoplasm is painted in golden yellow color, and the nucleus is painted in dark brown. The slides are prepared in the same procedures of the last slide, exchanging the normal saline with the iodine lugol solution [12].

C- Haematological examination

Blood tests including hemoglobin percentage, packed cell volume, white blood cells count, and differential white blood cells count by using MS-9 instruments. It likes the computer, having monitor, key boards ,and a special place for putting the tubes that contain the blood. After taking tubes which contain the blood samples, should mix the tubes kindly either manually by hands, or put them in the mixer, then open the tube and put it in its special place, it will take 15 microns from the blood sample and examine it. The result was appear in one minute.

Statistical analysis

All statistical analysis were done by using Pentium-4 computer through the SPSS program (version-10) and Excel application.

Results and discussion

Intestinal protozoal diseases continue to be a significant health problem in both developed and under developed countries. Among the commonest intestinal protozoa that affect man are *E. histilytica* and *G.lamblia* which are the two most common protozoa parasites that affect man[6].

In the present study, it was observed that, the prevalence rate of intestinal protozoa in AL-Mansour General Hospital was 34.5%. This result is similar to the study of [14] which recorded that the total infection rate was 35.5% in Basra General Hospital. While another study [15] recorded that the total rate of infection was 70.4% in Nainawa. The differences in the prevalence rate of intestinal protozoa depended on the number of samples, personal and general hygiene, and socioeconomic status.

Table (1) distribution of age group/ years among studied groups, this table showed that there were non significant differences ($p>0.05$) between the age group/ year of studied group. The highest prevalence rate for *E. histilytica* in the present study was observed among school age children was 45.5%, while *G.lamblia* prevalence was highest in pr school age was 53.3%. This result could be explained on the fact that school children are fully dependent on toilet use and more involved in outdoor activities which might led to *E. histilytica* transmission, and for *G. lamblia* it could be related to number of factors such as poor health hygiene and toilet training, overcrowding, low education of children.

Table (1): Distribution of age group/ years among studied groups

Studied Group		Age groups / Years				Total	Comparison of significant	
		<1	1-5	6-10	>10		P-value	Sig.
Control	N	33	58	37	2	130	0.151	Non sig. P≥0.05
	%	25.4	44.6	28.5	1.5	100		
<i>E. histolytica</i>	N	7	23	25	0	55		
	%	12.7	41.8	45.5	0	100		
<i>G. lamblia</i>	N	1	8	6	0	15		
	%	6.7	53.3	40	0	100		
Total	N	41	89	68	2	200		
	%	20.5	44.5	34	1	100		

Table (2) showed the relationship between source of water supply and parasitic infection. The result of this table showed a highly significant difference between the type of water supply and the intestinal protozoa. The source of water was the sole factor significantly association with the high prevalence rates of infection.

Table (2): Relationship between source of water supply and parasitic infection

Studied Group		Type of water supply					Total	Comparison of significant	
		Boiling water	filterdwater	Tap water	river	tanker		P-value	Sig.
Control	N	0	38	92	0	0	130	0.151	Non sig. (P≥0.05)
	%	0	29.2	70.8	0	0	100		
<i>E.histolytica</i>	N	4	6	34	7	4	55		
	%	7.3	10.9	61.8	12.7	7.3	100		
<i>G.lamblia</i>	N	2	0	11	1	1	15		
	%	13.3	0	73.3	6.7	6.7	100		
Total	N	6	44	137	8	5	200		
	%	3	22	68	4	2.5	100		

Table (3) show the hematological parameter data clearly observed low of hemoglobin level (gm/dl) for *E.histolytica* infected patients (10.36₋+1.58) with highly significant difference (p≤0.01) when compared with control (12.87₋+0.95), while non significant difference (p≥0.05) between patients infected with for *E.histolytica* and *G.lamblia*. The low level of Hb in patients infected with *E.histolytica* and *G.lamblia* could be explained by the malnutrition state of the infected children which may lead to iron deficiency.

Table(3): Mean distribution of haematological test among the studid group

Hematological test	Studied group	N	Mean	Std.deviation	Mini	Maxi	Comparison of significant	
							P-value	Sig.
Haematological level(g/dl)	control	130	12.78	0.95	12	15	-	-
	<i>E.histolytica</i>	55	10.36	1.81	4	1312	0.00	HS
	<i>G.lamblia</i>	15	9.73	1.58	6		0.00	HS
	total	200		<i>E.histolytica vs G.lamblia</i>			0.095	HS

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