

## Estimation of the *Entamoeba histolytica* and *Blastocystis hominis* among Patients in Baghdad Teaching Hospital

Somaia I. Hussein, MSc.\*

### الخلاصة:

**الهدف:** لتحديد مسببات الإسهال ونسب الخمج بالأوالي المعوية في مستشفى بغداد التعليمي وأهم العوامل المؤثرة فيها. **المنهجية:** جمعت (1374) عينة غائط من المرضى الوافدين لمستشفى بغداد التعليمي في مدينة بغداد وبأعمار مختلفة وللفترة من بداية تموز سنة 2007 ولنهاية حزيران لسنة 2008 مع الأخذ بنظر الاعتبار العمر، الجنس، فحصت العينات بطريقة التركيز وباستخدام المحلول الملحي المركز وصبغة الأيودين.

**النتائج:** ظهرت الإصابة بطفيلي المتحولة الحالة للنسيج بنسبة 21.5% وبطفيلي الكيسية الأريمية البشرية 19.2%. أظهرت النتائج وجود فروق معنوية في نسب الإصابة لكلا الطفيليين وأشهر السنة تحت مستوى معنوي  $p > 0.05$  حيث كانت أعلى معدلات الإصابة لهذين الطفيليين في شهر تشرين الأول وشباط على التوالي وأدناها في شهر نيسان وتشرين الأول على التوالي، كما لوحظ وجود فروق معنوية من ناحية الجنس والعمر تحت مستوى معنوي  $P > 0.05$  حيث كانت إصابة الإناث أكثر من الذكور والفئة العمرية (35- أقل من 40 سنة) هي الأكثر إصابة بالنسبة لطفيلي المتحولة الحالة للنسيج فيما كانت إصابة الذكور أكثر والفئة العمرية (10- أقل من 15 سنة) هي الأكثر إصابة بالنسبة لطفيلي الكيسية الأريمية البشرية.

**التوصيات:** أوصت هذه الدراسة وجود نسبة عالية بالإصابة بطفيلي المتحولة الحالة للنسيج وبطفيلي الكيسية الأريمية البشرية بين المرضى الوافدين لمستشفى بغداد التعليمي مما يتوجب عليه:

1. بناء برامج التنقيف الصحي وتقديمها إلى المجتمع للتعريف بمخاطر الطفيليات وطرق انتشارها.
2. تحسين الظروف الصحية للمناطق المصابة.
3. إجراء دراسات أخرى عن الإصابات الطفيلية لغرض تحديد العوامل الرئيسة المؤثرة في الإصابة وبذلك يمكن انجاز سبل السيطرة.

### Abstract:

**Objective:** To estimate infections agents of diarrhea and infection rate with intestinal parasites in Baghdad Teaching Hospital, and its relationship with factors influencing their spread.

**Methodology:** A total of (1374) stool sample were collected from patients who attended to Baghdad Teaching Hospital with different ages and they were divided into (11) age groups from beginning of July 2007 till the end of June 2008, were taken notes about age, gender. These participants were examined by concentration method by using saturated salt solution and Iodine stain.

**Results:** The results showed that the infection rate with *Entamoeba histolytica* was (21.5%), while the infection rate with *Blastocystis hominis* was (19.2%). The results revealed that there was a significant difference between the infection rate for both parasites and the monthly variation. The highest infection for both parasites was in October and February months respectively, while the lowest infection was during April and October months respectively.

There were significant differences between gender and infection with *Entamoeba histolytica*, *Blastocystis hominis*, females were more than males in infection with *Entamoeba histolytica* and vice versa for infection with *Blastocystis hominis*, males were more than females.

Significant differences were noted in the percentage of infection in relation to patient age in both parasites. The highest infection rate with *Entamoeba histolytica* and *Blastocystis hominis* in age group (35-less 40) year, (10-less 15) year respectively and the lowest infection in age group (5-less 10) year and (1 day-less 5) year respectively.

**Recommendations:** This study showed high infection rate with *Entamoeba histolytica* and *Blastocystis hominis* among patients in Baghdad Teaching Hospital, therefore the study recommends:

1. Construction of health educational programs to the communities regarding parasitic hazards on health and their modes of transmission to be presented to the community.
2. Promotion of environmental sanitation for the effected areas.
3. Research can be conducted on parasitic infections to determine the main factors influencing the occurrence of infections. So, control measures can be achieved.

**Keywords:** Epidemiology, *Entamoeba histolytica*, *Blastocystis hominis*, Intestinal parasites

### Introduction:

*Entamoeba histolytica* and *Blastocystis hominis* are protozoan parasites which have a worldwide distribution and are common in warm and moist climates throughout the world.

\*Assistant Instructor, College of Dentistry, University of Baghdad



## **Estimation of the *Entamoeba histolytica* and *Blastocystis hominis***

The prevalence rate of intestinal amoebiasis is considered one of the highest infection rates in the world <sup>(1)</sup>.

*Blastocystis hominis* is the causal agent of Blastocystosis, intestinal parasitic with a growing prevalence in different regions of the world <sup>(2)</sup>.

More recent reports have indicated that *Blastocystis hominis* infection are common in residents of tropical and subtropical and developing countries <sup>(3)</sup>.

The Panamerican Health Organization recognizes *Blastocystis hominis* as an intestinal parasite that causes diarrhea, gastrointestinal manifestation, abdominal pain, vomiting and flatulence <sup>(2,4)</sup>.

The present study is a continuation of previous studies in Iraq concerned with the epidemiology of intestinal parasites. The present study aims to determine the causative parasites of diarrhea in Baghdad and associated factors that influencing the infections.

### **Methodology:**

A total of (1374) stool samples were collected and examined from patients who attended at Baghdad Teaching Hospital in Baghdad city for the period from July 1<sup>st</sup> 2007 till July 30<sup>th</sup> 2008.

The examinations were performed by using saturated salt solution (concentration method) and Iodine stain. The patients' samples were studied with regard to age, gender. Patients' ages were divided into (11) age group.

The statistical analysis was done by using SPSS-15 under windows VP. ( $P > 0.05$ ).

### **Results:**

This study showed that the infection rate with *Entamoeba histolytica* among the examined samples was (21.5%), while the infection rate with *Blastocystis hominis* was (19.2%) (Table 1).

According to the monthly variations, table (2) and Figure (1) showed that there was a significant difference ( $P > 0.05$ ) between the infection rate and the monthly variation. The highest infection rate for both parasites was in October and February months (24.7%, 32.8%) respectively, while the lowest infection rate was in April and October months (16.7%, 14.5%) respectively.

According to table (3), the results showed that there was a significant difference ( $P > 0.05$ ) between gender and the infection, female patients acquired higher infection rate than male patients with *Entamoeba histolytica* infection (23.9%, 19.4%) respectively, while in *Blastocystis hominis* infection, males were more than females (21.2%, 16.8%) respectively.

Also, this study showed that there was a significant difference between the age groups and the infection rate ( $P > 0.05$ ), the highest infection with *Entamoeba histolytica* and *Blastocystis hominis* in age group (35-less 40) year, (10-less 15) year was (25.4%, 30.4%) respectively, while the lowest infection in age group (5-less 10) year, (1 day-less 5) year was (13%, 8.7%) respectively (Table 4).

**Table 1. Number and Percentage of Infected Persons with *Entameba histolytica* and *Blastocystis hominis***

	Infection with <i>Entamoeba histolytica</i>	Infection with <i>Blastocystis hominis</i>
No. of infected Samples	296	264
%	21.5*	19.2*

\*The total examined samples=1374

**Table 2. Distribution of *Entamoeba histolytica* and *Blastocystis hominis* Infection According to Months**

Month	No. of Examined sample	No. of infected Samples with		No. of infected Samples with	
		<i>Entamoeba histolytica</i>	%	<i>Blastocystis hominis</i>	%
June	188	35	18.6	42	22.3
July	129	31	24	20	15.5
August	70	15	21.4	14	20
September	114	26	22.8	21	18.4
October	117	29	24.7	17	14.5
November	130	27	20.7	19	14.6
December	65	15	23	17	26.1
January	59	14	23.7	10	16.9
February	73	16	21.9	24	32.8
March	101	22	21.7	21	20.7
April	149	25	16.7	27	18.1
May	179	41	22.9	32	17.8
Total	1374	296	21.5	264	19.2

P>0.05 Significant difference,  $\chi^2$ =chi-square 9.902, %=percentage

**Table 3. Comparison According to the Gender of Infected Person with *Entamoeba histolytica* and *Blastocystis hominis***

	No. of infected sample	Male (No. 740)		Female (No. 634)	
		Infected samples	%	Infected samples	%
<i>Entamoeba histolytica</i>	296	144	19.4	152	23.9
<i>Blastocystis hominis</i>	264	157	21.2	107	16.8

P>0.05 Significant difference,  $\chi^2$ =6.573, %=percentage



Table 4. Comparison Between Age Groups of Infected Person with *Entamoeb histolytica* and *Blastocystis hominis*

Age groups (year)	Examined sample	Infect. samples with <i>Entamoeb. histolytica</i>		Infect. sampels with <i>Blastocystis hominis</i>	
		No	%	No	%
1day-less5	80	16	20	7	8,7
5-less10	46	6	13	11	23,9
10-less15	69	10	14.4	21	30.4
15-less20	112	28	25	22	19.6
20-less25	128	18	14	23	17.9
25-less30	130	29	22.3	27	20.7
30-less35	142	32	22.5	28	19.7
35-less40	122	31	25.4	20	16.3
40-less45	155	37	23.8	24	15.4
40-less50	113	23	20.3	24	21.2
50and more	277	66	23.8	57	20.5
Total	1374	296	21.5	264	19.2

P>0.05 Significant difference,  $\chi^2=6.573$ , %=percentage

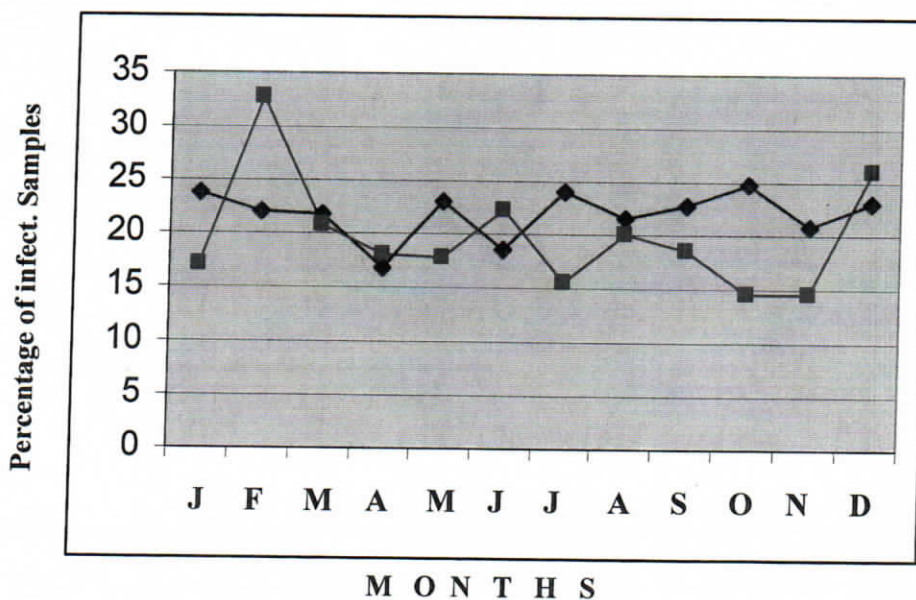


Fig.1: Variation in the Means of of Cumulative Monthly of *Entamoeba histolytica* *Blastocystis hominis* ■

**Discussion:**

This study indicated that the infection rate with *Entamoeba histolytica* among the examined samples (21.5%) (Table1), this rate is approached to other same studies in Iraq (22% in Baghdad and Babel, 19% in Baghdad, 29% in Baghdad) <sup>(5,6,7)</sup>, and to other studies in the world (23%in Kenya, 21% in Phillipine <sup>(8,9)</sup>. While, the infection rate with *Blastocystis hominis* (19.25%), this result is in agreement with some studies in Iraq (18% in Baghdad) <sup>(7)</sup>, and to other studies in the world (1-20% in America, 14.1 in Sarajevo) <sup>(10,11)</sup>, also the rate



infection with *Blastocystis homini* in this study within the rate 0.05-46% which was determined by Kukaschke<sup>(12)</sup>, and within the incidence of these parasites in Iraq (Baghdad) was ranged between 7-33% (12.4%, 7%), (11.4%, 7.2%), (10.1%, 18%)<sup>(13,14,15)</sup> respectively.

This high rate of *Entamoeba histolytica* and *Blastocystis hominis* infections may be related to a number of factors such as poor health, toilet training, overcrowding, low socioeconomic status and climatic conditions<sup>(14,15,16)</sup>.

This result for *Entamoeba histolytica* and *Blastocystis hominis* infection is high in Iraq, specially after the war in 1993 due to many reasons such as the fallback in health hygiene, decrease of socioeconomic conditions and the place where people poor sanitation effect in the prevalence of these protozoa<sup>(13,15,17)</sup>.

Finally, the source of water (treated water or untreated from wells...etc) is very important in this rate infection in Iraq<sup>(14,17)</sup> and other world countries<sup>(8,18)</sup>.

Concerning to the monthly variation, table (2) showed that there was a significant difference between the infection rate and the months of year, the highest infection rate with *Entamoeba histolytica* and *Blastocystis hominis* is in October and February respectively and the lowest infection rate is in April and October respectively, this result is in agreement with the study in Iraq<sup>(19)</sup>. This might be due to favorable life conditions for flies and other insects which are the mechanical vectors of both above mammal parasites, during winter months, temperature decreases and hence influences insects life, also the cold weather kills the infection cysts<sup>(16)</sup>.

In table 3, the results were analyzed statistically ( $P>0.05$ ), there was a significant difference between the prevalence of infection and patients gender, females' infections were more than males' ones in *Entamoeba histolytica* infections<sup>(20)</sup>, and vice versa for *Blastocystis hominis* infections, males were more than females, this is in agreement with some studies<sup>(2,7)</sup>. In male infection more, this might be due to the reason that males' responsibilities in their living habits are more, therefore they are getting indirect contact with environmental factors. Whereas, in the infected females were relatively higher than males, this might be due to the direct contact of the females with the vegetable and other contaminated food materials<sup>(7)</sup>.

Regarding to the age groups, the results revealed in (Table 4) that there was a significant difference between these groups. The age group (35-less 40) year and (10-less 15) year was required high level of infection with *Entamoeba histolytica* and *Blastocystis hominis* respectively, this might due to that these age groups are more active and have direct contact with the environment, while the age groups (5-less 10), (1 day-less 5) were required lower level of infection with *Entamoeba histolytica* and *Blastocystis hominis*, this is in agreement with other studies<sup>(15,19)</sup>.

The reason that these age groups under family and mother care, specially the personal hygiene. Another important factor which affects the rate of infection is the presence of asymptomatic patients in the community who can be considered as the main source of infection through continuously excreting the cysts stages with their stools<sup>(16)</sup>.

### Recommendations:

The study recommends that:

1. Construction of health educational programs to the communities regarding parasitic hazards on health and their modes of transmission to be presented to the community.
2. Promotion of environmental sanitation for the effected areas.
3. Research can be conducted on parasitic infections to determine the main factors influencing the occurrence of infections, so control measures can be achieved



**References:**

1. Shtayel, A.; Hamdan, M.; Shaheen, A. and Faigy, Y.: Prevalence in the Nables Area, West Bank of Jordan, **Ann. Trop. Med. Parasitol**, 1989, 83 (1), P.P.67-72.
2. Cruzlicea, V. and Agustin, P.: *Blastocystis hominis* Among Food Vendors in Xochimilco Markets, **Revi. Lat. Amer. de. microbiol**, 2003, 45 (1-2), P.P.12-15.
3. Qadri, S.; AL-Okaili, G. AL-Dagel, F.: Clinical Significance of *Blastocystis hominis*, **J. Clin. Microbiol**, 1989, 27 (11), P.P.2407-2409.
4. Peter, G.; Halsey, N.; Marcase, E. and Pickering, L.: **Red Book**, 23<sup>rd</sup> ed. **American Academy Pediatrics**, 1994, P.P.139-140.
5. Niazi, A.D; AL-Issa, T.B; ALKhalissi, A.and Khamis, F.Ascariasis in Iraq, **Bull. End. Dis**, 1983, 22 and 23 (1-4), P.P.69-80.
6. AL-Magdi, E.: Diarrhea of Multifactorial Aetiology, **M.Sc. Thesis, Coll. Med., University of Baghdad**, 1986.
7. AL-Tae, A. and AL-Mufragy, S.: Epidemiological Study of the Intestinal Parasites in Patients Attending Two Hospital in Baghdad, **Tik. Med. J**, 2008, 14 (2), P.P.179-182.
8. Jogce, T.; Mcguigan, K. and Conroy, R.: Prevalence of Enteropathogenes in Stools of Rural Massai Children Under Five Years of Age in the Massail and Region of the Kenyan Rift Valley, **East. Afr. Med. J**, 1996, 73 (1), P.P.59-62.
9. Auer, J.: Health Status of Children Living in a Squatter Area of Manila, Philippines, with Particular Emphasis on Intestinal Parasitoses, Southeast, **Asian. J. Trop. Med. Public Health**, 1990, 21 (2), P.P.289-300.
10. Peter, G.; Halsey, N.; Marcase, E. and Pickering, L.: **Red Book** online Quick Search, section three. Summary of Infection Diseases. **American Academy of Pediatrics**, 2006, P.P.790-820.
11. Pikula, Z.: *Blastocystis hominis* and Human Diseases, **J. Clin. Microbiol**, 1987, 25 (8), P.P.1681.
12. Kukaschke, K.; Necker, A. and Muller, H.: Detection of *Blastocystis hominis* by Direct Microscopy and Culture, **Eur. J. Clin. Microbial. Infec. Dis**, 1990, 9, P.P.305-307.
13. AL-Hashimi, A.: Epidemiological and Diagnostic Study of Cryptosporidiosis in Children Suffering form Diarrhea, **M.Sc. Thesis, College of Science, AL-Mustansiriya University**, 2000, P.79.
14. Abbas, E.: Epidemiology of Intestinal Parasites and Head Lice Among Pupils Primary Schools in Baghdad City, **M.Sc. Thesis, Ibn AL-Haitham College of Education, University of Baghdad**, 1997 (in Arabic).
15. AL-Mufragy. S.: The Protozoan Parasite *Blastocystis hominis* in Patients and Those Immunosuppressed Ones, **M.Sc. Thesis, College of Science, AL-Mustansiriya University**, 2000, P.65.

16. AL-Saeed, A. and Issa, S.: Frequency of *Giardia lamblia* Among Children in Dohuk, Northern Iraq, **Eastern Mediter Health. J.** 2006, 12 (5), P.P.555-561.
17. AL-Mussawi, K.: Distribution of Intestinal Parasitic Infection in Kerbala City, 2001, **M.Sc. Thesis, Ibn AL-Haitham College of Education, University of Baghdad, 2001 (in Arabic).**
18. Lai.K.P.F.Intestinal Protozoan Infection in Malaysia, **South Asian J. Trop. Heal and Public Health**, 1992, 23 (4), P.P.578-586.
19. Salman, A.: Epidemiological Study on the Intestinal Parasites Among Children Suffering from Diarrhea and Attending Two Pediatrics Hospitals in Baghdad City, **M.Sc. Thesis , Ibn AL-Haitham College of Education, University of Baghdad, 2002 (In Arabic).**