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Study the Relation between the Incidence of Giardiasis and Some Epidemiological Factors in Some Regions of Baghdad City

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Abstract

In this work, the incidence of giardiasis was investigated in some regions of Baghdad. Different factors were studied such as age, gender, personal hygiene and eating habits, in order to find its correlation with the prevalence of giardiasis. The study was carried out during the period of April 2014 till March 2015. During this period a total of 375 samples have been examined. The total rate of infection was 68/375 (18.13%. The most frequent noticed clinical symptoms in giardiasis cases are abdominal pain 60.97%, diarrhea 41.46% and fever 35%. For the studied factors, each of the age, personal hygiene and eating habits showed a relation with the incidence of giardiasis.

Keywords: Giardiasis, epidemiological factors, clinical symptoms

الخلاصة

في هذا العمل، تم التحري عن الإصابة بطفيلي الجيارديا في بعض مناطق بغداد. تم دراسة عوامل مختلفة مثل العمر والجنس والنظافة الشخصية والعادات الغذائية، وعلاقتها مع انتشارالإصابة بالجيارديا. وقد أجريت الدراسة خلال الفترة من أبريل ٢٠١٤ حتى مارس ٢٠١٥. خلال هذه الفترة تم فحص ما مجموعه ٣٧٥ عينة. كان المعدل الإجمالي للإصابة ٣٧٥/٦٨ (١٨,١٣٪). الأعراض السريرية الأكثر شيوعًا في حالات الجيارديا هي ألم البطن ٦٠,٩٧٪ والإسهال ٤١,٤٦٪ والحمى ٣٥٪. بالنسبة للعوامل المدروسة، أظهر كل من العمر، والنظافة الشخصية والعادات الغذائية علاقة مع انتشار الجيارديا.

Introduction

G.lamblia is common in children in developing countries according the reports of World Health Organization (WHO) [1]. The infection of *G.lamblia* ranges from mild infection, in the persons having normal immuno response, to dangerous diarrhea for both immunosuppressed persons and children suffering from poor nutrition [2]. Severity of the infection varies according to the host immune status, nutritional state, and age, as well as different virulence and pathogenicity of *G.lamblia* strains, some studies suggested that the parasite assemblage may contribute to the development of symptoms [3, 4]. The *G.lamblia* represents a complex species composed of at least eight genetic groups (assemblages A to H) that are distinguishable based on genetic polymorphisms in the glutamate dehydrogenase (*gdh*), β-giardin (*bg*), small-subunit unit rRNA (*ssu*-rRNA) and the triosephosphate isomerase (*tpi*) genes [5]. The main symptoms are watery, greasy and foul smelling diarrhea (steatorrhea), often accompanied by nausea, abdominal cramps or gurgling, bloating and weight loss [6]. Patients may present with extra-intestinal symptoms, such as fever, maculopapular rashes, pulmonary infiltrates, lymphadenopathy, polyarthritis and urticaria, symptoms of variable severity may persist for weeks [7]. The present study was conducted to estimate the effect of some epidemiological factors and some clinical features that correlated with giardiasis.

Materials and Methods

The specimens were collected from: outpatients of Medical City Lab, Al-Noamman Hospital and Al-Khadimya Teaching Hospital dur-

ing the period of April 2014 till March 2015. Stool samples were collected from 375 gastroenteritis patients, each sample was put in a clean screw cap container used for collecting stool samples, original request forms which filled for each patient or his relative including information's about the age, gender, hygiene habits, eating habits and the clinical symptoms' that are suffering from them.

Samples were examined under light microscope, using Lugol's iodine-stained preparation beside fresh normal saline smears in order to detect the presence of *G.lamblia* cyst or trophozoites [8], and Chromatographic Immunoassay detection kit of *Giardia* supplied by certest biotec had been used to be sure of presence of parasite.

Other technique which used in current study to detect the presence of *G.lamblia* is Zinc sulfate flotation technique [9].

Results and Discussion

Among the common parasites affecting humans, *Giardia lamblia* is regarded as the most intestinal ones. Records showed that near half-million cases are registered as new cases; developing symptoms of giardiasis were noticed in about 200 million people per year [7]. The results showed in Table 1 that the number of positive samples of *G.lamblia* was 68 /375(18.13%). While Al-Warid in 2012 mentioned that infective rate in north of Baghdad was 11.66% [10].

Regarding the gender and the infectivity rate, no significant relation was noticed by the results, for the infectivity rate, 36/375 (9.60%) was recorded in males and 32/375 (8.53%) was recorded in females as shown in Table 1, these results agree with observation of Al-Saad and Al-Emarah in 2014 at Al-Basrah province who showed that the incidence of *G.lamblia* was disassociated with gender [11], the reason of this finding may be due to that male and female have the same chance to be exposed to *G.lamblia*.

Table 1: The percentage of total infection and incidence of infection according to the gender

Gender	No. of Infected	No. of non Infected	Total cases	Percentage%
Male	36	158	194	18.55
Female	32	149	181	17.67
Total	68	307	375	18.13
Chi square =0.0485 p-value is 0.825642				

Table 2 showed the maximum infection rate in age group (1-9) year, 47.36%, and the babies under one year 17.77%, there was highly significant relation between age and the rate of infection ($p \leq 0.01$), these findings consistent with most previous research, whether in our country or neighboring countries [12, 13]. The prevalence of giardiasis in children may be due to several reasons, such as the lack of cultural and health education, usually play in places where soil contaminated with parasites [14].

Table 2: The percentage of infection according the age

Age group	No. of Infection	No. of non-infection	Total cases	Percentage %
< 1	8	37	45	17.77
1-9	45	50	95	**47.36
9-19	6	71	77	7.79
19-29	5	59	64	7.81
29-39	1	50	51	1.96
39-49	2	25	27	7.40
>50	1	15	16	6.25
Chi square =77.439 p value is < 0.0001 **P≤ 0.01				

The results in table (3) demonstrated that the take care of washing hands was important cause to decrease the infected because statistical analysis showed highly significant relation between two cases ($p \leq 0.01$), and it is agree with all theories that suggested the poor hygiene were predisposing to infected by *G.lamblia* (15).

Table 3: Percentage of infection according to take care of healthy habits

Take care of healthy habits	No. of infection	No. of non-infection	Total cases	Percentage %
Yes	25	180	205	12.19
No	43	127	170	**25.29
Total	68	307	375	18.13

Chi-square = 10.7414. The p-value is .001048 **P≤ 0.01

The patients asked if they were eating food and followed by symptoms. The infectivity rate of giardiasis in persons taking contaminated food or not, observe in table (4) statistical analysis confirmed that this results gave highly significant relation ($p \leq 0.01$) between *G.lamblia* infection and take contaminated food.

The main cause of food contamination by cyst of *G. lamblia* is the water which used in preparation of food. Eating raw, vegetables or undercooked food (16), and food contaminated with feces especially vegetables.

Table 4: Percentage of infection according to take contaminated food

Take contaminated food	No. of Infection	No. of non-infection	Total cases	Percentage %
Yes	40	85	125	**32
No	28	222	250	11.2
Total	68	307	375	18.13

Chi-square = 24.2863. The p-value is .000001 **P≤ 0.01

Gardia lamblia is an important cause of diarrhea in humans worldwide (1). In the current study, it was seen the diarrhea symptom in 28/68 (41.17%) table (5) of giardiasis patients, the present result is lower than that of study conducted in the province of Al-Basra, which noticed the incidence of diarrhea in giardiasis cases have been 75% (17), The differences in diarrheal percentage in giardiasis patients, may be due to, some cases were asymptomatic and the appearance of symptoms differs from person to person, depending on such factors as inoculums' size, duration of infection, individual host and perhaps parasite factors (18, 7). The most common presenting symptom in addition to diarrhea, is abdominal pain (7), in this study it had been noticed in 41/68 (60.29%) of giardiasis cases, table (5), as well as a lot of study had been revealed that symptom was a significant correlate with giardiasis compared with other symptoms. It was observed at 95% of patients in Egypt who showed positive result of *G. lamblia* in stool (19).

Table 5: Clinical symptoms of giardiasis among 68 human cases with percentage

Clinical symptoms	No. of cases	Percentage %
Diarrhea	28	41.17
Abdominal pain	41	60.29
Fever	24	35.29

References

[1] I,Vanni., Caccio,S.M., Lith,L.V., Lebbad,M., Svard,S.G., Pozio,E. and Tosini,F. Detection of *Giardia duodenalis* assemblages A and B in human feces by simple, assemblage-specific PCR assays. PLoS Negl Trop Dis; 2012. 6(8): pp 1-9.

[2] C.Amar, F., Dear,P.H., Pedraza,S., Looker,N., Linnani, E. and McLauchlin, J.. Sensitive PCR-restriction fragment length polymorphism assay for detection and genotyping of *Giardia duodenalis* in human feces .J Clin Microbiol; 2002.40 (2): pp 446-452.

[3] R,Papini., Paoletti,B.,Cardini,G.and Giangaspero,A. Genetic identification of *Giardia* isolates from symptomatic and asymptomatic shelter dogs. Revue Méd Vét; 2007.158 (3): pp 143-147.

[4] M,Halliez.C.M. and Buret,A.G. Extra-intestinal and long term consequences of *Giardia duodenalis* infections. World J Gastroenterol; 2013.19(47): pp 8974-8985.

[5] Y,Helmy.A., Klotz,C., Wilking,H., Krücken,J., Nöckler,K., Samson-Himmelstjerna, G.V., Zessin,K. and Aebischer,T. Epidemiology of *Giardia duodenalis* infection in ruminant livestock and children in the Ismailia province of Egypt: insights by genetic characterization. Parasit Vectors; 2014.7 (٣٢١): pp 1-11.

[6] L,Bartelt ,.A. and Sartor,R.B. Advances in understanding *Giardia*: determinants and mechanisms of chronic sequelae. F1000 Prime Reports; 2015. 7(62):pp 1-14.

[7] N,Harba, M., Rady, A. A. and Khalefa,K.A. Evaluation of flow cytometry as a diagnostic method for detection of *Giardia lamblia* in comparison to IFAT and other conventional staining techniques in fecal samples. PUJ;2012. 5(2): pp:-١٦٥ ١٧٤.

[8] N,Molina., Polverino,D., Minvielle,M. and Basualdo,J. PCR amplification of triosephosphate isomerase gene of *Giardia lamblia* in formalin-fixed feces. Rev Latinoam Microbiol; 2007.49 (1-2): pp 6-11.

[9] A.Zajac,A.M., Johnson,J. and King,S.E. Evaluation of the importance of centrifugation as a component of zinc sulfate fecal flotation examinations. JAAHA; 2002. 38: pp 221- 224.

[10] H,Al-Warid.S.J.Study of some epidemiological aspects of giardiasis in north of Baghdad. J Baghdad Sci; 2012. 9(2): pp251-252.

[11] R,Al-Saad. and Al-Emarah,G. Zoonoses *Giardia*. bilogical and molecular study of *Giardia* parasite as a zoonotic potential in human and animal at northern Basrah-Iraq.2014. Text book. Lambert .Germany.

[12] A,Arani.S., Alaghehbandan, R., Akhlaghi,L., Shahi,M. and Lari,A.R. Prevalence of intestinal parasites in a population in south of Tehran, Iran. Rev Inst Med trop S Paulo; 2008.50(3): pp 145-149.

[13] N,Turki,M., Mallah,M.O. and Kremsh,Y.D. Iraqi genotyping of *Giardia lambila* (A,B,E,F) in human stool in Al-Muthanna Province-Iraq. IJAR; 2015.3(10): pp 757-771.

[14] A,Basima.S. Study on the prevalence of intestinal parasites among children attending Al-Daura Health Centre-Baghdad. Sci J Nursing / Baghdad; 2005.18(1):pp 53-57.

[15] H,Ahmed .S. and A'aiz, N.N. Detection of giardiasis in apparently healthy cattle by using direct ELISA technique. Al-Qadisiya J Vet Med Sci; 2015. 4(1): pp 1-3.

[16] U.S.EPA.*Giardia*: Human health criteria document. United States Environmental Protection Agency. Office of Water 4304, 1998. EPA-823-R-002.

[17] G,Al-Emarah,.Y.A and Al-Saad,R.K.A Symptomatic assessment of human giardiasis in Basrah. J Infect Dis Ther; 2014. 2(5): pp 1-3.http://dx.doi.org/ 10.4172/2332-0877.1000154.

[18] L,Al-Taie. and Ali,F.M.(2009). Epidimiology of giardiasis in Sulaimaniya and

Chamchamal with its effect on some biochemical parameters and PCV. QMJ; 2009.5(7) pp 45-53.

[19] M,Helmy.M.F, Abdel-Fattah,H.S. and Rashed,L. Real-Time PCR/RFLP assay to detect *Giardia intestinalis* genotypes in human isolates with diarrhea in Egypt. J Parasitol;2009. 95(4): pp 1-5.