Study of Some Epidemiological Aspects of Giardiasis in North of Baghdad

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Abstract:

Different factors have been examined to be related with the prevalence of Girdiasis in the north of Baghdad in human beings which were (gender, age , occupation ,family size,faecal status and presence of domestic animals) during the period from the beginning of April 2009 till the end of March 2010.

This study revealed that the total rate of infection in human being was 11.66% , and no significant differences ($p \leq 0.05$) were noticed between male and female as their rates of infection were 52.32% and 47.68% respectively , as well as no significant relation was observed between faecal status and the rate of infection, the percentage of positive cases in diarrheal patients was higher than the non diarrheal patients who were 74.41 and 25.59 respectively ,while there was significant relation between the presence of domestic animals and prevalence of giardiasis ($p \leq 0.05$) ,the infectivity rate reached to 23.25% in persons who had domestic animals in their household .

Also high infection rate have been recorded among children less than 10 years old which was 51.16 % when it compared with other age groups, as well as preschool children and person belong to family composed of (5-9) individual were observed to be the majority groups that infected with *Giardia* which were 44.18% and 50% respectively, although there were no significant relation ($p \leq 0.05$) between each of age, occupation and family size with infectivity rate of *Gairdi*a.

Key words : Giardiasis , Epedimiology

Introduction:

Giardia lamblia (synonyms*: G.intestinalis, G.duodenalis*) is a universal and well-known enteric flagellated Protozoa that is found in the intestines of mammalian hosts, including domestic, wild animals and humans [1, 2]. It is a flagellated, teardrop-shaped parasite which has only two life forms, the trophozoite and the cyst [3].Giardiasis is associated with poor sanitary conditions, insufficient water treatment [4], day-care centers and with institutional facilities such as nursing homes [5]. Infection occurs when infective cysts of *G. lamblia* are ingested by a susceptible host through contaminated water, food, by direct person-to-person or animal-to-person transmission [6].

Giardia lamblia has a global distribution causing an estimated 280 million cases per year [7], and is the most common intestinal parasite of humans in developed countries. In Asia, Africa and Latin America, about 200 million people have symptomatic giardiasis with some 500,000 new cases reported each year [8]. It is also a frequently encountered parasite of domestic animals, especially livestock, dogs , cats, and numerous species of wild mammals and birds have been documented as hosts of *Giardia* [9].

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Several surveys of intestinal parasitosis in Iraq have shown a different incidence level of giardiasis in different age group, 3.78% in Baghdad governorate (urban region) [10] ,9.5% in Alanbar governorate [11] , 48% in Alexandaria commune / Wasit governorate (rural region) [12] , while the percentage in children were as following 12% in Baghdad governorate [13] , 11% in Al-Sowera / Wasit governorate [14], 38.5% in Dohuk governorate [15] and 71.43% in Diala governorate[16].

Although all previous studies occurred in Iraq , more description on the epidemiological status of this disease is needed as well as we have to update our data about this parasite and other related enteric parasites.

Materials and Methods:

This study was conducted in the North of Baghdad: AL-Noor primary health care center, AL-Noor General Hospital , AL-Khadimya Teaching Hospital and AL-Khadimya Hospital for children / Baghdad , during the period from beginning of April 2009 till the end of March 2010.

Faecal samples have been collected from 737 diarrheal and non diarrheal patients of both gender at various ages and occupations, each sample was put in a clean screw cap container used for collecting stool samples, labeled with the number and date of collection. A special form of information was filled for each patient. This study was done to evaluate the correlation between prevalence of *Giardia lambilia* and some related factors.

The samples have been concentrated by formalin-ether method. A drop was taken from each deposit by Pasture pipette and was smeared on a glass slide and then was examined by light microscope with ×100 objective [17].

Experimental data were presented in terms of observed numbers and percentage frequencies, and then analysed by Statistical Package for Social Sciences (SPSS 10.01) using the Chi-square test, P value $\leq$ 0.05 was considered statistically significant

Results and Discussion:

The prevalence of giardiasis was studied in two locations, in the north of Baghdad (AL-Shulaa and AL-khadimya) , the results showed that the total infectivity rate of Giardiasis was 11.66% (86/737) Figure 1 , this percentage was similar to the results of the studies that occurred in Al-Tamem and Arbil governorate the percentage was 11.45% and 10.9% respectively [18,19] , while the result of the current study was higher than other study occurred in Baghdad [10] that recorded 3.78% and was lower than the results of (Atia ,2009) [12] that got 48% in Wasit governorate, while the prevalence of *Giardia* in stool specimens submitted for ova and parasite examination has been reported to be 2%–5% in industrialized countries and 20%–30% in developing countries[20]. The differences in prevalence may be due to the nature of areas, socio-economic, educational and nutritional status, personal and community hygiene, and the methods used in examination of faecal samples [12].

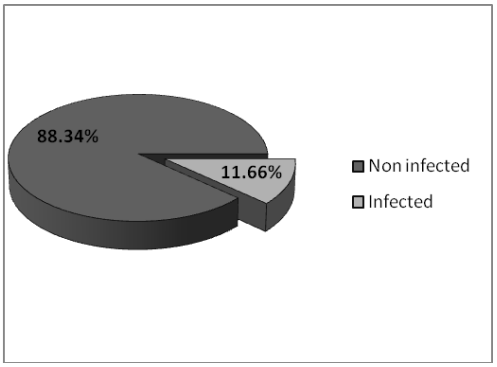

Fig.1. Percentage of infected and non infected persons with *Giardia*

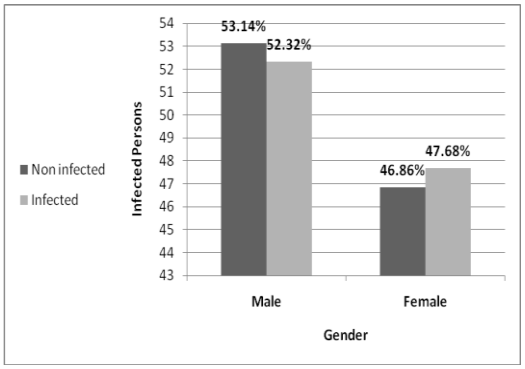

Fig.2. Gender related prevalence of *Giardia*

Figure 2 showed that there were no significant differences ($p \leq 0.05$) between male (52.32 %) and female (47.68%) infectivity rate, this non significance can be discussed by both male and female especially in urban region who have the same chance in working and learning so the exposure to *Giardia* and other parasites may not varied so much between genders , this result was in agreement with the result of Nunez et al.,(1999) [5] and Berrilli *et al*. (2006) [21], both showed that there were no differences in sex distribution , while other showed significant relation between gender and *Giardia* infectivity rate , some of them reported that the female had highest infectivity rate due to the household activities, such as; food preparation and cleaning which might expose them to parasites [22,23] , while other reported that the male had the highest infectivity rate ,they believed that the higher rate of infections with intestinal parasites in males may be due to the more activities and as they were more in contact with environmental conditions than females [15].

Another factor which affects the rate of giardiasis is the presence of asymptomatic patients in the community that can be considered as an important reservoir for spread of the infection [24] , in this study the percentage of asymptomatic patients was 25.59% while in the majority of infected individuals (about 60%, depending on the population) the infection remains asymptomatic [20] .Figure 3 illustrated that there was no significant relation ($p \leq 0.05$) between the faecal status and the infectivity rate this may due to the method used in diagnosis , so more sensitive method must be conducted to detect some of the gastrointestinal protozoan parasites[25].

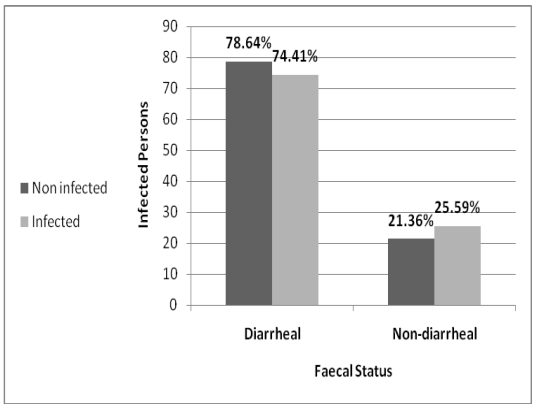

Fig.3. Faecal status related prevalence of *Giardia*

The finding of this study demonstrated that there was significant relation between the presence of

domestic animals and prevalence of giardiasis ($p \leq 0.05$) ,the infectivity rate reach to 23.25% in persons who had domestic animals in their household figure 4 , this result was in agreement with the result of Pereira *et al*.(2007) [26] who confirmed that Giardiasis was positively associated with the number of household cats such that the odds for infection increased by about 25% for each additional cat in the household, other a recent molecular epidemiological study reported zoonotic transmission in an endemic community where humans were living closely with dogs [27] ,as well as some investigators showed that the genus *Giardia* includes species that are host specific and species that have zoonotic potential. The latter include genotypes (assemblages A and B) found in humans and most mammalian orders [28] other postulated that domestic ruminants may be a reservoir for human infection [29,30].

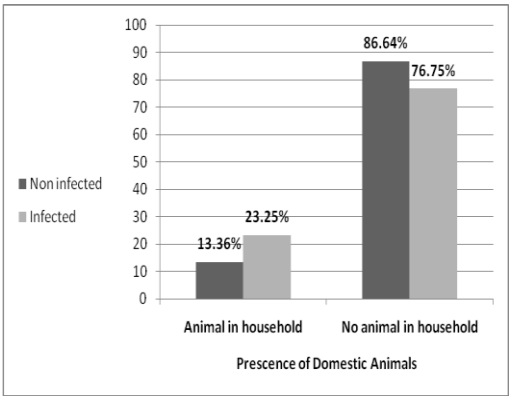

Fig. 4. Domestic animals presence related prevalence of *Giardia*

Figure 5 showed age related prevalence of giardiasis in the current study , the maximum infection rate was seen in age group less than 10 years (51.61%) while other age groups (10-19), (20-29) , (30-39) and (40≤) showed less infectivity rate (13.95%) ,(9.30%) ,(9.30%) and (16.27%) , but statistical analysis showed that the rate of infection in this study was not significantly related to the age of patients ($p \leq 0.05$) , this finding agreed with Kadir *et al*., (2006) [31] and other investigators from Latin American countries who reported that endemic intestinal parasitosis is persistent and prevalent in people of all ages, especially the soil-transmitted helminths and the protozoa *Cryptosporidium parvum*, *Giardia lamblia*, and *Entamoeba histolytica* [32], while the result of the current study disagreed with study done by Haydar [18] who observed significant difference between the rate of infection and different age groups.

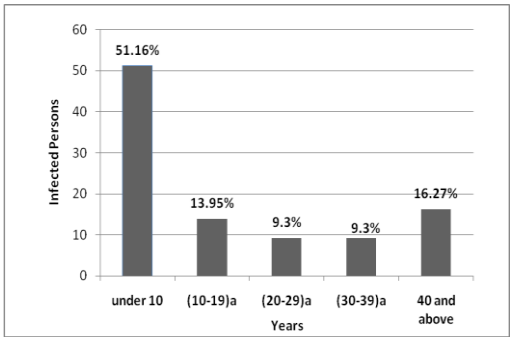

Fig. 5. Age related prevalence of *Giardia*

Other results of the current study showed in (figure 6) which illustrated the occupation related prevalence of giardiasis , the maximum infectivity rate was seen in pre-school children(44.18%) followed by student (26.74%) , while the minimum infectivity rate was seen in worker (16.27%) and house wives (12.79%) , but statistical analysis showed that there was no significant relation between occupation and infectivity rate , this was agreed with the result of Elspage *et al.* ,(2010) [33] , and disagreed with Raza & Sami (2009) [23] who showed significant high infectivity rate in student when it compared with other occupational group , while other investigator showed that housewives are more infected with giardia than other

because of household activity such as food preparation [22] , the present results showed no significant relation between family size and infectivity rate , although the high percentage of *Giardia* positive case (50%) were seen in families composed of (5-9) person when it compare with other family cluster which composed of (less than 5) ,(10-15) and (15 and above) the infectivity rate was (15.11%), (18.60%) and (16.27%) respectively figure 7. Children who lived in a family with other young children (< 10 years old) were at greater risk for *G. lamblia* infection compared to children in families without additional young children. For example, the odds of *G. lamblia* infection for the index child increased by about 50% for each additional household child, while the number of household adults was negatively associated with the odds of *G.lamblia*, in that the odds of *G. lamblia* infection declined by about 50% for each additional adult in the family [26], so in the current study not only the number of family members have to be scored but the number of child and adult person have to be scored in specific.

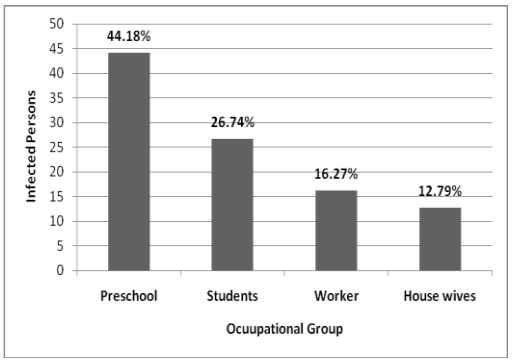

Fig.e 6. Occupation related prevalence of *Giardia*

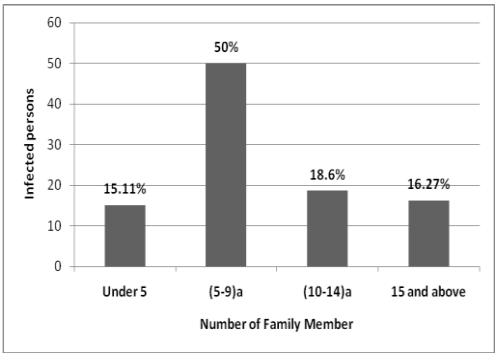

Fig. 7. Family size related prevalence of *Giardia*

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دراسة بعض الجوانب الوبائية للأصابة بطفيلي الجياردیا شمال مدينة بغداد

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الخلاصة:

تمت دراسة معدل انتشارالأصابة بطفيلي الجياردیا في سكان مناطق شمال بغداد ، خلال الفترة من نيسان 2009 حتى آذار 2010 ، في عينات من براز الأنسان، وقد تم فحص عدد من العوامل التي يمكن ان تكون ذات صلة مع انتشار هذا الطفيلي وهي: (جنس المريض ،العمر، المهنة عدد افراد العائلة، حالة البراز و وجود الحيوانات).

كشفت هذه الدراسة ان معدل الأصابة الأجمالية بالطفيلي كانت 11.66% . اظهرت النتائج عدم وجود فروق معنوية على مستوى ($P\leq 0.05$) بين الذكور و الأناث من حيث معدل الأصابات بطفيلي الجياردیا ، اذ بلغت معدلات الأصابة 52.32% و 47.68% على التوالي ، في حين لوحظ عدم وجود علاقة معنوية بين طبيعة البراز ومعدل الأصابة بالطفيلي ، حيث كان معدل الأصابة لدى المرضى الذين ظهرت عليهم علامات الأسهال اعلى من معدل الأصابه لدى المرضى الذين لم تظهر عليهم علامات الأسهال حيث كانت 74.41% و 25.59% على التوالي ، بينما ظهرت علاقة معنويه على مستوى ($P\leq 0.05$) بين معدل الأصابة بالطفيلي و وجود الحيوانات في المنازل اذ بلغت نسبة الأصابة لدى الأشخاص الذين يربون حيوانات في منازلهم 23.25%. سجلت اعلى معدلات الأصابه بالطفيلي لدى الأطفال بعمر اقل من 10 سنوات حيث بلغ معدل اصابتهم 51.16% مقارنة بالفئات العمرية الأخرى ، فضلا عن ان النسبة العظمى من الأصابات لوحظت في فئة الأطفال قبل سن المدرسة و الأشخاص الذين ينتمون الى عوائل مكونه من (5-9) افراد والتي كانت معدلات الأصابة لديهم 44.18% و 50% على التوالي، على الرغم من عدم وجود علاقة معنوية على مستوى ($P\leq 0.05$) بين كل من العمر،طبيعة العمل وحجم العائلة من جهه ومعدلات الأصابة بالطفيلي من جهه اخرى.