

**INCIDENCE OF *GIARDIASIS* IN PATIENTS
ATTENDING AL-IMAM ALI GENERAL HOSPITAL IN
AL-SIDDAR CITY, BAGHDAD, IRAQ**

**نسبة الإصابة بالجيارديات بين مراجعي مستشفى الإمام علي العام في مدينة الصدر
بغداد , العراق**

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Abstract:

The present study is aimed to asses the incidence of giardiasis in patients attending Al-Imam Ali general hospital in Al-Siddar city, Baghdad. A total of 2923 stool specimens collected from patients which have symptoms of diarrhoea.

The incidence of *Giardia. lamblia* infection was 6.84 %. The highest rate of infection was in July (12.22%) and the lowest in December (4.29 %) with significant difference ($P < 0.05$). Females had a higher rate than males (7.00% and 6.70 %) respectively without significant difference. The cysts infection had the highest rate compared with trophozoites infection with significant difference ($P < 0.05$).

Some samples showed mixed infections were *G. lamblia* was combined with *Entamoeba histolytica* and *Hymenolepis nana*.

المستخلص:

هدفت الدراسة الحالية إلى تقييم حدوث الإصابة بالجيارديا لمبليا بين مراجعي مستشفى الامام علي العام في مدينة الصدر ببغداد , إذ تم فحص 2923 أنموذجاً من عينات البراز التي جمعت من المراجعين ، فقد كانوا يعانون من الإسهال. بلغت نسبة الإصابة بالجيارديا لمبليا 6.84% . وقد بلغ أعلى معدل للإصابة في شهر تموز (12.22%) وأدنى معدل في شهر كانون الأول (4.29 %) مع فرق معنوي ($P < 0.05$). فيما يخص الجنس سجلت الدراسة معدلات إصابة في الإناث أكثر من الذكور (7.00% و 6.70 %) على التوالي ولكن بعدم وجود فروق معنوي ، ولوحظت أعلى نسبة إصابة بالأكياس مقارنة مع الناشطات مع فرق معنوي ($P < 0.05$). وقد أظهرت بعض العينات إصابة مزدوجة ، إذ كانت الجيارديا لمبليا مصحوبة بالمتحولة الحالة للنسيج ، والمحرشفة القزمية.

Introduction:

Giardiasis is parasitic infection of human , this parasite cause diarrhea and impaired gain of body weight . This study deals with epidemiology of *G. lamblia* infections in patients attending Al-Imam Ali general hospital in Al-Siddar city, Baghdad . *G. lamblia* is a parasitic protozoan which has worldwide distribution [1, 2] In recent years evidence has accumulated that *Giardia* infects and causes illness in million of people throughout the world in both epidemic and sporadic forms and the disease record by the WHO as one of important disease cause of diarrhoea and a bout 200 million infections occur annually in Africa, Asia and Latin America [3]. The prevalence of *G. lamblia* ranges from 2%–7% in industrialized countries and 20%–60% in developing countries [4, 5].

Water is the most frequently identified route of transmission [5,6], through drinking contaminated tap water [7,8] or recreational exposure in lake, rivers, or swimming pools [9]. Food may also be a vehicle of infection [10]. *Giardia* is generally considered capable of causing enteritis and diarrhea, extensive infections result in intestinal malabsorption and impairment of growth[11]. Giardiasis may significantly interfere with growth and normal development in children under 5 years of age [12]. *G. lamblia* is more common in children but all age groups are affected in epidemic areas [13]. Several surveys of intestinal parasites in Iraq have shown a high incidence of giardiasis among children [14, 15]. Now that human giardiasis is recognized as a zoonosis [16, 17, 18].

Materials and Methods :

This study was conducted from January 2007 to December 2007, Stool samples were collected from patients attending Al-Imam Ali general hospital in Al-Siddar city, Baghdad, have symptoms of diarrhoea. The stool samples were taken immediately to the laboratory of the hospital for examination. The stool samples were examined with the naked eye for colour, consistency and the presence of any adult helminthes. Then they were examined microscopically by direct and concentrated methods for presence of *Giardia* trophozoite and cyst stages and for detection of other parasite stages.

The concentrated method used in this study was the zinc sulphate floatation method [19]. Two types of direct wet film preparation were done for each sample at the same time, one slide by using normal saline 0.85% for detecting the motility of trophozoites and Lugol's iodine 5% slide for demonstrating structures [20].

Statistical analysis: variance and the significance differences were determined by chi square [21].

Results:

Stool samples from 2923 patients attending Al-Imam Ali general hospital in Al-Siddar city, Baghdad, from different age and of both sexes , have symptoms of diarrhoea were examined to investigate the prevalence of parasitic infections.

The incidence of *G. lamblia* was 6.84 % (Table1.) Among the 1537 samples taken from males 103 were positive for *G. lamblia*. The parasite was found in 97 of the 1386 females (Table 1.) The incidence of *G. lamblia* did not differ significantly between males and females ($P < 0.05$).

Table 1. Incidence rate of *G. lamblia* in patients attending Al-Imam Ali general hospital in Al-Siddar city, Baghdad

| Sex | Number of infected Patients / total patients | % |
|--|--|------|
| Male | 103/1537 | 6.70 |
| Female | 97/1386 | 7.00 |
| Total | 200 / 2923 | 6.84 |
| $\chi^2 = 0.096$, $df = 1$, $P < 0.05$ | | |

The distribution of *G. lamblia* according to the months and sex summarized in Table 2. *Giardia* were found in all months , but the highest rates of giardiasis were found in the July (12.22%), whereas the rates were lower in the December (4.29%). The statistical analysis revealed a highly significant difference in infection rate between July and other months ($P < 0.05$).

Table 2. Distribution of *G. lamblia* infection according to the months and sex.

| Months | Total No. | Infected No. | % | Male | | | female | | |
|-------------------------------------|-----------|--------------|-------|-------------------------------------|-------------|-------|-------------------------------------|-------------|-------|
| | | | | Total No | Infected No | % | Total No | Infected No | % |
| January | 102 | 10 | 9.80 | 62 | 3 | 4.84 | 40 | 7 | 17.50 |
| February | 104 | 5 | 4.81 | 54 | 2 | 3.70 | 50 | 3 | 6.00 |
| March | 192 | 12 | 6.25 | 100 | 8 | 8.00 | 92 | 4 | 4.35 |
| April | 357 | 25 | 7.00 | 157 | 14 | 8.92 | 200 | 11 | 5.50 |
| May | 320 | 19 | 5.94 | 157 | 9 | 5.73 | 163 | 10 | 6.13 |
| June | 265 | 21 | 7.92 | 136 | 14 | 10.29 | 129 | 7 | 5.43 |
| July | 270 | 33 | 12.22 | 164 | 17 | 10.37 | 106 | 16 | 15.09 |
| August | 232 | 20 | 8.62 | 105 | 9 | 8.57 | 127 | 11 | 8.66 |
| September | 294 | 18 | 6.12 | 179 | 6 | 3.35 | 115 | 12 | 10.43 |
| October | 304 | 14 | 4.61 | 180 | 8 | 4.44 | 124 | 6 | 4.84 |
| November | 320 | 16 | 5.00 | 160 | 9 | 5.63 | 160 | 7 | 4.37 |
| December | 163 | 7 | 4.29 | 83 | 4 | 4.82 | 80 | 3 | 3.75 |
| $\chi^2 = 22.36$, df = 1 , P <0.05 | | | | $\chi^2 = 65.15$, df =11 , P <0.05 | | | $\chi^2 = 24.46$, df =11 , P <0.05 | | |

Table 3. shows stage of *G. lamblia* infection. Cysts were the most predominant phase isolated from 126 patients (4.31%), while trophozoites were found in 74 patients (2.53 %). The highest infection rate of cysts were in July (8.51 %) followed by Jan. (5.88 %). The difference in the rates of infection during the months was significant (P < 0.05).

Table 3. Incidence rate of infection by *G. lamblia* trophozoites and cysts.

| Months | Total No. | No. of infected by trophozoites | % | No. of infected by cysts | % |
|-------------------------------------|-----------|---------------------------------|------|--------------------------------------|------|
| Jan. | 102 | 4 | 3.92 | 6 | 5.88 |
| Feb. | 104 | 2 | 1.92 | 3 | 2.88 |
| March | 192 | 2 | 1.04 | 10 | 5.20 |
| April | 357 | 10 | 2.80 | 15 | 4.20 |
| May | 320 | 10 | 3.13 | 9 | 2.81 |
| June | 265 | 6 | 2.26 | 15 | 5.66 |
| July | 270 | 10 | 3.70 | 23 | 8.51 |
| August | 232 | 8 | 3.45 | 12 | 5.17 |
| September | 294 | 7 | 2.38 | 11 | 3.74 |
| October | 304 | 7 | 2.30 | 7 | 2.30 |
| November | 320 | 4 | 1.25 | 12 | 3.75 |
| December | 163 | 4 | 2.45 | 3 | 1.84 |
| total | 2923 | 74 | 2.53 | 126 | 4.31 |
| $\chi^2 = 7.98$, df =1 1 , P <0.05 | | | | $\chi^2 = 38.14$, df = 11 , P <0.05 | |

Overall, 10 out of 200 infected samples showed mixed infections with other intestinal parasites combined with *G. lamblia* (Table 4). *G. lamblia* was combined with *Entamoeba histolytica* (70%) and *Hymenolepis nana* (30%).

Table 4. Distribution of other intestinal parasites associated with *G. lamblia* infection.

| Parasite (mixed infection) | No. of samples infected | % |
|--|-------------------------|-----|
| <i>G.lamblia+Entamoeba histolytica</i> | 7 | 70 |
| <i>G.lamblia+Hymenolepis nana</i> | 3 | 30 |
| Total | 10 | 100 |

Discussion :

The infection rate with *G. lamblia* was 6.84 % . Although *Giardia* infection has been reported from human in many parts of the world, prevalence data have often varied markedly , deduction procedures for acquiring , concentrating and identifying parasites differ significantly from laboratory to laboratory, some techniques are markedly more sensitive and accurate than others in detecting and identifying parasites, thereby influencing the data upon which the prevalence of infection is based[22]. The (prospect®)*Giardia* Rapid Assay detected 4% more *G. lamblia* infections than formalin-ether concentration, which is the method used routinely in the hospital laboratory[23].

The rate of infection in the present study is similar to other studies in Iraq, this slightly lower result may be due to the parasite has randomized passage in stool and therefore may have false negative results.

First study for detect intestinal parasites in Iraq carried by Senkji, *et al* in 1939,who found the prevalence rate of *G. lamblia* infection is 8.5% [24]. Halawani (1942) found that the infection rate of *Giardia* was 2.1%[25]. A total of 1858 stool specimens were collected from the primary school children in Kerbala (urban and rural) examined for intestinal parasites, *G. lamblia* was the leading parasite detected with a prevalence rate of 9.9%[26] . Same study in Numania district ,Wasit , *G. lamblia* was recorded with an infection rate of 18.7 % [27].

Incidence rates of *G. lamblia* in females and males were 7.00% and 6.70 % respectively. They were diagnosed at equivalent rates in males and females. Similarly , in a study in Jamaica, the gender of the patients studied did not influence the rate at which *G. lamblia* infections were detected [23]. In contrast, study in rural Egypt, male sex was associated with a significantly higher relative risk for the first episode of symptomatic giardiasis, although the rate of infection with parasite was lower in boys than girls [28]. On the other hand, study in northern Jordon [29] found the prevalence of giardiasis was higher among boys than girls.

G. lamblia were identified in all (100 %) months surveyed by direct examination and zinc sulphate flotation technique. The present study showed that in Baghdad , most infections with *G. lamblia* occurred in hot months, and peak of infection in July. These results agreement with others studies in Iraq and other parts of the world[6,14, 23,30],explain summer which may be sources of infection, due to greater consumption of drinks and food, e.g. ice cream. Cold weather kills the infective cysts [31]. The unfavorable temperature of *G. lamblia* cyst is less than 5 °C and the cysts usually die at more than 62 °C [32].

There were mixed infection by *G.lamblia* with *E. histolytica* was most common intestinal parasite associated with *G.lamblia* infection . The other important pathogenic parasite mix infection with *G.lamblia* was *H. nana*. Other studies have demonstrated the same results [26, 33]. In contrast , study in Jamaica showed that no mixed infections with parasites [23].

Giardia has been isolated from many animal species and until the 1950 these isolates were believed to be highly host specific and were named according to host species, for example, *G. bovis*

, *G. catis* , *G. canis*; over 40 species were thus described . Later only three distinct species were considered to exist, *G. lamblia* being the species which infects man and other mammals[6]. A study have successfully infected animals with *G. lamblia* cysts isolated from human, after several days show diarrhea and cysts in the feces of animals and trophozoites in the duodenum after killed animals[18],this demonstrate that human giardiasis is recognized as a zoonosis.

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