

Incidence and age distribution of *Giardia lamblia* infection for sex years in Al-Najaf province in Iraq

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Abstract

This study aimed to determine the prevalence of *Giardia lamblia* infection in Al-Najaf province, Iraq, based on various risk variables for sex years. From October 2015 to March 2021, samples were collected from suspected patients in the AL-Hakeem hospital and AL-Zahra maternity and paediatrics clinics in AL-Najaf province; stool samples were collected into clean, wide-mouth specimen bottles from suspected patients, and freshly voided stool specimens were processed and examined microscopically for intestinal parasitology. The current investigation found that 44 out of 44 (9.77%) patients were infected after detecting cyst and trophozoite of *G. lamblia*. The infection rate is proportional to the size of the family. Children from tiny families had the lowest infection rate (18.3%/15/82) and 18.3% (15/82). (4 persons). The infection rate gradually increased as family size grew, reaching 83.3 percent (5/6) in children from big households (12 persons). Based on the chi-square test, it was discovered that family size is non-significantly ($P > 0.05$) connected with pinworm infection.

Keywords: Incidence, *Giardia lamblia*, infection, Al-Najaf, Iraq.

INTRODUCTION

Infection with *G. lamblia* leads to the cause of the disease known as Giardiasis, which may be asymptomatic or may lead to cause several clinical manifestations (1). *Giardia* is among the five most common causes of diarrhea (2). In 2004 the world health organization classified the disease caused by *Giardia* as a neglected disease due to the lack of knowledge about the molecular mechanism of this disease, especially in undeveloped countries (3). According to an experiment applied to humans, the infection dose for *Giardia* may be as low as ten cysts (4). The symptoms may last several weeks, and the patient may fail to eradicate the parasite. This leads to chronic infection (5). Some studies refer to the parasite act to increase the secretion of chloride ions and decrease absorption of glucose, sodium and water; this leads to cause diarrhea (6) and also causes malabsorption of proteins, carbohydrates, fats, calcium and vitamins (7) especially fat-soluble vitamins, A, D, E and K and water-soluble vitamins B12 and lactose (8). Different clinical manifestations can be caused by factors such as the host's age, immunological and nutritional state, pathogenicity, and virulence of *Giardia* (9). *Giardia* transmission occurs via the faecal-oral pathway, indirectly through water and food or human-to-human and animal-to-human contact (10). According to several research, assemblage A causes acute diarrhoea, whereas assemblage B causes less severe diarrhoea (11,12). In other research, patients with intermittent diarrhoea were shown to have assemblage A, while those with more severe diarrhoea had assemblage B (13). The presence of some change in bile levels and changes in the number of normal flora in the intestine has been reported in some studies; additionally, the parasite can cause disease without penetrating the intestinal epithelium; and other factors that interfere with the disorder's appearance and pathogenesis include the patient's age and the number of ingested cysts (6).

MATERIAL AND METHODS

From October 2015 to March 2021, samples were collected from suspected patients in the AL-Hakeem hospital and AL-Zahra maternity and paediatrics clinics in AL-Najaf province; stool samples were collected into clean, wide-mouth specimen bottles

from suspected patients, and freshly voided stool specimens were processed and examined microscopically for parasitic intestinal infections (14).

RESULTS

The parasite was identified following investigations of stool samples using a general stool examination test; 44 of 44 (9.77%) patients were infected after detecting cyst and trophozoite of *G. lamblia*, as illustrated in figures 1, 2 and 3. Infection with Giardiasis and the size of the family As shown in Table 1, the infection rate is proportional to the size of the family. Children from low-income homes had the lowest infection rate (18.3%/15/82). (4 persons). The infection rate gradually increased as family size grew, reaching 83.3 percent (5/6) in children from big households (12 persons). Based on the chi-square test, it was discovered that family size is non-significantly ($P > 0.05$) connected with pinworm infection.

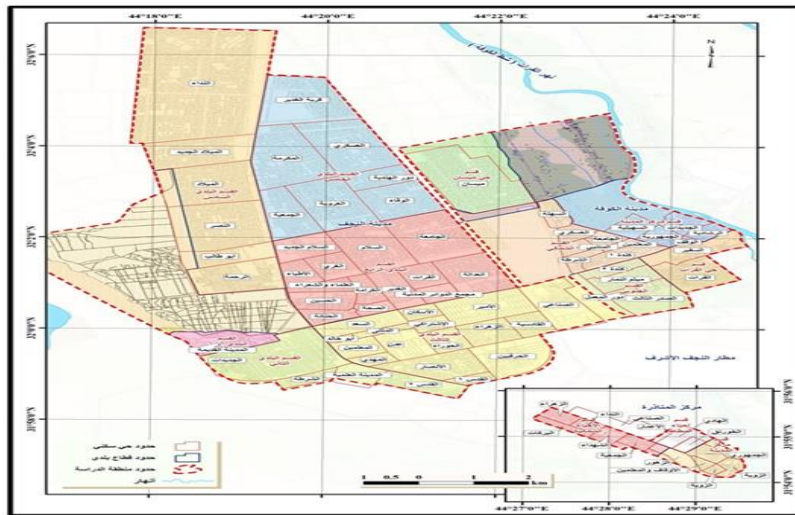


Figure 1: The map of Al-Najaf Al-Ashraf shows the location of the study (<http://arkansawhogsauce.com>)

Table 1: Giardiasis incidence and distribution according to family size in Najaf province, Iraq, 2015 – 2020

Family size of Giardiasis	NO. of examination	NO. of Giardiasis Ve+	NO. of Giardiasis Ve-	Percentage % Giardiasis Ve+
2	210	2	208	0.95
3	667	6	661	0.89
4	678	23	655	3.39
5	892	75	817	8.40
6	974	89	885	9.13
7	679	48	631	7.06
8	489	29	460	5.93
9	360	14	346	3.88
10	230	9	221	3.91
11	70	44	26	62.85
12	40	3	37	7.5
13	33	1	32	3.03
14	26	0	26	0

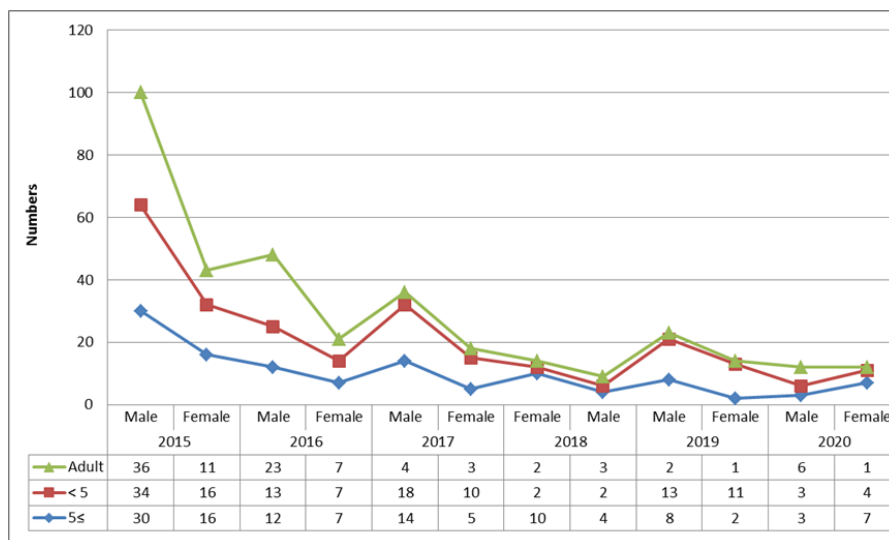


Figure 2: Giardia incidence and distribution by age, Najaf province, Iraq, 2015 – 2020.

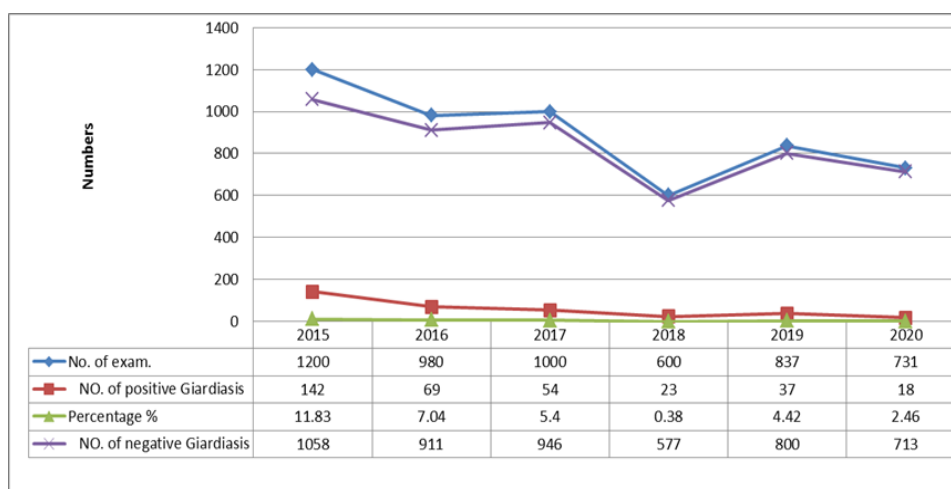


Figure 3: Number and percentage of Giardia incidence in Najaf province, Iraq, 2015 – 2020

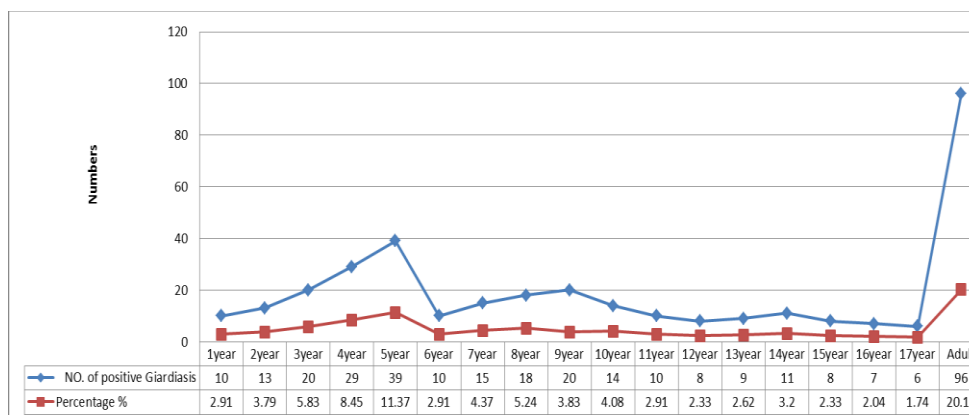


Figure 4: Number and percentage of Giardia incidence according to numbers of years age in Najaf province, Iraq, 2015 – 2020

DISCUSSION

According to table 1, the result of the study showed significant differences in the incidence of infection between male and female (77 male and 41 female $5 \leq$) and (83 male and 50 < 5) patients. In comparison, the adult (66 male and 26 female) were infected by recognizing cyst and trophozoite of *G. lamblia*, where the number of males was higher than that of females. These results agree with the result (15), which observed that the percentage of infection in males was 32.07 percent and in females, 25.2 percent. An increase in the per cent of male infection may be due to males' behaviour in dealing with their surrounding environment. The category most movement, contact with external environmental factors in terms of their survival for a long time outside their homes to practice the business, which imperative them to eat and drink in crowded restaurants and shops that not clear and street vendors and play games more than female in addition to bad habits such as put fingers in the mouth and biting nails all these lead to increasing infect with the parasite especially in male so that the male is more susceptible than female (16,17,18,19,20,15,21,22,23). While Heideri and Rokni(24) and Al-fatli (25) refer to the absence of a significant difference in the incidence of the infection between males and females and other studies, found that the per cent of disease in females is more than males (26,27). The present study investigated the possible risk factors associated with *Giardia* infection among the participants, revealing that children under 13 years old (1 month to 12 years old) were significantly associated with higher *Giardia* infection rates when compared to adults and children over 12 years old (13 to 84 years old), and this Agrees with the previous studies (28,29,30). This could be attributed to the higher exposure of young children to the source of a wide range of infections, which could be due to having lower personal hygiene standards than adults and older children. Developing a "high-risk household" definition may be valid for communicating risk and advising Households on reducing this risk. Household factors such as a greater concentration of individuals and Fewer facilities also increased the risk of transmission. This may be related to a higher risk of transmission from a contaminated toilet area in households with proportionately fewer toilet facilities per household Member. A more extensive study to investigate this association is required to confirm this finding. Assemblage typing found that most infections were assemblage B, previously associated with person-to-person transmission (31,32). There was a high percentage of mixed assemblage infections (20 percent). The concordance rate of index and secondary household cases has not been previously reported. Two households had discordant assemblages, possibly due to different sources or a missed mixed Infection in the household.

CONCLUSIONS

Family size is an essential factor influencing the number and percentage of infections with *Giardia lamblia* parasites. Gender and age influence the number and percentage of infections with *Giardia lamblia* parasite.

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Interested parties in conflict: Not found

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