Prevalence of *Giardia lamblia* in different localities of Erbil province/ northern Iraq

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Abstract

This Study included examination of 2952 stool samples, collected randomly from both sexes and different social classes for the presence of *Giardia lamblia.* Each sample was examined by both direct stool examination and zinc sulphate flotation technique, but no significant difference has been noticed between these two methods. It was found that 326 persons have been infected with *G. lamblia* (11.04%) and statistically significant differences have been noticed among different social classes. High percentage of infection was noticed among pre-school children (26.82%) and house wives (26.57%). The highest percentage of infection was found between the age group (below one year –10 years) followed by the persons whose ages were 51 and above. No significant difference has been found between infected males and females. There were significant differences in the prevalence of infection among the three school ages (primary, secondary and university students). The highest rate of infection was found among the primary school children. Considering seasonal variation, the highest rate of infection was in summer (25.68%) and the lowest was in winter (5.56%). On estimation of the blood group of infected persons. The highest prevalence was noticed among persons with blood group (A) (44.3%) followed by group (O) (21.59%) then (B) (20.45%) and lowest was among (AB) (13.63%).

Introduction

Giardiasis is a disease caused by *G. lamblia*; it is world wide in distribution. It is common in warm, moist climates particularly in children (1).The prevalence of infection is affected by the level of sanitation and socioeconomic factors (2).

The present study was carried out to show the prevalence of infection in males and females of different ages in different localities of Erbil province.

Materials & Methods

2952 stool samples were collected in special containers randomly from city center and rural areas of Erbil governor ate during 1991-1992. The stool samples were from males and females of different age groups from different social classes.

It included 1204 samples from primary, secondary and university students; 234 samples from outpatients clinics which have included the gynecological and paediatric departments and Al- Jumhury hospital in addition to the health centers (for investigations other than stool examination); 923 samples from food handlers and 591 samples were collected from some villages of Erbil governorate .

2. Blood samples: - Blood groups were done for 88 persons infected with Giardia and 88 healthy persons using the method described by Baker et al. (3).

Parasitological examination: - The stool samples were examined by both direct and zinc sulphate flotation techniques.

Results

From 2952 stool samples examined, 326 persons were infected with Giardia lamblia (11.04%). Statistically significant differences were noticed among different social classes. High percentage of infection was noticed among pre-school children (26.82%) and house wives (26.57%) (Table1).

The highest percentage of infection was found between the age group (below one year – 10 years) followed by the persons whose ages were (51) years and above. No difference has been found between males and

females of the groups who were infected with *Giardia lamblia* (Table 2).

Considering with the school ages, there were significant differences in the prevalence of infection among the three school ages (primary, secondary and university students). The highest rate of infection was found among the primary school children (Table 3).

Regarding seasonal variation, it was fount that the highest rate of infection was in summer (25.68%) and the lowest was in winter (5.56%) (Table 4).

Considering the blood group of the examined persons, there was significant difference among different blood groups, as the highest rate was noticed among persons with blood group (A) (44.3%), followed by group (O) (21.59%), then group (B) (20.45%), and (AB) (13.63%) (Table 5).

Discussion

The high rate of infection with *Giardia lamblia* among children in this study, reflects a poor sanitation and inadequate hygenic condition. This is in agreement with that reported by Kadir, et al. (4) and Molan and Farag (5) in Erbil and with Al-Rahaley (6) and Al- Kachachi (7) in Mosul.

The prevalence of infection among housewives was also high, this might be due to their direct contact with children which help transmission of infection from children to mothers and vise versa.

The infection rate among foodhandlers was (6.71%) which was higher than that reported by Shihab and Sultan (8), who reported (3.8%) in Baghdad.

Comparison the different age groups, it was found that the highest rate of infection below one year to 10 years old, followed by those 51 years old and above, these results are in agreement with Al- Madani et al . (9), who found that the high rate of infection in the age group below one year to 10 years old and those over 49 years old, as well as with Al- Abiady (10) in Mosul.

Concerning the sex, there was no significant differences between males and females in this study. This is also reported by Al-Hanoon (11) and Al- Kachachi (7) in Mosul.

Concerning with age groups, the highest rate of infection was found among the primary school children, which probably reflects a lower standard of personal hygiene in primary school children. The high prevalence of infection among primary school children is also reported by other workers: Al- Jeboori and Shafiq (12). Who reported (31%) in Baghdad; Madani and Jassim (13) (15.9%) in Basrah; Jassan et al, (14) (5.5%) and Kadir and Salman (15) (30.39%) in Kirkuk.

The high rate of infection among school children in low class district than those in high class district reflects a poor health care, bad sanitation in low class districts and playing children with paved foot in street and in sewage water and consuming unwashed vegetables and fruits. Osterholm et al. (16) reported that the distribution of Giardia infection is probably due to contaminated water or food with cysts of the parasite. The higher rate of infection in low class district than high class district is also shown by Molan and Faraj (5) in Arbil ; Al-Taee (17) and Al- Abiady (10) in Nineveh and Niazi et al . (18,19) in Baghdad.

The cysts of Giardia can not tolerate very low and very high temperature and dryness. The average temperature in Arbil during the period of this study (1991-1992) was 6.39 o C in winter and 30.72 o C in summer. This explains the high rate of infection during summer months, as it is known that the thermal death point of Giardia cyst is 62 o C (20).

The highest prevalence of infection among persons with blood group (A), is in agreement with that reported by Barnes and Kay (21) and Zieman (22) , who believes that , it is probably due to presence of similarity in the antigen of parasites and the blood group (A), therefore prevents immunological identification of parasites. But Paulsen (23) reported that the incidence of Giardia infection among persons with blood group (A) could be due to presence of reduced gastric acidity. The finding of this study is not in agreement with others (24& 25) who reported that there is no relation between the blood groups and Giardia infection.

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Table (1): Prevalence of *Giardia lamblia* infection among different social classes in Erbil.

Social classes	No. examined	No. positive	Positive %
Children below school age.	343	92	26.82
House wives	286	76	26.57
Working- man	157	11	7.01
Students (primary, secondary & university)	1204	84	6.97
Food handlers	923	62	6.71
Official	39	1	2.56
Total	2952	326	11.04

Table (2):- Prevalence of *Giardia lamblia* among 2952 individuals according to sex and age.

Age group	No. examined		No. positive		Positive %	
	M	F	M	F	M	F
Below 1 year to 10 years	361	384	65	66	18.00	17.18
11-20 years	468	331	45	31	9.61	9.36
21-30 years	595	252	46	22	7.73	8.73
31-40 years	284	60	17	7	5.98	11.66
41-50 years	105	39	12	4	11.42	10.25
51 years & above	53	20	8	3	15.09	15.00
Total	1866	1086	193	133	10.28	12.33

M = Male F= Female

Table (3): Prevalence of *Giardia lamblia* among students in high and low class districts according to age and sex.

Students	High class District				Low class District			
	No. exam		No. positive		No. exam		*No. positive*	
	M	F	M	F	M	F	M	F
Primary (6-12 years)	57	71	6 10.5	3 4.2%	185	164	21 11.3%	52 15.2%
Intermediate (13-15 years)	49	23	4 8.2%	2 8.7%	78	87	7 9.0%	2 2.3%
Secondary (16-18 years)	54	31	-	-	57	66	3 5.3%	3 4.5%
University (19-23 years)	88	93	1 1.1%	1 1.1%	47	54	5 10.6%	1 1.8%
Total	248	218	11 4.4%	6 2.7%	367	371	36 9.8%	31 8.3%

M = Male F= Female

Table (4): Prevalence of *Giardia lambila* according to seasons .

Seasons	No. examined	No. positive	Positive %
Summer	580	149	25.68
Autumn	720	74	10.27
Winter	791	44	5.56
Spring	861	59	6.85
Total	2952	326	11.04

Table (5): Blood group of persons infected with *Giardia lamblia* and controls.

Blood group	No. infected	Percentage	No. control	Percentage
A	39	44.3	21	23.9
B	18	2.4	24	27.3
AB	12	13.6	17	19.3
O	19	21.6	26	29.5
Total	88		88	