PREVALENCE OF GIARDIA LAMBLIA INFECTION IN AMMAN, JORDAN

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ABSTRACT

Objectives: To determine the prevalence rate of giardiasis among adults and children, males and females of various socio-economic levels in the city of Amman, Jordan.

Patients and Methods: All individuals (510) visiting Primary Health Care Centers (PHCCs), were recruited in the study. For each, stool samples were examined microscopically by the formalin ethyl acetate concentration method, and to study contributing factors, structured questionnaire was filled out.

Results: The overall prevalence was 29.6%. For children, adults, females, males was 78%, 19.3%, 57.3%, 22.6% respectively. Socio-economic status was not a significant factor in the prevalence of giardiasis, while age and sex were significant factors.

Conclusion: Water, personal hygiene and sanitation are contributing factors in the spread of giardiasis. This study could be of value for health care workers, sanitary engineers and health policy strategies.

KEYWORDS: Giardiasis, Socio-economic groups

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INTRODUCTION

Giardia lamblia is considered to be one of the leading causative agents of diarrhea, especially in children. Epidemiological surveys have shown that parasitic diarrhea in children is primarily due to G. lamblia infection while that in adults is a result of Entamobia histolytica infection, particularly in areas where fresh vegetables and drinking water sources are contaminated with sewage materials and foodstuffs can be purchased from street vendors[1].

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This cross-sectional study describes the prevalence of G. lamblia infection among the general population and its association with family income, level of education, age and gender.

PATIENTS AND METHODS

Five hundred and ten individuals visiting Primary Health Care Centers (PHCC) in Amman- Jordan, for various medical or surgical consultations were recruited for the study. Fecal sample was collected and a questionnaire was filled out by each patient or by child's escort. Each sample was graded as positive or negative based on microscopic finding of cysts or trophozoites in stool by formalin ethyl acetate concentration method. PHCC selection was based on the geographical location in the city, socio-economic status and standard of living of the population. One hundred and seventy fecal samples were collected from each of three PHCC in the city, representing lower socio- economic status in the east, middle socio-economic status in the city center, and high

socio-economic status in the west with various age and sex.

RESULTS

Five hundred and ten stool samples were collected from the PHCC, choice based on socio-economical status and geographical distribution of the inhabitants of greater Amman city area to represent low, medium, and high income. The samples were stratified based on age and gender. Of the population studied, adults were 82.4% and children 17.6%, males constituted 79.8% of the studied population and females were 20.2%, Table-I. The overall prevalence rate of microscopically positive for G. lamblia was 29.6%(151 out of 510) Table-II. The prevalence rate of G. lamblia among children is significantly higher than among adults, 78% and 19.3% respectively ($p< 0.05$), Table-II. Gender also appear to be an important factor in the prevalence rate of G. lamblia among studied sample. Table-III shows that G. lamblia infection is more common among females than males, 57.3% and 22.6% respectively, $p< 0.05$.

Table-I
The distribution of the sample according to sex and age in Amman

Age	*Number*		*Total*	*Percent(%)*
	males	*females*		
Children*	55	35	90	17.6
Adult	352	68	420	82.4
Total	407	103	510	_
Percent (%)	79.8	20.2	_	100

* Children were those less than 14 years of age

Table-II
Prevalence rate of Giardia lamblia according to age in Amman

Age	*n*	*Positive cases*	*% positive*
Children	90	70	78
Adult	420	81	19.3
Total	510	151	29.6

p-value <0.05

DISCUSSION

This is the first epidemiological study on Giardia lamblia infection in the city of Amman, Jordan. Most of the reports of Giardiasis have examined either a specific group of people or data based on hospital cases. The overall prevalence rate of giardiasis among population of Amman found in this study was 29.6%, the number of samples collected from the three PHCCs were equal (170 each) and satisfactory for the size of the study. There was no remarkable difference in the prevalence rate among the three PHCCs (29.3%, 28.6%, 30.1%) which shows that the role of socio- economic factor was minimal. These results were in agreement with reports from India[2] and from Turkey[3]. Contrary findings were reported from the Abha region in Saudi Arabia investigating the effect of socio-economic factors on the prevalence of Giardiasis. One study reported that there was no difference between various socio-economic classes[4], while another reported a much higher prevalence among individuals from a lower socio- economic status[5]. It was reported in rural Lesotho(a small country in Africa, completely surrounded by South Africa) that the use of small quantities of water, because of the minimal supply was a factor in the spread of giardiasis, more important than the use of non- purified drinking water or the lack of latrines[6]. Therefore, the quantity but not

Table-III
Prevalence rate of Giardia lamblia according to gender in Amman

Gender	*Number*	*Positive cases*	*% positive*
Male	407	92	22.6
Female	103	59	57.3
Total	510	151	29.6

p-value <0.05

the quality of water used for personal and domestic hygiene in underdeveloped countries seems to play a major role in the spread of the disease.

The age distribution of patients with giardiasis showed that, the highest rate of infection was found in children, since they eat indiscriminately and have less immunity to the parasite than adults who have been exposed during their childhood. Females showed higher prevalence than males (57.3% and 22.6%, respectively). This may be due to continuous contact with water for washing, child minding or cleaning latrines and with children who have a higher rate of infection.

In summary, this study gives an indication of the pattern and prevalence of giardiasis in the mixed population in Amman. Widely different levels of sanitation in the population examined are likely to have a direct impact on the spread of giardiasis. Intestinal parasitic infection, particularly giardiasis, seems to be a public health problem. Lack of knowledge about giardiasis among the average Jordanian, especially mothers and asymptomatic carriers, help to transmit more disease among children. Attention should be focused on public health education and improvement of the quality of water supplies.

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