

PREVALENCE AND RELATED RISK FACTORS FOR GIARDIA LAMBLIA INFECTION AMONG CHILDREN WITH ACUTE DIARRHEA IN THI- QAR , SOUTHERN IRAQ

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ABSTRACT :

The aim of this study was to determine the prevalence and to identify the risk factors associated with Giardia lamblia infection among diarrheic children who had been attended outpatient department of maternity and children teaching hospital for acute diarrhea and dehydration in Thi- Qar , Southern Iraq.

Fecal samples were collected from (396) children aged from(0 – 120) months and were examined by direct wet preparation and floatation method . Data relating to sociodemographic , environment and host were also collected by questionnaire. Giardia lamblia were present in faces of (94) diarrheic children (23 . 7%) . The age group (24 – 48) month had the highest rate of infection (33 .3%). Male had higher rate of infection than female (24. 7% vs 22.5%) respectively .

Living in rural area , low education level of mothers , drinking raw or municipal water , hot seasons ,living with four or more house hold children were significantly associated with Giardia lamblia infection ($p < 0.05$). Based on the results of this study , it is concluded that the high prevalence of Giardia lamblia infection among children with acute diarrhea is a significant public health problem in Thi-Qar.

INTRODUCTION :

Diarrhea is considered a major cause of morbidity especially in developing countries(1).

Five hundred million cases of acute diarrhea occur annually in children bellow five years of age throughout the world (2) . Common causes of diarrhea are inflections due to viruses , bacteria , helminthes and protozoa .A mong important enteric protozoa, Giardia lamblia which is worldwide distribution and is common in warm moist climates (3).

The prevalence of Giardia has been reported to be (2 – 5%) in industrialized countries and (20 – 30%) in developing countries (4) . The majority of inflections are asymptomatic but some are associated with acute or chronic diarrhea and

intestinal irritation (5) which contribute to malaborption and nutritional deficiency especially in children (6, 7) .

Giardia lamblia is transmitted by the fecal-oral route and direct person- to- person spread . In most of the cases it is associated with contaminated water with sewage material (8) .

Several surveys of intestinal parasitosis in Iraq have shown a high incidence of giardiasis among children (9 - 12) . However , there is no substational information is available about this parasite in Thi- Qar governorate , to address this deficiency a cross- sectional epidemiologic study was conducted to determine the baseline prevalence of giardiasis and to identity risk factors associated with this

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parasitic infection in children with acute diarrhea in this area of Iraq .

PATIENTS & METHODS :

This cross- sectional study was conducted in maternity and children teaching hospital in Thi- Qar, southern Iraq between 1 of March 2007 and 30 of February 2008 . The study population was diarrheic children aged from (0- 120) months old who had been attended outpatient department , emergency room and oral rehydration wards of the hospital for diarrhea and dehydration .

Diarrhea was defined according to WHO criteria (13) as three or more unformed stool in one 24 hr and still present when the fecal samples were collected. Exclusion group patients with diarrhea due to food intolerance .

Stool samples were collected from each patient with assistance of patient parents . The stool sample were taken immediately to the laboratory for examination .Those with negative results had two other samples had taken at deferent times . Stool samples were examined with naked eyes for color, consistency and presences of adult helminthes , they were then examined microscopically by direct and concentration methods for presence of Giardia trophozoit and cyst stages . The concentration method was the zinc sulphate floatation .

Two types of direct wet film preparation was done for each sample at the same time , one slid by using normal saline for detecting the motility of trophozoit and lugols iodine 5% slide for demonstrating structures .

The parent of these children were interviewed by comprehensive questionnaire which included the following items (age ,sex, , residence , number of household children , season, source of drinking water and level of education of mother).The results were analyzed statically using the F-test .

RESULTS :

The prevalence of Giardia lamblia in this study was (23 .7%),(94 / 396) . The rate of infection varied a cross different age groups of children (table 1) . The age group (24- 48) month showed the highest rate of infection (33. 3%) , and the lowest rate (14. 3%) was among children aged (0- 12) month .Male had higher rate of infection than female (24 .7% vs 22. 5%) respectively ,however there was no significance association between Giardia lamblia infection with age and gender .

The prevalence of Giardia lamblia infection was significantly higher in children living in rural areas than those living in urban area (28 . 2% , 15 .2% , p < 0.05) .The rate infection was significantly associated with level of mother education , illiterate or incomplete primary (26.9%), complete primary or secondary (22. 3%) and high school or university (9. 7%) .

(table 2) shows the highest rate of infection among children drink raw (untreated) water (62. 5%) Followed by municipal water (36 . 3%) and RO or purchase bottled water (6.1%) .

The rate of infection during hot season was higher than cold season (69.1% vs 30.8% table 3) .

(Table 4) shows a higher prevalence of giardiasis for household with four or more children compared to household with fewer children. The overall prevalence of giardiasis in children from household with fewer than four children was(18. 3%) compared to (28. 1%) for children from household with four more .

DISCUSSION :

In the present study , the prevalence of Giardia lamblia infection in diarrheic children in Thi- Qar was (23.7%), this result is similar to other studies in Iraq by Mahdi in Basra city (9)and Al-saeed in Dohok (12) , where the prevalence of Giardia lamblia infection was 24% , 31.3% respectively. This result are also in agreement with studies in other parts of the world conducted by New man et al in

Brazil 25% (14), Magambo et al in Sudan 24.4% (15) and Ozelik et al in Turkey 25% (16), but it is much higher than that reported from Saudi Arabia (17), Bangkok (18) and Philippines (19), where the prevalences was quite low, ranging from (1- 6.8%). This high rate of infection could be related to number of factors such as poor health hygiene, overcrowding, low socioeconomic status and climatic conditions (20). Giardia lamblia infection in our study was present in all age groups and infection increased after first year of life reach maximum at (24 – 48) month of age which similar to that of found in Brazil (14) and Kenya (21) and then the incidence rate tend to be declined after age of six year, this may have several explanations, first, the age dependant decline rate may be related to anti- Giardia immunity (22, 23) and secondly, the acquisition better hygienic practice which make the avoidance of this infection easier (24). The rate of infection with Giardia in male was higher than in female, the higher rate of infection in male may be due to the more activities and as they were more in contact with environmental conditions than female. This result was in agreement with (9, 12, 25). Residence in rural areas was found associated with higher prevalence of infection, this results are similar to that obtained in Albania (26) and Turkey (27), this because children in rural areas are likely to live in large size family, relative crowded conditions, low sanitation and socioeconomic status (28) and poor personal health habits where defecation occur in the open area (very common practice in rural which lead to higher level of contamination of the environment) (29).

In this study Giardia infection was higher in children where mothers had low level of education. The Relation between child health and mother education is well known. Health indicators of children whose mothers education level is lowers are always worse (30). Water supply is really an important risk factor for giardiasis and several outbreaks have resulted from the

contamination of municipal water supplies with Giardia lamblia cysts. In our study there was high prevalence of Giardia lamblia infection among children drink municipal or raw water in comparism with those drink RO and purchase bottled water, this high prevalence may be due to contamination of municipal water supplies with human waste, poor quality of water, faulty of sewage line and insufficient level of chlorine. Normal chlorine level used to kill bacteria in municipal water supplies will not Inactivate Giardia cysts(31), and Giardia cyst have been isolated from water supplies in different part of world(31,32).

Majority of Giardia infection occur during hot season. Cold weather kills the infective cysts (33), other behavioral factors could be involved such as greater consumption of water and drink in hot weather which may be sources of infection (32).

Increase number of household children is another risk factor for Giardia lamblia infection, our study showed a higher prevalence of giardiasis for households with four or more children compared to household with fewer children. This result corroborates the hypothesis of interpersonal transmission (34)

CONCLUSION:

Based on the results of this study we concluded that Giardia lamblia infection is a significant public health problem in Thi- Qar and associated with many sociodemographic and environmental factors. Contamination of municipal water supplies should be taken into account as potential risk factor for spread of infections to human and all drinking water should receive chemical pretreatment and should be supplied with concentration of less than 0.7- 70 cysts per 100 liters (35). Housing improvement with appropriate sewage system and educational measures to improve personal hygiene are an important factors to reduce prevalence of infection.

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participated in the study for their help , hospitality and cooperation .

Table 1 :

Distribution of Giardia lamblia infection among diarrheic children in Thi –Qar according to sociodemographic characters

Characters	no . of investigated children	infected with giardia No. (%)
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Age group (month):

P>0.05

≤ 12	167	24 (14.3%)
>12-24	133	41 (30.8%)
>24-48	66	22 (33.3%)
>48-72	18	5 (27.7%)
>72 -120	12	2 (16.6%)

Gender :

P>0.05

Male	210	52 (24.7%)
Female	186	42 (22.5%)

Residence:

P<0.05

Urban	138	21 (15.2%)
Rural	258	73 (28.2%)

Mother education status :

P<0.05

Illiterate or incomplete primary	234	63 (26.9%)
Complete primary or secondary	121	27 (22.3%)
High school or university	41	4 (9.7%)

Table 2 :

Distribution of Giardia lamblia infection among diarrheic children in Thi- Qar according to sources of water supply :

Sources of water supply	No. of investigation children	Infected with Giardia No. (%)
Municipal water	201	73 (36.3%) p<0.05
Ro*or purchase bottled water	179	11 (6.1%)
Raw (untreated)water	16	10 (62.5%)

*reverse osmosis

Table 3 :

Distribution of Giardia lamblia infection among diarrheic children in Thi –Qar according to seasons :

Season	No. of investigated children	Infection with Giardia No (%)
Hot	291	62 (69.1%) p<0.05
Cold	105	29 (30.8%)

Table 4 :

Distribution of Giardia lamblia infection among diarrheic children in Thi –Qar according to no. of household children :

No. household children	No. of investigated children	Infected with Giardia No. (%)
0-1	76	13 (17.1%) p<0.05
2- 3	107	21 (19.6%)
≥ 4	213	66 (28.1%)

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معدل انتشار الإصابة وعوامل الخطورة المتعلقة بالجارديّة اللامبليّة لدى الأطفال المصابين بالإسهال الحاد في محافظة ذي قار جنوب العراق .

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الخلاصة :

الهدف من هذه الدراسة هو تحديد معدل انتشار الإصابة وتميز عوامل الخطورة المتعلقة بالجارديّة اللامبليّة لدى الأطفال المصابين بالإسهال الحاد في ذي قار . تم فحص (٣٩٦) نموذج من عينات البراز للمرضى المصابين بالإسهال بالطريقة المباشرة وطريقة التعويم وتم أيضا جمع معلومات عن المرضى عن طريق الاستبيان حيث بلغ معدل انتشار الإصابة بالجارديّة اللامبليّة (٢٣,٧ %) ولوحظ أعلى نسبة للإصابة في الفئة العمرية (٢٤ - ٤٨) شهر بمعدل (٣٣,٣ %) وكانت معدلات إصابة الذكور أعلى من الإناث . وقد أظهرت الدراسة هناك ترابط إحصائي بين معدل الإصابة والعيش في المناطق الريفية ، المستوى التعليمي المنخفض للام ، شرب مياه الغير المعقمة أو مياه الإساله ، المواسم الحارة والعيش مع أربعة أطفال أو أكثر. نستنتج من هذه الدراسة أن معدل الإصابة المرتفع للجارديّة اللامبليّة لدى الأطفال المصابين بالإسهال الحاد يمثل مشكلة صحية في ذي قار .

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