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Prevalence of Intestinal Parasitic Infestations in Al-Anbar Province, West of Iraq.

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ABSTRACT

Intestinal parasitic infestation still represents an economic and public health problem in the world particularly in the developing countries including the Middle East. To estimate the current prevalence of intestinal parasitic infection among people living in Al-Ramadi City/ West of Iraq. 1804 faecal samples were collected from males and females of different ages attending Al Gailani-Central Medical Laboratory, Al-Ramadi/Al-Anbar, from June 2006 to October 2009. One methods used were direct faecal microscopic examination and formol-ether concentration. The total infectivity rate by intestinal parasites was 19.7%. The overall infection rate by intestinal protozoa was significantly higher than intestinal helminth infection. E. histolytica was the most prevalent intestinal parasitic infection, whereas E. vermicularis was the predominant helminth. The frequency of the parasitic infestations was slightly higher among females (20.7%) than males (19.1%). A significantly higher prevalence of parasitic infections among younger age groups than the older age groups, since age group ≤5 years showed the highest infection rate (33.3%) when it was compared with other age groups (5.3%). Intestinal parasitic infestation was more prevalent among younger age groups. Screening for parasitic infestation is necessary as part of the general health care programme. Preference should be given to screening the younger age group to improve the standards of infant care.

Introduction:

Intestinal parasitic infestations continue to be an important cause of morbidity and mortality in the developing world and thus it represents a large and serious medical and public health problem in these countries including our country[1-2]. According to the World Health Organization (WHO), approximately 500 millions people worldwide suffer from amoebiasis, with an annual mortality between 40000 and 110 000 [1,3]. Man is undoubtedly the most important reservoir of parasitic infections that are transmitted chiefly by ingestion of contaminated food or water or through direct contact. In the tropical areas, the most common intestinal helminthes leading to digestive disorders including *Taenia saginata*, *Hymenolepis nana*, *Ascaris lumbricoides*, *Strongyloides stercolaris*, *Trichuris trichuria*, *Enterobius vermicuralis*, and *hook worms*[4], while the most common protozoans reported in the developing countries include *Entamoeba histolytica* and *giardia lamblia* that are associated with poor socioeconomic conditions and unhygienic habits, as well as malnutrition . It was found that outbreaks of protozoan infections in humans have been linked to contaminated food from improper environmental sanitation and to inadequate personal hygiene[1].

The prevalence of intestinal-helminthic and protozoal infestation varied from one country to another and also vary within the same country from one area to another, This is due to variations in the socio-cultural and environmental factors.

Few Iraqi studies were conducted for studying the prevalence of intestinal parasites among Iraqi communities[5-7]. Therefore, this study was carried out to estimate the prevalence of general parasitic infestations among people living in Al-Ramadi City/Al-Anbar-West of Iraq.

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Materials and methods:

Sample:

The total number of people investigated in this study was 1804. Their ages range from two months - 70 years old, with a mean age of 23 ± 11.7 years. There were 718 females and 1086 males. The ratio of females to males was 0.65:1. This study was carried out in Al-Gailani-Central Medical Laboratory at Al-Ramadi City/Al-Anbar- West of Iraq. All subjects included in this study were selected randomly during the period from June 2006 to October 2009.

A special form of information was filled for each subject by direct interview with each subject or his/her relatives. This information included: age, sex, residence, and history of frequent intestinal disorders, Their stools were collected and examined for identification of intestinal parasitic infestations in the laboratory.

Laboratory methods:

Direct microscopic examination of the stool was carried out in a systematic manner using a 4×objective lens to select the area to be screened, followed by a 10×objective lens to locate any parasitic objects. Suspicious objects were identified under a 40× objective lens. Then 2 drops of Lugol solution were added to facilitate identification of undifferentiated protozoan cysts and specimens were re-examined 5 minutes later[4].

The formol-ether concentration technique was performed by adding 1 gm of fecal sample to 5 ml of formalin (10%), which was emulsified and strained, and the filtrate centrifuged for 2 minutes at 3000 rpm. Then one ml of sedimented faeces and 9 ml of 10% formalin solution were added to 3 ml of ethyl acetate and centrifuged further for 2 minutes at 2000 rpm. The upper 3 layers were decanted by inverting the tube and the last drop was allowed to fall back into the tube. The filtrate was allowed to sediment by gravity for 15 minutes, prepared, examined and identified as in the direct smear technique[4].

Statistical analysis:

The data were analyzed by SPSS, version 10. For comparison of proportions, the Chi-squared test was used. P value ≤ 0.05 was considered statistically significant.

Results:

Out of 1804 subjects examined, 356 were positive for intestinal parasites, the total infectivity rate was 19.7%. The frequency of the parasitic infestations was slightly higher among females (20.7%) than males (19.1%), but this difference was not statistically significant ($p>0.05$) (table 1).

The overall infection rate by intestinal protozoa was significantly higher than intestinal helminth infection ($p\leq0.05$). Out of the total subjects investigated, *E. histolytica* was the most prevalent intestinal parasitic infection, whereas *E. vermicularis* was the predominant helminth (table 2).

Table (3) showed a significantly higher prevalence of parasitic infections among younger age groups than the older age groups, since age group ≤5 years showed the highest infection rate (33.3%) when it was compared with other age groups ($p\leq0.05$).

Discussion:

In the present study, the overall infection rate of intestinal parasites among people living in Al-Ramadi City was 19.7 %. This result was lower than that reported by Babiker et al[8], who found that 32.1% of Sudanese food-handlers were harboring intestinal protozoa in stool samples. Our result was also lower than that obtained by AL-Lahham et al. [9] in Jordan where the prevalence of intestinal parasitic infections was 25.2%, This result was found to be higher than that reported by Abu Al Saud[10] in Saudi Arabia, who showed that the prevalence of parasitic infestations was 9.3%. However, it is in line with a study conducted by Costa-Cruz *et al*.[11] in Brazil, where the frequency of infection by intestinal parasites was (18.3%).

The discrepancy in number of sample, methods used in examination; in addition to variation in the socioeconomic status, environmental conditions, sanitation systems, waste management and lack of personal hygiene may explain this difference. The present study illustrated a higher overall infection rate of protozoa than helminths. This finding was similar to that reported by Babiker *et al*.[8], who found that 29.4% and 2.7% of Sudanese food-handlers were infected by intestinal protozoa and helminth, respectively. In Jordan, the rate of protozoa infection among Jordian people (30.2%) was also higher than the rate ofintestinal helminth infection (13.5%) [9].This similarity is likely due to the similar in exposure to socio-economic status and environmental conditions.

Concerning the commonest type of parasites isolated in this study, our finding showed that *E. histolytica* was the most common protozoa infection, whereas *E. vermicularis* was the most common intestinal helminth infection noted. In India, Hegde and Patel 1996[12], found that *A. lumbricoides* was the predominant helminth noted whereas *E. histolytica* was the most common protozoon found. In a survey conducted in Saudi Arabia, Abu Al Saud [10] found that

G. lamblia was the most prevalent intestinal protozoan infection (69%) while *H. nana* was the most common helminth infections (13.8%). In Morocco, Kettani *et al*. [13]found that *E. coli* was more prevalent protozoan infection while *A. lumbricoides* was the most common helminth infection. Furthermore, infection with *G. lamblia* in the present study was lower than that reported in Somalia (77%)[14], whereas the helminth infection in this study was higher than that reported by Tomaso *et al*.[15]who reported (0.2%) among food-handlers in Austria.

The age distribution of subjects with intestinal parasites showed that the largest number of intestinal parasitic infestations were found in children aged ≤5 years and that infestation declined progressively with increasing age groups. This finding may be due to the fact that the younger age groups are of low or no personal hygiene. Our result was similar to that reported by Mahdi and Ali[16] who found that the prevalence of intestinal parasitic infestations among young Iraqi patients with sickle-cell anaemia was higher than the older age groups. This result was also consistent to that reported by Abu Al Saud [10] in Saudi Arabia. Our finding was in agreement to that reported by El Kettani *et al*.[13] Who found that the age had no clear effect on the prevalence of the intestinal parasites. Babiker *et al* .[8] also reported that there was no relation between the prevalence of parasite infection and age. The present study indicated that screening of the younger population, especially those aged ≤5 years should be given preference over screening of the older age groups and that an education programmer in standards of hygiene in infant care should be initiated.

In addition, gender did not influence the prevalence of the intestinal parasites infestations in our study. Some studies showed higher prevalence of these infections among females[17-18] while others observed an increase in the prevalence of intestinal parasitic infection among the males[13] and others found an equality between both genders [8,12-13]. Our result illustrated an equal exposure of the both genders to parasitic infections due to sharing the same environmental conditions.

In conclusion, it is felt that the present study gives a better indication of the prevalence of parasitic infestation among Iraqi people living in Al_Anbar province. It is suggested that screening for parasite infestation is necessary as part of the general health care programme. Preference should be given to screening the younger age group to improve the standards of infant care. For this reason, preventive measures should be implemented. These could include health education, public and good personal hygiene practices.

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Table (1): Frequency of parasitic infections in the study group according to gender.

Gender	Total No. tested	Total No. infected	%
Males	**1086**	**207**	**19.1**
Females	**718**	**149**	**20.7**
Total	**1804**	**356**	**19.7**

P value Non Significant

Table (2): Frequency distribution of parasites in the positive stool isolated from the study group.

Parasite	Total No. of parasites detected	Percentage of total parasites %
	219	**61.6**
Entamoeba histolytica	**53**	**14.9**
Giardia	**35**	**9.8**
lambliaEnterobius	**24**	**6.7**
vermicularisAscaris	**8**	**2.3**
lumbricoides	**6**	**1.7**
Ancylostoma	**5**	**1.4**
duodenale	**3**	**0.8**
Hymenolepis	**3**	**0.8**
nanaTrichuris		
trichiura		
Schistosoma mansoni		
Taenia saginata		
Total	**356**	**100.0**

Table (3): Frequency of parasitic infection in the study group according to their age groups.

Age group /(years)	Total No. examined	Total No. infected	%
≤5	**430**	**144**	**33.5**
6-10	**286**	**83**	**29**
11-20	**227**	**41**	**18.1**
21-30	**297**	**30**	**10.1**
31-40	**206**	**35**	**17**
41-50	**168**	**13**	**7.7**
>50	**190**	**10**	**5.3**
Total	**1804**	**356**	**19.7**

P value 0.0025

انتشار الاصابة بالطفيليات المعوية في الأنبار ،غرب العراق

عباس عبيد فرحان

الخلاصة:

لاتزال الاصابة بالطفيليات المعوية تمثل مشكلة اقتصادية وصحية في العالم وخاصة في الدول النامية منها الشرق الاوسط. الغرض من الدراسة : لتحديد معدل انتشار الاصابة بالطفيليات المعوية لسكان محافظةالانبار/غرب العراق.

المواد وطريقة العمل: 1804عينة من البراز جمعت من الذكور والاناث من مختلف الاعمار والمترددين لمختبر الكيلاني الطبي المركزي في الرمادي للفترة من حزيران 2006 الى تشرين الاول 2009بأستخدام طريقة الفحص المجهري المباشر للبراز والتركيز بالايثر الفورمال.

النتائج: معدل الاصابة الكلية للطفيليات المعوية كانت 19.7%. معدل الاصابة بالطفيلي المعوي كانت بمغزى معنوي اعلى من معدل الاصابة بالديدان المعوية. الاصابة ب E. Histolytica كانت اكثر انتشارا من الاصابة ب E.Vemiclaris , تواتر الاصابة بالطفيليات لدى الاناث (20.7%) كانت قليلا اعلى مما لدى الذكور (19.1%). معدل انتشار الاصابة بالطفيليات المعوية لدى الصغار كانت اكثر مما هوعليه لدى الكبار وذي مغزى معنوي حيث ان معدل الاصابة لدى الفئة العمرية الاقل من خمس سنوات كانت (33.3%) عند مقارنتها مع معدل الاصابة لدى الفئة العمرية الاكبر سناً (5.3%).

الاستنتاج والتوصيات: الاصابة بالطفيليات المعوية كانت اكثر انتشاراً لدى الصغار وعليه فان التحري عن الاصابة بالطفيليات ضروري كجزء من البرنامج العام للرعاية الصحية ويفضل ان يركز التحري للصغار لتحسين الرعاية النموذجية للطفل.