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Parasitic infections in Kuwait: A study based on Primary Care Centers

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Abstract

Objectives: To determine the prevalence of different types of parasitic infections among patients attending primary health care centers, from all the five health regions of Kuwait and to find if infection differs with socio-demographic factors.

Subjects and Methods: A cross- sectional sampling survey was conducted in five health regions of Kuwait, from December 2001 to August 2002, for all age groups. Four primary health care clinics were selected randomly from each health region. One thousand questionnaires were distributed, and 912 completed questionnaires were received from the patients, who presented with gastroenteritis symptoms. The questionnaire included personal information with socio-demographic characteristics, and results of stool examination.

Results: A total of 912 participants in the study, comprised of 607 (66.6%) males and 305 (33.4%) females. 354 (38.8%) were Kuwaitis. Based on stool examination, 255

(28%) subjects were found to be positive for different types of parasitic infections**.** There was no significant difference in the prevalence of parasitic infection among gender and nationality, but was significantly higher among children ($p<0.001$). Infection was significantly higher ($p<0.001$) among people with education up to intermediate or none, as well as, those with low or middle class income ($p<016$) and also among the unmarried patients. The highest prevalence of parasitic infection was found in Al-Jahra and Al-Ahmadi health regions, about 48%, and the least in capital health region 15.8%.The most common type of parasite found was Enterobius vermicularis, 27.1% and was significantly higher (74.6%) among children ($p<0.001$). The E. histolytica and E.Coli was significantly higher among adults.

Conclusion: Our study showed that the parasitic infections were more prevalent among population with low socio-economic conditions. Hence, efforts are needed to increase prevention programmes and also to improve such conditions in the regions with high prevalence.

Key Words: Parasites, prevalence, Enterobius vermicularis, Entamoeba histolytica, Kuwait.

Introduction

Intestinal parasitic infection is considered one of the most common tropical diseases in developing countries [1]. There are over 30,000 living named species of protozoa. The protozoa that infected man range from forms never pathogenic to those that cause major disease of tropical countries [2].The prevalence of parasitic infections in developing countries is high and ranges between 30 and 60% [1]. Some helminthic and protozoal parasites have world wide distribution, but the majority occur in the tropics. The distribution of those parasites is considerably influenced by population mobility, but more importantly the pattern of distribution depends mainly on the availability of certain conditions that are required for certain parasites [3]. Kuwait is considered as a non-endemic country for most of the parasitic infections. The parasitic infection affects manpower in the Kuwait community, and it is important to screen the parasitic infections and find ways to prevent and control them.

The objective of this study was to determine the prevalence of different types of parasitic infections among patients attending primary health care clinics in Kuwait, and its prevalence in relation to various socio-demographic factors and variations in different health regions.

SUBJECTS AND METHODS

A cross sectional sampling survey was conducted in five health regions, during an eight month period, from December 2001 to August 2002. Four primary health care centres were selected were selected randomly from each health region.

One thousand questionnaires were distributed, of which 912 were completed from patients who attended the clinic for gastrointestinal symptoms including abdominal pain, diarrhoea, perianal itching and anaemia .Since the majority of individuals from the developing countries generally may not present with any of gastrointestinal symptoms, thus the carriers have been excluded .The questionnaire included information on age, gender, nationality, marital status, level of education and family income, results of stool examination and type of parasitic infection. All stool specimens of 912 patients were submitted for routine Stool examination. All specimens were examined by the direct fecal smear with saline or Lugol's iodine, formalin-ether concentration method [(4)] replacing ether with ethyl acetate and trichrome staining method which is the Wheatley modification of Gomoris's trichrome stain [(5)].

The patient's age groups were divided into children (from 0 to 12 years) and adults (more than 12 years). The data was transferred to the Statistical Package for Social Sciences (SPSS) software (PC version 11.0) for statistical analysis. Chi-square or Fisher's exact test was used to establish any associations between the variables and infection or to test the proportions. A probability level of $p \leq 0.05$ was considered significant.

RESULTS

In this survey, 912 questionnaires were completed from the five health regions. The mean age (±SD) of all the subjects was 29.5 age (±14.4) years. The adult patients were 762 (83.6 %), and the children 150(16.4%) with mean age (±SD) 33.9(±11.6) and 7.5(±2.8) years, respectively. Of all subjects 607, (66.6%) were males and 305(33.4%) females. 354 (38.8%) were Kuwaitis and 558 (61.2%) were non-Kuwaitis. Based on stool examination, 255(28%) were positive for parasitic infection. No significant differences were noticed in the prevalence of infection in both, gender and nationality. It was significantly higher among children ($p<0.001$). The prevalence in relation to socio-economic variables and in different health regions has been presented in Table 1. Parasitic infection rate was inversely proportionate to level of education ($p<0.001$) It was more in patients with low family income ($p<0.016$).and also among singles ($p<0.001$).The highest prevalence of infected patients was found in Al-Ahmadi (49%) and Al-Jahra (47%) health regions, followed by Hawalli, (39%) Farwaniya and Capital regions, with 16% each.

Our results showed that Enterobius vermicularis, 69 (27.1%) was the most common parasite.Detected were adult female warms seen most of the time microscopically. This was followed by Entamoeba histolitica 54 (21.2%), Entamoeba coli 43 (16.9%), Giardia lamblia 29 (11.4%), Ascaris lumbricoides 22 (8.6%). Blastocystic homoni 10 (4%), Schistosoma mansoni and Iodamoeba butschlin 6 (2.4%) each, Trichomonas hominis 5 (2.0%) , and one (0.4%) each of Endolimax nana and Ancylostoma duodenale (table 2). The most common type of parasite found in children was Enterobius vermicularis 74.6% followed by Giardia lamblia 11.9%, whereas the most common parasite found in adults was Entamoeba histolitica 26% followed by Entamoeba coli (21%). The other common parasites among adults were Enterobius vermicularis (12.8%), Giardia lamblia (11.2%) and Ascaris lumbricoides (9.7%). Among children, Enterobius vermicularis was

significantly higher (p<0.001), whereas Entamoeba histolitica and Entamoeba coli were significant higher (p<0.001) in adults. Certain type of parasitic infections were only seen in adults (Table 2).

Table. 1 Prevalence of parasitic infection according to certain Socio-economic Characteristics.

Characteristic	N (912)	%	infected (n)	%	p-value
Gender					
Male	607	66.6	167	18.3	>0.05
Female	305	33.4	88	9.6	
Nationality					
Kuwaiti	354	38.8	108	11.8	>0.05
Non-Kuwaiti	558	61.2	147	16.1	
Age-group					
Children	150	16.4	59	6.5	0.0001
Adults	762	83.6	196	21.5	
Education level					
Illiterate	180	19.7	80	8.8	
Primary/intermediate	455	49.9	139	15.2	0.001
Secondary	204	22.4	33	3.6	
University & above	73	8 (3)			
Family income					
Low	623	68.3	181	19.8	0.016
Middle	256	28.1	72	7.9	
High	33	3.6	2	0.2	
Marital status					
Married	259	28.4	39	4.3	0.001
Unmarried	653	71.6	216	23.7	
Health region					
Capital	209	23.0	33	3.6	
Hawalli	160	17.5	62	6.8	0.001
Farwaniya	313	34.3	50	5.5	
Al-Ahmadi	73	8	36	4.0	
Al-Jahra	157	17.2	74	8.1	

DISCUSSION

The survey of patients attending clinics for gastrointestinal symptoms showed that the prevalence of different types of parasitic infection was 28.0%. Ahmed S. et al [6] in their studies showed that the prevalence of intestinal parasites among Saudi and non- Saudi patients, who were examined between 1989 and 1992, was 16.7% . Another study done on school adolescents in Nepal showed 40% to be positive for parasites[7] . A study done

in Gaza to determine the prevalence of intestinal parasites was 24.5% [8] .Our data showed that Enterobius vermicularis was the most common parasite detected, followed by Entamoeba histolitica**,** Entamoeba coli and Giardia lamblia. Ascaris lumbricoides, Blastocystic homoni, Schistosoma mansoni**,** Iodamoeba butschlin, Trichomonas hominis, Endolimax nana and Ancylostoma were less prevelant parasites**.**

Study done in Saudi Arabia showed that the most common pathogen found among patients is Giardia Lamblia (6.7%), followed by Entamoeba coli (4.59%) and Endolimax nana (1.82%) [6] .The study done in Gaza showed that the most common parasite detected was Giardia lamblia (62.2%), followed by Ascaris lumbricoides (20.0%) then Entamoeba histolitica (18.0%) [8]. Our results showed that parasitic infections were significantly common in children (39.3%) than adults (25.7%). This is consistent with other study where children (19.5%) had the highest prevalence than adults (12%) [6].

Our data showed that the most common type of parasite found in adults were Entamoeba histolitica, followed by Entamoeba coli, whereas the most common type of parasite found in children were Enterobius vermicularis, followed by Giardia lamblia. Epidemiological surveys have shown that parasitic diarrhoea in children is primarily due to Giardia lamblia infection, while that of adults is a result of Entamoeba histolitica [9]. There was significantly higher prevalence of parasitic infections among those with low family income and having lower level of education. Study done in Riyadh showed that the role of socio economic factors was minimal [10]. In contrast to other study done in Abha reported a much higher prevalence among individuals from a lower socio- economic status [11]. Our data showed that there was no significant relationship between gender and parasitic infection.

This is consistence with study done in Jamaica which showed that there was no predilection for gender with any of the parasite [12]. Significantly, there was no difference in the prevalence of parasitic infection between Kuwaitis and non-Kuwaitis. This is consistence with the study done in Riyadh, which showed that there is no significant difference in the rate of infection between Saudis and non-Saudis [6]. Our results revealed that the highest prevalence of parasitic infection was found in Al-Ahmadi and Al-Jahra, and the least in capital health region .As we move away from the capital, agriculture is more practiced. These regions are crowded and lack basic facility. Mobayed et al [13] demonstrated that parasitic infections were almost twice as common among rural as compared with urban areas.

Table.3 Infection in children and adults by type						
Parasitic Infection	***Children (n=150) Infected***	***%***	***Adults (n=762) Infected***	***%***	**Total (n=912) Infected**	**%**
E.vermicularis	44	29.3	25	3.3	69	7.6
E.histolytica	3	2	51	6.6	54	5.9
G.lamblia	7	4.6	22	2.9	29	3.2
E.coli	2	1.3	41	5.4	43	4.7
A.lumbricoides	3	2	19	2.5	22	2.4
B. hominis	-	-	10	1.3	10	1.1
S.mansonis	-	-	6	0.8	6	0.7
T.homini	-	-	5	0.7	5	0.5
E.nana	-	-	1	0.13	1	0.1
I.butschlii	-	-	6	0.8	6	0.7
A.duodenale	-	-	1	0.1	1	0.1

* Children Vs Adults (Significantly higher, $p<0.001$)

CONCLUSION

The results of our study confirmed that poor hygienic conditions; low socio-economic status, and low education are the most important contributors to parasitic infection among people. Enterobius vermicularis is the most common parasite detected.

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