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INTESTINAL PARASITIC INFECTIONS AMONG CHILDREN IN AL-HASA, SAUDI ARABIA FROM 2012-2013

Medicine

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ABSTRACT

BACKGROUND: Intestinal parasitic infection is highly prevalent among general population, majority of them are children.
AIM: The objective of the study is to estimate the prevalence of intestinal parasites among children residing in Al Hasa.
METHODS: Retrospective study conducted from MCH laboratory data base from 2012 to 2013.
RESULTS: A total of 200 stool samples were reviewed and parasites were identified in (46.5 %) samples. The prevalence rate of IPI in male and female were 27% and 19.5%, respectively. Altogether four species of parasites were detected. Giardia lamblia was most common followed by Entamoeba coli, Entamoeba histolytica, and Enterobius vermicularis.
CONCLUSIONS: Intestinal parasitic infections are highly prevalent and are of major public health concerns. IPIs are intimately associated with poverty, poor environmental sanitation and lack of clean water supply. Awareness on infectious diseases, improving hygiene, and application of supportive programs for parents to elevate their socioeconomic conditions may reduce the burden of infection.

KEYWORDS

Intestinal parasites, parasitic infections, children, Saudi Arabia

INTRODUCTION:
Intestinal parasitic infections (IPIs) are globally endemic [1,2]. It is estimated that about 3.5 billion people are affected, and that 450 million are ill as a result of these infections, the majority being children [3]. The complex relationships between poverty and parasitic infections are well recognized [4,5]. IPIs are linked to lack of access to safe water and improper hygiene; therefore they occur wherever there is poverty [1]. The prevalence of intestinal parasites is linked by the socioeconomic and health conditions, education and beliefs related to traditional health practices, as well as the presence of domestic animals in the home and contamination of water and food [6,7]. Age is also an associated factor related to the individual's immunologic status and behavioral patterns contributing to the high prevalence of intestinal parasites in children than in adults [6,7].

Ascaris lumbricoides, *Trichuris trichiura* and hookworms, collectively referred to as soil-transmitted helminths (STHs), are the most common intestinal parasites [8]. *Ascaris lumbricoides* is the largest and the most common helminth parasitizing the human intestine and currently infects about 1 billion people worldwide [9]. *Hymenolepis nana* is the most common parasitic cestode prevalent globally [10]. *Giardia lamblia*, causing giardiasis, is the most prevalent protozoan parasite worldwide with about 200 million people being currently infected [10,11]. Another common intestinal protozoan is *Blastocystis hominis* whose parasitic status is under debate [9].

The intestinal protozoan parasite *Entamoeba histolytica* causes amebic colitis and extraintestinal disease, including amebic liver abscess [12]. Overall, the World Health Organization estimates that *E. histolytica* infection results in 100,000 deaths/year [12]. Also. infection with *Enterobius vermicularis* (pinworm), known as enterobiasis, is the most common helminthic infectionin the world, including developed contries [13,14].The nutritional status of people infected with helminths is altered through a decline in food intake and/or an increase in nutrient wastage through blood loss, vomiting or diarrhea [15]. These effects can lead to or aggravate protein energy malnutrition, anemia and other nutrient deficiencies [15]. In developing countries anemia, leukocytosis and eosinophilia are usually considered as indicators of a helminthic infection [16,17,18]. The aim of the present study is to determine the most common intestinal parasitic infections among the children in AL-Ahsaa, Saudi Arabia.

Patients & methods: Study design :
This retrospective study was contacted in Maternity and Children hospital (MCH)

Study population :
The study population consisted of all children from 6 to 12 years of age dividing into two age categories, group 1: from 6-9 years old and group 2: from 10-12 years old. Demographic and the type of different parasitic stages in stool sample were reviewed in MCH laboratory data base from 2012 to 2013 in Alahsa.

Statistical analysis :
Data was presented as mean ± standard deviation for continuous variables and proportion for categorical variables. T test and Chi sequer were used to determine the significant differences among groups. Differences were considered significant when $P \leq 0.05$. The statistical analysis was produced by using Statistical Package for Social Sciences (SPSS).

The Results:
The results represent information collected randomly from 93 stool samples.

Prevalence of Intestinal Parasitic Infections (IPIs):
The overall prevalence of the patient infected with intestinal parasite (IP) was estimated as 46.5%. *Giardia lamblia*, being the most common IP, was present in 33 samples (16.5%) followed by *Entamoeba coli* present in 27 samples (13.5%), *Entamoeba histolytica* in 25 samples (12.5%), *Enterobius vermicularis* were only in 8 samples (4.0%) (Figure 1, Table1).

Descriptive Characteristics:
IP infected children were 27% males and 19.5% were females. Statistically there is no significant difference between the infected with IP and age group ($P > 0.05$).Infected patient group 6-9 years old represent 25.5% while 21% of infected patient were from 9-12 years old. There is no statistically significant difference between the infected by the IP and the gender ($P > 0.05$).

Table 1:

		Frequency	Percent
Infected by IP:		93	46.5
	Entamoeba coli	27	13.5
	Giardia lamblia	33	16.5
	Entamoeba histolytica	25	12.5
	Enterobius vermicularis	8	4.0
Non-infected by IP		107	53.5
	Total	200	100.0

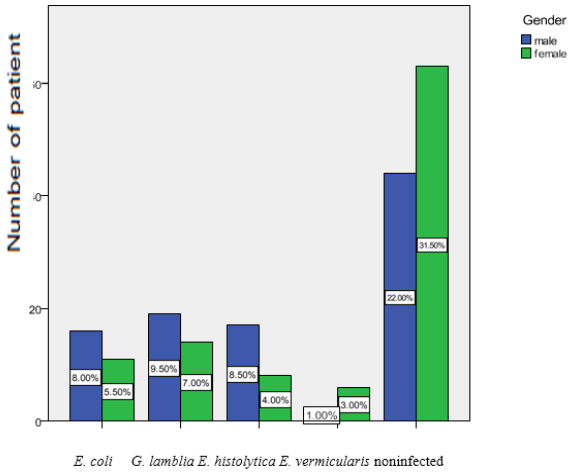

Figure 1: The percentage of patients infected and non-infected by IP according to the gender, AL-Ahsa

DISCUSSION:

The morbidity due to intestinal parasites has always been important public health p roblem [19]. This study estimated the prevalence of intestinal parasitic infections (IPIs) a mong children 6–12 years of age from Alhassa. The prevalence of IPIs was estimated to b e 46.5% and such high prevalence has been consistently reported by a number of studies c onducted in populations [20],[21].

In this study the intestinal parasites namely *Giardia lamblia, Entamoeba* coli,*Enta moebahistolytica* and *Enterobius vermicularis* were identified from the stool samples. *Gia rdia lamblia*and *Entamoeba coli*, the first and the second most common protozoa in the st udy, both can be transmitted orally through drinking water [22].

Water supply is an important risk factor for giardiasis. The effect of social economic status on risk of infectious diseases in general and parasitic infections in particular, is com plex in nature and could be attributed to several other factors such as lack of access to cle an water, poor hygienic [23]. The results of our study showed the occurrence of several in testinal parasites among children in Al-Ahssa. The overall prevalence of intestinal parasit es in this study was (46.5%).

In our study, the prevalence of intestinal parasitic infections was slightly higher in males than in females compared to other community-based studies conducted in Riyadh, Saudi Arabia which showing that around one-third of the population (32.2%) in Riyadh was infected by intestinal parasites [24].

In contrary in our result, the predominant intestinal parasitein Ethiopia was *Hymen olepis nana*, followed by *Entamoebahistolytica/dispar* and *Ascarislumbricoides* with 42 (13.8%), 28 (9.2%), 18 (5.9%), respectively, also the prevalence of intestinal parasites was high in age group of 10-12 years compared to other age groups [25].

According to the present study, the prevalence of *Giardia lamblia* was 16.5%. Infe ctions with *Giardia lamblia* were more prevalent among the male population (9.5%), but t he association was not statistically significant. However, the present finding was relativel y higher than that reported from urban dwellers in southwest Ethiopia, where Mengistu et al. [26] recorded 3.6% for giardiasis while others reported it asthe most common (37.7%) and it was similar between male and female [24].

In the present study, the rate of contamination with *E. coli* was (13.5%) and most c ommon in male population. This result was in contrary with studies in Iran, in which the most common intestinal parasite were *G. lamblia* 3.7% and *E. coli* 5.5%, respectively [27].

Al-Shammari et al.[24] studied the parasitic infections in Riyadh which represented abo ut 10.4% of the studied population. The higher rates in these communities may be attribut ed to improper hygiene and agricultural backgrounds.

*E. histolytica*in our study was (12.5%) most common in male population which in contrary to the study performed by McConnel et al.[28]. It represent only 4.0% and it was most common in female from (15-44) age group and less than in children school group Th e possible difference in the socio-demographic condition of the study population and the e nvironmental condition might explain the observed difference in double infection in the t wo study localities [28].

According to the present study, the prevalence of *Enterobiusvermicularis* was 4.0%. Infections with *Enterobiusvermicularis* were more prevalent among the female and be tween 6 to 9 years old. However, there was no significant difference between patients infe cted by IP and gender or age. However, the study finding was relatively similar with the r eported from Al-Medina district, Saudi Arabia, where Al-Ballaa et al. recorded, indicate o f 1.4 % for *Enterobiusvermicularis* [29]. Also, this IP infected the female more than the m ale. Also, they found the prevalence among preschool children was highly associated with older age, rural residence, non-municipal water supply, inadequate latrine type, low level of parental education, abdominal pain and diarrhea [29].

CONCLUSION:

The present study showed that intestinal parasitic infections are highly prevalent a mong school-aged children in Al-Ahsa. *Giardia lamblia*is the most common intestinal par asitic infections in the study region. Measures including enhancing socioeconomic status, and health education to increase the awareness of personal hygiene for both the children a nd their parents especially the mother are a good strategies to reduce the prevalence of IPI in the area.

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