

Prevalence of Intestinal Parasitic Infections in Sharjah, United Arab Emirates

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Abstract: A survey of prevalence of intestinal parasites among the expatriates and native Emirati people attending Ministry of Health hospitals in Sharjah, United Arab Emirate was performed during the year 2008 and 2009. Stool examination from 10,514 patients (64% expatriates and 36% native Emiratis) was performed. Eight hundred fourteen specimens of the 10,514 examined were found to be positive for intestinal parasites. The infection rates were 15.7% and 3.2% among the native and expatriate population respectively (odds ratio = 5.5). The rate of infection in males (58%) was higher than in females (42%). Overall, protozoa infections (92.2%) were higher than the helminth infections (7.8%). *Entamoeba histolytica* (71.8%) and *Giardia lamblia* (17.5%) were the commonest intestinal parasites identified. Among the helminths, *Ancylostoma duodenale* and *Ascaris lumbricoides* were the common ones. In comparison to helminthic infestations, protozoa infections were more common among the native Emirati population than the expatriate population. The high prevalence rate of intestinal parasitic infections among the local Emirati people clearly indicates that there is continuous ongoing transmission of various parasitic infections in the community.

Keywords: intestinal parasites, protozoans, helminthes, Emirati, expatriates

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Background

About one third of the world (more than two billion people) is infected with intestinal parasites.¹ Poverty, illiteracy, poor hygiene, lack of access to potable water, and a hot and humid tropical climate are some of the common factors attributed to intestinal parasitic infections (IPI). About 39 million disability adjusted life years (DALYs) are attributed to IPI and thus represents a substantial economic burden due to these infections.² In the United Arab Emirates (UAE) Sharjah is the third most populated emirate having around 600,000 people.³ In the recent years it has experienced a rapid growth in socio-economic development and its population. This has resulted in a large influx of expatriates from many developing countries, especially from South and South-East Asian countries like India, Bangladesh, Pakistan, Sri Lanka, Philippines and Indonesia. This expatriate workforce coming from developing countries may be expected to carry parasitic infections endemic in their respective countries. Many of them find suitable jobs in food manufacturing industries, hotels, restaurants and fast food outlets. They also work as food handlers, domestic helpers and baby sitters. Thus, possible transmission of intestinal parasitic infections can occur between the immigrant workforce and native Emirati population. Here, we report a survey of prevalence of intestinal parasitic infections among people attending Ministry of Health hospitals in Sharjah, United Arab Emirates.

Methods

Laboratory data analysis of ten thousand five hundred and fourteen fecal specimens in five different Ministry of Health hospitals within the emirate of Sharjah was carried out between January 2008 and December 2009. These were continuous samples for laboratory investigations from patients presented with gastrointestinal infections of suspected parasitic etiology. A data sheet was used to record variables such as age, sex, nationality, occupation, immune status, presenting symptoms, parasite identified, and treatment dispensed. Stool specimens were obtained from all participants and examined for the presence of intestinal parasite cysts, eggs, trophozoites and larvae. In the laboratory, slides were prepared directly for wet mount in saline as well as in iodine and then were microscopically examined initially under low power (10 × 10 magnification) bright field then under high

power (40 × 40 magnification) bright field. Finally the sample was concentrated using the procedure of formalin ethyl acetate technique⁴ and iodine stained slides were prepared and examined microscopically.

Results

Characteristics of study population

During the study period a total of 10,514 stool specimens were examined. Six thousand seven hundred thirty samples (64%) were from expatriates and the rest 36% were from native Emiratis. The expatriate population was a heterologous mixture of various nationalities from Indian Subcontinent, Middle-East, South-East Asia, Africa and East European countries. The age-group of the study population varied between 1–58 years with mean age of 32 years. None of the study population was noted for any immunocompromised status. Eight hundred fourteen specimens of the 10,514 examined (7.7%), were found to be positive for intestinal parasites. The prevalence rates of intestinal infections were 15.7% and 3.2% among the native and expatriate population respectively (odds ratio = 5.5) (Table 1). Of the 814 positive specimens, five hundred ninety three (73%) were from native Emirati population and rest 27% belonged to the expatriates. Male and female distribution was 58 and 42% respectively.

Parasitism in the studied population

Overall, the protozoan infections (92.2%) were higher than the helminth infections (7.8%). *Entamoeba histolytica* (71.8%) and *Giardia lamblia* (17.5%) were the commonest intestinal protozoa parasites identified. Among the helminths, *Ancylostoma duodenale* and *Ascaris lumbricoides* were the common ones (Table 2). The rate of protozoa infection in native Emirati population was 71% (577). On the other hand, the helminth infections were more common among the expatriates (6%) than the native people. Most cases were infected with a single pathogen except in 20 cases

Table 1. Intestinal parasitic infections in the study population.

Distribution of study population		Intestinal parasitic infection	
		Positive	Negative
Native Emirati population	3784	593	3191
Expatriate population	6730	221	6509

Table 2. Common intestinal parasites in the study population.

Parasites	Positive cases	
	No	% of total infections (814)
<i>Entamoeba histolytica</i>	585	72
<i>Giardia lamblia</i>	143	18
<i>Ascaris lumbricoides</i>	14	2
<i>Ancylostoma deudanale</i>	23	3
<i>Trichiuris trichiura</i>	10	1.2
<i>Enterobius vermicularis</i>	3	0.36
<i>Trichostrongylus orientalis</i>	3	0.36
<i>Hymenolepis nana</i>	10	1.2
<i>Strongyloides stercoralis</i>	3	0.36
Total parasites (infection)	814	7.7
Total number of cases studied	10514	100

with multiple infections were noted. The most common pathogenic parasite associations in people harboring double infections were between *E. histolytica* and *G. lamblia* followed by *E. histolytica* and *H. nana*. Distribution of both protozoans and helminthic parasites among the various expatriate populations shows that hookworm and *Entamoeba histolytica* infection was common among the people from Indian subcontinent like India, Pakistan, Bangladesh, Sri Lanka and Nepal. In contrast people from South East Asia like Indonesia and Philippines were commonly infected with *Trichiuris trichiura* and roundworm. In fifty-eight fecal specimens, non pathogenic protozoans like *Trichomonas hominis*, *Entamoeba coli*, *Iodamoeba butschlii* and *Endolimax nana* were observed based on the size of the cyst and other microscopic features.

Discussion

Intestinal parasitic infections are endemic worldwide and remain a major public health concern in many tropical and subtropical countries. In Sharjah, the prevalence of intestinal parasitic infections is around 7.7% and most of these infections are due to protozoans like *Entamoeba histolytica* and *Giardia lamblia*. These two protozoans remain the most common intestinal parasitic pathogens (92%) in the study population. The transmission of these parasites occurs via fecal-oral route, either directly from person-to-person or indirectly by eating or drinking fecally contaminated food and water. The asymptomatic carriers of these pathogens pose a

constant risk for transmission in the community. It is interesting to note that, in Sharjah with the availability of potable drinking water, adequate toilet facilities and regular garbage disposal the probability of transmission by contaminated water remains significantly low. However, transmission from person-to-person e.g. food handlers, domestic helpers and baby sitters remains high in the household and community at large.⁵ As most of these expatriate working as food handlers, baby sitters and domestic helpers hail from parasitic endemic countries, there are possibilities for them to carry them as asymptomatic carriers and to transmit them.⁶⁻⁸

In contrast to protozoan infections, the prevalence of helminthes infections in our study was significantly low (8%) and it was mainly seen in expatriate population. Similar observations have been made in studies performed in the neighboring countries.^{9,10} The reasons for this may be due to unfavorable ecological environment and other prevailing socio-cultural factors that influence parasite survival and transmission. In Sharjah, most people having access to clean water, adequate toilet facilities and habitual use of foot ware the transmission of soil transmitted helminthes are significantly reduced. In addition, the locally prevailing lengthy summer and the dry harsh desert environment adversely affect the microclimates of the microhabitats in which helminth eggs and larvae can normally survive until infection of the final hosts is accomplished.¹¹

Possibly the most surprising and unanticipated finding was the far greater prevalence of intestinal parasitic infections among the native Emirati population (15.7%) compared with the expatriates (3.2%) with an odds ratio of 5.5. The higher rates of parasitic infections among native population when compared to the expatriates have also been observed in studies from neighboring countries like Kuwait and Qatar.^{12,13} This may be attributable to prompt health seeking attitude and better accessibility of native people to ministry hospitals than the expatriates. The high prevalence rate among the local Emirati people clearly indicates that there is continuous ongoing transmission of various parasitic infections in the community.

There are several potential limitations in this cross-sectional study which should be considered while analyzing the results. Firstly, this is retrospective study analyzing only the notified cases of intestinal parasitic



infections, thus it may not reflect the true incidence of IPI in the community. Secondly, laboratory diagnosis of IPI was based on a single stool examination, which could have underestimated the prevalence, as optimal laboratory diagnosis of IPIs requires the examination of at least three stool specimens collected over several days.¹⁴ However, more recent studies have suggested that one or two stool samples will detect up to 90% of the protozoa present.^{15,16} Lastly, in our routine laboratory diagnostic setup we considered all pathogenic amoebas as *Entamoeba histolytica* based on the microscopic features and did not differentiate it from *Entamoeba dispar*.^{17,18}

Conclusion

In this age of globalization, mass migration will continue to promote transmission of human intestinal parasites around the world. Health education, raising awareness and strengthening the existing screening methods especially for food handlers, domestic helpers and baby sitters are among the ways to control the problem of intestinal parasitic infections in the general population in Sharjah.

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Disclosures

This manuscript has been read and approved by all authors. This paper is unique and is not under consideration by any other publication and has not been published elsewhere. The authors and peer reviewers of this paper report no conflicts of interest. The authors confirm that they have permission to reproduce any copyrighted material.

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