

Prevalence of intestinal parasites among expatriate workers in Al-Khobar, Saudi Arabia

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ABSTRACT

Background and Objective: The Kingdom of Saudi Arabia is considered to be one of the countries with a high number of expatriates. The importance of this study lays in its approach to tackle a significant issue, which is the health of expatriate unskilled laborers who are serving the society in very vital activities such as baby-sitting, cooking and cleaning. This study was aimed at determining the prevalence of intestinal parasites among expatriate workers in Al-Khobar, Saudi Arabia.

Methods: A retrospective cross-sectional study was conducted among expatriate workers in Al-Khobar, a major city in the Eastern Province of Saudi Arabia. Using systematic sampling (1 in 10 files), a sample of 1,019 medical files was studied.

Results: The results showed that the prevalence of parasitic infection is 31.4%. 22.3% are single infection and 9.1% with multiple infections (double and triple and quadruple). Hookworm, *Trichuris trichiura*, and *Ascaris lumbricoides* were the most common infections in all nationalities. Parasites were found to be more prevalent among Indians followed by Indonesians, Filipinos then Sri Lankans.

Conclusion: The prevalence rate found in this study was high enough to merit a spotlight on it as a problem. Health education should be increased to raise awareness of the society about such a health problem.

INTRODUCTION

In spite of a great development in healthcare, the problem of parasitic infections continues to be acute. WHO estimated that more than 2,000 million people are infected by schistosomiasis and soil-transmitted helminths (STH) worldwide, of which more than 300 million suffer from associated severe morbidity. STH

infections are widely distributed in tropical and subtropical areas, especially in poor populations (1).

The Kingdom of Saudi Arabia has experienced a rapid socio-economic development in recent years. The improved standards of living have led to a large influx of expatriate workers from developing countries and hence, one should expect parasitic infections among them (2).

It is obliged by the Saudi Health authorities that the expatriate workers are infection-free and physically fit to avoid disease transmission, as most of the workers are housemaids, food-handlers, private cooks and baby-sitters.

The expatriate labor, largely coming from Sri Lanka, Indonesia, Philippines, India and Bangladesh, could be expected to have been infection with various types of parasites. They are coming from endemic areas where intestinal parasites are becoming a major health problem in their countries (3, 4).

Studies done on the expatriates working in Saudi Arabia reported different prevalence rates. It varies between 55.7% and 41.4% in Riyadh (2, 5) and 40.3% in Jeddah (6) and 46.5% in Abha (7).

Studies done on the food handlers reported 14% prevalence in Al-Medinah (8) and 7.56% in Dammam and Al-Khobar (9).

The prevalence of parasitic infections among expatriates was higher than in Saudi patients (5, 6).

This study was aimed at determining the prevalence of intestinal parasites among expatriate workers in Al-Khobar, Saudi Arabia.

METHODS

The regulations in Saudi Arabia require that foreign labor should be subjected to medical check-ups to ensure medical fitness and to be screened for infectious diseases. The screening techniques involve laboratory examination for intestinal parasites where fresh saline as well as Lugol iodide stool preparations are made.

The material for this retrospective cross-sectional study was the medical file of foreign labourers who attended for entry medical check-up.

Sampling Procedure: It was estimated at the time of the study (1994) that the total annual medical examinations of 12,156 were done at the primary health care centers in the Eastern Province of Saudi Arabia. A sample of 1,019 files was studied. This represents about 8% of all files. This sampling procedure was a systematic sample of 1 in 10 files.

Methods of Data Collection: A checklist was used to record data. The checklist included variables such as age, sex, nationality, type of work, pregnancy test, gonorrhoea tests, medical fitness, pus cells, type of parasites, and treatment dispensed.

Statistical Methods: The statistical analysis operations have been executed by an IBM personal computer using WHO's EPI-% statistical package. Frequency distributions and cross-tabulation of data was carried out.

RESULTS

Table 1 illustrates some socio-demographic characteristics of the sample, the majority of which were females and their main job was housemaid. Sri Lankans formed the bulk of the labourers - 45%.

A small number of the studied sample, 2.5% was found medically unfit and were rejected. They were either pregnant, HIV carriers or suffering from venereal disease.

Table 2 illustrates the prevalence of intestinal parasites in the sample studied. The prevalence of parasitic infection is 31.4%. 22.3% are single infections and 9.1% with multiple infections.

Hookworm, *Trichuris trichiura*, and *Ascaris lumbricoides* were the most common infections in all nationalities. The distribution of all parasitic infections found is listed in Table 3. Table 4 represents the pattern of double, triple and quadruple infections.

Table 5 illustrates the distribution of parasites according to nationalities.

DISCUSSION

The Kingdom of Saudi Arabia is considered to be one of the countries with a high number of expatriates. The general population statistics of 2004 show that 27.1% of the population are foreigners (10). A large number of them are unskilled labourers of both sexes who came from tropical and subtropical countries where low socio-economic levels are present along with poor medical care (4).

The importance of this study lays in its approach to tackle a significant issue, which is the health of expatriate unskilled laborers who are serving the society in very vital activities such as baby-sitting, cooking and cleaning.

Females formed the majority of the study population. This is due to the fact that most Saudi families favor female housemaids over males for cultural, religious and traditional reasons.

The results of this study support the assumption that those labourers came from a low medical health care

system, where parasites are found in about one-third of the total cases examined and this is considered a high rate. This is lower than the other studies done in expatriates in Riyadh (2, 5) and that done in Jeddah (6) and Abha (7). But it is higher than that found in other Gulf regions (23% in Al-Ain, UAE) (11). Lower prevalence in a previous study done in the same area of Al-Khobar (9) may be related to the differences in the samples used (gender, nationality and type or work).

Two-thirds of the positive cases were singly infected and the other third with multiple infections. The majority of them are carrying some of the most common detected parasites: Hookworm, *Trichuris trichiura*, and *Ascaris lumbricoides*. This finding agrees with the fact that the three parasites are geo-related and might be carried by the same patient (12). It is consistent with other studies conducted in Saudi Arabia in different geographical areas, where such three parasites were the most common among expatriates examined (6, 7, 11).

The presence of multiple infections highlights the need for thorough investigation for cases that show one type of infection. There was an interesting relationship between the nationality and the type of parasite. Parasites were found to be more prevalent among Indians followed by Indonesians, Filipinos then Sri Lankans. *Ascaris lumbricoides* was common among Indonesians. *Trichuris trichiura* and *Entamoeba histolytica* were the most common among Filipinos and Hookworm among Sri Lankans. This is similar to findings shown in UAE (11).

On the other hand, the presence of certain parasites like *Enterobius vermicularis*, even though it was found in low rate, is alarming. The transmission of such parasites occurs easily (by scratching the anus region and lack of personal hygiene). Autoinfection is common with this parasite (13).

It is also documented that the presence of even nonpathogenic amoebae in the stool indicates a reservoir of infection and low standard of hygiene among the population (14). That was emphasised by another study, which showed that an infection with *E. histolytica* and *E. dispar* was significantly associated with an *Entamoeba coli* infection (15). That was noticed in this study where there was low prevalence of *E. coli* in nearly all nationalities.

Global migration patterns will continue to promote transmission of human intestinal parasites in the foreseeable future because untreated or incompletely treated infected individuals can serve as roving reservoirs of infection for long-lived parasites (16). To maintain a low prevalence of such infestations, the government of Saudi Arabia covers the cost of the medical examination, laboratory tests, treatment and medicines. These costs are high, bearing in mind that costs of international medical health care are rising all over the world.

Treatment is dispensed free for the infected cases. Metronidazole is highly effective against *E. histolytica* and *Giardia lamblia*.

It is concluded that high prevalence of parasites among expatriates should be considered as a pointer to a health problem that may exert its effect on the Saudi society due to the nature of the expatriates' work.

It is recommended that health education should be increased to raise the awareness of the society about such health problems. Among the ways to control this problem is the immediate check-up upon arrival of labor.

Table 1: Socio-demographic characteristics of the studied sample

Characteristics	No.	(%)
Sex		
Male	95	(9.6%)
Female	899	(90.4%)
Nationality		
Sri Lankan	445	(44.8%)
Indonesian	278	(28%)
Filipino	179	(18%)
Indian	86	(8.6%)
Others	6	(0.6%)
Type of work		
Housemaid	898	(90.3%)
Driver	72	(7.3%)
Cook	11	(1.1%)
Baby-sitter	8	(0.8%)
Others	5	(0.5%)
Mean age for Male	39	
Mean age for Female	34	
Total	994*	

*Small numbers of the selected sample (2.5%) were found medically unfit and were rejected.

Table 2: Prevalence of intestinal parasitic infection among the studied sample

Pattern of infection	Infected cases	
	No.	%
Single infection	222	22.3
Double infection	70	7.1
Triple infection	17	1.7
Quadruple infection	3	0.3
Total number of infected cases	312	31.4
Total sample	994	100

Table 3: Prevalence of common intestinal parasites among foreign expatriates in Al-Khobar area

Parasites	Positive cases	
	No.	% of total infections (424)
Hookworm	116	27.4
Trichuris trichiura	113	26.7
Ascaris lumbricoides	110	25.9
Entamoeba histolytica	39	9.2
Entamoeba coli	21	5
Giardia lamblia	17	4
Enterobius vermicularis	4	0.9
Strongyloides stercoralis	4	0.9
Total parasites (infection)	424*	42.6
Total number of cases studied	994*	100

Table 4: Common patterns of parasitic infection

Type of parasite	No. of patients
Double infections	
Ascaris lumbricoides + Trichuris trichiura	25
Trichuris trichiura + Hookworm	15
Ascaris lumbricoides + Hookworm	6
Entamoeba histolytica + Hookworm	4
Entamoeba histolytica + Entamoeba coli	4
Entamoeba histolytica + Trichuris trichiura	2
Trichuris trichiura + Entamoeba coli	2
Giardia lamblia + Trichuris trichiura	2
Giardia lamblia + Entamoeba histolytica	2
Ascaris lumbricoides + Entamoeba coli	2
Giardia lamblia + Hookworm	1
Entamoeba histolytica + Ascaris lumbricoides	1
Hookworm + Entamoeba coli	1
Ascaris lumbricoides + Giardia lamblia	1
Enterobius vermicularis + Hookworm	1
Enterobius vermicularis + Ascaris lumbricoides	1
Total positive double infections	70
Triple infections	
Ascaris lumbricoides + Trichuris trichiura + Hookworm	9
Hookworm + Entamoeba histolytica + Entamoeba coli	2
Trichuris trichiura + Entamoeba histolytica + Entamoeba coli	2
Trichuris trichiura + Entamoeba histolytica + Ascaris lumbricoides	1
Trichuris trichiura + Hookworm + Strongyloides stercoralis	1
Trichuris trichiura + Ascaris lumbricoides + Strongyloides stercoralis	1
Hookworm + Entamoeba histolytica + Trichuris trichiura	1
Positive triple infections	17
Quadruple infections	
Ascaris lumbricoides + Trichuris trichiura + Hookworm + Enterobius vermicularis	1
Trichuris trichiura + Entamoeba histolytica + Ascaris lumbricoides + Enterobius vermicularis	1
Trichuris trichiura + Entamoeba histolytica + Ascaris lumbricoides + Strongyloides stercoralis	1
Positive quadruple infections	3

Table 5: Distribution of parasites according to nationalities

Types of parasites	Labor nationality					Total	%
	Indonesian	Sri Lankan	Filipino	Indian	Others		
Hookworm	35	67	5	9	0	116	27.4
Trichuris trichiura	34	35	29	13	2	113	26.7
Ascaris lumbricoides	43	34	22	11	0	110	25.9
Entamoeba histolytica	9	14	12	4	0	39	9.2
Entamoeba coli	5	7	4	5	0	21	5
Giardia lamblia	3	4	5	5	0	17	4
Enterobius vermicularis	0	4	0	0	0	4	0.9
Strongyloides stercoralis	0	3	0	1	0	4	0.9
Total infection	129	168	77	48	2	424	100
Total no. of each nationality examined	278	445	179	86	6	994	-
% of positive cases in each nationality	46.4	37.8	43	55.8	33.3	42.6	-

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