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Research Article

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Prevalence of Entamoeba Histolytica in Adult Diarrheic Patients of King Fahd Hospital in Jeddah, Saudi Arabia

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ABSTRACT

This study aimed to assess the prevalence of intestinal infections with Entamoeba histolytica and E. histolytica cysts among adult patients visiting King Fahd Hospital in Jeddah, Saudi Arabia. Fresh stool samples were collected from 188 patients (121 males and 67 females). Microscopic examination of fecal preparations (formol-ether concentrations) was done for detection of protozoan cysts, and larvae. To confirm the presence of E. histolytica, the stool samples were tested using the E. histolytica II antigen detection Kit. E. histolytica was detected in 156 (83%) of patients that most of them 106 (68%) needed outpatient care. The prevalence of E. histolytica infection among male was higher than that among female with no significant difference. According to nationality, Saudi patients were more infected by E. histolytica. However, E. histolytica cysts infection was more detected in non-Saudi population. E. histolytica infection was most common among Saudi women than Saudi men. In contrast, the invasive disease caused by E. histolytica infection is more common among men.

Key words: *Entamoeba histolytica, prevalence, Saudi patient.*

INTRODUCTION

Infections caused by intestinal parasites are endemic worldwide; particularly in developing countries and are described as constituting the major cause of illness and disease [1, 2]. The current assessments estimated that about 3.5 billion people are affected with intestinal parasites in the world, and 450 million are ill. The majority of people are living in the rural and urban slum areas of tropical and semi tropical parts of the world [3, 4].

Among intestinal parasites, Entamoeba histolytica is a pathogenic protozoan parasite, which can cause amoebiasis the third most frequent infectious disease leading to mortality [5]. According to the World Health Organization, Entamoeba histolytica affects about 500 million people worldwide, causing 50 million persons suffereing from symptomatic illness and about 100,000 deaths [6]. It is a major public health problem, particularly in developing countries [7]. The rate of infection by E. histolytica varied among countries, socio-economic and sanitary conditions, and populations [8].

Saudi Arabia is one of important countries receiving expatriate workers from different regions that are known to be endemic for many diseases, including those caused by intestinal parasites. In Saudi, intestinal infection is one of significant public health problem mostly among children.

Previous studies in Saudi Arabia revealed high prevalence rates of infection with many species of intestinal parasites in many regions of Saudi Arabia. The majority of these studies are interested in children [9-11]. In this context, Entamoeba histolytica is one of the most common intestinal parasites identified in many regions of Saudi Arabia with varied prevalence.

The present study was interested to investigate the prevalence of E. histolytica among adult patients in Jeddah, Saudi Arabia.

MATERIALS AND METHODS

Patient selection

This study was carried out at King Fahd Hospital, Jeddah, Saudi Arabia during the period from November 23, 2015 to November 23, 2016. Adult male and female with Saudi and non-Saudi nationality were recruited in the study.

Samples collection and laboratory technique

A total of 188 fresh stool samples (121 males and 67 females) were collected in sterile plastic containers and sent immediately to the hospital laboratory of parasitology.

Microscopic examination of fecal preparations (formol-ether concentrations) was done to examine the presence of ova, cysts, and larvae.

To confirm the presence of E. histolytica, the stool samples were tested using the E. histolytica II antigen detection Kit (TechLab, Blacksburg, VA) according the instructions of the manufacturer [12].

Ethical Consideration

All patients were informed of the purpose of this study and signed consent forms authorizing their voluntary participation. Data collection and clinical samples collection were approved by the university ethics committee. All the participants were interviewed by the same interviewer using a structured questionnaire.

Statistical analysis

The analysis of the collected data was done using Statistical Package for Social Science (SPSS) version 20.0. The risk was estimated by using odds ratio and 95% confidence interval. The results of the association were considered as significant when the p value was below 0.05.

RESULTS AND DISCUSSION

In the current study, characteristics of samples study are shown in table 1. Among 188 participants, 121 (64.4%) were male and 67 (35.6%) were female. Regarding the nationality, 92 (48.9%) were Saudi and 96 (51.1%) were Non Saudi. Out of the 188 patients, 83% were infected by E. histolytica and the parasite ova was detected in 17% of patients.

In the present study, the rate of parasitic protozoan infection among male (64.4%) was higher than that among female (36.6%). This result was in agreement with previous studies [13, 14]. This may be explained by male lifestyle characterized by greater contact with the environment and livestock compared to females. The prevalence of inpatient cases was 38.3%, which was higher than that detected in previously studies in Saudi Arabia [11, 15]. The prevalence of cases with E. histolytica was 83% and only 17% of cases were recently attenuated with E. histolytica cyst. This may be attributed to the ability of cysts, if inside the body, to resist environmental conditions for days to weeks and can be responsible for disease transmission [16]. The transmission of these infections is usually associated with contaminated food, water, and hands, and an improper hygiene [17, 18]. The degree of each factor and the prevalence of infections differ from one region to other [14].

Tabele 1. Chracteristics of study samples

Chracteristics	N (%)
Gender	
Male	121 (64.4)
Female	67 (35.6)
Nationality	
Saudi	92 (48.9)
Non Saudi	96 (51.1)
Type of parasite	
Entamoeba histolytica	156 (83)
Parasite OVA	32 (17)
Type of care	
Inpatient	72 (38.3)
Outpatient	116 (61.7)

The distribution of E. histolytica and the parasite ova related to the gender, nationality, and type of care are shown in table 2. In our study, infection with E. histolytica or E. histolytica cysts was not associated with gender. E. histolytica or E. histolytica cysts infections were equally distributed between the genders with higher proportion of men infections. This result is in agreement with the previous studies suggested that E. histolytica infection was equally distributed between men and women with higher proportion of men [11, 19], and infection of E. histolytica was more prevalent in male hosts compared to female hosts in another study with no significant association [20].

Several drugs were available for treatment of E. histolytica or E. histolytica cysts infections. The choice of drugs, dosage, and the period of treatment has to be adopted after diagnostic of clinical feature of parasite and its disease manifestation (non invasive or invasive disease) [21]. Most individuals with amebiasis may be treated on an outpatient basis. Several clinical scenarios may favor inpatient care. In the present study, a significant association was shown between infection with E. histolytica or E. histolytica cysts and the type of care (P value <0.001). Among inpatient cases (69.4%) are infected with E. histolytica and (30.6%) are infected with E. histolytica cysts. Concerning outpatient cases, 91.4% are infected with E. histolytica and (8.6%) are infected with E. histolytica cysts. This difference in type of treatment may be due to the aggressivety of infection and the risk of invasive disease [22]. In the other hand, inpatient care will reduce the risk of transmission to others [23]. The prevalence of inpatient infected with E. histolytica cysts is higher than inpatient infected with E. histolytica. This result may be explained by the danger of contamination to others due the presence of cysts, because cyst excreted can transmit the pathogenic protozoa to household contacts years later [24].

Non-Saudi patients are the expatriate workers coming principally from Bangladesh, Philippine, India, Indonesia, Pakistan, Sri Lanka and Egypt which are known to be endemic foci for intestinal parasites. A significant association was shown between distribution of E. histolytica and E. histolytica cysts in Saudi and Non Saudi patient. The prevalence of infection with E. histolytica cysts was higher in Non Saudi patient (26.0%) compared to Saudi patient (7.6%). This may be contributed to the lifestyle, nature of work, the socio-economic status of these workers, and their direct contact with contaminated sources [25]. Also, the foodborne and waterborne transmission remain the primary sources of infection with cysts [26]. However, the prevalence of Saudi patient infected with E. histolytica was the highest. This result may attribute the type of domestic water used.

The distribution of E. histolytica infection according to gender was shown in table 3. There is a significant difference in the prevalence of E. histolytica infection among Saudi and non Saudi cases according to the gender. The prevalence of female infection with E. histolytica in Saudi population is higher than in non Saudi female. This result was in agreement with the result of Jamila [27] who recorde that, women were more affected than men with E. histolytica in Jeddah, but this difference was not significant. In contrast, non Saudi men have the highest percentage of E. histolytica infection. This result remains controversial between several studies in different population [11, 20, 28, 29]. These differences could be attributed mainly to behavior (type of work), ecological and physiological reasons or hormonal reasons. Regarding the type of care among male and female E. histolytica infection, we shown that women don't need an inpatient care. However, 50.5% of men infected needed inpatient care. This result showed that the invasive disease caused by E. histolytica infection is more common in men [26].

Table 2. Distribution of E. histolytica and E. histolytica cyst infection related to gender, nationality and type of care

	Entamoeba histolytica	**Entamoeba histolytica cyst**	**p**	**OR (CI 95%)**
Gender				
Male	99 (81.8)	22(18.2)	0.5	
Female	57 (85.1)	10 (14.9)		
Nationality				
Saudi	85 (92.4)	7 (7.6)	0.001	4.27 (1.74-10.46)
Non Saudi	71 (74.0)	25 (26.0)		
Type of care				
Inpatient	50 (69.4) 32	22 (30.6)	<0.001	0.21(0.09-0.48)
Outpatient	106(91.4) 68	10(8.6)		

Table 3. Distribution of Entamoeba histolytica infection in Male and Female patient

	Male	Female	p	OR (CI 95%)
Nationality				
Saudi	47 (47.5)	38 (66.7)	0.02	0.45 (0.23-0.89)
Non Saudi	52 (52.5)	19 (33.3)		
Type of care				
Inpatient	50 (50.5)	0 (0.0)	<0.001	0.46 (0.37-0.56)
Out patient	49 (49.5)	57 (100.0)		

CONCLUSION

This study revealed a relativily high frequency of E. histolytica infection among patient visiting King Fahd hospital in Jeddah. Both E. histolytica and E. histolytica cyst infection were identified in the studied patients with different degree of aggressiveness and type of care. In Saudi Arabia, E. histolytica poses a common and significant public health problem. In order to prevent the infection or its spread to others, it is necessary to follow a good hygiene to interrupt the major way of contamination. Also, it may be time to need a vaccine against E. histolytica to guard against this serious E. histolytica infection.

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