

Original article

A study of the prevalence of intestinal parasitic infection in HIV positive individuals in Mashhad, Northeast Iran

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Abstract

Introduction and objective: Intestinal parasitic infection is an important problem in the Human Immunodeficiency Virus (HIV)-infected patients. The aim of this study was to investigate the prevalence of intestinal parasitic infections among HIV+ patients in Mashhad, Iran.

Materials and methods: A coproparasitological study was conducted from October 2005 to August 2006 at Emam Reza hospital, Mashhad University of Medical Sciences, Iran. It was carried out on 31 HIV+ patients admitted at the HIV clinic and 20 HIV-negative individuals as control group using direct and formalin-ether sedimentation concentration methods, trichrome and acid-fast staining.

Results: Overall prevalence of intestinal parasites among HIV+ population was 67.7% and in control group was 55% without significant difference between the two groups. More specifically, the following parasites were identified in HIV+ group: *Giardia lamblia* 22.6%, *Blastocystis hominis* 22.6%, *Chilomastix mesnili* 22.6%, *Entamoeba coli* 9.7%, and *Entromonas* 3.2%. In the control group *Entromonas* (45%), *B. hominis* (15%), *E. coli* (10%), *G. lamblia* (5%), and *Hymenolepis nana* (10%). However, the prevalence of *G. lamblia*, *B. hominis* and *C. mesnili* was greater for HIV+ patients ($p < 0.05$). There were statistically significant differences between trichrome staining (28, 54.9% positive for parasites), acid fast methods (6, 11.8%), direct method (7, 13.7%) and formalin-ether method (13, 25.5%) in detection of parasites in two groups ($p < 0.05$).

Conclusion: Our study shows the importance of testing for intestinal parasites in patients who are HIV-positive, and emphasizes the necessity of increasing awareness among clinicians regarding the occurrence of parasite infections in these patients. Routine examination of stool samples for parasitic infections could significantly benefit the HIV-

infected individuals by contributing to reduce morbidity, mortality and improved quality of life.

Keywords: HIV+ Patients, Intestinal parasites, *Giardia lamblia*, *Blastocystis hominis*, *Chilomastix mesnili*

Introduction

Acquired Immunodeficiency Syndrome (AIDS) is currently one of the biggest and most deadly infectious diseases worldwide in distribution [1]. Patients with AIDS are at higher risk for many diseases including different kinds of biological agents. Intestinal parasitic infection is an important problem in the Human Immunodeficiency Virus [HIV]-infected patient [2]. In AIDS patients, opportunistic parasitic gastrointestinal infections cause severe diarrhea, profoundly compromise the absorptive function of the small intestine, and significant mortality [3].

Many individuals with high risk for HIV also live in areas hyper endemic for intestinal parasitic infections, which are mainly acquired in childhood and remain as chronic infections into adulthood [4]. Opportunistic infections caused by intestinal parasites also vary according to the geographical area and the endemic levels in each location [5]. There are few reports about the parasitic infections in HIV positive patients in Iran.

The aim of this study was to investigate the prevalence of intestinal parasitic infection among HIV/AIDS patients from HIV clinic of Mashhad in North-east Iran which conducted between October 2005 and August 2006.

Materials and methods

This study was conducted from October 2005 to August 2006 at Emam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran. We screened HIV-infected individuals, who were visited in HIV clinic of Mashhad. Control group was

HIV-negative individuals who had been referred to Emam Reza hospital at the same period of time. A structured questionnaire was used to collect socio-demographic characteristics.

Three stool specimens were collected in clean plastic stool cups, which contained 10% formalin. The specimens were prepared as wet mounts. Moreover specimens were processed using the formalin-ether sedimentation technique. The pellet obtained was smeared on a glass slide and observed under a light microscope. Second smear from sedimentation was made and stained using a modified acid-fast procedure to detect parasite under a light microscope (x100). Another smear was stained with trichrome's stain to identify the intestinal parasites.

All data from stool study was collected then analyzed using descriptive statistical analysis. The data was entered and analyzed using the SPSS. A comparison of the frequency of parasites between case and control groups was performed by Fisher's exact test. Subsequently, the Cochran test was used to compare different laboratory methods. P value <0.05 was considered significant.

Results

A total of 51 individuals were enrolled in the study 31(60.8%) were HIV+ patients with mean age of 38.21 ± 8.52 years. Of these 25(80.6%) were males and 6(19.4%) were females and most of them (70%) were intravenous drug abusers. The HIV negative control group included 20 subjects with a mean age of 26.1 ± 2.17 years, 13(65%) were males and 7(35%) were females. Overall

prevalence of intestinal parasites among HIV+ population was 67.7% and in control group was 55%. There was no significant differences between parasitic infections in two groups ($p=0.25$).

More specifically, the following parasites were identified in HIV+ group: *Giardia lamblia* 22.6%, *Blastocystis hominis* 22.6%, *Chilomastix mesnili* 22.6%, *Entamoeba coli* 9.7%, and *Entromonas* 3.2%. In control group *Entromonas* (45%), *B. hominis* (15%), *E. coli* (10%), *G. lamblia* (5%), and *Hymenolepis nana* (10%). No statistically significant difference in the prevalence of individual parasite species was detected between cases and controls excepting *C. mesnili* that of which were significantly higher in HIV patients ($P < 0.05$).

The prevalence of infection with different parasites in patients and control group is summarized in Table 1. Based on Cochran test, there were statistically significant differences between trichrome staining (28, 54.9% positive for parasites) and acid fast methods (6, 11.8%) and direct method (7, 13.7%) and formalin-ether method (13, 25.5%) in detection of parasites ($p < 0.05$). In 3.4% HIV-patients *G. lamblia* and *C. mesnili* were seen.

Table 1: Prevalence of intestinal parasitic infections in 31 HIV+ patients and 20 control group in Mashhad, Iran, 2006

Parasite species	Percent (%)	
	HIV patients	Control group
<i>G. lamblia</i>	22.6%	5%
<i>B. hominis</i>	22.6%	15%
<i>C. mesnili</i>	22.6%	0%
<i>E. coli</i>	9.7%	10%
<i>Entromonas</i>	3.2%	45%
<i>H. nana</i>	0%	10%
Total	65.5%	55%

Discussion

Since the first AIDS cases were described, a high prevalence of gastrointestinal disorder has been reported, especially diarrhea due to parasite infection [5]. Our study demonstrated a prevalence of 67.7% parasitic infection in HIV-positive patients and 55% of the controls. On the other hand, in two respective studies in Iran, the prevalence of intestinal parasite infection was 11.4%, and 18.4% [3,6]. The results of parasite infection prevalence observed in our study were in agreement with Wiwanikit [2] (Thailand, 60 patients, 50%) and Hailemariam *et al.* [7] (Ethiopia, 78 patients, 52.6%).

In Turkey Buyukbaba Boral *et al.* [8] studied 38 AIDS patients, enteric parasites were detected in 18 (47%), 16 patients had a single parasite, and two patients were found to be infected with more than one parasite. In our study, multiple parasite infection was 12.9%. Beside impaired immunity, infection with intestinal parasitic organisms resulting in diarrheal symptom is commonly seen [2]. In these patients the prevalence of parasite infection observed in our study was 67.7%, comparable to other studies in Iran and may be related to two factors: first, high prevalence rate of parasitosis in Khorasan region as documented in control group (55.5%), and second in our study the methods for examining of stool based on three sample and four laboratory parasitological methods which led to higher sensitivity for detection of parasites.

The detection of such common intestinal parasites in both patients and controls could be a reflection of the poor environmental sanitation and personal hygienic practices, which emphasize the need for interventional measures at the community level to reduce the risk factors of acquiring intestinal parasites in immunocompromised patients. Diarrhea is

one of the most prevalent manifestations of disease among AIDS patients. Such high frequency of diarrhea is basically associated with presence of intestinal parasites [9]. In tropical countries, chronic diarrhea that begins acutely and lasts for more than 4 weeks, is associated with weight loss and is often the first presenting symptoms of HIV infected individuals [7]. In our study only 25.8% of patients had diarrhea and because of drug abusing many of them had constipation. *G. lambelia*, *B. hominis* and *C. mesnili* appeared to have the highest prevalence and equal in our study, followed by *E. coli* and *E. hominis*.

Blastocystis hominis was the most commonly detected parasite in both populations by Damien *et al.* [10] in Australia. However, there is little knowledge of the basic biology of this organism. As a result, controversy surrounding its role as a pathogen still exists. Doyle *et al.* [11] prospectively investigated a large number of patients in whom *B. hominis* was the only detectable potential pathogen. *Giardia* was the most prevalent pathogenic protozoa detected in HIV+ group. *Giardia* is not considered an opportunistic parasite and less frequently observed to cause severe illness in HIV-positive patients and many of *Giardia* infected patients have clinical symptoms like diarrhea and abdominal pain [3].

Cryptosporidium and *Isospora belli* were not detected in any of HIV+ patients and it may be related to treatment with trimethoprim-sulphamethoxazole for other infections (such as *Pneumocystis carinii*). In this study, of the 21 patients who tested positive for intestinal parasites, seven had diarrhea. Intestinal parasites were significantly more common among patients with diarrhea than those without. This study highlights the importance of testing for intestinal parasites among Iranian HIV-positive patients, especially those with low

immunity presenting with diarrhea. Therefore we suggest that all HIV-positive patients stool must be checked for intestinal parasites periodically with formalin ether and trichrome staining which are more precise laboratory methods.

The intestinal protozoa have been increasingly identified in immunocompromised patients [12]. This is because, parasitic infections still remain one of the most prevalent types of infection in the world [13,7]. In both groups, monoparasitism was more prevalent than polyparasitism and intestinal protozoa were more prevalent than helminthes.

Conclusion

The present study highlights the importance of testing for intestinal parasites in patients who are HIV-positive, and emphasizes the necessity of increasing awareness among clinicians regarding the occurrence of these parasites in this population. Routine examination of stool samples for parasitic infections could significantly benefit the HIV-infected individuals by contributing to reduce morbidity, mortality and improved quality of life.

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