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A study on Prevalence of Gastrointestinal Parasitic Infections in HIV (+) Patients Referred to Ahvaz Razi Hospital in 2008-2009

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ABSTRACT

Background: Accute Immune Deficiency Syndrom (AIDS) is a serious and lethal disease in many parts of the world, rendering a patient sensitive to all opportunistic pathogens that can cause death as the disease progresses. Many patients suffer from intestinal opportunistic infections by parasites.

Objectives: The aim of present study was to examine parasitic intestinal infections in AIDS patients in Razi Hospital, Ahvaz.

Patients and Methods: We collected 100 stool samples from 60 HIV (+) patients who were referred to Razi Hospital, Ahvaz. The samples were examined by direct and MIF (merthiolate-iodine-formaldehyde) method. All samples were stained with Ziehl-Neelsen (acid fast staining) and trichrome. General data, such as clinical signs, duration of disease, route of infection, and habitat of patient, were obtained by questionnaire.

Results: Thirty percent of HIV (+) patients were infected with intestinal protozoan parasites. There was no significant difference in the prevalence of parasite infections between sex or age. The prevalence of parasitic infections was as follows: *Blastocystis hominis*, 16. 7%; *Cryptosporidium parvum*, 8. 3%; *Endolimax nana*, 5%; *Entamoeba coli*, 5%; *Giardia intestinalis*, 3. 3%; *E. histolytica cyst*, 1. 7%, and *Dientamoeba fragilis*, 1. 7%.

Conclusions: This study shows that the prevalence of parasitic infections is not high in HIV (+) patient in Ahvaz compared with other studies, but it is recommended that fecal examination be performed every 3 months to detect serious parasitic infections and that parasitic infections should be treated after laboratory diagnosis and in the presence of the gastrointestinal symptoms.

Implication for health policy/practice/research/medical education:
Although the prevalence of gastrointestinal parasites in HIV (+) patients is not high, parasitic disease should be considered in such patients who live in tropical and endemic areas due to failure of their immune system.

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1. Background

HIV virus was reported in the US for the first time in homosexual men in the summer of 1981 who were infected with *Pneumocystis jiroveci*; subsequently, the rate of concomitant infection rose in transplant patients, especially after blood transfusion, and patients with hemophilia. The causative agent is an RNA virus belongs to the Retroviridea family and Lentivirus subfamily. Transmission of the infection occurs through several routes, including sexual activity (hetero- and homosexual activity), transfu-

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sion of infected blood and its products, usage of common infectious syringes, drug misuse, and congenital transmission (1).

ELISA is the standard test for diagnosis of the disease and seroepidemiological survey, with more than 99.5% sensitivity and less specificity. The clinical signs of disease are fever, throat pain, lymphadenitis, rash, and headache lasting for several days to 3 weeks (1). The clinical signs are similar to those of mononucleosis infection. The most important clinical signs of AIDS patients are a primary defect of the immune system due to a decrease in the quality and quantity of T lymphocytes, especially CD4 lymphocytes (1). The number of CD4 T cells diminishes below a critical value (under 300 cell /μL), and the patient becomes more sensitive to opportunistic infections (1). Common important opportunistic parasitic infections in HIV (+) patients are *Cryptosporidium, Microsporidium, Isospora* (1), *Giardia lambelia, Blastocystis hominis, Entamoeba histolytica,* and *Strongyloides stercuralis*. Patients with gastrointestinal symptoms have lower CD4 counts than nonsymptomatic patients (2).

Many HIV patients live in areas with moderate endemicity or hyperendemicity of infectious disease. In some cases, the patients acquire chronic parasitic infections in childhood (3). *C. parvum* is an intercellular protozoan that lives in the brush border of intestinal epithelial cells. The disease is transmitted directly by ingestion of contaminated food and water with oocysts. *Cryptosporidium* induces malabsorption syndrome and causes severe and persistent diarrhea, abdominal discomfort, nausea and vomiting, fever, decrease of appetite, and weight loss (2).

2. Objectives

Unfortunately, in recent years, the prevalence of disease has increased in Iran (4) ; thus, we decided to investigate the prevalence of parasitic infections in HIV (+) patients. The results of this research have increased our knowledge about opportunistic infections in HIV (+) patients in this area and helped us use the proper treatment and control parasitic infections.

3. Patients and Methods

One hundred samples were obtained from 60 HIV (+) patients who were referred to Ahvaz Razi Hospital. The disease was previously confirmed by serological test (ELISA), and the patients were referred regularly to an infectious disease center for control and treatment. All HIV (+) patients participated in this study, regardless of sex, age, or existence of gastrointestinal symptoms. Two or 3 samples were obtained from each patient. The samples were transported immediately to the Parasitology Laboratory of the medical school. Each sample was subjected to the merthiolate-iodine-formoldehyde (MIF) technique. Trichrome and Ziehl-Neelsen staining were performed to detect amoeboid and coccidian infections, including *C. parvum*, *Isospora belli*, and *Cyclospora*. General information was obtained using a questionnaire. The data were analyzed by chi-square and Fisher tests to detect any correlation between the rate of parasitic disease and age and sex. The proposal was approved by the ethical committee of Ahvaz Jundishapur University.

4. Results

Sixty patients with HIV (+) infection participated in this study. The age range of patients was 5 and 57 years, with a mean of 34 years. Patients were divided in 4 age groups as follows: < 30 (21, 35.0%), 30-39 (23, 38.3%), 40-49 (11, 18.3%), and > 50 (5, 8.3%). The numbers of men and women were 53 (88.3%) and 7 (11.7%) respectively. The route of AIDS infection was as follows: 80% by infected syringe in narcotic drug use, 18.3% via sexual activity, and 1 case via congenital and placental transmission. The rate of parasitic infection in the HIV (+) patients was 30% (18/60).

There parasitic rate differed between age groups. The highest infection rate was seen in 30-39-year-olds, and the lowest rate was in the under 30-year-old group; this different was not significant ($P > 0.05$). Parasitic infection rates did not differ between genders ($P > 0.05$). The infection rate in men and women was 30.2% and 28.3%, respectively.

The prevalence of infection according to the type of parasite is shown in *Figure 1*. The most common infection was

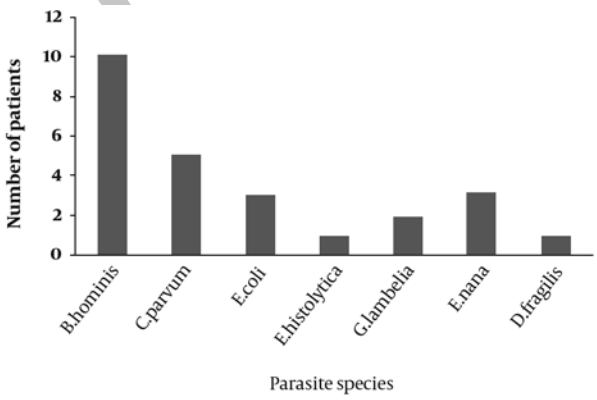

Figure 1. The Prevalence Rate of the Parasitic Infections According to Species of Parasite in HIV+ Patients

Blastocystis hominis (16.7%), and the least common were *E. histolytica* and *Dientamoeba fragilis* (1.7%). Some patients were infected by more than one parasite. Diarrhea was seen in 12 of 60 HIV (+) patients. The rate of parasitic infection in diarrheic and non-diarrheic patients was 41% and 27%, respectively. There was a significant difference between those with and without clinical signs ($P < 0.05$).

5. Discussion

There are many published studies on opportunistic pathogenic agents in HIV (+) patients in the world. In this study, the prevalence of parasitic infections in HIV (+) patients was 30%. Zali *et al.* (2) observed that 18.4% of HIV (+) patients were infected by gastrointestinal parasites in Tehran versus 46% in Kermanshah (5) and 67% in Mashhad (3). The prevalence of parasitic infections in Mashhad and

Kermanshah were higher than what we observed due to different hygiene levels and populations. In this study, we did not see any significant difference in the rate of parasitic infections between sex or age, although the highest prevalence of infection was seen in 30-39-year-olds. The presence of *Cryptosporidium* in diarrheic patients might be significant in monitoring HIV (+) patients.

Several groups have confirmed that there is no significant difference in the rate of infection between HIV (+) patients and controls. Zali *et al.* (2) and Akhlaghi *et al.* (6) recorded a parasitic infection rate of 14. 3% and 21.2% in the control group, respectively. Daryani *et al.* (7) observed that the parasitic infection rate in HIV (+) patients was 17.2% versus 17.9% in the control group (NS). The most common infection was *Cryptosporidium parvum* (9.4%), and the least common were *E. histolitica, E. coli*, and *Chilomastix meslini* (1.6%). This finding is in agreement with our results.

A similar study was carried out in 120 patients with AIDS in India. The results showed that 30% of patients had intestinal parasitic infections and that *Cryptosporidium*, *Giardia*, and *Cyclospora* were the dominant infections (8). Lindo *et al.* (9) showed that the rate of parasitic infections in HIV (+) patients in Honduras was 42% and that *Cryptosporidium* and *Strongyloides stercoralis* were the dominant infections. The rate of parasitic infections in the control group was 64. 6%. In Mexico City, 52 (25.6%) of 203 HIV (+) patients were infected by intestinal protozoa that consisted of *E. coli* (7.3%), *E. histilytica* (5.9%), *Endolimax nana* (6.4%), *Giardia intestinalis* (1.9%), *B. hominis* (1.9%), and *Isospora belli* (0.4%) (10).

Guk *et al.* (11) showed that 23.8% of HIV (+) patients were infected by gastrointestinal parasites, with *Cryptosporidium* and *Isospors* as the predominant infections. In our study, no worm infections were seen, but some studies have reported them (4, 9, 11-13). The reason of this disparity might be due to the use of filtered water in most patients, reduced worm infection rates in recent years in Ahvaz, and the very hot and dry climate of this region, which can immediately eliminate the free stage of worm parasites. The cyst stage of protozoan parasites can survive better in water than nematode eggs. In this study, the rate of parasitic infections in HIV (+) patients was low compared with other investigations in Iran.

Although we expected that the rate of parasitic infections in HIV (+) patients would be high, there were no significant differences between HIV (+) and HIV (-) patients in the prevalence of parasitic infections. Treatment of patients should be done according to gastrointestinal clinical signs and the detection of parasites with precise parasitology tests. Further investigation in HIV (+) and HIV (-) patients with molecular parasitology tests is recommended. Concomitant disease should be diagnosed rapidly and treated immediately in HIV (+) patients. The use of healthy and clean water by HIV (+) patients and patient education can decrease the prevalence of parasitic infections.

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