



Original Research Article

Prevalence of Intestinal Parasitic Infections in HIV-Positive Patients

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ABSTRACT

Keywords

Cryptosporidium parvum,
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Human Immuno-
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Diarrhea

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) are among the leading causes of infectious disease morbidity and mortality worldwide. Diarrhea is one of the most common AIDS-related illnesses causing a significant morbidity and mortality in HIV infected patients. The opportunistic enteric parasites most commonly implicated in HIV-positive patients are *Cryptosporidium parvum*, *Iso spor a belli*, *Cyclo spor a*, *Micro spor idium spp*, *Giardia intestinalis*, *Entamoeba histolytica* and *Strongyloides stercoralis*. Despite the spread of HIV infection in India, and the high prevalence of diarrheal disease, there is little information available on the epidemiology of diarrheal disease among people with HIV infection. The present study was aimed to determine the prevalence of intestinal parasites in HIV infected patients. HIV infection was prevalent in the age group 36–40 years, followed by age group of 31–35 years, with males outnumbering females. *Cryptosporidium parvum* followed by *Iso spor a belli* and *Giardia intestinalis* were the most common intestinal parasites isolated. Our study highlights the importance of early diagnosis and treatment of intestinal parasites, so as to reduce morbidity and mortality in HIV/AIDS patients due to diarrhea.

Introduction

The human immunodeficiency virus (HIV) has changed the social, moral, economic and health fabric of the world in a short space. In the coming years there is likely to be an increase in the number of HIV/AIDS deaths, with worrying projections of 6.5 million deaths in 2030 and HIV/AIDS being the main burden of disease in some developing countries by 2015. It has been recently estimated that 2.5 million individuals are living with HIV infection in India. Opportunistic infections leading to

significant morbidity and mortality grossly effect the health and quality of life of person infected with HIV. Since the beginning of the AIDS pandemic, opportunistic infections (OIs) have been recognized as common complications of HIV infection. Diarrhea is one of the most common AIDS-related illnesses causing a significant morbidity and mortality in HIV infected patients (Siddiqui *et al.*, 2012). Reports indicate that diarrhea occurs in 30–60% of AIDS patients in developed countries and in about 90% of

AIDS patients in developing countries (Framm and Soave 1997). The etiologic spectrum of enteric pathogens causing diarrhea includes bacteria, parasites, fungi and viruses (Mitra *et al.*, 2001), though that of parasitic origin is prominent in patients with AIDS in developing countries (Cimerman *et al.*, 1999).

Of these, protozoan parasitic infections are the most serious ones causing severe morbidity and mortality. In India, the prevalence of enteric parasites varies from 7.5% to 73.3%. The opportunistic enteric parasites are *Cryptosporidium*, *Isospora*, *Cyclospora*, *Microsporidia*, *Giardia*, *Entamoeba* and *Strongyloides*. The outcome of infection by intestinal parasites is dependent on absolute CD4⁺ cell counts, with lower counts being associated with more severe disease, more atypical disease, and a greater risk of disseminated disease. However, with the progressive introduction of HAART starting in 1996, modifications have been observed in the morbi-mortality profile among HIV/AIDS patients, reflecting the reduced occurrence of opportunistic infections, including those caused by enteroparasites (Willemot and Klein, 2004). The present study is, therefore, aimed to determine the prevalence of intestinal parasites and to study their association with immune status in HIV-positive patients.

Materials and Methods

The study was conducted in patients attending the ART centre in J.N.Medical College Hospital, during the period from January 2012 to March 2013. The study group comprised of 50 HIV sero-positive patients and 10 healthy individuals (as negative control), of similar age group. This study group was further divided into 2 categories-Patients with gastrointestinal

symptoms and Patients without gastrointestinal symptoms.

Stool samples were collected in clean wide mouth container. The samples were processed as per WHO standard procedure (WHO, Basic laboratory methods in Medical Parasitology, 1991).

Macroscopic examination of stool samples was performed for consistency, colour, odour, presence of mucus and/or blood, adult intestinal helminthes and segment of tapeworm (Deorukhkar *et al.*, 2011).

Microscopic examination was done with the help of wet mounts (saline wet mount, iodine wet mount and lacto-phenol cotton blue mount) for detection of cysts and trophozoites, and various staining techniques like Modified acid-fast staining, Chromotrope staining, Quick-Hot Gram-Chromotrope staining and Modified Safranin (Hot Method) Staining, for demonstration of coccidian parasites.

Results and Discussion

Figure 1 shows the age and sex distribution of HIV infected individuals into 7 groups. Maximum numbers of patients (34%) were in the age group 36–40 years, followed by age group of 31–35 years. Mean age of study group was 36.44±7.66 years. Males were more than females and comprised 60% of study group, whereas females were 20 in number (40%). Mean age of males was 38.23±7.31 years. Mean age of females was 33.75±7.55 years.

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Figure.1 Age and sex distribution of study group

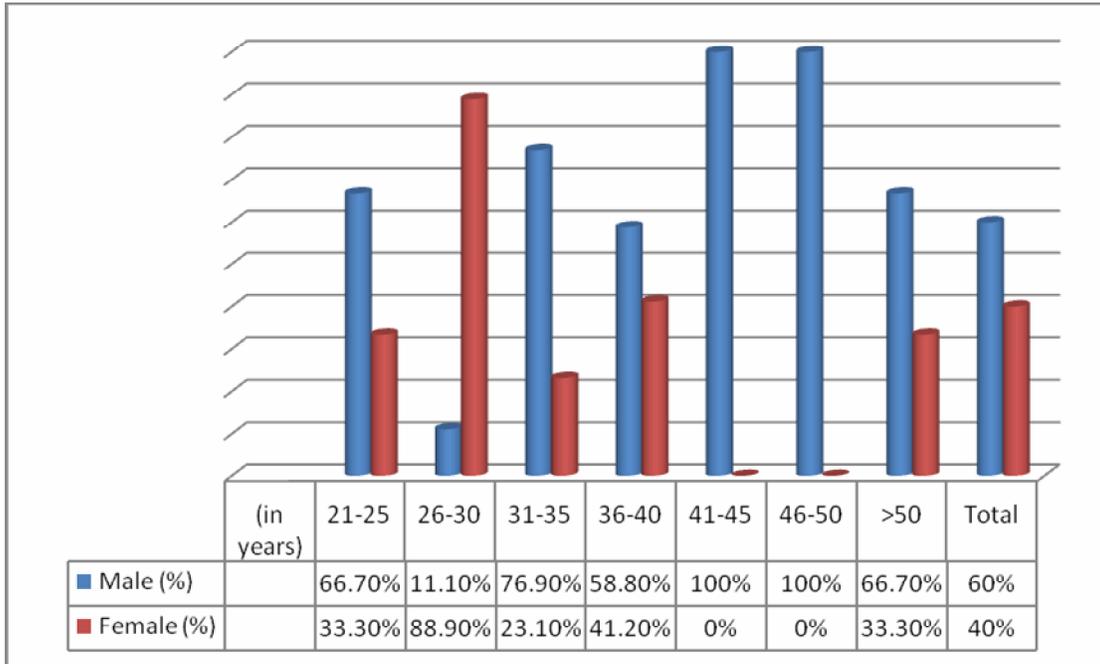


Figure.2 Distribution of patients according to their clinical presentations

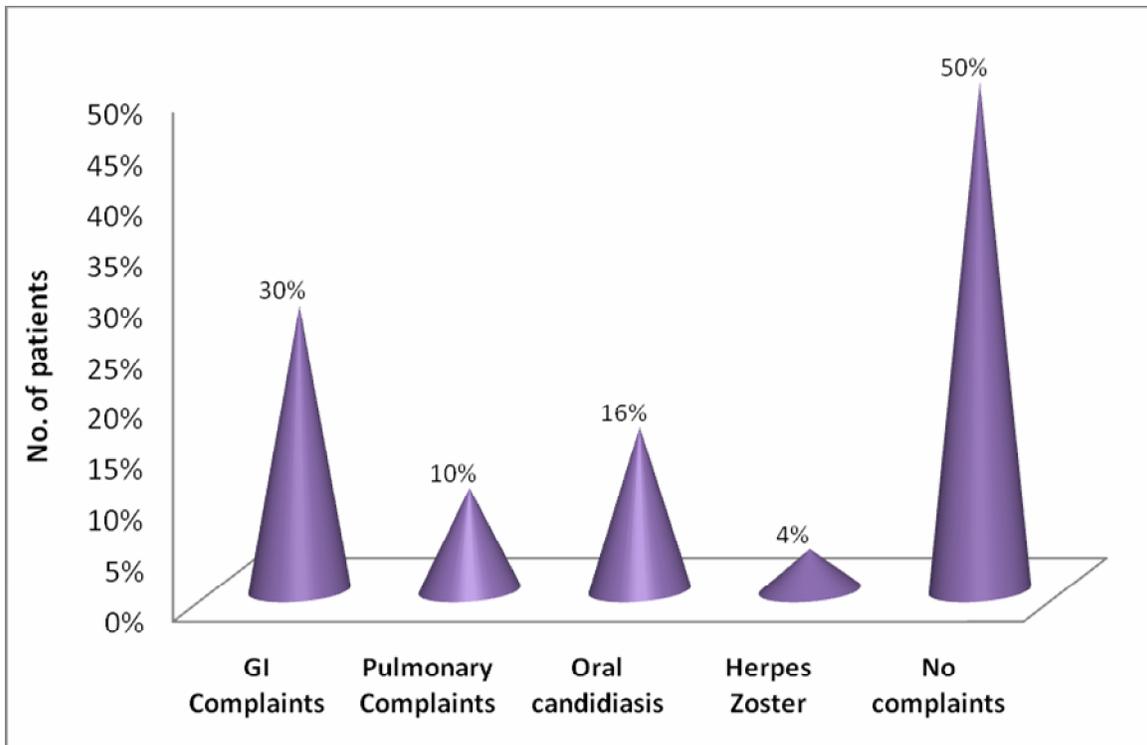
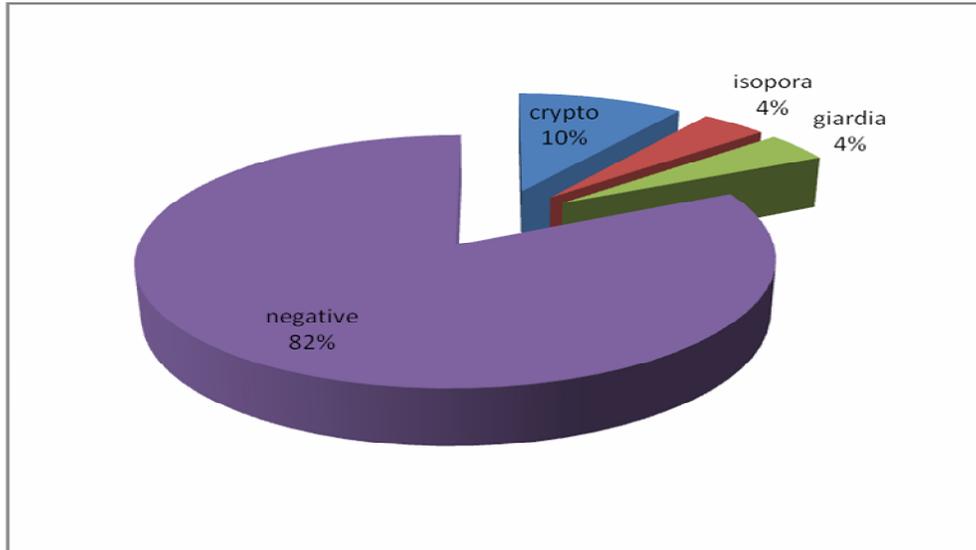


Figure.3 Pie-chart showing distribution of positive clinical isolates in stool samples of study group



In a similar study done by Uppal *et al.* (2009), New Delhi, in HIV positive patients with diarrhea, the age range of 31-40 years old was the most predominant with overall size (46%), and males outnumbered females in the study group. Another study done by Mehta *et al.* (2013), showed majority of the patients (76%) are in 25–44 years age group with a male preponderance (76%).

Figure 2 shows distribution of patients according to their clinical presentations. Most of the patients (50%) were not having any complaints at the time of presentation. 30% patients presented with gastrointestinal complaints like pain abdomen, diarrhea and abdominal tuberculosis. 8 (16%) patients were having oral candidiasis, 5 (10%) patients complained of pulmonary problems like cough, bronchitis and TB, while 2 (4%) patients presented with complain of herpes zoster.

Figure 3 shows distribution of patients in relation to positive findings. 9 (18%) of the HIV positive patients were found to be infected with intestinal parasites.

Cryptosporidium sp. was the most common protozoa detected in the study group (10%). *Giardia* (2) and *Isospora belli* (2) were seen in 4% patients respectively.

Protozoal etiology of diarrhea was seen in 9 (18%) patients out of study group of 50 patients. Of these 9 patients, 8 were suffering from diarrhea, while only one patient was having no complaints. *Cryptosporidium sp.* was the most common protozoa detected (10%). *Giardia* (2) and *Isospora belli* (2) were seen in 4% patients respectively, and no helminthic infestation was encountered in any of the patients. This observation was comparable with the study done by Kashyap *et al.* (2010), in which protozoal etiology was seen in 30% patients, and most common pathogen isolated was *Cryptosporidium* in 42% cases, followed by *Giardia* in 16% and *Isospora belli* in 5% patients respectively. A study done by Tuli *et al.* (2010), showed *Cryptosporidium spp* (36.22%) to be the most common isolated protozoan, followed by *Microsporidia spp.* (23.11%).

In our study we could not detect helminthic and *E. histolytica* infection in HIV positive infections. However there are studies suggestive of such infections in AIDS patients. In a study done by Uppal *et al.* (2009), enteric parasitosis was seen in 20% of HIV positive patients with diarrhea. In HIV-positive patients with diarrhea, out of 10 cases of enteric parasitosis, they isolated helminthes in 3 cases (*Ascaris lumbricoides* in 2 and *Strongyloides stercoralis* in 1) and protozoa in 7 cases (*Entamoeba histolytica*, *Giardia lamblia*, and *Cryptosporidium parvum* in 2 each and *Isospora belli* in 1).

Intestinal parasites are important cause of diarrhea in HIV/AIDS patients, and may cause symptomatic or asymptomatic infections. Our study emphasizes the importance of screening of HIV infected patients for presence of intestinal parasites that will help reducing morbidity and mortality in HIV patients.

References

- Cimerman, S., Cimerman, B., Lewi, S.D. 1999. Enteric parasites and AIDS. *Sao Paulo Med. J.*, 117(6): 266–273.
- Deorukhkar, S., Katiyar, R., Saini, S., Siddiqui, A. 2011. The prevalence of intestinal parasitic infections in HIV infected patients in a rural tertiary care hospital of western Maharashtra. (A 5 year study). *J. Clin. Diagn. Res.*, 5: 210–212.
- Framm, S.R., Soave, R. 1997. Agents of diarrhea. *Med. Clin. North Am.*, 81: 427–447.
- Kashyap, B., Sinha, S., Das, S., Rustagi, N., Jhamb, R. 2010. Efficiency of diagnostic methods for correlation between prevalence of enteric protozoan parasites and HIV/AIDS status—an experience of a tertiary care hospital in East Delhi. *J. Parasit. Dis.*, 34(2): 63–67.
- Mehta, K.D., Vacchani, A., Mistry, M.M., Kavathia, G.U., Goswami, Y.S., 2013. To Study the prevalence of various enteric parasitic infections among HIV infected individuals in the P.D.U. Medical College and Hospital, Rajkot, Gujarat, India. *J. Clin. Diagn. Res.*, 7(1): 58–60.
- Mitra, A.K., Hernandez, C.D., Hernandez, C.A., Siddiq, Z. 2001. Management of diarrhea in HIV infected patients. *Int. J. STD AIDS*, 12: 630–639.
- Siddiqui, U., Bini, E.J., Chandarana, K., *et al.* 2012. Prevalence and impact of diarrhea on health-related quality of life in HIV infected patients in the era of highly active antiretroviral therapy. *J. Clin. Gastroenterol.*, 41(5): 484–490.
- Tuli, L., Singh, D.K., Gulati, A.K., Sundar, S., Mohapatra, T.M. 2010. A multi attribute utility evaluation of different methods for the detection of enteric protozoa causing diarrhea in AIDS patients. *BMC Microbiol.*, 10: 11.
- Uppal, B., Kashyap, Bhalla, P. 2009. Enteric pathogens in HIV/AIDS from a tertiary care hospital. *Indian J. Commun. Med.*, 34(3): 237–242.
- WHO Library Cataloging in Publication, 1991. Basic laboratory methods in medical parasitology.
- Willemot, P., Klein, M.B. 2004. Prevention of HIV-associated opportunistic infections and diseases in the age of highly active antiretroviral therapy. *Expert Rev. Anti Infect. Ther.*, 2: 521–532.