

ORIGINAL ARTICLE

PREVALENCE OF INTESTINAL PARASITES IN HIV-POSITIVE/AIDS PATIENTS

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The aim of this study was to assess the prevalence of intestinal parasites among HIV-positive/AIDS patients. A control group comprising 30 apparently healthy HIV-negative individuals was included. Of the 60 samples collected from the patients and examined, 34 (56.7%) presented with diarrhoea, while 26 (43.3%) had no reported cases of diarrhoea at the time of study. Seventeen (50%) of the parasites detected in the 34 patients (those with history of diarrhoea) were diarrhoea-related causative agents. However, 17 (50%) of the parasites detected were not diarrhoea-related causative agents. In relation to diarrhoea, *Cryptosporidium parvum* had the highest prevalence (10%), followed by *Giardia intestinalis* (8.3%), *Entamoeba histolytica* (6.7%), *Isospora belli* (3.3%) and *Blastocystis hominis* (3.3%) in that order. This study showed a significant prevalence ($P<0.05$) of intestinal parasites in HIV-positive/AIDS patient. Also, the prevalence of intestinal parasites was higher ($P<0.05$) in HIV-positive/AIDS patients than in HIV-negative subjects. Although the study is limited in scope, however, it does reflect the importance of evaluating the prevalence of intestinal parasites in HIV-positive/AIDS patients especially at the local level where antiretroviral therapy is not available. The results of this study thus provide vital information for health professionals who are managing these patients. This could lead to improvement in patients' management and care.

Key words : Prevalence, parasitic infection, HIV-positive/AIDS, diarrhoea, patients.

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Introduction

Research and experimental studies have documented gastrointestinal problems resulting from parasitic or opportunistic parasitic infections in human immunodeficiency (HIV)-infected/AIDS subjects (1, 2). Literature evidence indicate that this often present as diarrhoea and that significant disease have been recorded in 50-96% of cases with 90% prevalence rate reported in Africa (1, 2, 3). Moreover, HIV/AIDS has become a major threat in the African continent and its prevalence in Lesotho is significantly high. Lesotho is a country with a population of about 2 million and 45% of the total population is believed to be infected with HIV (4). Different species of protozoa have been associated with acute and chronic diarrhoea in HIV infection and AIDS; namely *Cryptosporidium parvum*, *Isospora belli*, *Microsporidium* species, *Entamoeba*

histolytica/Entamoeba dispar, *Giardia intestinalis* and account for a significant number of cases of diarrhoea (1-4).

Infective causes of chronic diarrhoea can satisfactorily be diagnosed because with the exception of cryptosporidiosis and HIV-related enteropathy, good response to treatment can be expected (1,2). However, all aetiological agents cannot be easily diagnosed in Africa on routine basis because of limited diagnostic facilities and trained personnel (5). It is known that the pathogens responsible for diarrhoea are different according to geographical location, therefore laboratory diagnostic evaluations are required to determine prevalence rate in each population so that it can provide guidelines for therapy for treatable aetiological agents and necessary data for planning and evaluation of HIV-positive/AIDS patients care.

The aim of this study was to assess the

Table 1: Intestinal parasites detected in HIV-positive/AIDS patients and the relationship with diarrhoea

Parasite Types:	Number (%)	Diarrhoea (%)
<i>Cryptosporidium parvum</i>	6 (10%)	6 (100%)
<i>Giardia intestinalis</i>	5 (8.3%)	3 (60%)
<i>Entamoeba histolytica</i>	4 (6.7%)	4 (100%)
<i>A.duodenle</i>	4 (6.7%)	0 (0%)
<i>Entamoeba coli</i>	6 (10%)	0 (0%)
<i>Ascaris lumbricoides</i>	10 (16.7%)	0 (0%)
<i>Trichuris trichuira</i>	6 (10%)	0 (0%)
<i>Isospora belli</i>	2 (3.3%)	2 (100%)
<i>Blastocystis hominis</i>	2 (3.3%)	2 (100%)
<i>Mixed parasitic infections</i>	15 (25%)	5 (3.33%)

prevalence of intestinal parasites in HIV-positive/AIDS patients. This study was carried out at Tebellong Hospital, Lesotho. It is situated in the mountainous areas of South-eastern Lesotho, somewhat remote and isolated from the more populous lowlands to the North-west of the country. As a general hospital, it is the first referral hospital for the health centres in the Tebellong Health Service Area (HSA) and their respective populations. Being situated on elevation of 1800 metres above sea level and latitude of 30° south, there is considerable temperature fluctuations.

Materials and Methods

Sixty HIV-positive/AIDS patients chosen randomly from the Inpatient and Outpatient Departments of Tebellong Hospital, Lesotho, were recruited into the study. The patients were informed about the study and their rights to decline participation in the study. The inclusion criteria are: patients must be HIV-positive, willing to participate in the study and ability to comprehend. The exclusion criteria are: HIV negative and inability to comprehend. The patients were counselled and verbal consent was obtained before inclusion in the study. HIV-seropositive patients were defined as those who had tested positive for HIV-1 and 2 antibody using two consecutive rapid test (Abbott, USA) while AIDS patients in addition to been HIV-

positive show clinical symptoms classified by WHO and CDC as symptoms for AIDS. Thirty HIV-negative volunteers, all apparently healthy individuals were included as controls. The volunteers' HIV status was determined before admitted into study.

Specimen Collection

Stool samples were collected into clean wide-mouth specimen containers from male and female patients attending Tebellong Hospital for clinical treatment. A total of 60 samples were obtained from 25 males and 35 females aged 15-50 years.

Specimen Processing

Freshly voided stool specimens were processed and examined microscopically using X10 and X40 objective lens as saline wet mount to detect motile trophozoites as described by Cheesbrough (6). Formol-ether concentration was performed and the sediment examined as iodine wet mounts to detect ova, larva and cysts. Ten X40 objective fields of the stool smears were examined before a slide was considered negative. Air-dried smears prepared from fresh stool samples were stained by a modified acid-fast stain (AFS) to detect *Cryptosporidium* and *Isospora* species (7, 8).

Data analysis

Student t-test analysis was used to determine

Table 2 : Prevalence of parasitic infections with regard to age

Parasites:	Age in years			
	15-20 (n=8)	25-34 (n=18)	35-44 (n=22)	>44 (n=12)
Cryp. Parvum	0	1	3	2
G. intestinalis	1	2	1	1
E. histolytica	1	1	1	1
A. duodenale	0	2	2	0
E. coli	2	1	1	2
A. lumbricoides	1	3	4	2
T. trichiura	1	1	2	2
I. belli	0	0	1	1
B. hominis	0	0	1	1

Key : *Cryp. Parvum*= *Cryptosporidium parvum*, *G. intestinalis*= *Giardia intestinalis*, *E. histolytica*= *Entamoeba histolytica*, *A. duodenale*= *Ancylostoma duodenale*, *E. coli*=*Entamoeba coli*, *A. lumbricoides*= *Ascaris lumbricoides*, *T. trichiura*= *Trichuris trichiura*, *I. Belli*= *Isospora belli*, *B. hominis*= *Blastocystis hominis*.

significant difference. The level of significance was set at a probability of less than 5% ($P < 0.05$).

Result

Stool samples were collected from 60 HIV-positive/AIDS patients. Thirty-four (56.7%) of these patients (15 males and 19 females) presented with history of diarrhoea while 26 (43.3%) of the patients had no reported cases of diarrhoea at the time of study. There was no significant difference ($P > 0.05$) according to gender with regard to diarrhoea. Seventeen (50%) of the parasites detected in the 34 patients (those with history of diarrhoea) were diarrhoea-related causative agents while 17 (50%) of the parasites detected were not diarrhoea-related. Among the 60 patients investigated, 6 had *Cryptosporidium parvum*, 5 had *Giardia intestinalis*, 4 had *Entamoeba histolytica*, 4 had Hookworm, 6 had *Entamoeba coli*, 10 had *Ascaris lumbricoides*, 6 had *Trichuris trichiura*, 2 had *Isospora belli* while 2 had *Blastocystis hominis*. There were cases of mixed parasitic infections in 15 patients and this accounted for 25%. The percentage of diarrhoea cases in relation to parasites and parasites load is

presented in Table 1. The prevalence of parasitic infections with regard to age and sex are presented in Tables 2 and 3 respectively while prevalence of specific parasites in HIV-positive/AIDS patients and HIV-negative subjects (control group) is shown in Table 4. It was noted that the prevalence of the parasites tended to be higher in AIDS patients than in HIV-positive patients.

Discussion

This study showed that parasitic or opportunistic intestinal parasitic infections are common among HIV-positive/AIDS patients and that there exist a relationship between the type of parasites, parasites load and severity of diarrhoea. The prevalence tended to be higher in patients with AIDS than in asymptomatic HIV-positive patients. This finding is similar to that reported in Ethiopia and Uganda (5, 9). With regard to prevalence and diarrhoea, *Cryptosporidium parvum*, *Entamoeba histolytica* and *Giardia intestinalis* were higher than other parasites. However, the percentage reported in this study is lower than the percentage reported in previous studies (10, 11). It is suggested that better

Table 3 : Prevalence of parasitic infections with regard to sex

Parasites:	Sex	
	Male (n=25)	Female (n=35)
Cryp. parvum	2	4
G. intestinalis	1	4
E. histolytica	2	2
A. duodenale	3	1
E. coli	2	4
A. lumbricoides	3	7
T. trichuira	3	3
I. belli	0	2
B. hominis	1	1

Key: *Cryp. Parvum*= *Cryptosporidium parvum*, *G. intestinalis*= *Giardia intestinalis*, *E. histolytica*= *Entamoeba histolytica*, *A. duodenale*= *Ancylostoma duodenale*, *E. coli*=*Entamoeba coli*, *A. lumbricoides*= *Ascaris lumbricoides*, *T. trichuira*= *Trichuris trichuira*, *I. Belli*= *Isospora belli*, *B. hominis*= *Blastocystis hominis*.

laboratory equipment and stage of HIV infection could probably explain the difference in the prevalence of parasites. *Isospora belli* and *Blastocystis hominis* prevalence rate was lower in comparison to the rate reported by Fiseba *et al.* (12) and Wiest *et al.* (13). It is known that geographical location and general hygiene level of the population play a role in the distribution of parasites. Both may have combined to play a role in this case. Although, *Entamoeba coli* and *Blastocystis hominis* is believed to be non-pathogenic, nonetheless, few findings have implicated their involvement in opportunistic diarrhoeal cases especially in immuno-compromise subjects such as HIV-positive/AIDS patients (2, 10, 11).

The distribution of intestinal parasites according to age and sex does not clearly indicate a true reflection of difference in terms of prevalence, largely due to the number of patients studied, but

appeared to be higher within the age group of 35-44. Further study with larger sample size could perhaps throw more light on parasite distribution according to age and sex. The sexual difference observed (not statistical difference) in the prevalence rates of the parasites could probably reflect the exposure frequencies of the individual subjects. There exist a difference in the number of parasites identified between HIV-positive/AIDS patients and control group and is similar to the finding of Fleming (10). The distribution of the helminths and specific protozoan among the control group in the locality considered is similar to the previous finding reported by Oguntibeju (14). The overall prevalence of intestinal parasites was found to be significantly higher in HIV-positive/AIDS patients. This is associated to the fact that parasite establishment is enhanced by immuno-suppression and may thus increase parasite load, hence these parasites can be

Table 4 : Prevalence of specific parasites in HIV-positive/AIDS patients and HIV-negative subjects

Parasite types	HIV-positive/ AIDS patients	HIV-negative subjects
<i>Cryptosporidium parvum</i>	6	0
<i>Giardia intestinalis</i>	5	3
<i>Entamoeba histolytica</i>	4	2
<i>A. duodenale</i>	4	5
<i>Entamoeba coli</i>	6	5
<i>Ascaris lumbricoides</i>	10	4
<i>Trichuris trichuira</i>	6	3
<i>Isospora belli</i>	2	0
<i>Blastocystis hominis</i>	2	2

easily detected and identified in stool samples of HIV-positive/AIDS patients than HIV-negative subjects, justifying the higher rate in the former group. The prevalence rate seen in the control group reflect the poor environmental and poor hygienic measures in the community to a certain extent. Unfortunately, this study could not detect intestinal parasites such as *Microsporidium* species, *Cyclosporidium* species that could play important role in causing diarrhoea in HIV-positive/AIDS patients. Therefore, further and detailed study that would include the examination and identification of causative agents other than the intestinal parasites detected in this study is recommended.

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