

Intestinal Parasitic Infection among HIV-Seropositive and HIV-Seronegative Individuals at Nnewi, South Eastern Nigeria

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Abstract: Intestinal parasitic infections remain an important source of morbidity and mortality particularly in developing countries whereas portable water supply, proper waste disposal and good hygienic habits are lacking or inadequate. Several species of parasites, especially protozoa that cause opportunistic infections have been associated with acute or chronic diarrhoea among HIV infected individuals. We conducted a study on the distribution of intestinal parasites infecting HIV seropositive and HIV seronegative adults seen at Nnamdi Azikiwe University Teaching Hospital, Nnewi between 2005 and 2006. Stool samples were collected from 98 HIV seropositive and 90 HIV seronegative individuals. Wet mount, formol ether and Ziehl Neelson techniques were used to identify parasites. Parasites identified among both groups include cysts of *Entamoeba histolytica/E. dispar*, ova of hookworm and *Ascaris lumbricoides*. Other parasites identified among HIV seropositive patients also include ova of *Giardia lamblia* and oocyst of *Cryptosporidium*. Symptoms recorded among HIV seropositive patients include diarrhoea and abdominal pains. Overall 29.6% of Seropositive patients and 25.6% seronegative individuals respectively were infected with parasites. Measures to reduce transmission of parasitic infections should include regular deworming particularly children, incorporation of poverty alleviation programs, effective waste disposal system and safe water supply involving the state and the community and these should be sustained for a long period.

Key words: HIV/AIDS • Parasitic infections • Symptoms • Adults

INTRODUCTION

Intestinal parasitic infections are widespread particularly in developing countries. The gastro intestinal tract has been recognized as a major site of HIV related pathology and up to 90% of HIV infected patients experience gastrointestinal symptoms during the course of their disease [1]. Sub-Saharan Africa remains the region most heavily affected by HIV worldwide, accounting for over two thirds (67%) of all people living with HIV and nearly three quarters (72%) of AIDS-related deaths in 2008 [2]. In Nigeria, an estimated 2.98 million people are living with HIV/AIDS [3]. Diarrhoea has been reported in 30-60% of AIDS patients in developed countries and in about 90% of AIDS patients in developing countries. Enteric pathogens causing diarrhoea include bacteria, parasites, viruses and fungi [4]. The incidence and

prevalence of infection with intestinal pathogens including opportunistic protozoa in Africa vary and may depend on the endemicity of that particular parasite in the community. *Cryptosporidium parvum*, *Isoospora belli* and *Entamoeba histolytica* have been reported as the most frequently identified organisms in HIV infected individuals in many parts of the world. Very few studies have been conducted in this area on the prevalence of intestinal parasites among HIV-infected individuals especially with more of them having access to antiretroviral drugs.

MATERIALS AND METHODS

The study was a cross-sectional study conducted between March and April 2006 at Nnamdi Azikiwe University Teaching Hospital, a tertiary and central

referral hospital in Nnewi, Anambra State, south-eastern Nigeria. The study was approved by the Ethical Committee of the hospital. Informed consent was obtained from all participants. Patients were adults attending the HIV clinic and were confirmed as having HIV infection. Some of them were on antiretroviral therapy, while others were not depending on recommendation from the attending physician. Healthy blood donors who were confirmed HIV sero-negative were recruited as controls.

A structured questionnaire was used to collect socio-demographic characteristics and gastrointestinal symptoms. Stool specimens were collected in clean, leak-proof and labeled plastic containers and were taken to the laboratory immediately. Stool specimens were examined following direct, formalin-ether concentration and modified Ziehl-Neelsen's methods [5, 6]. Direct microscopy of the smears was performed in saline (0.85% NaCl solution) and Lugol's iodine for the detection of ova, larvae, trophozoites and cysts of intestinal parasites. Formalin-ether concentration method was done and followed by staining of air-dried, methanol fixed smear with cold carbol-fuschin for 10 minutes. It was decolorized in 1% acid alcohol for 10 seconds then washed off with water and counterstained with 0.25% of methylene blue for 30 seconds. It was washed off with water and drained dry. The preparation was examined after air drying under x100 objective for identification of oocyst of coccidian parasites.

The data obtained was entered and analyzed using SPSS version 10 statistical package. Frequency of parasites between cases and controls was performed by chi-square test, p-value < 0.05 was considered significant.

RESULTS

A total of 188 individuals were enrolled in the study out of which 98 were confirmed HIV/AIDS patients with a mean age of 33years. The age and sex distribution of controls and cases are shown on Table 1. Age range of the control group is 23-44 years while that of the cases is 23-52 years.

Table 2 shows the prevalence of intestinal parasites detected in the study subjects. Intestinal parasites was detected in 29(29.6%) of HIV/AIDS patients and in 23(25.6%) of the controls but this difference is not statistically significant. However, the difference between the males in the two groups was statistically significant (p<0.05).

Table 1: Age and Sex Distribution of controls and HIV/AIDS patients in NAUTH, Nnewi

Age group (yrs)	Controls		HIV/AIDS Patients	
	Males	Females	Males	Females
21-30	25	25	13	30
31-40	15	20	27	36
40-50	3	2	10	24
>50	0	0	8	5

Table 2: Prevalence of intestinal parasites among controls and HIV/AIDS patients in NAUTH, Nnewi

Controls	HIV/AIDS patients			
	No. Examined	No. Positive (%)	No. Examined	No. Positive
Males	43	19(20.9%)	39	14(35.9%)
Females	47	14(29.8%)	59	15(25.4%)
Total	90	23(25.6%)	98	29(29.6%)

Table 3: Prevalence of intestinal parasites among controls and HIV/AIDS patients in NAUTH, Nnewi

	Controls (n=90)		HIV/AIDS Patients (n=98)	
	No.	(%)	No.	(%)
<i>Entamoeba histolytica</i>	11	(12.2%)	13	(13.3%)
Hookworm ova	3	(3.3%)	4	(4.1%)
<i>Ascaris lumbricoides</i>	2	(2.2%)	2	(2.0%)
<i>Cryptosporidium parvum</i>	0		2	(2.0%)
<i>Giardia lamblia</i>	0		2	(2.0%)
All Helminths	3	(3.3%)	6	(6.1%)
All Protozoa	14	(15.6%)	17	(17.3%)

Table 4: Distribution of intestinal parasites based on symptoms in HIV/AIDS patients

Symptoms	No. with symptoms	No. positive for parasites
Diarrhoea	30 (30.6%)	6
Abdominal pain	20 (20.4%)	7
Vomiting	12 (12.2%)	5
Nausea	2 (2.0%)	2
Weight loss	15 (15.3%)	2
Fatigue	23 (23.5%)	3
Fever	21 (21.4%)	3

Prevalence of individual parasites in cases and controls (Table 3) shows that *Cryptosporidium parvum*, an opportunistic protozoa and *Giardia lamblia* were seen in two cases but not in the control group. The prevalence of protozoa is statistically higher than prevalence of helminthes in the cases and also in the control group (p<0.05).

Table 4 shows that diarrhoea was the most frequent symptom (30.6%) recorded, followed by abdominal pain (20.4%) in HIV/AIDS patients. However, only 6 patients with diarrhoea and 7 patients with abdominal pain were positive for intestinal parasites.

DISCUSSION

Prevalence of intestinal parasitic infection was 29.6% among HIV/AIDS, this is higher than the prevalence (25.6%) in the controls but the difference was not statistically significant. Some of the patients, (40/98) were receiving antiretroviral drugs and this is expected to improve their immune status. The prevalence among patients in our study was lower than those reported in other studies in Africa [7-12]. In a study conducted in Ethiopia, the prevalence was much higher (56.6%) among HIV/AIDS patients, while the controls recorded prevalence of 42.3% [8]. Males were more infected in patients than in the control, this could result from hygienic standard of the individuals.

E. histolytica showed the highest frequency in both groups, but it was higher in the patients (13.3%) than in the control group (12.2%). The prevalence in the patients was similar to reports from else where in Africa [9, 10]. In our study whereas 40.8% were receiving antiretroviral drugs the prevalence of *Cryptosporidium parvum*, an opportunistic protozoa was 2.0%. Other studies in Africa show prevalence rates ranging from 3.9 to 28% [9-12]. In a study in Cameroon 3.9% was reported while 8.7% was reported in Cote d'Ivoire. In Nigeria, 25% was recorded among children who had HIV infection or AIDS [10]. In our study, 30 out of 98 patients (30.6%) had diarrhoea but only 6 of them were infected with parasites, while 20 patients had abdominal pain, but only 7 of them had intestinal parasites in their stool specimen. Overall, frequency of protozoa was significantly higher than helminthes in both groups this could be due to the prevalence in the area. Patients were not selected based on the presence of diarrhoea, therefore the prevalence of intestinal parasitic infections observed among those with diarrhoea in our study may be lower than if patients were selected on the basis of diarrhoea.

In conclusion, the prevalence of intestinal parasites was higher in patients than in the controls and was also higher in male patients than in controls. *E. histolytica* showed the highest prevalence while *Cryptosporidium parvum* was seen in only two patients. Overall, intestinal protozoa showed higher prevalence than intestinal

helminthes. The number of patients receiving antiretroviral drugs is 40 out of 98 which shows that more patients have access to the drugs. There is still a need for regular deworming and to increase awareness of good hygienic practices and sanitation in the area.

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