Prevalence of Enteric Parasites in Human Immunodeficiency Virus HIV-Positive and HIV-Negative Patients attending Hospitals in Jos, Nigeria.

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ABSTRACT

This study was carried out in two hospitals in Jos metropolis, namely Jos university teaching hospital (JUTH) and the Plateau Specialized Hospital. Three hundred (300) fecal samples were collected from patients satisfying a clinical case definite for AIDS, another 352 apparently healthy subjects were sampled Demographic information, including ages were obtained. The presence of diarrhoea was also determined by direct observation of stool and frequency of stooling was obtained. Specimens were examined microscopically for the presences of Leucocytes, erythrocytes, and parasites (amoebae, cysts, ova, and larvae) by using a saline and iodine preparation. Modified acid-fast smears for the detection of *Cryptosporidium* were performed for all specimens. Stool samples were also examined using the direct smear and the lugos iodine for the detection of coccidian and other enteric pathogens. Of the 652 subjects examined (300 HIV sero-positive and 352 HIV sero-negative), 62.7% of the HIV infected and 52.9% of the HIV-negative were infected with various types of intestinal parasites. Infection among HIV sero-positive subjects was statistically higher than that in HIV sero-negative (P>0.05). the isolation of one parasite in the two groups had the highest frguency:53.3% and 41.4% in the two groups respectively, the isolation of two parasites had the highest prevalence in the HIV group:23.3% than in the case of the HIV-negative group:14%,the isolation with ≥ 6 parasites only occurred in the HIV positive group:0.3%.Four opportunistic parasites were isolated in the course of this studies and the prevalence was observed to be high in the HIV-positive group: *Cryptosporidium* sp.35.5%, *Microsporidia* sp. recorded 19.6%, *Cyclospora* sp. and *Isospora belli* recorded 25% and 19.6% respectively than the HIV-negative group were *Cryptosporidium* had 3.1%, *Microsporidia* sp., *Cyclospora tenesis*, and *Isospora belli* recorded the prevalence of 4.6%,4.9% and 3.4% respectively. This study aimed at showing the prevalence of enteric parasites in HIV/AIDS.

Keywords: Prevalence, Enteric, Parasites, HIV-positive, HIV-negative, Hospital.

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INTRODUCTION

Intestinal parasitic infections in man are important health problem. More often they are not considered in the differential diagnosis of intestinal disease in tropical Africa and poor economy settings (Cotte *et.al*., 1993; Crawford and Vermund, 1988). The prevalence of this infection in temperate zones and in industrialized countries is growing because of increasing international travels and migration. More children in day cares, adult's sexual habits and crowding in institutions contribute to transmission of these parasites in urban areas (Enriquez *et al*., 1997; Cruickshank *et al*., 1988; Blanshard *et al*., 1992). Intestinal parasites are also frequently in populations in the tropical and subtropical areas and the advent of HIV has favored an increase in the prevalence of some of these parasites. Interest in important tropical diseases has increase with the rising number of travelers in the case of tropical gastroenterological disorder. Some of the causative organisms of chronic and acute gastroenteritis are Viruses and bacteria. More importantly however, are *Entamoeba histolytic, Giardia lamblia, Cryptosporidium, Isospora and Schistosoma* have been linked as opportunistic parasitic infections associated with HIV infections (Esfandiari *et al*., 1995; Floch *et al*., 1989; Dillingham *et al*., 2002). As the gastrointestinal tract is a potential reservoir for HIV, the causative agent of the acquired immunodeficiency syndrome (AIDS) and it is an important site for HIV induced immunodeficiency (Current *et al*., 1983; Chalmers *et al*., 1983; Xiao *et al*.,1991) in human oral defense mechanisms, predispose the gastrointestinal tract to a spectrum of Viral, fungal, bacteria and protozoan parasites which is an important health problem affecting people in both developing and developed regions of the world. Although some are usually self-limiting and almost invariably non fatal, usually its results in significant morbidity. This prospective study investigating a cross-sectional cohort of HIV positive and HIV- negative patients was undertaken to determine the prevalence of intestinal protozoan of patient attending clinical services in Jos metropolis.

MATERIAL AND METHODS

The study was carried out in two hospitals in Jos metropolis, namely Jos university teaching hospital (JUTH) and the Plateau Specialized Hospital. Three hundred (300) fecal samples were collected from patients satisfying a clinical case definite for AIDS, another 352 from apparently healthy subjects were sampled Demographic information, including ages were obtained. The presence of diarrhoea was also determined by direct observation of stool and frequency was obtained from interview of subjects/patients.

All specimens were examined microscopically for the presences of Leucocytes, erythrocytes, and parasites (amoebae, cysts, ova, and larvae) by using a saline and iodine preparation. Modified acid-fast smears for the detection of *Cryptosporidium* were performed for all specimens. Stool samples were also examined using the direct smear and the lugos iodine for the detection of coccidian and other enteric pathogens.

RESULTS

Of the 652 subjects examined (300 HIV seropositive and 352 HIV seronegative), 62.7% of the HIV infected and 52.9% of the HIV-negative were infected with various types of intestinal parasites (table 1). Infection among HIV sero-positive subjects was statistically significant (P>0.05) than that in HIV sero-negative. The frequency of the isolation of enteric parasites was noted in table 2, the isolation of one parasite in the two groups had the highest frequency of 53.3% and 41.4% in the two groups respectively, the isolation of two parasites had the highest prevalence in the HIV group 23.3% than in the case of the HIV- negative group:14%, the isolation in the patients screened occurred with ≥ 6 parasites which only occurred in the HIV positive group 0.3%. Four opportunistic parasites were isolated in the course of this studies and the prevalence was observed to be high in the positive group: *Cryptosporidium* sp.35.5% *Microsporidia* sp.recorded 19.6% *Cyclospora* sp. and *Isospora belli* recorded 25% and 19.6% respectively than the negative group were *Cryptosporidium* had 3.1%, *Microsporidia* sp., *Cyclospora tenesis*,and *Isospora belli* recorded the prevalence of 4.6%,4.9% and 3.4% respectively(Table 3)

Table 1: The prevalence of enteric parasites in relation to immune status of HIV/AIDS and HIV-negative patients.

	No. positive in relation to serostatus			
	Hiv-negative(n=350)		HIV-positive(n=300)	
Parasites	No.+ve	%+ve	No.+ve	%+ve
Protozoans				
Entamoeba histolytica	14	4	20	6.7
Microsporidia spp.	10	2.9	22	7.3
Giardia lamblia	12	3.4	28	9.3
Cryptosporidium spp.	11	3.1	40	13.3
Isospora belli	12	3.4	22	7.3
Helminthes				
Ascaris lumbriciodes	14	4	8	2.7
Diphylobothrium latum	23	6.6	5	1.7
Taenia spp.	20	5.7	13	4.3
Strogyloides sp.	12	3.4	2	0.7
Trichuris trichuria	14	4	3	1
Schistosoma mansoni	31	8.9	11	3.7
Ancylostoma duodenale	12	3.4	14	4.7

Table 2: Freguency of isolation of enteric parasites in HIV/AIDS and HIV-negative patients

No. of parasites	No(%) in relation to serostatus HIV-positive(n=300)		HIV-negative(n=350)	
	No.+ve	%+ve	No.+ve	%+ve
1	106	53.3	84	41.4
2	73	23.3	49	14
3	26	8.7	9	1
4	18	6	6	2
5	11	3.7	0	0
≤6	0	0.3	0	0

Table 3: Prevalence of four opportunistic parasites in HIV/AIDS and HIV-negative patients.

	HIV-negative(n=350)		**HIV-Positive(n=300)**	
Parasites	No.+ve	%+ve	No.+ve	%+ve
Cryptosporidium spp.	11	3.1	40	35.7
Microsporidia sp.	16	4.6	22	19.6
Giardia lamblia	17	4.9	28	25
Isospora belli	12	3.4	22	19.6

DISCUSSION AND CONCLUSION

Different factors contribute to the prevalence of intestinal parasites in a given population, the most important being environmental, parasitic and host factors. (Current *et al*.,1994; Cama *et al*., 2003).

The overall prevalence of 62.7% in the HIV positive group and 52.9% in the negative group recorded in this study is relatively high when compare to that from other parts of Nigeria. Agi *et al*., (1995) reported a prevalence rate of 44.8% among HIV infected patients in the Niger delta though the low prevalence recorded could be due to public awareness and improvement of environmental sanitation, another reason could be that since these patients are coming to clinic as a result of their illness, some of them would have been on chemotherapy. However this prevalence rate is in agreement with the result of this study.

Helminthes infection rate was generally higher than that of protozoan, it is worthy to note that the differences though significant among HIV sero-negative patients ($p<0.05$), remain non significant among HIV sero-positive patients ($p>0.05$). The higher rate of helminthes could be due to tropical climate, which favors survival of helminthes ova.

Cryptosporidium species is among the opportunistic parasites commonly found in HIV patients, it’s high rates of occurrence in the HIV- positive patients, reveals this parasites as an opportunistic parasites, and three other opportunistic parasites were also isolated in the cause of this study, these were: Microsporidia spp and *Isospora belli* and *Giardia lamblia*.

The effect of intestinal parasites such as *Cryptosporidium* species, *Cyclospora cayetanensis*, *Isospora belli* and microporidia in HIV infected persons leads to increase morbidity and mortality of individuals affected (Fayer *et al*., 1996; 2000).The control of intestinal parasite therefore should involve adequate treatment and proper health education, provision of adequate toilet facilities so that the continual contamination of the environment with ova and cysts of such parasites will greatly be reduced.

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