

## PREVALENCE OF INTESTINAL PARASITES AMONG HIV/AIDS PATIENTS IN KANO, NIGERIA

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### ABSTRACT

**Background:** Parasitic infestation of the intestinal tract is a major source of disease in patients with HIV infection in the tropics, where diarrhea of variable severity is a common complaint in which specific treatable causative pathogens is often isolated.

**Objectives:** The aim of this study was to determine the prevalence of intestinal parasites among patients with HIV/AIDS at Aminu Kano Teaching Hospital, Kano, Nigeria.

**Methods:** A cross sectional study of two hundred (200) HIV positive patients was carried out to determine the presence of intestinal parasites in them irrespective of whether or not they had diarrhoea. Patients fresh stool samples were examined microscopically and their CD4 count determined.

**Results:** Out of the 200 patients, 69 (34.5%) had intestinal parasites irrespective of their diarrhoea status. Of these, 38 (55.2%) had diarrhoea, while 31 (44.2%) did not. There was no statistically significant difference in the prevalence of intestinal parasites among those with diarrhoea and those without ( $P > 0.05$ ). The most commonly isolated pathogen was *E. Histolytica* accounting for 33 (47.8%). This was followed by *G. Lamblia* 13 (18%), *Hookworm (N Americanus)* 4 (5.8%), *Entamoeba coli* 3 (4.3%) and *S. Stercoralis* 4 (5.8%). *T. Hominis*, *H. nana*, *S. Mansoni* and *Cryptosporidium* each accounted for 2 (2.9%), while *A lumbricoides*, *T. Trichiura*, *D. latum* and *I. Beli* each accounted for 1 (1.4%) occurrence.

**Conclusion:** Intestinal parasitic infestation is common among HIV/AIDS patients in our environment with *E. histolytica* being the most common isolate.

**Key words:** - Prevalence, Intestinal parasites, HIV/AIDS, Kano, Nigeria.

### INTRODUCTION

Intestinal parasitic infections cause significant morbidity and mortality in HIV positive individuals world wide.<sup>1</sup> Patients infected with HIV often experience diarrhoea during their illness. A number of enteric pathogens are identified in these patients depending on the intensity and sensitivity of the diagnostic tests carried out.<sup>2</sup>

Parasitic infection is an important problem in the HIV- infected patient due to the impaired immunity in them.<sup>3</sup> Diarrhoea is experienced by over 50% of AIDS patients during the course of their illness, and is an important cause of morbidity and mortality in up to a quarter of the patients<sup>4</sup> and is commonly infective in origin. A wide range of pathogens may give rise to diarrhoea including bacteria, viruses, and parasites involving the small and large bowels.<sup>5</sup>

A number of protozoa have also been associated with both acute and chronic diarrhea (defined as three or more loose

stools passed daily for more than two consecutive weeks in HIV patients).<sup>6</sup> These include: - *cryptosporidium parvum*, *isospora belli*, *microsporidia species*, *Giardia intestinalis*, *Entamoeba histolytica*, *Cyclospora species*, *Blastocystis hominis* and *Dientamoeba fragilis*. Besides these, *Strongyloides stercoralis* a ubiquitous parasite in tropical and subtropical areas can cause diarrhoea and overwhelming infestation (disseminated strongyloidosis) in patients with variety of immunosuppressive disorders including HIV/AIDS.<sup>7</sup>

Although various viruses such as *rotavirus*, *adenovirus*, *corona virus*, *astrovirus*, and *calcivirus* have also been implicated as causes of diarrhoea in HIV/AIDS patients, most appear to be self-limiting and do not require any form of treatment.

Highly Active Antiretroviral Therapy (HAART) is causing a reduction in opportunistic infections as a cause of diarrhea.

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Chronic diarrhea is usually associated with low CD<sub>4</sub> cell counts of less than 200 cells/ $\mu$ l. Some additional pathogens such as *cryptosporidia cayetanensis*, *cryptosporidia* may give large volume diarrhoea in patients with immunodeficiency. *Isosporiasis* and *microsporidia* account for up to 20% of diarrhoea in those with CD<sub>4</sub> count <50/ $\mu$ l, and as much as 60% in those with chronic diarrhoea.

Since diarrhoea due to parasitic etiology among HIV patients is on the increase in recent times and pathologic organisms responsible differ in different geographic areas, studies using modern diagnostic facilities are needed to determine disease prevalence in a specific population to provide basic guidelines for empirical treatment and data for planning and evaluation of HIV/AIDS care.

### MATERIALS AND METHODS

This was a descriptive, cross-sectional study conducted between April and November 2005 amongst HIV-infected patients attending the medical outpatients' department (MOPD) of Aminu Kano Teaching Hospital, Kano to determine the prevalence of intestinal parasites among them.

Approval for the study was sought and obtained from the hospital's Ethical Committee.

Two hundred consecutive patients with clinical and/or laboratory diagnosis of HIV/AIDS were studied during the period. After obtaining relevant clinical history and conducting a physical examination using an interviewer-administered structured questionnaire, each patient recruited was then given a sterile universal screw capped sample bottle and instructed to bring fresh stool sample in the morning. The Stool specimens were examined for parasites using binocular Olympus microscope (x10 and x40 objectives) for the presence of trophozoites, cysts, oocysts, larvae and ova of intestinal parasites using normal saline and lugol's iodine smear. Formol-ether concentration technique was used to detect cysts and ova, while modified Ziehl- Nielsen (ZN) staining technique was used to identify *cryptosporidium*, *isospora*, and *cyclospora* species.

Using a 21G hypodermic needle and 5ml syringe, 5ml of venous blood was also collected from each patient from a suitable forearm vein into an Ethylene Diamine Tetra acetic Acid (EDTA) bottle and mixed by gentle inversion. The blood sample was allowed to stand at room temperature (18- 22<sup>o</sup>c) for 60 minutes. The plasma was then

aspirated out using Pasteur pipette and stored at - 20<sup>o</sup> C until it was tested for HIV. Antibodies to HIV 1 and 2 were tested for using latex agglutination method (Capillus HIV -1 and HIV 2) according to manufacturer's instructions. All reagents were brought to room temperature before use. Determination of CD<sub>4</sub> count was performed by Cyflow SL green machine (Partec, Munster, Germany).

The data obtained was analyzed using SPSS for windows version 11.0 statistical software (SPSS Chicago, III USA). Results were expressed in simple frequencies and percentages. Quantitative data were presented in form of median and ranges. Tables were drawn using Microsoft word. Chi-square ( $\chi^2$ ) test of statistical significance was used to determine significance of statistical association. A p value of  $\leq 0.05$  was considered to be statistically significant.

### RESULTS

The age and sex distribution of the study subjects showed that out of the 200 HIV/AIDS patients studied, 131(65.5%) were males, while 69(34.5%) were females. The ages ranged between 17 and 74 with a median age of 39 years. The age group 21- 30 years was the predominant group in both the patients with diarrhoea and those without, accounting for 27.5% and 13.5%, respectively.

Distribution of patients by diarrhoea status showed that 110(55.0%) had diarrhoea, while 90(45.0%) did not. Twenty (10.0%) and 19 (9.5%) of those patients in the diarrhoea and non-diarrhoea groups, respectively had CD4 cell count <200 cell/mm<sup>3</sup>. There was no statistically significant difference in CD<sub>4</sub> cell counts between the diarrhoea and non-diarrhoea patients ( $P > 0.05$ ). (Table 1).

The prevalence of intestinal parasites among the patients studied was 34.5% (69/200) irrespective of their diarrhoea status. Of the 69 patients infected with intestinal parasites, 38 (55.18%) had diarrhoea, while 31(44.9%) did not. There was no significant difference in the prevalence of intestinal parasites among those with diarrhea and those without ( $P > 0.05$ ).

Table 2 shows the distribution of parasites isolated from stools of subjects studied.

**Table 1:** Relationship between CD4 Cell count and diarrhea in HIV/AIDS patients in Kano, Nigeria.

Diarrhoea	CD4 cell count range				Total
	<200	200-350	350-500	>500	
<b>With</b>	20	38	37	15	110
<b>Diarrhoea</b>	(10.0%)	(19.0%)	(18.5%)	(7.5%)	(55.0%)
<b>Without</b>	19	36	27	8	90
<b>Diarrhoea</b>	(9.5%)	(18.0%)	(13.5%)	(4.0%)	(45.0%)
<b>Total</b>	39	74	64	23	200

**Table 2:** Prevalence of intestinal parasites in patients with HIV/AIDS in Kano, Nigeria

Parasite	Number and percentage of parasite isolated		Total
	with diarrhea	without diarrhea	
<i>E. Histolytica</i>	19 (11 cysts) (8 trophozoites)	14 (All cysts)	33 (47.8)
<i>Giardia lamblia</i>	7	6	13 (18.0%)
<i>Hookworm</i>	3	1	4 (5.8%)
<i>Entamoeba coli</i>	1	2	3 (4.3%)
<i>S. stercoralis</i>	1	3	4 (5.8%)
<i>I. Hominis</i>	2	-	2 (2.9%)
<i>H. Nana</i>	1	1	2 (2.9%)
<i>S. Mansoni</i>	-	2	2 (2.9%)
<i>Cryptosporidium</i>	2	-	2 (2.9%)
<i>A. lumbricoides</i>	1	-	1 (1.4%)
<i>T. Trichuri</i>	1	-	1 (1.4%)
<i>D. latum</i>	-	1	1 (1.4%)
<i>I. Beli</i>	-	1	1 (1.4%)
<b>Total</b>	<b>38</b>	<b>31</b>	<b>69</b>

The most commonly isolated pathogen was *E. Histolytica* accounting for 47.8% (33); 8 (11.6%) trophozoites and 25 (36.2%) cysts. This was followed by *G. Lamblia* 13 (18%), *Hookworm* 4 (5.8%), *E. coli* 3 (4.3%) and *S. Stercoralis* 4 (5.8%).

*T. Hominis*, *H. nana*, *S. Mansoni* and *Cryptosporidium* each accounted for 2 (2.9%), while *A. lumbricoides*, *T. Trichuria*, *D. latum* and *I. Beli* each accounted for one (1.4%).

## DISCUSSION

It is a well-known fact that many factors contribute to the prevalence of intestinal parasites in a given community, among which are parasite factors, environmental as well as host factors. Immune competence is one important host factor that determines infestations by intestinal parasites with immunosuppression clearly associated with increased risk of parasitic infestation and/or dissemination of existing parasitic disease.

The advent and pandemic of HIV/AIDS has led to increased incidence of intestinal parasitization and diarrhoeal disease.

The overall prevalence of intestinal parasites in HIV infected adult patients in this study was 34.5%. This is lower than the figure obtained in Ilorin,<sup>8</sup> that reported prevalence rates of 70.8%. The result of this study is however, similar to that obtained in Abeokuta,<sup>9</sup>

southwestern Nigeria where a prevalence of 28.4% was reported. A prevalence rate of 44.8% was also reported from Ethiopia.<sup>10</sup> The relatively lower prevalence obtained in our study as compared to the Ilorin<sup>8</sup> study might not be unconnected with differences in the level of awareness among our subjects, in addition to their being probably from higher socio-economic background and therefore differ in their levels of personal hygiene and eating habits. Differences in the levels of exposure to sources of these parasites might also have been responsible for difference in the prevalence of these parasites from different parts of the world. For example, a relatively lower prevalence rate of *cryptosporidium parvum* (2.9%) was obtained in this study as compared to report from other places like Cuba<sup>11</sup> (11.9%), Ethiopia<sup>10</sup> (11%) and Abeokuta<sup>9</sup> (5.7%).

Although *E. Histolytica* was the commonly isolated pathogen in this study, most of them were carried as cysts rather than trophozoites. The implication of this is that most of the cases of *E. Histolytica* infestation might just as well be a reflection of the high carrier rate (cysts) in the general population rather than a true increase in prevalence in HIV infected patients. Another case controlled study with HIV negative controls will be required to assess the true prevalence of both carrier rate and invasive amoebiasis in our HIV infected patients.

Therefore, one can conclude that intestinal parasitic infestations are common among HIV infected individuals and *E. Histolytica* and *G. lamblia* are the most common pathogens isolated. It is worthy of note however, that out of the 33 patients with *E. Histolytica* infestation in this study, 25 had cysts of the parasite and only 8 had trophozoites indicating invasive amoebiasis and all had diarrhoea. Therefore, the high prevalence of *E. Histolytica* observed might just be a reflection of the high carrier rate of the parasites in the general population.

It is recommended that health education regarding personal hygiene and eating habits will go a long way in reducing the incidence of diarrhoea caused by parasitic infestations among HIV/AIDS patients. This will no doubt reduce morbidity and mortality from these conditions in these

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