

## Effect of Anti-retroviral Therapy and Anti-parasitic Drugs on the Prevalence of Intestinal Parasitic Infections in HIV Positive Patients in Selected Hospitals in Federal Capital Territory (FCT), Abuja, Nigeria.

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**Abstract:** A study on the effect of anti retro-viral and anti-parasitic drugs on the Prevalence of Intestinal Parasites on Human Immune Deficiency Virus (HIV) patients was conducted in selected Hospital in FCT, Abuja, Nigeria. A total of 150(52 male and 98 female) HIV positive consented participants were recruited into the studies from June 2015 to February 2016. Structured questionnaires were used to collect clinical information after obtaining consent from participants. Stool samples were collected from each subject for intestinal parasitic examination using direct microscopy and formol-ether concentration method to detect ova, cysts or trophozoites. There was a strong significant association between intestinal infection and anti-retroviral therapy (P=0.039). The prevalence was lower (14%) among HIV infected subjects on ART compared to those not on treatment (31.6%) There was no significant association between parasitic intestinal infection and anti-parasitic drugs (P=0.111). The prevalence of intestinal parasites was lower (7.4%) among HIV infected patients on anti-parasitic therapy compared to those not on anti-parasitic therapy (23.6%). Six types of intestinal parasites were identified, the most dominant being, *Entamoeba histolytica* with 67.7% *Giardia lamblia* with 9.7%, *Ascaris lumbricoides* with 6.5% and the least being, *Isoospora belli*, *Strongyloides stercoralis* and *Entamoeba coli* with a prevalence of 3.2% respectively.

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### 1 Introduction

Parasitic infections are among the most widespread of all chronic human infections worldwide. The rate of infection is remarkably high in sub-Saharan Africa, where the majority of human immunodeficiency virus (HIV) and AIDS cases are concentrated (Akinbo *et al.*, 2010 ). The prevalence of intestinal pathogens among HIV infected individuals has dramatically decreased in countries where antiretroviral agents are widely available<sup>3</sup>. However, in most African countries, where few patients have access to antiretroviral treatment (ART), intestinal pathogens still represent a frequent cause of diarrhea, wasting and weight loss (Zeynudin *et al.*,2013). Global statistics of about 78 million people are living with HIV/AIDS are in World, of which Sub-saharan Africa account for almost 70% (UNAIDS, 2014). In Nigeria the prevalence of HIV is 3.4% with the most affected age group being 20-39 years. Mortality and morbidity in this group will have an impact on labour, thereby affecting productivity. Thisdaylive Report, 2013). Enteric parasites are major cause of diarrhoea in HIV infected individuals especially those living in poor sanitation region (Kulkarni *et al.*, 2007). Diarrhoea affects 90% of people living with HIV/AIDS, causing significant morbidity and mortality Among those opportunistic pathogens,

*Isoospora belli*, *Cryptosporidium parvum*, *Cyclospora cayatanensis* and *Microsporidium* species are being increasingly reported as causes of enteritis and as opportunistic pathogens in immune compromised individuals (Lekha *et al.*, 2008). The presence of non-opportunistic parasites such as *Entamoeba histolytica*, *Giardia lamblia*, *Trichuris trichiura*, *Ascaris lumbricoides*, *Strongyloides stercoralis* and *Ancylostoma duodenale* in developing countries infect HIV/AIDS patients. Moreover, opportunistic parasites play a major role in causing chronic diarrhoea accompanied by weight loss. Among the species of opportunistic protozoa associated with diarrhoea in HIV/AIDS patients are; *C. parvum*, *I. belli*, *Microsporidium* species, and *Cyclospora* species. *Strongyloides stercoralis*, a nematode can cause diarrhoea and overwhelming infestation in patients with immunosuppressive disorders (Okai, 2012). Because of inadequate information on the prevalence of opportunistic intestinal parasite among HIV patients, laboratory diagnostic evaluations are needed to determine the disease prevalence in a specific population. These will help in providing guidelines for empirical treatments, prevention and control measures of opportunistic infections in HIV infected individuals, then generation of necessary data for planning and evaluation of HIV/AIDS patients'

care. Hence, this study aimed at evaluating effect of anti retro-viral and anti-parasitic drugs on the Prevalence of Intestinal Parasites on Human Immune Deficiency Virus (HIV) patients in selected Hospital in FCT, Abuja, Nigeria.

## 2. Materials and Methods

FCT metropolis lies approximately between latitude 8.25 and 9.20 north of the equator and longitude 6.45 and 7.39 east of Greenwich Meridian, Abuja is geographically located in the center of the country. The Federal Capital Territory has a landmass of approximately 7,315 km<sup>2</sup>, of which the actual city occupies 275.3 km<sup>2</sup>. It is situated within the Savannah region with moderate climatic conditions. It has a population of 1,405,201 in 2006 census and population density of 190 per sq.km. The Abuja municipal area council (AMAC) is one of the area council in FCT. Random sampling technique was used to select 150 consenting HIV positive patients, This was a cross sectional study that involved using of questionnaire to get some information on anti-retroviral and anti-parasitic drugs. The study population is made up of HIV positive patients (Both male and female) of age range 1- 60yrs in these hospitals (Nyanya and Garki hospital) located in FCT Abuja. These hospitals have HIV clinic centres which is being sponsored by Institute of Human Virology Nigeria ( IHVN) under the President Emergency Plan For Aids Relief ( PEPFAR) A sample size of 150 participants consisting of both male and female HIV Positive patients attending HIV clinic, registered with the clinic. 2 hospitals (Nyanya General, and Garki Hospital) were used. A random selection of participants that gave consent was used until the sample size required for the study was attained. This

research was conducted within the required ethical guideline of the hospital. A letter / ethic clearance form was written to the ethical committee of the hospital for the approval of the study and the consent of each participant. Participants were informed that they are free to withdraw consent anytime and their medical records and specimens would be examined and treated with strict confidentiality.

Stool specimens were collected using a clean wide mouth specimen container from patients attending the HIV clinic. Freshly voided stool specimens were collected, processed and examined microscopically with saline wet mount to detect larva, eggs, trophozoites and cysts of the parasites. Also Formol-ether concentration method was performed and modified cold Zeihl-Neelsen (ZN) was used to detect coccidian species. The data obtained from questionnaires was analyzed using the statistical software SPSS version 20. The information obtained from the questionnaire was presented and the results obtained from the stool specimens were presented as frequencies and percentages. Chi-square test was used to determine the association between different variables.

## 3. Results

From the Table 1: Majority of the intestinal parasites were intestinal protozoans which recorded a prevalence of 90.3% with *E.histolytica/dispar* having the highest frequency of 67.7%, *Gardia lamblia* and *Entamoeba coli* having 9.7% respectively, while *Isospora. belli* has 3.2%. Few helminthic infection was recorded with *Ascaris lumbricoides* having the highest frequency of 6.5% and *Strongyloides stercoralis* 3.2%. *Isospora belli* was the only opportunistic pathogen isolated.

**Table 1: Distribution of Intestinal Parasites among HIV positive patients**

Parasites	Frequency of Parasites	Percentage
<i>E. histolytica/dispar</i>	21	67.7
<i>Gardia lamblia</i>	3	9.7
<i>Isospora belli</i>	1	3.2
<i>Ascaris lumbricoides</i>	2	6.5
<i>Strongyloides stercoralis</i>	1	3.2
<i>Entamoeba coli</i>	3	9.7
Total	31	100

Table 2 shows the effect of anti-retroviral and anti-parasitic drugs on the Prevalence of Intestinal parasites among HIV positive patients, In relation with anti retroviral therapy, there was a strong significant association between intestinal infection and anti-retroviral therapy (P= 0.039). The prevalence was lower (14%) among HIV infected subjects on ART compared to those not on treatment (31.6%). Also among those taking the ART, the prevalence was

higher in those that have just taken ART drugs 1 – 3 months (70%), 3 – 6 months (20%) and 6- 12months (8.3%). Those that have taken more than 1 year had the least prevalence (3.6%). There was no significant association between parasitic intestinal infection and anti-parasitic drugs (P=0.111). The prevalence of intestinal parasites was lower (7.4%) among HIV infected patients on anti-parasitic therapy compared to those not on anti- parasitic therapy (23.6%).

**Table 2: Effect of anti-retroviral and anti-parasitic drugs on the Prevalence of Intestinal parasites among HIV positive patients.**

Anti-retroviral Status	Number tested	Number Infected	Percentage Infected	OR	95% CI	P-Value	
Non ART	57	18	31.6	1.957	1.022, 3.746	0.039	
ART	93	13	14	0.443	0.202, 0.971		
1 – 3months	10	7	70	2.471	0.760, 8.032	0.000	
3 – 6 months	15	3	20	0.286	0.059, 1.375		
6 – 12 months	12	1	8.3	2.231	0.218, 22.788		
>1 year	56	2	3.6	0.429	0.036, 5.118		
<b>Anti-Parasitic Drugs</b>							
No		123	29	23.6	2.766	0.698, 10.961	0.111
Yes		27	2	7.4	0.314	0.071, 1.397	

#### 4. Discussion

Intestinal parasitic infection was showed highest prevalence in HIV patient who used Anti- retroviral therapy (ART) within last six months than those used ART above six month. Therefore, the prevalence of parasitic infections and duration of ART has significant association (P=0.039). This is in line with the study in Ethiopia ( Zeynudin *et al.*, 2013). This could be because of ART lead to a robust immunological response as measured by CD4 cell count as a result, diminishes the likelihood of HIV related opportunistic infection possibly as a result of maximal viral suppression.

Those that are not on the anti-retroviral drugs had high prevalence compared to those that are on drugs which conforms with the study in Kano ( Jegede *et al.*, 2014). So the drugs must have played a very major role in reducing the viral load and boosting their immunity.

There was no significant association between antiparasitic drugs and intestinal parasitic drug. (p=0.111). Those on anti parasitic drugs had low prevalence compared to those that were not which is in line with the study in Kano (Jegede *et al.*, 2014). The present study highlights the importance of testing for intestinal parasites in patients who are HIV-positive, and emphasizes the necessity of increasing awareness among clinicians regarding the occurrence of these parasites in this population. The wide distribution of anti-retroviral drugs dramatically decreases prevalence of opportunistic intestinal infection, even though non-opportunistic parasitic infections are still important problems in HIV patients of any immunity level with or without symptom of diarrhea. Routine examination of stool samples for parasitic infections could significantly benefit the HIV-infected individuals by contributing to reduce morbidity, mortality and improved quality of life.

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