Prevalence of Intestinal Parasitic Infections in HIV Positive Individuals in FCT, Abuja, Nigeria in relation with their Socio-economic status.

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Abstract: Studies was conducted on the prevalence of intestinal parasites in Human Immune Deficiency Virus (HIV) positive patients in FCT, Abuja, Nigeria in relation with their socio-economic status. A total of 150 HIV positive consented participants of age range<1- >40 were recruited into the studies from June 2015 to February 2016. Structured questionnaires were used to collect clinical information. 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. Six types of intestinal parasites were identified, the most dominant being, *Entamoeba histolytica* 67.7% *Gardia lamblia* 9.7%, *Ascaris lumbricoides* 6.5% and the least being, *Isospora belli*, *Strongyloides sterc*oralis and *Entamoeba coli* with a prevalence of 3.2% respectively. There was a significant association between infection status with respondent social economic status. Sources of water had a strong association with infection status (P=0.001), food preparations also had a significant difference with intestinal parasite (P=0.011) and toilet facility also had an association (P=0.02).
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1. Introduction

HIV/AIDS has become a major public health concern in the African continent accounting for 67% of infection worldwide (Kipyegen *et al*., 2012). 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. The most productive age group coincidentally is the most affected by the HIV pandemia. (Thisdaylive Report, 2013).

The parasitic infections are commonly grown in children, old age and immunocompromised people living in poor sanitation regions (Arora and Arora, 2010). Studies conducted in most African countries and elsewhere have demonstrated the presence of intestinal parasites as the cause of severe diarrhoea in HIV/AIDS patients (Gupta *et al*., 2008).

Opportunistic infections are common complications of HIV infection and other Acquired Immune Deficiency Syndrome (AIDS) defining decisions that rarely cause harm in healthy individuals. Opportunistic infection poses major health problems among HIV patients particularly in the late stage of the disease when immune suppression is severe (Saidu *et al*., 2009). The sources of parasitic infections in humans include contaminated soil, food and water sources with human faeces and poor sewage disposal such as use of night soil as fertilizer. Faecal oral route is significant in the transmission of parasitic infections via poor personal hygiene and environmental contamination. Nosocomial outbreaks of cryptosporidiosis have also been described, where an individual gets infected in hospital (Hunter and Nichols, 2002).

Among those opportunistic pathogens, *Isospora belli, Cryptosporidium parvum, Cyclospora cayetanensis and Microsporidium* species are being increasingly reported as causes of enteritis and as opportunistic pathogens in immune compromised individuals. The presence of non-opportunistic parasites such as *Entamoeba histolytica, Giardia lamblia, Trichuris trichiura, Ascaris lumbricoides, Strongyloides stercoralis* and *Ancyclostoma 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). In developing countries, gastrointestinal parasite infections are mostly due to poverty characterized by poor hygienic habits, absence of portable and clean water, absence of good faecal disposal system and poor nutrition. Pathogens responsible for causing diarrhea differ according to

geographical location; therefore laboratory diagnostic evaluations are required to determine their prevalence in each population so as to provide guidelines for therapy and necessary data for planning and evaluation of HIV-positive/AIDS patient's care and management (Kipyegen et al., 2012).

Hence, this study is to determine the prevalence of intestinal parasites in Human Immune Deficiency Virus (HIV) positive patients in FCT, Abuja, Nigeria in relation with their socio-economic status.

2. Materials and Methods

The 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 km², of which the actual city occupies 275.3 km^2. 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 (Source of drinking water, Food Preparations, Toilet Facility).

The study population is made up of HIV positive patients (Both male and female) of age range <1- > 40years 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), The inclusion criteria were Patients (male and female) that were positive for HIV, with or without signs of diarrhea, either on anti-retroviral or not, consented to participate in the study and also registered with the clinic.

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 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 in the structured questionnaire and intestinal parasitic infection. The results were statistically significant if the p-value was less than 0.05 and vice-versa.

3. Results

From 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 parasite isolated.

Table 1: Distribution of Intestinal Parasites among HIV positive and negative individuals

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

Table 2 shows the prevalence of intestinal parasites among HIV positive patients in relation with their Sources of Water There was a significant association between infection status with respondent sources of water (P=0.001). Based on the source of drink water, the prevalence was highest with 52.2% among consumers of any type of water they come by, followed by those drinking sachet water with 26.2%. Those taking borehole had 20%. Then bottled and pipe

borne water had 12.5% respectively, boiled water had 9.5% while treated with water guard had the least prevalence (5.3%).

Table 2: Prevalence of intestinal parasites among HIV positive patients in relation with their Sources of Water

Sources of water	Number tested	Number Infected	% Infected	Number Uninfected	% Uninfected	P-Value
Pipe borne	8	1	12.5	7	87.5	0.001
Bore hole	10	2	20	8	80	
Sachet	42	11	26.2	31	73.8	
Boiled	21	2	9.5	19	90.5	
Bottled	8	1	12.5	7	87.5	
Treated (water guard)	38	2	5.3	36	94.7	
Mixed (anyone)	23	12	52.2	11	47.8	

Table 3 shows the prevalence of intestinal parasites among HIV positive patients in relation with their Food preparations and Toilet Facility With regards to food preparations, there was an association with infection status (P=0.011). Those preparing food by themselves had the least prevalence (13%), those using both had 21.4% while those buying already prepared meals had the highest prevalence (30.7%). There was a significant association between Toilet Facility and Intestinal parasitic infection (P=0.02). Those using pit toilet/ bushes had the highest prevalence (38.1%), those using Public water cistern had 26% while those that use private water cistern had the least prevalence (12.7%).

Table 3: Prevalence of intestinal parasites among HIV positive patients in relation with their Food preparations and Toilet Facility

Food Preparations	Number tested	Number Infected	% Uninfected	Number uninfected	% Uninfected	P-Value
Prepared by themselves	77	10	13	67	87	0.011
Buying already prepared meal	31	12	30.7	19	61.3	
Using both	42	9	21.4	33	78.6	
Toilet Facility						
Private WC	79	10	12.7	69	87.3	0.02
Public WC	50	13	26	37	74	
Pit/Bushes	21	8	38.1	13	61.9	

4. Discussion

Majority of the intestinal parasites were intestinal protozoans with E.histolytica/dispar being the most prevalent, this is in conformity with previous studies done in Abuja by (Udeh et al., 2008 and Abaver, 2012), Kano (Jegede et al., 2014), Kenya (Kipyegen et al., 2012) Cameroun (Nkenfou et al., 2013), and (Okodua et al., 2003). *Gardia lamblia* and

having the highest frequency of 6.5% which is in line with the result obtained from Southern Ethopia (Fekadu et al., 2013) with 6.7%, Kenya (Kipyegen et al 2012) with 8.6%, almost with the result from Benin (Akinbo et al.,2010) with 4.2%. *Strongyloides stercoralis* had a prevalence of 3.2% which is in line with the result from Ethopia (Fontanet et al.,2000) with a prevalence of 5.1% but lower than the result obtained from Southern Ethopia (Fekadu et al., 2013) with 10.5%. The most prevalent protozoan parasite is *E.histolytica/dispar*, while *A.lumbricoides* was the prevalent helminth. This is in conformity with the study obtained in Baringo, Kenya (Kipyegen et al., *Entamoeba.coli* having 9.7% respectively. The prevalence for Gardia was in line with the one obtained from Malaysia (Oguntibeju, 2006) with 8.3% and North India (Mohandas et al.,2002) with 8.3% but higher than the rates found in Southern Ethopia (Fekadu et al.,2013) with 4.1%, Benin (Akinbo et al,2010 with 0.6%. Little helminthic infection was recorded with Ascaris lumricoides

2012) *Isospora belli* was the only opportunistic parasite recorded in this study with a prevalence of 3.2% which is almost in line with result obtained from Northern India (Mohandas et al.,2003) with 2.5% but lower than the result from Benin (Akinbo et al.,2010 with 7.8%. In general such prevalence of these non opportunistic parasites in the present study could have been the effect of water and food contamination, or it could have been due to poor personal hygiene. So the presence should not be neglected. There was a strong significant association between infection status with respondent Sources of water (p=0.001). The prevalence was highest with 52.2% among consumers

of any type of water they come by, that is both boiled, sachet, bore-hole, pipe borne followed by those drinking sachet water with 26.2%. Those drinking water treated with watergaurd had the least prevalence (5.3%). In this study however, lack of basic social amenities in both study areas such as potable drinking water has given rise to a high prevalence infection as most residents resort to purchasing sachet water as their source of drinking water. Unfortunately producers of sachet water in these communities are not properly monitored and therefore may serve as a source of infection. Inadequate water availability could lead to poor sanitation posing a risk to parasitic infections. High infection rates were associated with lack of water treatment practices among the respondents where an individual can get exposed to contaminated water with cyst/ova of the intestinal parasites. In terms of food consumption, there was an association with infection status. Those preparing food by themselves had the least prevalence (13%), while those buying already prepared meals had the highest prevalence (30.7%). There was a significant association between Toilet Facility and Intestinal parasitic infection. Those using pit toilet/ bushes had the highest prevalence (38.1%), while those that use private water cistern had the least prevalence (12.7%). There was high prevalence of intestinal parasites among HIV positive patients, with most of the parasites found being waterborne protozoan. Provision of safe drinking water and health education on efficient environmental sanitation and improving personal hygiene could enable curb water, food and individual contamination, thus promoting good health.

Reference

1 Kipyegen C. K, Shivaro R. S Odhiambo R. O (2012), " Prevalence of Intestinal Parasites Among HIV Patients in Baringo Kenya". *Pan African Medical Journal* (213:37).

2 Thisdaylive (2013). Online. Available at: www.thisdaylive.com/article/in-a-new-survey-nigeria s-hiv-aids-prevalence-drops-to-3. Accessed on 25/08/2015.

3 Arora, D. R (2010), "Medical Parasitology", 3rd edition, CBS Publishers India.

4 Gupta, S., Narang, V. and Singh, S. (2008), " Chronic Diarrhoea in HIV patients. Prevalence of Coccidian Parasites." *Indian Journal of Medical Microbiology*; 26(No.2): 17217.

5 Saidu, A. S, Bunza, M. D. A, Abubakar U, Adamu T, Ladan, M. J and Fana, S. A (2009), "A Survey of Opportunistic Infections in HIV Seropositive patients attending Major Hospitals of Kebbi State", Nigeria. Bayero *J. Pure and App. Sc*. (vol2(1):70-74.

6 Hunter P. R. and Nicholas G. (2002), "Epidemiology and clinical features of *Cryptosporidium* infection in immunocompromised patients". *Clin Microbiol Rev;* 15:145-154.

7 Okai, A. E. N (2012), " Intestinal Parasitic Infection in HIV-Infected Patients at Different CD4 T-cell counts in an Africa Rural and Periurban Settings". Online: Available at*:* ir.knust.edu.gh/bitstream/.../1/ARYEE%20ERIC%20NII%20OKAI.pdf. Accessed on June 5, 2015.

8 Udeh EO, Goselle ON, Popova D, Abelau M, Popov TV, Jean N DJ. The prevalence of intestinal protozoans in HIV/AIDS patients in Abuja, Nigeria. *Sci World J*. 2008;3(3):1–4.

9 Abaver, D.T (2012), "Prevalence of Intestinal Parasitic Infections among HIV/AIDS Patients from Two Health Institution in Abuja, Nigeria". Division of Academic Affairs and Research, Directorate of Research Development, Walter Sisulu University, Eastern Cape, South Africa. Online: Available at: www.omicsgroup.com/conferences/ACS/conference/speaker_ppt/1382-speaker-ppt. Accessed on March, 2016.

10 Jegede E. F, Oyeyi E. T, Bichi A. H, Mbah H. A, Torpy. K (2014), "Prevalence of Intestinal Parasites among HIV/AIDS, Patients attending Infectious Disease Hospital Kano Nigeria". *Pan Africa Medical Journal*.17:295

11 Oguntibeju, O. O, 2006, " Prevalence of intestinal parasites in HIVpositive/AIDS patients". *Malaysian J Med Sci*.; 13: 68_73.

12 Mohandas, K., Sehgal, R., Sud, A. and Malla, N. (2002). " Prevalence of Intestinal Parasitic Pathogens in HIV Seropositive Patients in Northern India". Jpn *J Infect Dis*; 55(No. 3): 83-84.

13 Fekadu, S, Taye, K, Teshome, W, Asnake, S, (2013), "Prevalence of Parasitic Infections in HIV Positive Patients in Southern Ethopia". *J. Infect. DevCtries:*7(11):868-872.

14 Akinbo, F. O, Okaka, C. E and Omoregie R, (2010) "Prevalence of Intestinal Parasitic Infections among HIV patients in Benin City, Nigeria". *Libyan J. Med.*