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Prevalence of Intestinal parasites in HIV Patients in Owerri, Imo State, Nigeria

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Abstract

One hundred (100) HIV seropositive patients were compared with thirty seronegative patients with respect to the prevalence of intestinal parasites. Stool samples were collected and examined for parasites using direct saline/lodine (wet mount preparation), formol-ether concentration method and Modified Acid Fast Stain (AFS), their HIV status was also confirmed with standard diagnostic kit by serological methods. 64% and 23.3% of HIV seropositive and seronegative patients respectively were found to have intestinal. Parasites identified included *Gardia lambli, Entamoeba histolytica, Ascaris lumbricoides, Isospora belli,* Hookworm and *Entamoeba coli* among which *Entamoeba coli* (34.4%) had the highest occurrence in the seropostive patients. *Gardia lambli,* Hookworms *and Isospora belli* were not observed in the seronegative patients. Infection was higher in younger age group (21 – 40 years). There was no significant difference in the degree of infection between male and female HIV seropositive patients ($P \geq 0.05$). Protozoan parasites (71.9%) had more prevalence than Helminth parasites (28.1%) in both HIV seropositive and seronegative patients. Results of this study recommend that HIV infection increases the risk of acquiring intestinal parasites. Therefore patients with HIV infection should be regularly examined with stool microscopy for early detection and treatment of parasitic infection so as to minimize the chances of these parasites adding to the complications associated HIV cases.

Keywords: Intestinal Parasites, HIV, Patients, Owerri, Imo State

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Introduction

Intestinal parasitic infection remains an important cause of morbidity and mortality in developing countries especially among HIV-infected patients. They are frequently transmitted by unhygienic habits such as direct transfer of ova or cysts from anal region to mouth, eating with unwashed hands or eating and drinking of contaminated food and drinks (Okpala, 1961). Intestinal parasitic infections are widely distributed throughout the world especially in tropical and subtropical areas of the developing countries. It is estimated to cause one million deaths a year (Ejezie, 1993). Intestinal parasitic infection is an important health problem in the HIV-infected patients. With the impaired immunity in these patients infestation with intestinal parasitic organisms resulting in diarrhea symptoms is commonly seen (Tarimo, 1996). Human Immunodeficiency Virus (HIV) infection is a worldwide problem in the present day with about 42 million people infected globally, while sub-Saharan Africa accounts for more than half (29.4 million) of this number. Studies on intestinal parasites from developing countries have revealed 60% prevalence among HIV infected patients (Kumar *et al,* 2002). In Nigeria, infection rate range between 4.97% and 5.4 % (Obi *et al,* 1995).

Human immunodeficiency virus (HIV) infection leads to acquired immune-deficiency syndrome (AIDS) and the major causes of morbidity and mortality of such patients are opportunistic infection caused by viral, bacterial, fungal and parasitic pathogens. Gastrointestinal involvement in HIV/AIDS is almost universal and significant disease occurs in 50 – 90% of patients. Diarrhea can be a presenting manifestation or a life threatening complication of infection with HIV, sometimes during the course of the disease (Awole *et al,* 2003). Eventually, most HIV infected individuals develop AIDS. These individuals mostly die from opportunistic infections associated with the progressive failure of the immune system (Lawn, 2004)

In recent years, numerous studies have outlined the emergence of gastrointestinal protozoa like *Microsporidia* species, *Cryptosporidium parvum, Entamoeba histolytica*, *Gardia lamblia*(Awole *et al,* 2003). Nematodes like *Strongyloides stercoralis* can also cause diarrhea and overwhelming manifestation in patients with variety of immunosuppressive disorders including HIV/AIDS (Pullock *et al,* 1997). Other nematodes such as hookworms and *Ascaris lumbricoides* can also be seen in stool of HIV patients (Wiwanitkit, 2001). The types of intestinal parasite infesting humans vary from different locality. Because of the fact that diarrhea illness due to parasitic etiology among HIV infected patient is on the increase during recent times, the present study was undertaken to examine the prevalence of intestinal parasites among HIV infected patients in Owerri, Imo State, Nigeria.

Materials and Methods

This study was conducted in Owerri, the capital of Imo State, Nigeria. Owerri comprises of three local governments namely, Owerri North, Owerri West and Owerri Municipal. Owerri Municipal was carved out of the former Owerri local government area of Imo State in 1996, as the only municipal council in Imo State. Owerri is located at approximately between latitude 7^0S and $7^0$30E with a population of about 963, 039 (Ministry of Information and Culture, Imo State, 2000). It has a temperature of between 20^0 and 30^0 with a relatively high humidity of about 75% reaching 85% during the rainy season. The city is surrounded by other rural communities that make up Owerri geopolitical zone of Imo State with few small scales industry ranging from agricultural to manufacturing industries. The health centers comprise of the Federal Medical centre and General Hospital both in Owerri Municipal and Owerri West respectively, take care of basic health care needs of the residents. Owerri is called the Eastern heartland because of its strategic central location as regards to the fact Owerri connects all the State within the eastern region of Nigeria Permission was obtained from the Hospital Management and the patients were informed, guided and counseled before the study commenced.

The main source of data collection was from Heart to Heart Center for HIV Test (under the auspices of GAIN, an International NGO) of the General Hospital Umuguma which is situated at Owerri West. It supports HIV/AIDS suspected and laboratory confirmed patients by giving medical treatment and other services. The study subject consisted of 100 people with confirmed cases of HIV infection who regularly came for treatment. Additionally, 30 subjects who were found to be HIV negative were used as controls. Their HIV status was determined with standard diagnostic kit by serological methods as in (Obiajuru and Ozumba, 2009). Information spanning the period of June-August 2009 were sourced, noted and grouped by the use of structured questionnaire. From the questionnaire, patient's age, sex and anti-retroviral status were assessed. Stool specimens were collected from 100 patients comprising (42 males and 58 females) with age bracket between 21 – 65 years that were HIV-infected irrespective of presence or absence of diarrhoea. Stool samples were collected from subjects in clean glass bottles.

The stool samples were processed and examined microscopically for the presence of trophozoites, ova, cysts, larvae and oocysts of parasites in the Microbiology and Parasitological laboratory of the General Hospital by direct saline, lodine (wet mount preparation) and formol - ether concentration method and Modified Acid Fast stain (AFS). Fresh stool specimens were examined as saline wet mount to detect motile trophozoites. Formol ether concentration was subsequently performed and the sediment examined as iodine wet mounts to detect ova, larva and cysts according to Cheesebrough(1998). Air dried smears from fresh stool samples were stained by a modified AFS to detect Cryptosporidium or Isospora species. Data obtained were analyzed by the use of descriptive statistics and chi- square analysis

Results and Discussion

In this study, a total of six intestinal parasites were identified which included *Gardia lambli, Entamoeba histolytica, Ascaris lumbricoides, Isospora belli,* Hookworm and *Entamoeba coli*. Intestinal parasites were found to be more prevalent in HIV-infected patients than in the HIV-negative patients (Table 1). Out of the 100 samples that comprised of 58 (58.0%) females and 42(42.0%) males, 64 patients had intestinal parasites, while the remaining 36 were not infected while out of

the 30 control samples, 7 were infected with intestinal parasites and 23 were unaffected. Among the parasites identified, *Entamoeba coli* was the most prevalent (34.4%) and *Isospora bellia* (3.1%) was the least in the HIV positive while *Entamoeba coli* (57.4%) also predominated in HIV negative patients and *Ascaris lumbricoides* (14.3%) was the least (Table 2). Table 3 presents the result of the distribution of intestinal parasites according to age and sex. Infection was more prevalent in the age bracket of 31-35 years old while also more intestinal parasites were found in the female group with a prevalence rate of 59.38% than the male 40.63% counterparts. Protozoan parasites (71.9%) were more prevalent than the helminthes (Table 4).

The prevalence of parasitic infection found in this study showed that HIV-Infected patients had higher rates of infection 64% than the HIV-negative patients 23.3%. A possible explanation to this could be due to high vulnerability of the patients to parasitic infection resulting from their immuno - compromised state. Another possible explanation for this finding could be related to the fact that patients with HIV are impoverished as a result of economic restriction imposed on them by the disease which prevents them from securing gainful employment for sustainable livelihood. This situation may lead to poverty, inadequate sanitation and poor food hygiene which may invariably increase the risk of acquiring intestinal parasites. Highlighting on this, Fakande(2000) reported that the incidence of malnutrition due to poor food intake as a result of poverty was high among Nigerian patients with HIV. Ukoli(1990) stated that the transmission of parasitic infections is associated with a low level of sanitation in which food and water are easily contaminated with human faeces and where poverty and ignorance combine to inhibit adequate treatment and purification of water and food.

Higher prevalence of the parasites was found among the HIV positive patients than the non - infected group. *Entoameba coli*, *Entoameba histolytica*, *Gamdia lamblia* and *Ascaris lumbricoides* have higher frequency in the infected than uninfected patients. In this study *Isospora belli* was found in 2 (3.1%), *Gardia lamblia* in 10 (15.7%), *Ascaris lumbricoides* in 10 (15.5%), *Entamoeba coli* in 12 (18.8%) and Hookwrm in 8 (12.5%) of HIV-infected patients which were significantly ($P \geq 0.05$) higher than those in the HIV- negative subjects. The current prevalence of *Isospora belli* (3.1%) obtained in this study is closer to the report of 3.9% from Southwestern, Ethiopa (Awole *et al*, 2003) but a little higher than1.5% prevalence rate from the study carried out in Cuba among HIV-infected patients (Esoledo *et al*, 1999), but much lower when compared with the result from a study in India (Kumar *et al*, 2002) with a report of 18.6% prevalence. Intestinal coccidians are opportunistic infections which are found exclusively in HIV patients with chronic diarrhea (Awole *et al*, 2003). *I. bellia* was the only opportunistic pathogen found in this study though the prevalence rate is lower than 18% reported by Kumar *et al* (2002). The discrepancies observed in the findings of this study and previous studies by other researchers could be attributed to differences in the place of study, that is geographical location and other conditions which can affect the research findings so that slight discrepancies could occur.

More protozoan parasites (73.2%) were recorded compared to helminthes (26.8%), this contrasts the result of Okodua *et al* (2003) who found higher prevalence of helminthic infection in their study population. The occurrence of these gastrointestinal parasites vary from region to region with regard to hygienic situation of a given area included coupled with the higher rate of multiplication of the protozoans. *Gardia lambli; Entamoeba histolytica; Isospora belli* and *Entamoeba coli*, these are parasites which cause diarrhea and malabsortion regardless of the patients HIV status but are also believed to occur in HIV patients in association with diarrhea (Awole *et al*, 2003).

Younger individuals under 21- 40 years old were predominantly affected than the older people. This result agrees with the report of Okodua *et al*, (2003) who similarly recorded higher infection rate in younger individuals than older patients in Southwestern Ethopia.

Similarly, the parasites were also found to be more prevalent in the females (65.5%) than their male (61.9%), although the result is not statistically significant ($p \leq 0.05$). This could be attributed to fact that the girls play more active roles in domestic activities, they help in farms, washing, fetching water and fire wood etc. This is consistent with Beaver (1975) who noted that activities of individual may strongly contribute to morbidity and prevalence of these endoparasites. Most times they embark on these activities bare-footed and eating with hands unwashed creating easy access to the infective stages of the various intestinal parasites.

Conclusion and Recommendations

The result of this study recommend that HIV-increases the risk of acquiring intestinal parasites. However, the issue of sanitation and basic personal hygiene as a link to contracting gastrointestinal diseases cannot be over – emphasized. These parasites are frequently transmitted by unhygienic habits such as direct transfer of ova or cysts from anal region to mouth, eating with unwashed and drinking of contaminated food and drinks. Therefore stool microscopy should be included in routine evaluation of all patients with HIV irrespective of the presence or absence of diarrhea and all patients found to be infected should be treated promptly to improve quality of life of HIV patients.

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Tables

Table 1: Intestinal parasite Infection rate between HIV positive and negative subjects

Subject category	**No of subjects without intestinal parasites (%)**	**No of subjects with intestinal parasites (%)**
HIV positive (n=100)	36 (36)	64 (64)
HIV negative (30)	23 (76.7)	7 (23.3)

Table 2: Prevalence of Intestinal parasites among HIV positive and HIV negative Patients

Parasites	**HIV Positive (n=100)**	**HIV Negative (n=30)**	**Total (n=130)**
Gardia lamblia	10(15.6)	0(0.0)	10(14.1)
Ascaris lumbricoides	10(15.6)	1(14.3)	11(15.5)
Entamoeba coli	22(34.4)	4(57.4)	26(36.6)
Entamoeba histolytica	12(18.8)	2(28.6)	14(19.7)
Hoookworm	8(12.5)	0(0.0)	8(11.3)
Isospora bellia	2(3.1)	0(0.0)	2(2.8)
Total	64(90.1)	7(9.9)	71

Table 3: Age and sex distribution of Intestinal parasites in HIV positive Adult patients

	Males		Females		Total	
Age bracket	**No examined**	**No with parasites (%)**	**No examined**	**No with parasites**	**No examined**	**No with parasites**
21-25	5	3(60)	5	5(100)	10	8(80)
26-30	8	6(75)	14	11(78.6)	22	17(77.3)
31-35	5	5(100)	7	7(100)	12	12(100)
36-40	10	5(50)	8	5(62.5)	18	10(55.5)
41-46	2	2(100)	8	4(50)	10	6(60)
46-50	2	2(100)	5	2(40)	7	4(57.1)
51-55	1	0(0)	3	2(66,7)	4	2(50)
56-60	7	3(42.9)	4	0(0)	11	3(27.3)
61-65	2	0(0)	4	2(50)	6	2(33.3)
Total	42	26(40.6)	58	38(59.4)	100	64(64)

Table 4: Prevalence of Protozoan and Helminthic parasites among HIV seropositive and seronegative patients

Patients' Status	HIV Seropositive(n=100)	HIV Seronegative(n=30)	Total(n =130)
Helminths	18(28.1%)	1(14.3%)	19(26.8%)
Protozoa	46(71.9%)	6(85.7%)	52(73.2%)
Total	64(90.1%)	7(9.9%)	71(54.6%)