INTERNATIONAL JOURNAL OF MEDICAL AND APPLIED SCIENCES
eISSN:2320-3137
Earthjournals Publisher
www.earthjournals.in

RESEARCH ARTICLE

PREVALENCE STUDIES ON OPPORTUNISTIC INTESTINAL PARASITES OF HIV PATIENTS ON ART AND NON ART HIV PATIENTS INOWERRI, IMO STATE NIGERIA.

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Publication history: Received on 10/12/2016, Published online 13/12/2016

ABSTRACT:

Background: The major health challenges among HIV-positive individuals is opportunistic intestinal parasites infection due to low immunity. The objective of this study was to determine the prevalence of intestinal parasites infection in HIV-infected patient on anti retroviral therapy in Imo state,Nigeria between February 2013 and December 2014.Methods: Stools samples were collected from 220 HIV on cART, 200 HIV not on cART and 100 control group. A structured questionnaire was used to collect socio-demographic data of the patients. Stool samples were examined by direct saline, iodine wet mount, formol-ether concentration method, modified Ziehl-Neelsen staining techniqueand modified Trichrome staining method. Results:Out of 520 stool samples examined 314 were positive for opportunistic intestinal parasites with overall prevalence rate of (60.3%). The highest rate 200(98.5%) of intestinal parasites were observed among HIV positive non cART patients, followed by HIV positive on cART 200(51.3%) and HIV negative individuals 100(4.0%). Cryptosporidium parvum 13(2.5%),Isospora belli 14(2.6%), Microsporidiumspp14 (2.6%), Giardia lamblia91(17.5%)andEntamoebahistolytica182(35%).Conclusions: The prevalence of intestinal parasitic infections remains significicant in HIV-infected patients with or without low CD4 counts in the cART era. The E. hystolytica and G lamdia as well as Cryptosporidium parvum, Isospora belli and Microsporidiumspp are the major opportunistic intestinal parasites observed in HIV / AIDS patients. Therefore,early detection and treatment of these intestinal parasites are very important to enhance the life and well -being of HIV/AIDS patients with or without diarrhoea.

Keywords: Prevalence, intestinal parasites, HIV, antiretroviral therapy and Owerri

INTRODUCTION

Human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) is a disease of the human immune system caused by infection with human immunodeficiency virus (Sepkowitz, 2001). The incidence of Human Immunodeficiency Virus (HIV) is a global concern particularly in Sub Saharan African where they are widespread. The existence of HIV has been reported in Nigeria (Onyenekwe*et al*., 2007). Studies also suggest that existence of HIV may accelerate immunological deterioration (Neilson *et al*, 2005). Evidence has shown that HIV seropositive individuals suffer from oxidant/antioxidant imbalance. In people living with HIV, opportunistic intestinal parasites have been reported (CDC, 1987).

HIV is contracted through transfusion of infected blood to an un-infected person and through sexual fluids of an infected person such as semen, virginal fluid and breast milk etc. However, the main route of transmission includes unprotected sexual intercourse with an infected person as well as mother to child transmission during pregnancy delivery and breast feeding. Also, HIV is transmitted through the use of contaminated sharps; hypodermic needles and syringes. However, it is pertinent to note that there is still no cure for HIV/AIDS but treatment for people living with HIV has greatly improved (Ijioma*et al*., 2010).

The opportunistic intestinal parasitic infections in HIV/AIDS are the infections which become clinically apparent due to weakened immune system of the patients. The spectrum of parasitic opportunistic infections (POI's) affecting HIV-infected individuals is classified into protozoa and helminthes (*Nematodes*, *cestodes*, and *trematodes*). These POI's are not only linked with symptomatic HIV-infected patients but contribute to decreasing immune system (Ijioma*et al*., 2010). Among the parasitic opportunistic diseases, *cryptosporidiosis*, *isosporidiosis* and *microsporidiosis* are the main enteric intestinal parasites infections while the *leishmaniasis* and *toxoplasmosis* are the main systematic POI's reported in HIV-infected patients. However, *cryptosporidiosis*, *isosporidiosis* and most importantly *toxoplasmosis* with brain involvement are the three key parasitic diseases which have been included in the Centers for Disease Control and Prevention (CDC) case definition for AIDS (CDC, 1987).

In developing countries, gastroenteritis caused by opportunistic intestinal parasites may be complicated and kills millions of AIDS patients annually. Hence, the consequences of opportunistic parasitic infections are among the major health problems in developing countries especially Nigeria (Adamu and Petros, 2006).

These parasitic infections usually produce diarrhea by infecting the small or large intestine or both.Diarrhea in patient with AIDS is significantly caused by intestinal parasites (Akinbo*et al.*, 2010). The main etiologic agents are intracellular protozoa, *Isospora belli*, *Cryptosporidium parvum*, and *Cyclosporaspp*(Mohanda*et al*, 2002). However, infection with other extra cellular parasites is also related to diarrhea disease in AIDS patients. Among these parasites *Entamoebahistolytica*, *Giardialamblia* are the most important (Janof and Smith, 1998). Since cellular immunity is the major defence mechanism against intestinal parasitic infections, the association between intestinal parasite and individuals with reduced immunity due to $CD4^+$ T-lymphocyte reduction in HIV/AIDS is well predictable, particularly from case presented with diarrhea (Smith and Rose1990).

In general, diarrhoea illness is becomes one of the most common clinically observable gastrointestinal manifestations in AIDS patients, occurring at the late stages of HIV infection. It is usually, due to opportunistic intestinal parasites. Opportunistic intestinal parasites are highly prevalent in Nigeria particularly Owerri, Imo State; where shortage of clean water, lack of sewage system and other unhygienic factors contribute largely to increase probability of infection. Opportunistic intestinal parasites infections are common health problem among HIV/AIDS patients.Hence, this study helps to test the hypothesis that ART will reduce the prevalence of *diarrheogenic* opportunistic intestinal parasites among HIV/AIDS patients.

Hence, the aim of this study is to evaluate the epidemiology of opportunistic intestinal parasites of HIV patients on antiretroviral therapy (ART) in Imo State.

MATERIALSANDMETHODS

The samples used for this study were stool and blood samples collected from HIV patients attending HIV clinic at the specialist hospital Owerri for care and treatment and apparently healthy individual were also randomly selected. This samples were collected following ethical approval by the Hospital.

Sample Size / Population

The sample size of this study was 520 and participants were people living with HIV and HIV negative individuals aged <20 to 75 years. This comprises 220 HIV seropositive patients on ART, 200 HIV seropositive patients non ART and 100 HIV sero-negative individuals. Relevant data such as age, sex, occupation and awareness of HIV and opportunistic intestinal parasite were also obtained and noted.

Ethical clearance was obtained from parasitic and infectious disease research unit, Imo State University.

Method Used in Examination of Samples

Stool samples were macroscopically examined (formed, soft, lose or watery, semiformed), for presence of blood mucus or Stool samples were microscopically examined using direct saline and iodine wet mount to detect the trophozoitesof *E. histolytica* and *G. Lamblia* (Ukaga and Nwoke, 2007).

Selection of Study Participants.

The study group participants were people living with HIV of both sexes <20 to 75years of age, Non ART patients and healthy individuals were selected randomly for this study. Specifically, the study group involved a total of 520 participants. This comprises 220 HIV Sero positive patients on ART, 200 HIV Seropositive patients non ART and 100 HIV: Sero Negative individuals. The participants were further categorized as Traders, Drivers ,Farmers, Civil Servants and Students. The objectives of the study were carefully explained to the participants and their willingness to participate in the study was sought for., those who understood and voluntarily accepted to be included in the study were selected. The diagnosis of these patients was based on two separate tests (HIV Screening and Confirmatory tests). Stool samples were collected from the patients and were use to assay for opportunistic intestinal parasites

Microscopic Examinations: Microscopic examination of stool samples includes the following methods: Direct saline and iodine wet mount of stool was used to detect the *trophozoites* and cysts of *E.histolytica* and *G.lamblia*. Formalin-ether concentration of stools was performed and the sediment obtained. Smears from all the stool samples after

concentration were stained by modified acid-fast stain to detect the coccidian parasites; *cryptosporiumparvum*and*Isospora belli*. Also, modified trichrome staining of smears from the concentrated stool was used to detect the *microsporidium* spores (Ma and Soave, (1983)**.** Examination of Stool Samples By Direct Saline and Iodine Wet Mount as describedby Ukaga and Nwoke ,(2007)

Data Analysis. Collected data in the study were analysed using simple percentages and charts. Differences among the study groups were analysed using analysis of variance methods (ANOVA)

Results:

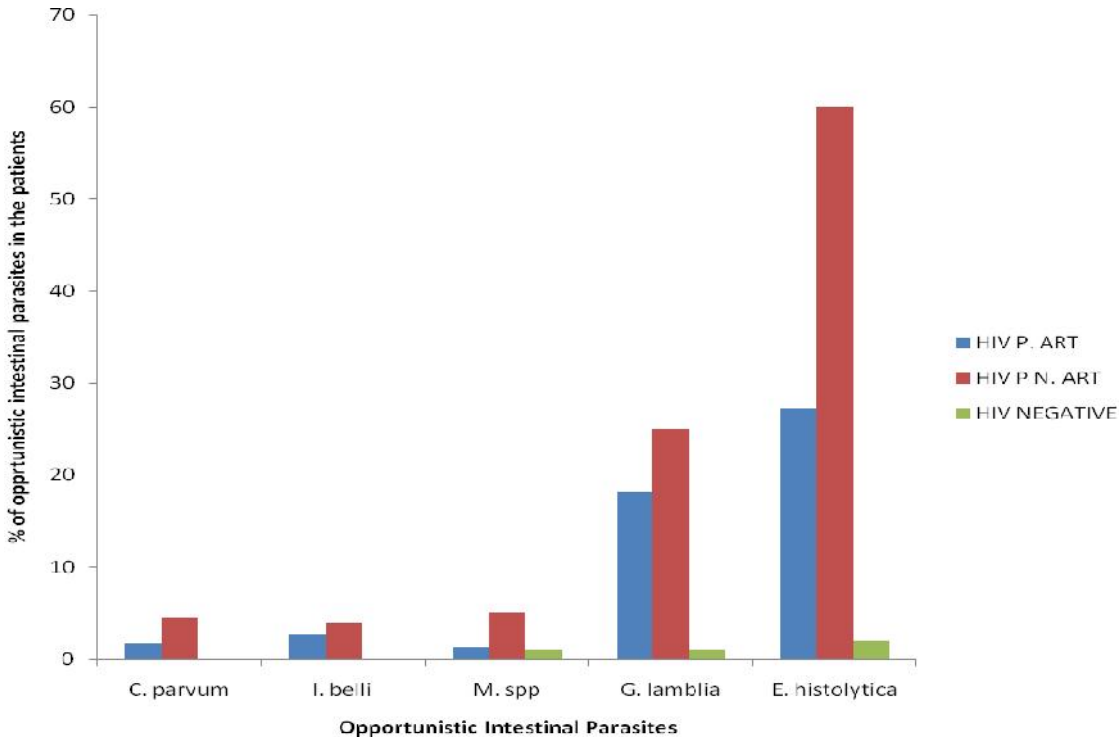

Fig. 1.Percentage distribution of opportunistic intestinal parasites in HIV patients on ART and without ART.

HIV P. ART	=	HIV patients on ART
HIV P. N ART	=	HIV patients non ART
HIV NEGATIVE	=	HIV negative
C. parvum	=	*Cryptosporidium parvum*
I. belli	=	*Isospora belli*
M. Spp	=	*MicrosporidiumSpp*
G. lamblia	=	*Giardia lamblia*
E. histolytica	=	*Entamoebahistolytica.*

DISCUSSION

The emergence and pandemic spread of the AIDs is one of the greatest challenges of public health in modern times. Opportunistic infection constitutes a major health problem in patients infected with HIV. Among these opportunistic intestinal parasites are *Entamoebahistolytica, Gambia lamblia, Cryptosporidium spp., Isospora belli and Microsporidium spp*. (Smith *et al* 1988). However, the role of these parasites in the occurrence of diarrhoea among adult patients with HIV infection in Nigeria is just emerging (Onyenekwe et al, 2007). In this study, it was investigated and evaluated the epidemiology of opportunistic intestinal parasites in HIV patients on antiretroviral therapy in Imo state Nigeria. HIV /AIDs patients have reduced immune response, thus are at high risk of acquiring intestinal parasitic infections which are responsible for considerable morbidity and mortality (Chinwe*et al* ., 2002).

The specific prevalence of opportunistic intestinal parasites of HIV (positivesubjects) on ART and HIV non ART were high when compared with HIV negative subjects. The specific prevalence revealed that 314(60.3%) of 520 of stool samples examined in HIV seropositive patients were infected with intestinal parasites. Opportunistic intestinal parasites identified in this study include *Cryptosporidium parvum* 2.5%, *Isospora belli* 2.6%, *Microsporidiumspp* 22.6%, *Giardia lamblia* 17.5% and *Entameobahistolytica* 35.0%. In this study, *Entamoebahistolytica* 35% and *Giardia lamblia*17.5% recorded high prevalence. *Entamoebahistolytica*was the most frequent isolated intestinal parasites.

These findings are in line with the previous study on gastrointestinal parasites in HIV positives in different part of the country and other parts of the world by Smith and Rose (1990). Also the findings are in agreement with the reports of previous studies in parts of Nigeria by Anosike*et al* (2004),andChikwe*et al*.,(2002). They reported prevalence rates of 13.2%, 19.4% and 15.7% in Imo, Kebbi and Anambra states respectively, among HIV patients with diarrhea. The high prevalence of *Entamoebahistolytica* recorded in this study and in some parts of sub-Sahara Africa could be attributed to poor environmental and sanitary conditions, inadequate and contaminated water suppliers, ignorance, ingestion of raw vegetables, uncooked food etc. This fact is recorded by Jannof and Smith (1998).

Conclusion

In conclusion, *E. histolytica* and *G. lamblia,Cryptosporidium parvum, Isospora belli* and *Microsporidiumspp* are the major opportunistic intestinal parasites observed in HIV / AIDS patients. Therefore,early detection and treatment of these intestinal parasites are very important to enhance the life and well -being of HIV/AIDS patients with or without diarrhoea**.**

This 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.

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Paper cited as: **Njoku-Obi T.N., Nnodim JK., Ukaga CN., Nwoke BEB, Ajaero CMU ,Onyeka PIK. PREVALENCE STUDIES ON OPPORTUNISTIC INTESTINAL PARASITES OF HIV PATIENTS ON ART AND NON ART HIV PATIENTS INOWERRI, IMO STATE NIGERIA. International Journal of Medical and Applied Suciences, 5(4), 2016, pp.1-6.**