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Full Length Research Paper

Intestinal parasitosis among HIV/AIDS patients with diarrhoea at a missions hospital in tropical west africa: Pattern and types

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Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDS) is still endemic in Benue state and Mkar community with often limited facilities for its management. The study was set up to ascertain the nature and types of intestinal parasites among HIV/AIDS patients with diarrhoea, a common clinical presentation in the community. Study was hospital based, patients attending HIV clinic at Mkar were consecutively enrolled for the study between January and June 2009. Close ended questionnaires were administered and relevant information such as age, sex, marital status, educational background occupation and regular intake of antiretroviral drugs were obtained. Stool samples were collected, stored, transported and processed using standard procedures of microscopy, culture and sensitivity. Data was analysed using simple descriptive methods and Epi Info 6 statistical software, P values ≤ 0.05 were considered significant. Parasites recovered from stool samples of HIV/AIDS patients at Mkar were: *Entamoeba histolytica*, 48.9%; *Giardia lamblia*, 14.9%; Hookworm, 11.7%; *Crytosporidium parvum,* 11.2%; *Ascaris lumbricoides,* 6.4%; *Isospora belli* 4.3% and *Trichuris trichiura* 2.6%. Bacteria were responsible for 53.5% of the diarrhoea cases, the commonest being *Escherichia coli*. Strict antiretroviral drug compliance was 6.3%. Symptomatic management of diarrhoea in HIV/AIDS patients should embrace these parasites not neglecting contributions of *Enterobacteriaceae*.

Keywords: Acquired immunodeficiency syndrome, Human immunodeficiency virus, Intestinal Parasites, Mkar.

INTRODUCTION

Human immunodeficiency virus (HIV) infections have continued to pose a serious challenge to the global health community over the past three decades (1982-2011) and currently affects 33.3 million people 22.5 million from sub-saharan Africa alone. By the end of 2011 the disease is estimated to have cumulatively caused at least 28 million deaths across the globe, 17 million of these from sub-Saharan Africa alone and is projected to account for 80 million deaths by the year 2030 (Yousaf et al., 2011; Schull et al., 2011, Desmonde et al., 2011) Nigeria with a population of 160 million is estimated to harbor about 4.5 million people living with HIV while effective control of the disease in the country still appears elusive and in 2009 alone the disease is estimated to have caused at least 220,000 deaths (Oboh and Tsue, 2010; Hilhorst et al., 2006; Federal Ministry of Health (Nigeria), 2011).

In Nigeria as it is in other parts of sub-Saharan Africa, diarrhoea occurs in about 90% of acquired immunodeficiency syndrome (AIDS) of patients and has contributed significantly to both the morbidity and mortality associated with HIV infections over the period (Mousa et al., 2010; Ojurengbe et al., 2011). Several organisms have been strongly associated with diarrhoea in HIV/AIDS patients from other regions and this has influenced the management of the patients in such settings (Velasquez et al., 2011; Lono and Kumar, 2011;

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Anane et al., 2011). This is however usually not always the case in most rural and semi-urban communities where over stretched health facilities are unable to offer comprehensive treatment to those patients especially in the aspect of laboratory diagnosis (Idu and Obinne, 2003).

At least 9% of the 3.5 million people living in Benue state are believed to be living with HIV, 75% of these are rural dwellers (Benue State AIDS Control Agency (BENSACA), 2010). Management of diarrhoea among HIV/AIDS patients in rural communities where laboratory facilities are in short supply is usually symptomatic based on laboratory findings elsewhere. For instance, reports from Ethiopia, India and Benin-city, Nigeria have repeatedly documented organisms such as *Cryptosporidium parvum, Isospora bell, Balantiium coli* among others (Getaneh et al., 2010; Kashyap et al., 2010; Akimbo et al., 2010). This study was therefore set up to ascertain the microbial agents of diarrhoea among HIV/AIDS patients at Mkar, a semi-urban community in Benue state. The findings would serve as reference data to health personnel in the community and environs constrained by laboratory facilities in the course of management, and also as an update on microbial causes of diarrhea among HIV/AIDS patients from this part of the world.

MATERIALS AND METHODS

Setting

The study was carried out at Mkar, a sub-urban community in Gboko local government area of Benue state located at about 85 kilometres north east of Makurdi, the state capital. Based on 2006 national population census the community has a population of about 35,000 inhabitants and houses a university, a mission's hospital (NKST-Nongu U Kristu U Ken Sudan hen Tiv Hospital), and other higher institutions among others. More than 90% of the inhabitants are subsistent farmers while over 98% o the populace are of Tiv ethnicity.

Sampling Procedure

The study was carried out at NKST Hospital Mkar which has a HIV/AIDS treatment centre which caters for the needs of host community and environs as well as people from other parts of the state. HIV/AIDS patients with diarrhoea attending the clinic between January and June 2009 were consecutively recruited into the study. Participation was voluntary, questionnaires were administered to obtain relevant information such as age, gender, educational level, occupation, marital status, and presence or otherwise of diarrhoea. Control subjects were obtained from non-HIV/AIDS in- and out-patients with diarrhoea.

Sample Collection and Processing

Stool samples were collected using wide mouthed grease-free stool containers; saline and iodine wet preparions, modified Ziehl-Neelsen staining procedure, and microscopy were carried out using standard prcedres27. Concentation of stool was carried out using fomol-ether concentration tehnique27.

Data Management and Analysis

Data obtained was analysed using simple descriptive methods of arithmetic sum, mean, mode and standard deviation. SPSS 16 statistical software was also used to compare differences at 95% confidence intervals where applicable.

RESULTS

From the 366 HIV/AIDS patients with diarrhoea studied comprising 168(46.0%) males and 198(54.0%) females, the age range was 17-66 years, mean age of 34 years (±2 SD) with a bimodal age of 27 and 33 years and a median age of 31 years. Regular intake of antiretroviral drugs was found to be 6.7% (25/366). Micro-organisms were recovered from 357 (97.5%) stool samples (Table 1).

Microbial isolates recovered from stool samples of HIV/AIDS patients consisted of bacteria, 196 (53.5%) and parasites 165 (45.1%), nil organism in 5(1.4%) patients while multiple or co-infections were common. Bacteria associated with diarrhoea among HIV/AIDS patients were *Escherichia coli, 111* (43.4%); *Shigella dysentheriae/flexneri*, 79 (30.6%) and *Salmonella typhi*, 67 (26.0%). There was no significant age, gender or occupational associations or correlations ($P > 0.05$; CI≥3.3).

The rate of parasitic infections among HIV/AIDS patients was 51.4% (165/366) while 24.0% (24/100) was recorded among the control group ($P< 0.05$). Analysis of rate of multiple infections showed that one, two and three parasites were recovered from 139 (74.1%), 22 (22.0%) and 6 (3.1%) respectively while four parasites were recovered from 1 (0.8%) patient.. Only two patients from the control had 2 parasite species from their stool samples with a strong correlation of multiple parasitaemia with HIV/AIDS (CI= 1.27, RR= 1.3). (Figure 1).

Parasites recovered from HIV/AIDS patients were *Entamoeba histolytica*, 97 (48.9%), *Giardia lamblia*, 28 (14.9%), Hookworm, 22 (11.7%); Crytosporidium parvum 21 (11.2%); *Ascaris lumbricoides* 12 (6.4%); *Isospora*

Table 1. Age* and gender ** distribution of HIV/AIDS patients with diarrhea at Mkar, north central Nigeria.

Age Interval (Years)	Male (%)	Female (%)	Total (%)
≤20	11 (3.00)	21 (5.70)	32 (8.70)
21-30	32 (8.70)	49 (13.40)	81 (22.10)
31-40	86 (16.70)	63 (17.20)	124 (33.90)
41-50	38 (10.40)	30 (8.20)	68 (18.60)
51-60	20 (5.50)	24 (6.50)	44 (12.00)
≥61	6 (1.70)	11 (3.00)	17 (4.70)
Total	168 (46.00)	198 (54.00)	366 (100)

*X^2(Yates Corrected)= 0.23, df=5, p= 0.68
*X^2(Yates Corrected)= 0.71, df=1, p= 0.91

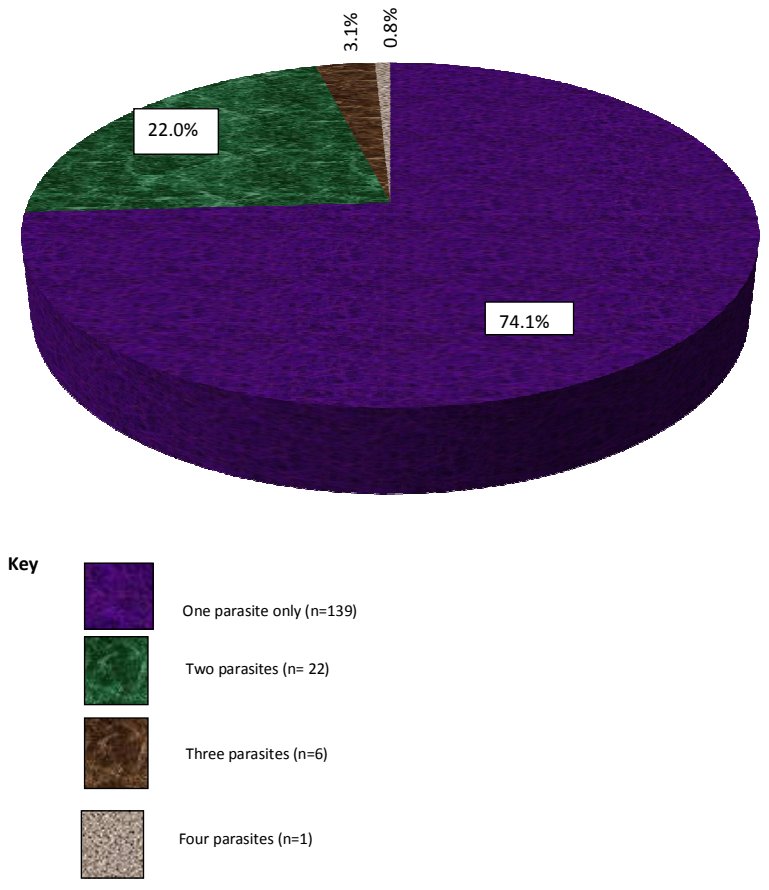

Figure 1. Rate of parasites* co-infection among HIV/AIDS patients with diarrhea at Mkar, north central Nigeria (N=359).

belli 8 (4.3%) and *Trichuris trichiura* 5 (2.6%). Cryptosporidium parvum was recovered from one non-HIV/AIDS diarrhoeal patient while Giardia lamblia, Isospora belli and Trichuris trichiura were absent in the control population. This shows strong correlation of these parasites with HIV/AID (CI= 1.34, RR= 1.5). The frequency of infection of other parasites was significantly higher among the test subjects compared to the control

Table 2. Parasites recovered from stool samples of HIV/AIDS patients with diarrhea at Mkar, north central Nigeria.

Parasite	HIV/AIDS With Diarrhoea (%)	Diarrhoea without HIV/AIDS (%)	P Values
Entamoeba histolytica	92 (48.90)	6 (25.0)	< 0.05
Giardia lamblia	28 (14.90)	0 (0.0)	<0.05
Hookworm	22 (11.70)	5 (20.8)	<0.05
Cryptosporidium parvum	21 (11.20)	0 (0.0)	<0.05
Ascaris lumbricoides	12 (6.40)	13 (54.2)	>0.05
Isospora belli	8 (4.30)	0 (0.0)	<0.05
Trichuris trichiura	5 (2.60)	0 (0.0)	<0.05
Total	188 (100)	24 (100)	

(P< 0.05). (Table 2).

DISCUSION

The rate of intestinal parasitosis among 366 HIV/AIDS patients with diarrhoea at Mkar was 45.1% compared to 24.0% among the control group (P< 0.05). Parasites recovered from stool samples of HIV/AIDS patients at Mkar were: *Entamoeba histolytica*, 48.9%; *Giardia lamblia*, 14.9%; Hookworm, 11.7%; *Crytosporidium parvum,* 11.2%; *Ascaris lumbricoides,* 6.4%; *Isospora belli* 4.3% and *Trichuris trichiura* 2.6%. Bacteria were responsible for 53.5% of the diarrhoea cases.

The limited accessibility to antiretroviral drugs as well as low strict adherence to their intakes could largely be responsible for the microbial patterns in the present study. This is in line with the already established fact low drug accessibility in poor resource countries have promoted the impact of Escherichia coli in diarrhoea among HIV/AIDS patients (Chiller et al., 2009; Abong'o et al., 008; Medina et al., 2010).

The present findings show that there are similarities with the findings from other parts of the world such as India, Indonesia, Gabon and Ethiopia where parasites such as *Cryptosporidium parvum, Trichuris trichiura, AAsscaris lumbricoides, Entamoeba histolytica* and *Isospora belli* were the most frequently encountered parasites among the patients (Kashyap et al., 2010 Wiria et al., 2010; Mor and Tzipori, 2008; Assefa et al., 2009). Varying degrees of frequency could be attributed to the mode of voluntary presentations of patients for the various researches. Management of diarrhoea among HIV/AIDS patients while waiting for laboratory reports should consider the possibility of this wide range of parasites in addition to the possibility of a member of Enterobacteriaceae being causative agent.

The findings from the present study are however different from that of studies from: South Africa where *Cyclospora* (Samie et al., 2009); Ethiopia where *Strongyloides stercoralis* (Anane et al., 2011); Tunisia where *Enterocytozoon bieneusi* and *Microsporidia* (Getaneh et al., 2010; Abdelmalek et al., 2011), were among the common isolates encountered. The sampling procedures along with differentials in laboratory procedures from microscopy to molecular or genetic and automated procedures with different sensitivities and specificities could have played significant roles in these varying reports. Also the degrees of immunosuppression along with the levels of CD_4^+ helper T cells in the respective patients could have played a major factor as has been proven in Thailand, Iran and Haiti (Saksirisampant et al., 2009; Daryani et al., 2009; Raccurt et al., 2008). This global picture should not be submerged under local data by health personnel in the course of symptomatic management of patients.

In conclusion, the present study has also contributed to the existing body of knowledge that parasites still contribute to up to half of diarrhoeas among HIV/AIDS patients while *Enterobacteriaceae* also contributing to in about similar proportion especially where accessibility to antiretroviral drugs is low. Symptomatic management should embrace these two.

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