

Research

## Prevalence of enteric parasites in HIV-infected patients in Southwestern Nigeria

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Received: 9 June, 2005      Revision accepted: 22 July, 2005

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### Abstract

*This study investigates the prevalence of enteric parasites in Immunodeficient HIV-infected outpatients (with and without diarrhoea) of Olabisi Onabanjo Teaching Hospital, Sagamu, southwestern Nigeria, between November 2004 and April 2005. Stool samples collected from the patients were examined microscopically for the presence of intestinal parasites using wet preparation and stain smears. 50% of the 110 patients examined showed symptoms of diarrhoea (symptomatic) while the remaining half were asymptomatic. The prevalence of intestinal parasites was significantly higher ( $P < 0.05$ ) in symptomatic (15.4%) than asymptomatic (7.3%) diarrhoea patients. More cases of combined parasitism were reported in symptomatic than asymptomatic infected patients. 49% of the symptomatic cases had acute diarrhoea while 51% had chronic diarrhoea. However, the differences were non significant ( $P > 0.05$ ). Overall, protozoa were the most commonly identified etiologic agents (11.8%) closely followed by helminths (10.9%). *Entamoeba histolytica* (6.4%) was predominant followed by *Giardia lamblia* (5.5%) while Hookworm (2.7%) least occurred. Protozoan infection was most prevalent among 21-30 age group but non-significantly less ( $P > 0.05$ ) among 31-40 years and above. Studies on the frequency of occurrence of potential etiologic agents of diarrhoea in HIV-infected patients in different geographical locations are important guide to physician for case management.*

**Keywords:** HIV, enteric parasites, symptomatic, asymptomatic diarrhoea

### Introduction

Human Immunodeficiency Virus (HIV), a retrovirus responsible for the fatal Acquired Immunodeficiency Syndrome (AIDS) has infected nearly 50 million people worldwide. Of these, about 50 percent are women and up to 50 percent of the children born to them contract HIV-infection. Sub-saharan Africa account for almost 60-70% of total cases followed by the Asia subcontinent, which contributes 5-6 million cases (Kumar *et al.*, 2002a). Nigeria has about 3.5-5 million HIV positive patients, of which 5.8 percent are adults (Falase, 2000; De Cherney, 2003).

HIV-infected patients often experience acute or chronic diarrhoea, during the course of their infection. Acute diarrhea is defined as an increase in watery

tion. Acute diarrhoea is defined as an increase in watery or loose stool more than is customary for the patient. This often last less than two weeks with characteristic abdominal symptoms such as cramping, bloating as well as vomiting and fever. Although often mild, acute diarrhoea can lead to severe dehydration due to loss of large fluid and electrolyte (Talaro & Talaro, 1998). However, chronic diarrhoea could be more severe because, it may last for weeks or months with massive loss of fluid and electrolyte leading to substantial weight loss and emaciation (Prescott *et al.*, 2002, Surawiczi, 2005). The occurrence of diarrhoea in HIV patients have been found to be more common in developing countries, between 60 and 90 percent of the infected population (Dallabetta *et al.*, 1992; Kelly *et al.*, 1996; Mathewson *et al.*, 1997).

Gastroenteric infections are the most common causes of sporadic diarrhoea and the frequency of isolation of the pathogens varies widely between geographical locations and age groups (Paul & Walsh, 1971). Some of the pathogenic organisms include *Campylobacter jejuni*, *C. coli*, *Candida albicans*, *Salmonella*, *Shigella*, *Escherichia coli*, Rotavirus, *Giardia lamblia*, *Entamoeba histolytica*, and other parasites contracted through consumption of contaminated food and water as well as faecal-oral and sexual transmission (Chintu *et al.*, 1992). Opportunistic infections such as cryptosporidiosis, microsporidiosis and isosporiasis have also been reported in patients infected with diarrhea (Bowers, 1997). A number of these implicated organisms associated with diarrhoea have been reported in HIV-infected patients (Prasad *et al.*, 2000; Gassama *et al.*, 2001; Wiwanitkit, 2001; Awole *et al.*, 2003; Kumar *et al.*, 2002a & b; Okodua *et al.*, 2003). Also, antibiotics or any other drug therapy that may alter the normal intestinal flora have been found to associate with diarrhoea episode (Sande, 1997, Cheesbrough, 1998, Prescott *et al.*, 2002). However, proper identification of all etiologic agents of diarrhoea in patients with HIV infection or AIDS is very important for appropriate therapy in order to reduce morbidity and mortality.

## Materials and Methods

### Study population

Stool samples were collected from 110 outpatients of the Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu, Ogun State, Nigeria with confirmed diagnosis of immunodeficiency between November 2004 and April 2005. These patients visit the outpatient clinic weekly for clinical attention. Recruitment and tests followed informed consent from all volunteers and approved human use protocol by the ethical committee of the OOUTH.

The patients were interviewed individually using a short questionnaire to collect information relating to their socioeconomic and clinical status. These include age, sex, marital status, educational background, occupation, type of illness and clinical symptoms relating to episode of diarrhoea.

The study population was grouped into symptomatic (diarrhoea) and asymptomatic (non-diarrhoea) patients based on the responses obtained from the questionnaires and nature of the tested stool samples. Patients have received immunosuppressive therapy at one time or the other. Patients with symptoms of diarrhoea were further categorized into two groups: acute (diarrhoea lasting for less than 14 days) and chronic (diarrhoea lasting for 14 days or more). The asymptomatic patients served as control. In this study, the intestinal parasites considered to be

potentially pathogenic were *Entamoeba histolytica*, *Giardia lamblia*, *Trichuris trichiura*, *Ascaris lumbricoides* and hookworms.

### Examination of stool for enteric parasites

Two consecutive faecal samples collected from each patient were microscopically examined in the laboratory within an hour. All the samples were examined for protozoa and helminths by direct wet mount and concentrated by formol-ether sedimentation method (Cheesbrough, 1998).

### Statistical analysis

The data were analysed using the Chi square test to determine the association of the parasites with diarrhoea.

### Results

50% (55) of the 110 patients examined showed symptoms of diarrhoea (symptomatic) while the remaining half showed no symptom (asymptomatic). The prevalence of intestinal parasites was significantly higher ( $P < 0.05$ ) in symptomatic (15.4%) than in asymptomatic (7.3%) diarrhoea patients. More cases of combined parasitism were reported in symptomatic than asymptomatic infected patients (Table 1).

Table 1: Microscopic analysis of faecal samples from HIV patient

Faecal matter	Number	Asymptomatic	Symptomatic	%
Protozoa	13	4	9	11.8
Helminths	12	2	10	10.9
Combined parasites	34	9	25	30.9
Negative	51	30	21	46.4
Total	110	45	65	100

Overall, 30.9% had combined parasitic infection while the remaining 69.1% had either protozoan or helminths infection. Although protozoan infection (11.8%) was higher than helminths (10.9%), the difference was non-significant ( $P > 0.05$ ). Moreover, protozoan infection was more prevalent among 21-30 age group but less common among 31-40 years and above. The differences in the prevailing rates were, however, not significant ( $P > 0.05$ ).

Some of the parasitic combinations observed in symptomatic group include *Giardia lamblia* and *Trichuris trichiura* (6 cases), *Entamoeba histolytica* and *Giardia lamblia* (8 cases), *Ascaris lumbricoides* and *Trichuris trichiura* (7 cases), hookworm and *A. lumbricoides* (4 cases). Parasitic combinations in asymptomatic group were *E. histolytica* and hookworm

(2 cases), *A. lumbricoides* and *Trichuris trichiura* (3 cases), *Giardia lamblia* and *E. histolytica* (4 cases).

49.1% of the 55 symptomatic cases had acute diarrhoea while 50.9% had chronic diarrhoea. The occurrence of enteric parasites in the acute cases was non-significantly lower ( $P>0.05$ ) than the chronic ones (Table 2).

Table 2: The occurrence of intestinal parasites in symptomatic and asymptomatic diarrhoea infection in HIV-infected patients

Organisms	Asymptomatic N=55	Symptomatic N=55		Total(110) N (%)
		Acute	Chronic	
<i>A. lumbricoides</i>	1	2	2	5 (4.5)
<i>T. trichiura</i>	1	1	2	4 (3.6)
<i>E. histolytica</i>	2	2	3	7 (6.4)
Hookworm	1	-	2	3 (2.7)
<i>G. lamblia</i>	3	1	2	6(5.5)
Total (110)	8	6	11	25(22.7)

*E. histolytica* (6.4%) was the most commonly detected enteric parasites in the HIV-infected patients followed by *G. lamblia* (5.5%) while Hookworm (2.7%) was the least frequent.

22.7% were positive for potentially pathogenic parasites in the study population.

## Discussion

Intestinal parasitic infection is an important health problem in HIV-infected patients especially in developing countries where episode of diarrhoea occurs in almost 100% of the cases (Botero *et al.*, 2003). Non-opportunistic intestinal parasites such as *E. histolytica* (6.4%), *T. trichiura* (3.6%), *A. lumbricoides* (4.5%), *G. lamblia* (5.5%), and hookworm (2.7%) were the most commonly detected parasites in our patients. Previous findings had reported variation in species and proportion of intestinal parasites in HIV patients (Lindo, *et al.*, 1998, Ambriose-Thomas, 2001, Wiwanitkit, 2001, Kumar *et al.*, 2002b, Okodua *et al.*, 2003). The prevalence of protozoan infection especially *E. histolytica* and *G. lamblia* as common etiologic agents of diarrhoea has been documented by previous workers (Dryden & Shanson, 1988; Prasad *et al.*, 2000; Gassama *et al.*, 2001). The high rate of occurrence of these organisms could be the result of multiplying effect due to low immunity in immunocompromised patients (Cheesbrough, 1998). This study showed that patients with clinical manifestation related to gastro-intestinal tract among the different groups of immunocompromised individuals possessed a higher number of potentially pathogenic parasites than asymptomatic patients (Table 1). More so, a large proportion of asymptomatic patients (46.4%)

were negative for potentially pathogenic parasites, which indicated that symptoms were due to intestinal parasites in the symptomatic patients.

High rate of parasitic infection was recorded in chronic diarrhoea than acute cases (Table 2). This further corroborates the supposition that episode of diarrhoea in HIV patients is associated with intensity of potential etiologic agents.

The overall prevalence of enteric parasites (22.7%) was low compared to previous reports in Nigeria and the tropics generally (Dallabetta *et al.*, 1992, Mathewson *et al.*, 1997, Wiwanitkit, 2001, Awole *et al.*, 2003). This may not be unconnected with high level of hygienic practices maintained by this group, which kept human-human transmission of enteric pathogens low. Moreso, these patients visit the OOUTH outpatient clinic regularly for therapeutic treatment and medical counseling. It has also been shown that advancement in HIV treatment is changing the profile of AIDS-associated infections such that highly active antiretroviral therapy (HAART) resulted in reduction of opportunistic infections like diarrhoea. However, the occurrence of diarrhoea is still one of the common gastrointestinal tract symptoms of HIV/AIDS especially as immune deficiency advances (Sande *et al.*, 1997)

Our findings showed the importance of common intestinal worm infection in Nigeria and the relevance of non-opportunistic intestinal parasite infections among HIV-infected patients to clinical management.

## Acknowledgements

We are mostly grateful to Dr. O. L. Odusoga, Dr. O. Osinupebi, Mr. O. Osho, Mr. J. Ajewole and all staff of Community Health Care of Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu for technical assistance and permission to collect samples from patients.

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