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Prevalence of Intestinal Parasites and Other Parasites among HIV/AIDS Patients with on-ART Attending Dilla Referral Hospital, Ethiopia

Fekadu Alemu*

Department of Biology, College of Natural and Computational Sciences, Dilla University, Ethiopia

Abstract

One of the major health problems among HIV sero-positive patients are superimposed infection due to the defect of immunity. Furthermore, intestinal parasites infection and other parasites, which are also one of the basic health problems in tropical region, are common among antiretroviral treatment patients. In this study, was aimed to assess the prevalence of intestinal parasites and other parasites among antiretroviral treatment patients in Dilla Referral Hospital. A cross sectional study design on clinical records of HIV/AIDS patients in ART clinics. Systematic simple random sampling method was used to obtain the required data. The most prevalence parasites infection were on males than females 72.00% and 28.00% in ART patients at 2011 as well as parasite infection were also shown on male ART patients with 52.00% followed by 48.00% females during 2013. And also the most commonly infected with parasites were males with 58.33% followed by females with 41.67% at 2014. Intestinal Parasitic infections were high among young antiretroviral treatment patients while low on children and old antiretroviral treatment patients. Therefore, the high prevalence of intestinal parasites among antiretroviral treatment patients are an evidence for the need of urgent for regular screening and de-worming of antiretroviral treatment patients.

Keywords: Antiretroviral treatment patients; Dilla Referral Hospital; *E. histolytica;* Human immunodeficiency virus; Parasitic infection

Introduction

Current estimates showed that at least more than one-quarter of the world's population is chronically infected with intestinal parasites and that most of these infected people live in developing countries [1-6]. Dramatic expansion of the HIV/AIDS pandemic has brought about a significant change in the fauna of intestinal parasites all over the world [7,8].

Like in many other developing countries, intestinal parasites are widely distributed in Ethiopia largely due to the low level of environmental and personal hygiene, contamination of food and drinking water that results from improper disposal of human excreta [9-11]. In addition, lack of awareness of simple health promotion practices is also a contributing factor [12,13]. According to the Ethiopian Ministry of Health [14], more than half a million annual visits of the outpatient services of the health institutions are infected due to intestinal parasitic infections. However, this report may be an underestimate, because most of the health institutions lack appropriate diagnostic methods to detect low levels of parasite burden. In addition, some of the diagnostic methods for specific intestinal parasites, especially for the newly emerging opportunistic intestinal parasites, are not available to peripheral health institutions.

With HIV/AIDS pandemic, many intestinal parasites, previously considered being sporadic or zoonotic infections, have become opportunistic parasites causing uncontrollable life threatening diarrhoea [15-17]. As compared to developed countries, the prevalence of opportunistic intestinal parasites is expected to be higher in developing countries among HIV infected population. This is also reflected by the prevalence of opportunistic intestinal parasites in a given geographical locality among the general population [17,18]. HIV infection has been shown to predispose the patient to intracellular opportunistic intestinal parasites such as *Cryptosporidium parvum, Isospora belli, Cyclospora cayetanensis, Enterocytozoon bieneusi* and *Encephalitozoon intestinalis* [15,16,19,20].

Almost 80% of AIDS patients die from AIDS-related infections including intestinal parasites rather than HIV infection itself [21].

Several intestinal parasites previously considered non- pathogenic or with transient pathogenic potential in immunocompetent individuals are opportunistically becoming aggressive and causing debilitating illness in HIV/AIDS patients. Most of these infections are caused by organisms that do not normally affect immunocompetent individuals [22]. The principal pathogenic intestinal parasites commonly reported as opportunistic and that cause chronic diarrhoea in HIV/AIDS patients are *Cryptosporidium parvum*, *Isospora belli*, *Cyclospora cayetanensis* and intestinal microsporidia (*Enterocytozoon bieneusi* and *Encephalitozoon intestinalis*).

Intestinal parasitic infections which are caused either by protozoa or helminthes or both are among the most widespread of human infections worldwide. It is estimated that as much as 60% of the World's population is infected with intestinal parasites which may play a significant role in morbidity due to intestinal infections [11]. Co-infection of HIV with parasitic infections dramatically enhance progressive decline of the immune system, causing a more rapid progression to AIDS, as a result of more rapid decline of the CD4⁺ T-lymphocyte counts which characteristically falls below 200 cells/ml [23,24] Such co-infections, generally, are the proximate cause of death of AIDS patients [25,26]. The rate of infection is also remarkably high in Sub-Saharan Africa, where the majority of Human Immune Deficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) cases are concentrated where factors including poverty and malnutrition could promote transmission of both infections in the region [25].

*Corresponding author: Fekadu Alemu, Department of Biology, College of Natural and Computational Sciences, Dilla University, Ethiopia, Tel: +251920839215; E-mail: fekealex@gmail.com

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Like in many other developing countries, intestinal parasites are widely distributed in Ethiopia largely due to the low level of environmental and personal hygiene, contamination of food and drinking water that results from improper disposal of human excreta [27]. Intestinal parasites as a major concern in most developing countries have been pronounced with the co-occurrence of malnutrition and HIV/AIDS. Opportunistic parasitic infections are a common feature in HIV/AIDS infections where almost 80% of AIDS patients die of AIDSrelated infections including intestinal parasites rather than of the HIV infection itself which usually occur late in the course of HIV infection when Cluster of Differention (CD4)⁺ T-cell count has been severely depleted mostly below 200 cells/mm³ [21,28,29].

In the absence of Anti Retroviral Therapy (ART) HIV/ AIDS patients in developing countries unfortunately continue to suffer the consequences of opportunistic parasites [30]. Patients enrolling into ART programmes with very low CD4 cell counts have heightened risk of morbidity and mortality before ART [31]. There is evidence that the control of these opportunistic parasitic infections in HIV-positive persons under HAART is also induced by the inhibition of the as partly protease of the parasites and by the reconstitution of the immune system of the patient [32,33]. Gastrointestinal infections are very common in patients with HIV infection or AIDS [34]. Human immunodeficiency virus (HIV) infection is a significant health problem with most of the cases in Asia and Africa. Similarly, intestinal parasitic infections are endemic in many developing countries of Asia and Africa due to poor sanitation, poor hygiene, and unavailability of safe drinking water. Therefore, this study was aimed to assess the prevalence of intestinal parasites and other parasites among antiretroviral treatment patients at Dilla Referral Hospital. This information will provide useful the epidemiology of those infections among HIV-infected patients in Ethiopia, thus facilitating the understanding of clinical manifestations, diagnosis and treatment management of intestinal parasitic diseases.

Materials and Methods

Description of study area

This study was conducted at Dilla Referral Hospital (DRH) which found at Dilla town, South of Addis Ababa 365 km, in Gedeo zone. The Hospital was far from the Dilla University main campus. This study was conducted from March 2013 to June 2014 at Dilla Referral Hospital, Ethiopia.

Study design

A cross sectional study design on clinical records of HIV/AIDS patients in ART clinics. Systematic simple random sampling method was used to obtain the required data. The total sample size was 78 HIV positive patients.

Data collection technique

The data collection was carried out typically by refereeing secondary data from already recorded document at Dilla Referral Hospital. The data were obtained from the data clack of antiretroviral treatment (ART) individuals at Dilla Referral Hospital.

Ethical clearance

The study protocol was reviewed and ethically approved by Dilla University ethical and clearance committee. Before data collection, an informed consent was obtained from respondents. The confidentiality of the respondents was maintained.

Data analysis

Data entry and analysis was performed using the statistical package for Social Sciences for Windows SPSS (version 16.0). For analysis of the percentage and total HIV infected individuals tested at Dilla Referral Hospital. The results were expressed graphically and as tabules.

Results

The purpose of the study was to assess the parasite disease associated on HIV patients (ART) at Dilla Referral Hospital. Consequences, 78 ART patients assessed for this study. Out of these, 46 (58.97% were males and 32 (41.03%) were females ART patients from 2011-2014 year at Dilla Referral Hospital.

Prevalence of intestinal parasites and other parasites among ART HIV/AIDS patients at Dilla Referral Hospital at 2011 year

The prevalence of opportunistic intestinal parasites at 2011 among ART patients at Dilla Refrral Hospital were 20.00%, for both *E. histolytica* and Malaria on males at age 15-49, Malaria with 20.00% on females at same age (Table 1).

Prevalence of intestinal parasite and other parasites among-ART HIV/AIDS patients at Dilla Referral Hospital at 2012 year

The most prevalent parasitic at 2012 year among both sex were malaria 18.75% and 25.00% males and females respectively. The three intestinal parasitic were shown on ART patients during 2012 year *A.lumbricoids*, *H.nana*, *T.saginata* at percentage (18.75%) (Table 2).

Prevalence of intestinal parasites and other parasites among ART HIV/AIDS patients at Dilla Referral Hospital at 2013 year

Table 3 show that toxoplasmosis were show at 2013 year among

		Sex					
		Male					
Type of parasitic infection	Age range			Age range			Treatment
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1-14	15-49	>49	1-14	15-49	>49	
G. lamblia	-	4 (16.00 %)	-	-	-	-	Tindazole
E. histolytica	-	5 (20.00 %)	1(4.00%)	-	2 (8.00 %)	-	Tindazole, Omeprazole
S. stercolaris	-	1 (4.00 %)	-	-	-	-	Tibendazole
Malaria	-	5 (20.00 %)	-	-	5 (20.00%)	-	Chloroquine, Ciproflaxin
Malaria and IP	-	2 (8.00 %)	-	-	-	-	Ciproflaxin, Amoxacillin
Total	-	17 (68.00%)	1 (4.00%)	-	7 (28.00%)	-	

Table 1: Type of Parasitic Infection on HIV positive patients at DRH/HIV patients (ART) 2011.

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		Male			Female		
Type of Parasitic infection	Age range			Age range			Treatment
	1-14	15-49	>49	1-14	15-49	>49	
G.lamblia	-	1 (6.25 %)	-	-	-	-	Cotrimoxaxole
E.histolytica	-	1 (6.25 %)	-	-	1(6.25 %)	-	Metrindazole
S.stercolaris	-	-	1(6.25 %)	-	-	-	Cotrimoxaxole
A.lumbricoids	1 (6.25 %)	-	-	-	1(6.25 %)	-	Ameprazole
E.coli	-	1(6.25 %)	-	-	-	-	Albendazole
H.nana	-	-	-	-	1(6.25 %)	-	Niclosamide
T.saginata	-	-	-	-	1(6.25 %)	-	Albendazole
Malaria	-	3 (18.75 %)	-	-	4 (25.00 %)	-	Ciproflaxin
Total	1 (6.25%)	6 (37.50%)	1 (6.25 %)	-	8 (50.00%)	-	

Table 2. Type of Parasitic Infection on HIV positive patients at DRH/HIV patients (ART) 2012.

		Sex						
Type of Parasitic Infection		Male			Female			
	Age range			Age range			Treatment	
	1-14	15-49	>49	1-14	15-49	>49		
G. lamblia	-	4 (16.00%)	-	-	1(4.00%)	-	Metrindazole, Tindazole	
E.histolytica	-	2 (8.00%)	1(4.00%)	-	2 (8.00%)	-	Mebendazole, ORS	
S.stercolaris	-	3 (12.00%)	-	-	-	-	Albendazole, ORS	
Toxoplasmosis	-	1(4.00%)	-	-	2(8.00%)	-	Cotrimoxaxole	
Hook worm	-	-	-	-	1(4.00%)	-	Albendazole	
T. saginata	-	1(4.00%)	-	-	-	-	Albendazole	
Malaria	-	1(4.00%)	-	-	6 (24.00%)	-	Chloroquine, Ciproflaxine	
Total	-	12 (48.00%)	1 (4.00%)	-	12 (48.00%)			

Table 3. Type of Parasitic Infection on HIV positive patients at DRH/HIV patients (ART) 2013.

males ART patients at Dilla Referral Hospital and hook worm were shown at same year among females ART patients.

Prevalence of intestinal parasites and other parasites among ART HIV/AIDS patients at Dilla Referral Hospital at 2014 year

The most commonly infected with parasites were males with 58.33% followed by females with 41.67%. The elephantiasis diseases were shown on males with 8.33%. The drug given to elephantiasis diseases were Doxicyclin and Albendazole.

Discussion

As results were revealed the parasitic infections among ART patients were decrease across year. The most prevalence parasites infection was among males than females 72.00% and 28.00% in ART patients respectively as indicted in Table 1. The most commonly drug were give to the ART patients against to parasitic were as follow Tindazole, Tindazole Omeprazole, Tibendazole Chloroquine Ciproflaxin, Ciproflaxin Amoxacillin for *G. lamblia, E. histolytica, S. stercolaris,* Malaria and Malaria and IP respectively. *Ascaris, Trichuris* and Hook worm species (*Ancylostoma duodenale* and *Necator americanus*) were detected more in non-diarrheic stool samples of HIV infected, whereas the majority of (60%-100%) *S. stercoralis, S. mansoni, E. histolytica,* and *G. lamblia* were detected in diarrheic stool sample of HIV infected patients [35].

The most commonly drug give to the ART patients were Cotrimoxaxole, Metrindazole, Cotrimoxaxole, Ameprazole, Albendazole, Niclosamide Albendazole, Ciproflaxin against those parasites *G. lamblia*, *E. histolytica S. stercolaris*, *A. lumbricoids*, *E. coli*, *H. nana, T. saginata* and Malaria respectively as indicted in Table 2. *S. stercoralis,* and *S. mansoni* was also detected more frequently (70%-75%) in HIV infected [35]. *Ascaris lumbricoides, Giardia lamblia* and *Trichuris trichuria* (19.7%) were the most common followed by *Entamoeba histolitica* (16.4%) [36] and slightly higher prevalence of intestinal parasitosis 69.2% were found among HIV patients in Ethiopia [37].

The most prevalence parasites infections were shown on males ART patients with 52.00% followed by 48.00% females. The most commonly give drug to ART patients were Cotrimoxaxole for toxoplasmosis as indicted in Table 3. Hookworm and *Ascaris lumbricoides* appeared to have the highest prevalence (13.33% and 13.33%), followed by *Opisthorchis viverrini* (10%), *Isospora belli* (5%), *Strongyloides stercolaris* (3.33%), Cryptosporidium (3.33%), and Microsporidium (1.67%) infection [38]. In Zambia 80% of intestinal parasites were observed and 52.7% caused by *Ascaris lumbricoides* [39].

The three intestinal parasites (*G. lamblia, E. histolytica* Malaria) were commonly prevalence across four assessments on ART patients at Dilla Referral Hospital and also *S. stercolaris* commonly shown among ART patients except at 2014 year. *A. lubricoids* parasites were shown among ART patients at 2012 and 2014 year as indicted in Table 4. The most prevalent protozoan parasites and helminths in ART naïve patients were trophozoite of *E. histolytica*/dispar and *A. lumbricoides* with respective prevalence of 19.1% and 2.9% [40]. Slightly higher prevalence of intestinal parasitic infection (30.0%-35.7%) has been reported from HIV-infected individuals from Kathmandu Valley [41,42].

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Type of Parasitic Infection	Male Age range			Female Age range			Treatment
	G.lamblia	-	-	1(8.33 %)	-	1(8.33 %)	-
E.histolytica	1 (8.33 %)	1(8.33 %)	-	-	2 (16.67%)	-	Cotrimoxaxole, ORS
A.lubricoids	1(8.33 %)	-	-	-	-	-	Metrindazole
T.saginata	-	-	-	-	2(16.67%)	-	Metrindazole
oxoplasmosis	-	1(8.33 %)	-	-	-	-	Fansidar tablet
Elephantiasis	-	1(8.33 %)	-	-	-	-	Doxicyclin, Albendazole
/lalaria	-	1(8.33 %)	-	-	-	-	Ciproflaxin
ſotal	2 (16.67%)	4 (33.33 %)	1 (8.33%)	-	5 (41.67%)	-	

Table 4. Type of Parasitic Infection on HIV positive patients at DRH/HIV patients (ART) 2014.

Conclusion

In the present study, high prevalence of intestinal parasites among ART patients in Dilla Referral Hospital was observed. Intestinal parasitic infections are common in HIV-infected people in Ethiopia. Based on the finding, management of ART patients by De-worming programs for intestinal parasitic disease should consider these facts for more effective treatment outcomes.

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