Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2014; 2(6G):3366-3369 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com **DOI:** 10.36347/sjams.2014.v02i06.102

Research Article

Distribution of Intestinal Parasite in People Living with HIV/AIDS of Different Care Centre of Pokhara Valley, Nepal

Suresh Jaiswal[1]*, Subham Sharma[2], Surya Rana Bhat[3], Tripti Pokhrel[4], Niraj Chaudhary[5], Ishor Sharma[6]
[1-5]Department of Laboratory Science, School of health and Allied Sciences, Pokhara University, kaksi, Nepal
[6] Department of Public Health, School of health and Allied Sciences, Pokhara University, kaksi, Nepal

***Corresponding author**
Suresh Jaiswal
Email: suuress@gmail.com

Abstract: Intestinal parasitic infection affects the health and quality of life of people living with HIV. This study was designed to determine the patterns of intestinal parasitic infections in HIV/AIDS individuals and its relationship with diarrhoea, CD4 T- cell counts and ART. Hence a cross sectional study was conducted from total 103 patients visisting ART clinic of Western Regional Hospital, Community Support Group, Nayabazar and Star Children Homes, Pokhara, from 15th November 2013 to 10th January 2014. All the fecal samples were examined for the presence of parasites both macroscopically and microscopically. Microscopic examination was done by wet mount (Saline mount and Iodine preparation) method, by concentration method employing formal-ether sedimentation technique and diarrheal samples were also subjected to sucrose flotation method. The total parasitic infection was found to be 38(36.9%). Distribution of different intestinal parasite was found to be *Entamoeba* 11(25%), *Ascaris* 10(22.7%), *Giardia* 7(15.9%), *C. Parvum* 3(6.8%), *Taenia* 3(6.8%), *Isospora* 3(6.8%), *Hookworm* 2(4.5%), *Cyclospora* 2(4.5%), *H. nana* 2(4.5%) and *Microsporodia* 1(2.2%). The association between diarrohea and non diarrohea patient reveals 8.4 time chances of intestinal parasitic infection with P-value 0.001, which is highly significant. The association between CD4 cell count revealed the status that <200 CD4 count had 8.53 times and 1.54 chances more than 400-600 CD4 count and 200-400 CD4 count respectively with P-value 0.002, which is highly significant. Routine examinations of stool samples for parasites would significantly benefit the HIV patients by contributing in reducing morbidity and improving the efficiency of antiretroviral treatment.
Keywords: Parasites, HIV, Immunodeficiency, ART, Prevalence, AIDS.

INTRODUCTION

Intestinal parasitosis continues to be one of the major causes of public health problems in the world, particularly in the developing countries. Globally an estimated 3.5 billion people are affected by intestinal parasites, while 450 million becomes ill due to of intestinal parasitic infections [1]. They are very common in patients with HIV infection or AIDS. Diarrhoea is a common clinical presentation of these infections. It is indicated that diarrhoea occurs in 30-60% of in developed countries and in about 90% of AIDS patients in developing countries [2]. The enteric pathogens causing diarrhoea includes bacteria, parasites, fungi and viruses [3]. The opportunistic parasites *Cryptosporidium parvum*, *Cyclospora cayetanensis*, *Isospora belli* and *Microsporidia* are also documented in patients with AIDS [4]. Non opportunistic parasites such as *Entamoeba histolytica*, *Giardia lamblia*, *Trichuris trichiura*, *Ascaris lumbricoides*, *Strongyloides stercoralis* and *Ancylostoma duodenale* are frequently encountered in developing countries but are not currently considered opportunistic in AIDS patients [5].

Human immunodeficiency virus (HIV) infection is a significant health problem with most of the cases in Asia and Africa. In Nepal, about 60,000 people are living with HIV and many of them face problems to access life-saving highly active antiretroviral therapy (HAART) [6]. 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.

Parasitic infections in HIV infected patients are common in many regions and populations in Nigeria representing a public health challenge. Interactions between HIV and other infective agents, including parasites, influence the health status of people living with HIV/AIDS has been recognized.

Antiretroviral treatment (ART) increases the length and quality of life and productivity of patients. It

improves survival and decrease the incidence of opportunistic infections in people with HIV by reducing the viral load and increasing the level of CD4 cells [7].

Children and immuno-compromised individuals in developing countries are commonly affected groups by diarrhea. But in developed countries, diarrhea has fallen considerably, morbidity remains high [8].

MATERIALS AND METHODS

This study was designed to determine the patterns of intestinal parasitic infections in HIV/AIDS individuals and its relationship with diarrhoea, CD4 T-cell counts and ART. Hence a cross sectional study was conducted from total 103 patients visisting ART clinic of Western Regional Hospital, Community Support Group, Nayabazar and Star Children Homes, Pokhara, from 15th November 2013 to 10th January 2014. Questionnaire was administered to retrieve information on age, sex, history of antiparasitic and Anti-Retroviral Therapy and toilet facilities. Participants aged between 8 and 72 years previously enrolled in the ART clinic and all other new patients who were admitted to the clinic upon a Voluntary Counselling and Testing (VCT) were asked to volunteer for this study and to provide stool samples for the detection of ova, larvae, flagellates and cyst of parasites, regardless of the presence of diarrhoea, during their scheduled visit in the cohort. For each patient, data regarding age, sex, use of antiretroviral drug and cotrimoxazole and CD4 T-cell counts were estimated.

All the HIV patients were provided with clean, dry, screw capped and properly labeled plastic container for the collection of the stool sample. Only a single morning stool sample was collected. All the fecal samples were examined for the presence of parasites both macroscopically and microscopically. Microscopic examination was done by wet mount (Saline mount and Iodine preparation) method, by concentration method employing formal-ether sedimentation technique and diarrheal samples were also subjected to sucrose flotation method. The significance in difference of quantitative data was analyzed by Chi-square test. A 95% confidence interval and less than 5% level of significance was used to check for association between independent and dependent variables by SPSS software [1].

RESULTS

Out of total 103 patients visiting different HIV care centres of Kaski district 57(55.33%) were male and 46(44.67%) were female. The total parasitic infection was found to be 38(36.9%) as shown in Table 1. Distribution of different intestinal parasite was found to be *Entamoeba* 11(25%), *Ascaris* 10(22.7%), *Giardia* 7(15.9%), *C. Parvum* 3(6.8%), *Taenia* 3(6.8%), *Isospora* 3(6.8%), *Hookworm* 2(4.5%), *Cyclospora* 2(4.5%), *H. nana* 2(4.5%) and *Microsporodia* 1(2.2%) as shown in table 2.

There was no association with the age group, sex, duration of HIV infection and based on ART. The association between diarrohea and non diarrohea patient reveals 8.4 time chances of intestinal parasitic infection with p-value 0.001, which is highly significant. The association between CD4 cell count revealed the status that <200 CD4 count had 8.53 times and 1.54 chances more than 400-600 CD4 count and 200-400 CD4 count respectively with P-value 0.002, which is highly significant as shown in Table 3.

Table 1: Prevalence of infections amongst the HIV patients

Sl. No.	Parasite	Frequency (%)
1.	Absent	65 (63.1)
2.	Present	38 (36.9)

Table 2: Distribution of the parasites

Sl. No.	Types	Frequency (%) (Multiple infections possible)
1.	*Entamoeba*	11 (25%)
2.	*Ascaris*	10 (22.7%)
3.	*Gairdia*	7 (15.9%)
4.	*C. Parvum*	3 (6.8%)
5.	*Taenia*	3 (6.8%)
6.	*Isospora*	3 (6.8%)
7.	*Hookworm*	2 (4.5%)
8.	*Cyclospora*	2 (4.5%)
9.	*H. nana*	2 (4.5%)
10.	*Microsporidia*	1 (2.2%)

Table 3: Factors associated with the infections amongst the HIV patients

Variables	Infected	Non-infected	Total	Chi-square	P-value	OR (95% CI)	p-Value
Age Group							
<15	8 (32)	17 (68)	25 (100)	0.36	0.834	NA	
15-50	26 (38.8)	41 (61.2)	67 (100)				
>50+	4 (36.4)	7 (63.6)	11 (100)				
Sex							
Male	19 (33.3)	38 (66.7)	57 (100)	0.69	0.40		
Female	19 (41.3)	27 (58.7)	46 (100)				
Diarrohea							
Presence	23 (69.7)	10 (30.3)	33 (100)	22.44	0.001**	8.4 (3.3-21.5)	
Absence	15 (21.4)	55 (78.6)	70 (100)				
Duration of HIV infection							
<1 Year	7 (41.2)	10 (58.8)	17 (100)	3.35	0.186	NA	
1-5 Years	7 (23.3)	23 (76.7)	30 (100)				
5+ Years	24 (42.9)	32 (57.1)	56 (100)				
ART							
Received	29 (34.9)	54 (65.1)	83 (100)	0.701	0.403	NA	
Not Received	9 (45)	11 (55)	20 (100)				
CD4 Cells							
<200	12 (75)	4 (25)	16 (100)	12.57	0.002**	8.53 (2.3-31.2)	0.001**
200-400	13 (35.1)	24 (64.9)	37 (100)				0.35
400-600	13 (26)	37 (74)	50 (100)			1.54 (0.61-3.8)	1

Note:- **=highly significant

DISCUSSION

Our study aimed at finding the distribution of HIV-intestinal parasites co-infection and to evaluate the risk factors associated to this co-infection. The overall prevalence of intestinal parasites was 36.9% in the HIV infected patients.

The result is almost similar to the that reported in Afar, Ethiopia [9], Cameroon [10], and Saudi Arabia [11], but lower than those from Jimma [12].

In this study, *Entamoeba histolytica/E. dispar* and *Giardia lamblia* were the commonest nonopportunistic protozoa. The overall prevalence of *Entamoeba histolytica* was 25%. But it is higher than a report in Ethiopia (4.2%) [13], Saudi Arabia (5.2%) [11] and Jakarta (0.3%) [16]. It is lower than the one in Kenya (58.3%) [15] and similar with Ethiopia (23.8%) [12]. The overall prevalence of *Gardia lamblia* was 15.9 %., slightly higher than 10.6% in Ethiopia [12]; but higher than report of 1.1% in Ethiopia [13], 1.9% in Jakarta [16] and similar with16.6% in Kenya [15].

Opportunistic protozoa like Cyclospora species and *Isospora belli* were also identified in this study. The prevalence of *Cyclospora* species was 4.5% and this is similar to the findings from other studies which are found in the range of 4.9% to 15.8% [9, 11–14, 16]. While *Isospora belli* was found at 6.8%, this is higher than other studies which are found in the range of 3.9% to 11.7% [9, 12–14]. *Microsporidia* prevalence was found to be 2.2% which is similar to other studies like 2.8% Ethiopia [12].

CONCLUSION

The distribution of intestinal parasite was high. Opportunistic and non-opportunistic parasites were identified with a different rate. The distribution of intestinal parasites was higher among those HIV infected individuals with diarrhea, low CD4 count, and ART-naive group groups. The result of this research describes the need for considering early detection and treatment of intestinal parasites in HIV infected individuals in order to reduce their morbidity. This seeks great attention by those clinical service providers who are working in the ART unit. People living with HIV/AIDS should be highly conscious about their personal hygiene and their environmental factors surrounding them.

ACKNOWLEDGEMENT

The authors are grateful to the staff and administration of Western Regional Hospital, Community Support Group, Nayabazar and Star Children Homes, Pokhara for their kind support in shaping of the work. All over the authors are highly grateful to the participants who participated in the study by providing the sample.

REFERENCES

1. Jaiswal S, Pant DR, Tiwari BR; Prevalence of Intestinal Parasite among School Children of Bharatpokhari V.D.C., Kaski, Nepal. British

Microbiology Research Journal, 2014; 4(9): 1007-1012.
2. Framm SR, Soave R; Agents of diarrhea. Med Clin North Am., 1997; 81: 427-447.
3. Mitra AK, Hernandez CD, Hernandez CA, Siddiq Z; Management of diarrhea in HIV infected patients. Int J STD AIDS, 2001; 12: 630-639.
4. Goodgame RW;Understanding intestinal spore forming protozoa: Cryptosporidia, Microsporidia, Isospora and Cyclospora. Ann Intern Med., 1996: 124: 429-441.
5. Lucas SB; Missing infections in AIDS. Trans R Soc Trop Med Hyg., 1990; 86: 353-354.
6. National Center for AIDS and STD Control (2010); Epidemic Update of Nepal, as of August 2010.
7. Hogg RS, Yip B, Kully C, Craib KJ, O'Shaughnessy MV, Schechter MT *et al*.; Improved survival among HIV-infected patients after initiation of triple-drug antiretroviral regimens. Canadian Medical Association Journal, 160(5): 659–665.
8. Kosek M, Bern C, Guerrant RL; The global burden of diarrhoeal disease, as estimated from studies published between 1992 and 2000. Bull World Health Organ., 2003; 81: 197-204.
9. Adamu H, Petros B; Intestinal protozoan infections among HIV positive persons with and without Antiretroviral Treatment (ART) in selected ART centers in Adama, Afar and Dire-Dawa, Ethiopia. The Ethiopian Journal Health Development, 2009; 23(2): 133–140.
10. Sarfati C1, Bourgeois A, Menotti J, Liegeois F, Moyou-Somo R, Delaporte E *et al*.; Prevalence of intestinal parasites including microsporidia in human immunodeficiency virus-infected adults in Cameroon: a cross-sectional study. The American Journal of Tropical Medicine and Hygiene, 2006; 74(1): 162–164.
11. Al-Megrin WAI; Intestinal parasites infection among immunocompromised patients in Riyadh, Saudi Arabia. Pakistan Journal of Biological Sciences, 2010; 13(8): 390–394.
12. Mariam ZT, Abebe G, Mulu A; Opportunistic and other intestinal parasitic infections in AIDS patients, HIV seropositive healthy carriers and HIV seronegative individuals in Southwest Ethiopia. East African Journal of Public Health, 2008; 5(3): 169–173.
13. Alemu A, Shiferaw Y, Getnet G, Yalew A, Addis Z; Opportunistic and other intestinal parasites among HIV/AIDS patients attending Gambi higher clinic in Bahir Dar City, North West Ethiopia. Asian Pacific Journal of Tropical Medicine, 2011; 4(8): 661–665.
14. Naik R, Ravichandraprakash H, Ukey PM, Vijayanath V, Shreeharsha G, Chandak VK; Opportunistic intestinal parasitic infections in HIV/AIDS patients presenting with diarrhea and their correlation with CD4+ T-lymphocyte counts. International Journal of Pharmacy and Biological Sciences, 2012; 2(4): 293–299.
15. Kipyegen CK, Shivairo RS, Odhiambo RO; Prevalence of intestinal parasites among HIV patients in Baringo, Kenya. Pan African Medical Journal, Pan Afr Med J., 2012; 13: 37.
16. Kurniawan A, Karyadi T, Dwintasari SW, Sari IP, Yunihastuti E, Djauzi S *et al*.; Intestinal parasitic infections in HIV/AIDS patients presenting with diarrhea in Jakarta, Indonesia. Transactions of the Royal Society of Tropical Medicine and Hygiene, 2009; 103(9): 892–898.