A Comparative Study Of Parasitic And Fungal Infections In HIV Positive And Negative Subjects In The Urban Setting Of Yaounde

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Abstract

Subjects with HIV infection and AIDS are prone to opportunistic infections owing to their state of immune depression. The goal of the study was to detect, differentiate and compare the parasitic and fungal infections is HIV positive and negative subjects.

This comparative study was carried out over 6 months in Yaoundé, Cameroon. 255(102 HIV negative and 153 HIV positive) subjects were enrolled.

There were more fungal and parasitic infections in the HIV positive group. Multiple parasite infection was frequent in both groups but more in the HIV positive group. We detected 10 different protozoal species and 9 different fungal species.

The HIV positive subjects presented with more clinical manifestations.

We concluded that HIV positive subjects present with more clinical manifestations than HIV negative subjects and are more frequently infected than HIV negative subjects, especially by opportunistic infections. Clinical and biological data correlate in the HIV positive subjects.

INTRODUCTION

The Acquired Immune Deficiency Syndrome (AIDS) can be defined as the symptomatic stage of the effect of chronic infection by the human immuno-deficiency virus (HIV). This symptomatic stage is characterised by a decreased defence mechanism and is complicated by opportunistic infections. Regardless of the mode of contamination with the virus, once the immunity drops, the subjects become chronically ill and if not taken care of as regards treatment of opportunistic infections and with antiretroviral therapy, they succumb to overwhelming infections. Parasitic and fungal infections in most cases are due to usual organisms. In immune competent subjects, the infections may be self limiting, and respond well to antimicrobial treatment. Relapse are not common in immune competent persons, while in immune compromised persons the chances of relapse are high and for this reason secondary prophylaxis is given .

HIV infection is associated with a marked drop in T4 lymphocytes and an increase in the viral load. This disequilibrium in the immune system explains the occurrence of many opportunistic infections. They can be bacterial, viral, parasitic or fungal. The T4 lymphocyte count is a good prognostic factor for severe complications.

OBJECTIVES

The goal of the study was to detect and differentiate the parasitic and fungal infections in HIV positive and negative subjects. More specifically we wanted to compare their clinical manifestations, pathogens and age/sex distribution.

MATERIALS AND METHODS

This study was carried out from the period of June to December 1998, in 8 health structures and four parasitology and mycology laboratories. The health structures involved were the Yaoundé Central Hospital (YCH), the Yaoundé Military Hospital (YMH), the Jamot Hospital of Yaoundé (JHY), the University Teaching Centre (UTH), the District hospitals of Cite Verte, Biyemassi and the Messa and Mvog-ada Health Centres. The laboratories used were the laboratory of the Faculty of Medicine and Biomedical

Sciences, the Laboratory of the UTH, the Pasteur Centre and the Central laboratory.

Standard clinical material was used to examine patients. Samples were obtained and analysed using the necessary equipment found in the above mentioned laboratories.

The patients were chosen in a simple non random manner. All the patients who came for consultation on the day of enrolment were included. We included however only those who had already done an HIV test irrespective of symptoms, those aged more than 6 months and who lived in Yaoundé. We exclude those who refused to take part in the study. Our sample size was obtained using the Lorenz formula. Our prevalence for HIV was 6.75%, our degree of precision was 0.05, our confidence interval was 0.02. We obtained sample size of 96 after applying the above-mentioned formula. We enrolled 255 patients of which 102 were HIV negative and 153 were HIV positive.

Data collected included demographic data and a clinical examination in the search for manifestations of parasitic, bacterial, viral and fungal infections. For parasitic infections the following techniques were used for analysis: direct exam, May – Grunwald- Giemsa, Ziehl –Neelson stain modified by Henrikson and Pohlenz, the anal scotch test, and the simplified Kato and Ritchie tests. For fungal infections the following techniques were used: direct exam, cotton blue satin, culture on Sabouraud medium and human serum for isolation and the API20C gallery for identification.

RESULTS

255 subjects were enrolled in the study. 102 were HIV negative. This included 46 males and 56 females, with ages ranging from 3 to 57 for the males (average of 29 years) and 18 months to 48 years for the females (average of 31 years). 153 were HIV positive with 72 males and 81 females. Their ages varied from 4 to 46 years in the males (average of 28 years) and 2 to 52 years in the females (average of 32 years). 44.1 % of those in the HIV negative group were married as opposed to 32% in the HIV positive group.

We found that there were more fungal and parasitic infections in the HIV positive group. (Table 1 and 2) Multiple parasite infection was frequent in both groups but more in the HIV positive group (Table 3). Opportunistic species were found in both groups but to a lesser extent in the HIV negative group (Table 3). We detected 10 different protozoal species and 9 different fungal species. (Table 4 and 5)

From a clinical point of view the HIV positive subjects presented with more clinical manifestations (Table 6). In both group we found subjects with clinical manifestations despite the absence of detectable parasites.

There was a correlation between the clinical and biological findings in the HIV positive group.

Figure 1

Table 1: Variations in level of parasite infections

Sex	HIV negative		HIV positive		Probability	Significance
	N	%	N	%		
Male	30	29.4	67	43.8	0.02	significant
Female	27	26.4	71	46.4	0.001	significant
Total	57	55.8	138	90.2	<0.001	significant

Figure 2

Table 2: Variations in levels of fungal infections

Sex	HIV negative		HIV positive		Probability	Significance
	N	%	N	%		
Male	7	6.8	57	37.2	<0.001	significant
Female	12	11.7	76	49.6	<0.001	significant
Total	19	18.5	133	86.8	<0.001	significant

Figure 3

Table 3: Distribution of the various types of infections

Species	HIV negative	%	HIV positive	%	Total number
Parasites	44	43.1	5	3.3	50
Fungi	12	11.8	4	2.6	16
Parasites and fungi	12	11.8	132	86.3	144
Opportunistic species	29	28.4	138	90.2	167
Non opportunistic species	46	45.1	66	43.1	112
Indeterminate Fungi	3	2.9	10	6.5	13
No germ found	33	32.3	11	7.2	44

Figure 4

Table 4: Parasite species found in HIV negative and positive subjects

HIV negative			*HIV positive*		
Species	*N*	*%*	*Species*	*N*	*%*
Protozoa	*52*	*50.9*	*Protozoa*	*125*	*81.7*
E. histolytica	*18*	*17.6*	*I. belli*	*39*	*25.5*
E. coli	*12*	*11.7*	*Cryptosporidium sp.*	*37*	*24.2*
P. carinii	*7*	*6.8*	*E hystolytica*	*27*	*17.6*
G. intestinalis	*7*	*6.8*	*p. carinii*	*13*	*8.5*
E. nana	*4*	*3.9*	*Microsporidium sp.*	*13*	*8.5*
I. belli	*4*	*3.9*	*G. intestinalis*	*7*	*4.5*
T. vaginalis	*3*	*2.9*	*E. coli*	*7*	*4.5*
Cryptosporidium sp	*2*	*1.9*	*T. intestinalis*	*3*	*1.9*
T. intestinalis	*1*	*0.9*	*E. nana*	*2*	*1.3*
Helminths	*13*	*12.7*	*T. vaginalis*	*2*	*1.3*
A. lumbricoides	*5*	*4.9*	*Helminthes*	*26*	*16.9*
T. trichiura	*3*	*2.9*	*S. stercoralis*	*9*	*5.9*
N. americanus	*2*	*1.9*	*A. lumbricoides*	*6*	*3.9*
E. vermicularis	*2*	*1.9*	*E. vermicularis*	*5*	
S. stercoralis	*1*	*0.9*	*N. americanus*	*4*	*2.6*
			T. Trichiura	*2*	*1.3*

Figure 5

Table 5: Fungal species found in HIV negative and positive subjects

HIV negative			*HIV positive*		
Species	*N*	*%*	*Species*	*N*	*%*
C albicans	*19*	*18.6*	*C. albicans*	*123*	*80.4*
Aspergillus sp	*2*	*1.9*	*Candida sp.*	*9*	*5.8*
C. guillermondii	*1*	*0.9*	*Trichosporon sp.*	*9*	*5.8*
Histoplasma sp	*1*	*0.9*	*G.candidum*	*7*	*4.5*
G. candidum	*1*	*0.9*	*C. pseudotropicalis*	*6*	*3.9*
Indeterminate	*3*	*3.9*	*Aspregillus sp.*	*5*	*3.2*
			C. neoformans	*5*	*3.2*
			Histoplasma sp.	*4*	*2.6*
			C. guillermondi	*2*	*1.3*
			Indeterminate	*10*	*6.5*

Figure 6

Table 6: Clinical manifestations

Manifestations	HIV negative		HIV positive		Probability	Significance
	N	%	N	%		
General signs	37	36.2	117	76.4	<0.001	Significant
Digestive	18	17.6	83	54.2	<0.001	Significant
Pulmonary	6	5.8	38	24.8	<0.001	Significant
Hematological	7	6.8	73	47.7	<0.001	Significant
Cutaneous	5	4.9	72	47	<0.001	Significant
Cardiac	3	2.9	9	5.8	0.43	Non significant
Neuropsychyatric	7	6.8	39	25.4	<0.001	Significant
Urogenital	13	12.7	32	20.9	0.09	Non Significant

COMMENTS

The health centers from which the subjects were enrolled were chosen because they are located in the four corners of the city of Yaoundé and are visited by people of all social standards. The laboratories were chosen because they had the required equipment and could perform the special diagnostic procedures.

The sample size obtained can not really represent the whole city of Yaoundé, but only the hospitals in which the study was carried out. It was easier to obtain samples from inpatients.

More women were affected in both groups. These results are in contrast with the findings of Feumbi ([5]) and Fotso ([6]) , who found that there were more HIV positive men. Our finding concerning the ages of the subjects most affected were in concordance with literature ([6,7,8]) .

The techniques used in this study were chosen because of the availability and affordability of their reagents and because of their specificity in the detection of parasites and fungi. These tests have been used with good results in others studies e.g. Folefack ([9]) , Mbassi ([7]) and Lohoue ([10]) .

Our findings concerning the species of parasitic infections found in HIV positive subjects are similar to those found in other studies ([7,11,12,13,14]) . There was a wider variety of fungal infections found in HIV positive subjects. Fauci, Viard and Hennequin had found similar results ([16,17,18]) . The clinical findings in HIV positive subject had a close correlation with the biological findings (CD4 count and viral load) as have earlier been described. ([6,7,9,14,16,17,18]) this may be because of their greater tendency to develop disease in the presence of germs, owing to their immune depression. In the HIV negative subjects, not all those with positive tests had clinical manifestations. We think that some parasitic and fungal infections may exist in latent form in both HIV positive and negative subjects.

CONCLUSIONS AND RECOMMENDATIONS

At the end of our study we concluded that HIV positive subjects present with more clinical manifestations than HIV negative subjects. HIV positive subjects are more frequently infected than HIV negative subjects and especially by opportunistic infections. Non opportunistic infections occur in equal proportions in both groups. Clinical and biological data correlate in the HIV positive subjects, while in the HIV negative group only diarrhoea and abdominal pain were found to correlate with non opportunistic intestinal parasitic infections.

We hereby recommend that more sensitization should be done on HIV and AIDS, and that each health unit should have adequate structures for the diagnosis, education and

follow up of people infected with HIV. It would also be wise for health structures to improve on their ability to detect opportunistic infections. We also recommend that all HIV/AIDS patients should be screened for opportunistic infections and treated. Treatment and prophylaxis for opportunistic infections should be free.

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