Gender Difference in Early Treatment Patients for Human Immunodeficiency Virus Type 1 Infection in Kinshasa, Democratic Republic of Congo

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ABSTRACT

Context: In Sub-Saharan Africa, the epidemic of Human Immunodeficiency Virus (HIV) infection tends towards a certain feminization because of the high prevalence of infected women.

Objective: The objective of this study was to highlight some gender-related differences in biological monitoring parameters in early treatment management for HIV infection in Kinshasa.

Methods: Cross-sectional descriptive study conducted in 8 Ambulatory Treatment Centers (ATC) for monitoring of HIV infection in Kinshasa. Included were all persons over the age of 18 who were serologically positive and willing to participate in the work. Five milliliters of blood were collected in a tube with EDTA anticoagulant to determine CD4 cell counts and viral load.

Results: A total of 153 patients, 60.13% women and 39.87% men participated in this work. The average age of this population was 37 ± 12 years for the general population. The most represented age group in general is 26 to 35 years old with 42 patients (27.5%). Clinical stages, CD4 levels, viral loads, and the distribution of HIV-1 strains in relation to gender were different.

Conclusion: In terms of CD4 count and viral load, there is no significant difference in the initiation of antiretroviral therapy compared with the gender. The visible differences are more in terms of age group and clinical stage compared to the start of treatment.

KEYWORDS

HIV-1; Kinshasa; Gender; Biological Parameters.

INTRODUCTION

Human Immunodeficiency Virus (HIV) infection reaches all levels of society around the world. For the year 2014, more than 35 million people have been reported infected with HIV according to the World Health Organization (WHO) [1]. Nearly two-thirds of those infected are located in sub-Saharan Africa, which carries the heavy burden of this epidemic [1]. In this region, the epidemic of HIV infection tends towards a certain feminization because of the high prevalence of infected women. The status of women is still subject to social discrimination and subordination in matters of sexual intercourse, which places them more at risk of contamination [2]. The concept of gender, as a biological distinction between women and men, is important because it implies differences between women and men not only biologically, but also culturally and socially.

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In the Democratic Republic of Congo (DRC), the prevalence of HIV infection was 1.6% and 0.6% respectively for the female and male gender in 2013-2014 in a population aged 15 to 49 years [3]. For Kinshasa, this prevalence was respectively 2.6% for women and 0.3% for men in the same population for the same years [3]. The general prevalences were respectively 1.2% for the DRC and 1.6% for the city of Kinshasa [3].

The purpose of this study was to highlight some gender-related differences in biological monitoring parameters and early treatment management for HIV infection in Kinshasa.

METHODS

Frame

The present work is a cross-sectional descriptive study that was conducted in 8 Ambulatory Treatment Centers (ACTs) for the follow-up of Human Immunodeficiency Virus (HIV) infection in Kinshasa. The ACTs were randomly selected from a predefined list based on 2 ACTs per district of the city.

Patients

All people who came for voluntary HIV testing in the different ACTs in the period from August 2013 to October 2014 were considered for this study. Included were all persons over the age of 18 who were serologically positive and willing to participate in the work. Inclusion was voluntary for the present work. The sociodemographic and anthropometric parameters of the patients were recorded in the survey sheets previously tested.

Sampling and Analysis

Five milliliters of blood were collected in a tube with EDTA anticoagulant from the vein in the elbow crease. The CD4 lymphocyte count and the Viral Load (VL) were evaluated for patients at the Molecular Biology Laboratory of the Faculty of Medicine of the University of Kinshasa (UNIKIN) at the inclusion of the work [4]. Samples taken were sent to the Liège AIDS Reference Laboratory for sequencing viral strains [5].

Statistics

Quantitative variables were evaluated using the Student's T test, while the qualitative variables were evaluated using the Chi^2 test.

RESULTS

A total of 153 patients participated in this work. This population consisted of 92 women (60.13%) and 61 men (39.87%), a sex ratio of nearly 2 women for one man. The average age of this population was 37 ± 12 years for the general population; 35.4 ± 12 years for the female gender and 39.3 ± 10 years for the male gender. The most represented age group in general was 26 to 35 years old with 42 patients (27.5%), followed by those aged 36 to 45 years with 39 patients (25.5%). For the female gender, the most prevalent age group is 26 to 35 years of age with 32 patients (34.8%), followed by that of 36 to 45 years with 21 patients (22.8%) and that of 18 to 25 years with 20 patients (21.7%). While for the male gender, the most prevalent age group was 36 to 45 years old with 18 patients (29.5%), followed by 46 to 55 years old with 16 patients (22.2%); and that of 18 to 25 years with 12 patients (19.7%). Clinical stages, CD4 levels, Viral Loads, and the distribution of HIV-1 strains in relation to gender are presented in the attached table.

Characteristics		Patients	
Sex			
Female		92 (60.13%)	
Male		61 (39.87%)	
	Female	**Male**	**Total**
Age (years) n=153			
Mean	35.4±12 years	39.3±10 years	37.2±12 years
Age groups			
18-25	20 (21.7%)	12 (19.7%)	32 (20.9%)
26-35	32 (34.8%)	10 (16.4%)	42 (27.5%)
36-45	21 (22.8%)	18 (29.5%)	39 (25.5%)
46-55	11 (12.0%)	16 (22.2%)	27 (17.6%)
56-65	8 (8.7%)	5 (8.2%)	13 (8.5%)
Clinical Stage (according to WHO) n=153			
Stage 1	0	0	0
Stage 2	11 (12.0%)	10 (16.4%)	21 (13.7%)
Stage 3	61 (66.3%)	42 (68.9%)	103 (67.3%)
Stage 4	20 (21.7%)	9 (14.7%)	29 (19.0%)
CD4 Cells count (cells/mm3) n=91			
Median	187	180	180
0-200	36 (62.0%)	18 (54.5%)	54 (59.3%)
201-350	8 (14.8%)	7 (21.2%)	15 (16.5%)
351-500	7 (12.8%)	3 (9.1%)	10 (11.0%)
>500	7 (12.8%)	5 (15.2%)	12 (13.2%)
Viral Load (RNA Copies/ml) n=153			
Median	301 605	297 659	301 053
0-1 000	5 (5.4%)	2 (3.3%)	7 (4.6%)
1 001-5 000	7 (7.6%)	3 (4.9%)	10 (6.5%)
5 001-10 000	2 (2.2%)	2 (3.3%)	4 (2.6%)
10 001-50 000	8 (8.7%)	13 (21.3%)	21 (13.7%)
50 001-100 000	11 (12.0%)	2 (3.3%)	13 (8.5%)
>100 000	59 (64.8%)	39 (63.9%)	98 (64.0%)
Subtypes of HIV-1 n=153			
A	21 (22.8%)	14 (22.9%)	35 (22.9%)
B	1 (1.1%)	2 (3.3%)	3 (1.9%)
C	8 (8.7%)	7 (11.5%)	15 (9.8%)
D	5 (5.4%)	7 (11.5%)	12 (7.8%)

F	5 (5.4%)	1 (1.6%)	6 (3.9%)
G	8 (8.7%)	7 (11.5%)	15 (9.8%)
H	8 (8.7%)	4 (6.5%)	12 (7.8%)
J	7 (7.6%)	2 (3.3%)	9 (5.9%)
K	9 (9.8%)	6 (9.8%)	15 (9.8%)
U	6 (6.5%)	2 (3.3%)	8 (5.2%)
CRF01_AE	3 (3.3%)	2 (3.3%)	5 (3.3%)
CRF02_AG	10 (10.7%)	7 (11.5%)	17 (11.1%)
Undetermined	1 (1.1%)	0	1 (0.6%)

DISCUSSION

The purpose of this paper was to highlight some of the gender-related differences in biological monitoring parameters and early treatment management for HIV infection in Kinshasa. It was performed on a population of 153 HIV-positive patients from 8 different centers in Kinshasa.

More than 60% of the selected population was female, giving a sex ratio of 2 women to 1 man. This feminine predominance is found in various works in our mist [6-9] and also presented by various national and international reports [10,11]. This strong female presence among HIV-infected patients in Kinshasa, DR Congo, and sub-Saharan Africa can be explained by early sexual relations in girls, lack of information and education for life and HIV, as well as sexual risk behaviors [11].

For the general population, the average age is 37 ± 12 years. In terms of gender, mean ages are 35.4 ± 12 years and 39.3 ± 10 years for the female and male population respectively (p = 0.01). Although not significant, the average ages of both groups show that women are infected younger rather than men. These results are also shared by different studies [3], thus presenting a precocity of the infection in the feminine gender.

The most represented age groups are respectively 26 to 35 years for the female gender with 34.8% and 36 to 45 years for the male gender with 29.5%. In the female gender group, this age group is followed by those aged 36 to 45 years (22.8%), 18 to 25 years (21.7%), and 46 to 55 years (12.0%) and 56 to 65 years (8.7%). In the male gender group, this age group is followed by those aged 46 to 55 years (22.2%), 18 to 25 years (19.7%), and 26 to 35 years (16.4%) and 56 to 65 years (8.2%). These data are similar to those published by the Demographic Health Survey in 2014 [3].

The most represented WHO clinical stage was clinical stage 3 with 66.3% for the female population and 68.9% for the male population respectively. It was followed by stage 2 for men with 16.4% and stage 4 for women with 21.7%. This shows that patients in general, women and men alike, start antiretroviral therapy (ART) when there are already more or less serious clinical signs. This observation is also presented in various works [12,13]. On the other hand, more women are starting treatment late in the Kinshasa centers.

Median rates of CD4 were 187 cells/mm^3 for the female gender and 180 cells/mm^3 for the male gender, respectively (p = 0.001). Although these differences are non-significant, the population tends to start treatment with a median CD4 count generally less than 250 cells/mm^3 which is already a sign of poor prognosis for ART.

The median Viral Loads (VL) are 301 605 RNA copies/ml for the female gender and 297 659 RNA copies/ml for the male gender, respectively (p = 0.005). High VLs at the start of ART are often documented in our setting [12,13]. High VL at the beginning of ART is also a sign of poor prognosis for ART.

The distribution of HIV-1 subtypes in relation to gender was different, but none of the differences were significant between gender. The distribution of HIV-1 subtypes is more or less the same, even according to sex.

CONCLUSIONS

In terms of CD4 count and Viral Load, there is no significant difference in initiation of antiretroviral therapy in the infected population compared to gender. The differences observed with respect to gender were more in terms of age group and clinical stage compared to the beginning of treatment.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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