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Research Article

Determinants of Adherence to Antiretroviral Treatment Among HIV-Infected Patients at the Departmental Teaching Hospital of Oueme-Plateau

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Abstract

Objective: To determine factors associated with adherence to antiretroviral treatment among people living with HIV (PLHIV) coming to the Departmental Teaching Hospital of Oueme-Plateau (CHUD-OP).

Methods: This was a descriptive and analytical cross-sectional study conducted from 01 July to 01 October, 2017. The study population was HIV-infected persons under antiretroviral treatment and followed in the internal medicine department of CHUD-OP. The Center for Adherence Support Evaluation (CASE) questionnaire, commonly known as the CASE Adherence Index, was used to assess adherence.

Results: A total of 266 patients were included in this study. The mean, minimum, and maximum age of the patients were, respectively, 39.6 (± 10.3), 19, and 69 with a predominance of the 30 to 50 year-old age group (63.5%). The study population was predominantly female (203 or 76.3%), with a sex ratio of 0.31. Among the 266 respondents, 186 (69.9%) had a good adherence score (>10) to the ARV treatment against 80 (30.1%) who had a poor adherence score. Factors associated with adherence to ART were: absence of adverse events (p=0.001); initial clinical stage (p=0.031); high level of education (p=0.026); sharing of HIV status with family (p=0.034) and spouse (p<0.001); circumstances of HIV discovery (p=0.003); number of tablets per day ≤ 3 (p=0.001). Adherence to ART was also associated with CD4 count ≥ 500 cells/mm3 (p<0.001) and viral load at the time of the survey, undetectable (p < 0.001) testifying to the benefit of this treatment adherence.

Conclusion: It is advisable to insist on reinforcing therapeutic education and psychosocial care for patients on ARV treatment.

Keywords: Adherence to Treatment; Associated Factors; HIV; Porto-Novo

Introduction

Human Immunodeficiency Virus (HIV) infection is still a major public health issue worldwide and particularly in sub-Saharan Africa [1]. Actually, we have 12% of the world's population in Sub-Saharan Africa, but 70% of them are people living with HIV (PLHIV) [2]. In Benin, for the last ten years, the national prevalence of HIV infection has been stable at around 1.2% and it represents one of the lowest in the ECOWAS region where the average is 1.6% [3]. Medical care for PLHIV began in Benin in February 2002, with the Beninese Initiative for Access to Antiretrovirals (IBAARV), the first patients received triple therapy in Cotonou.

Adherence to treatment was to be facilitated by the availability of health care personnel and by the fact that antiretroviral treatment was given for free.

Methods

This study is set as a descriptive cross-sectional study with an analytical purpose conducted from July 01 to October 01, 2017. In the study population, we have every HIV-infected individual under antiretroviral treatment (ART) and followed in the internal medicine department of the departmental teaching hospital of Ouémé-plateau (CHUD-OP). Actually, we included patients over 15 years of age, infected with HIV on ART and followed at the CHUD-OP site for at least six months, with available and usable medical records and who gave their consent to participate in the survey.

About the data collection technique, we can state that it was a census of all patients' files and individual interviews of patients who came for consultation. The dependent variable was adherence to antiretroviral therapy. It was measured using the Center for Adherence Support Evaluation (CASE) questionnaire, commonly called the CASE Adherence Index [4]. We chose this latter tool because it provides an objective evaluation of adherence in patients and will facilitate the comparison of our results with those in other studies. In accordance with the CASE Adherence Index, the variable will be filled in as «Yes» for patients with good adherence, i.e., patients with an Index Score greater than 10, or «No» for patients with poor adherence, i.e. patients with an Index Score less than or equal to 10.

As independent variables, we have sociodemographic variables, economic and cultural variables, and clinico-biological and therapeutic variables. Free and informed consent was required from each of the patients before submission of the questionnaire. After a discussion session, patients were given clear explanations of the procedures in order to obtain their verbal informed consent. The use of medical records has been done with confidentiality. The data were digitalized using EPI Data software after verification of each form, and analyzed using SPSS and EPIINFO version 7 software. Word processing, tables and graphs were done using Microsoft Word 2013 and Microsoft Excel 2013. Comparisons of means were made using the t-test and comparisons of proportions were done using the Chi-square test or Fisher's test as required. A p value <0.05 was considered significant.

Results

Sociodemographic characteristics

A total of 266 patients were included in this study. Their mean age was 39.6 (± 10.3) years old. The youngest was 19, the oldest 69, and we got a predominance of the 30 to 50 years old age group (63.5%). We would like to emphasize that the study population was predominantly female (203 or 76.3%), with a sex ratio of 0.31. (Table 1).

Age	Frequency	Proportion (%)
< 30	43	16.2
[30–50]	**169**	**63.5**
≥ 50	54	20.3
Gender		
Male	63	23.7
Female	**203**	**76.3**
Religion		
Christian	**186**	**69.9**
Muslim	68	25.6
Animist	12	04.5
Marital status		
Married	**172**	**64.7**
Single	51	19.2
Divorced	23	08.6
Widowed	20	07.5

Table 1: Distribution of patients according to socio-demographic characteristics.

Clinico-biological characteristics

The HIV discovery was made for most of the patients (50%) during a sick episode. The average initial CD4 count was 156 (± 125.8) and almost every patient (97.7%) had an initial CD4 count of less than 500 cells/mm^3. In contrast, in the survey, the mean CD4 count was 426.9 (± 234.2) and 64.7% of patients had an initial CD4 count below 500. In addition, viral load was detectable in 70 patients, i.e., 26.3% (Table 2).

	Frequency	Proportion (%)
Circumstances of HIV discovery		
Clinical suspicion	133	50.0
Voluntary testing	95	35.7
Blood donation	6	02.3
Preoperative assessment	2	00.7
Prenatal assessment	30	11.3
Initial CD4 count		
< 500 cells/mm^3	260	97.7
≥ 500 cells/mm^3	6	02.3
CD4 rate at investigation		

<500 cells/mm³	172	64.7
≥500 cells/mm³	94	35.3
Viral load at time of survey		
Detectable	70	26.3
Undetectable	196	73.7

Table 2: Distribution of patients according to the circumstances of HIV discovery, initial CD4 count, CD4 count at the survey, and viral load at the survey.

A total of 111 patients or 41.7% were in stage I as shown in Figure 1.

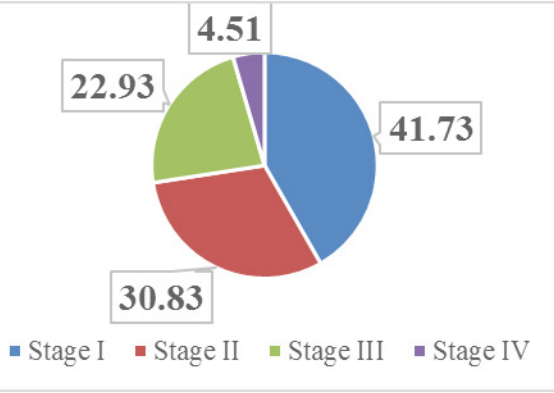

Figure 1: Distribution of patients by initial clinical stage.

The most commonly used treatment regimens were: Zidovudine-Lamivudine-Effavirenz (124 patients or 46.6%), Tenofovir-Lamivudine-Effavirenz (71 patients or 26.7%) and Tenofovir-Lamivudine-Lopinavir/ritonavir (63 patients or 23.7%). The average duration of treatment was 54 months with extremes of 6 months and 99 months. It should be noticed that 44.4% of the patients had a duration of treatment of at least 61 months and that 13 of them (4.9%) were using traditional treatment.

Assessment of adherence to ARV treatment

Self-assessment of adherence to ARV treatment: Among the 266 HIV-infected, 252 (94.7%) acknowledged that they were adhering to the ARV treatment, compared to 14 (5.3%).

Adherence to ARV treatment: Among the 266 patients, 186 (69.9%) had a good adherence score (>10) to the ARV treatment against 80 (30.1%) who had a poor adherence score.

Distribution of patients according to reasons for not taking medication: A total of 167 patients were revealed to have missed at least one treatment. The main reason for not taking the medication was forgetfulness in 44.91% of cases (Table 3).

	Frequency	Proportion (%)
Oversight	75	44.9
Breakdown on site	3	01.8
Lack of supply	41	24.5
Fear of stigma	3	01.8
Travel	16	09.6
Tired of taking	4	02.4
Not in the mood	23	13.8
Side effects	2	01.2

Table 3: Distribution of patients according to reasons for not taking medication.

Factors associated with adherence to ARV treatment

Education, shared status with spouse, and spouse support were each associated with adherence to ARV treatment (Table 4).

	Adherence (%)			
	Yes	**No**	**OR [95% CI]**	**p**
Age group				*0.507*
< 30	28 (65.1)	15 (34.9)	1	
[30 - 50[	120 (71.0)	49 (29.0)	1.31 [0.64-2.66]	0.452
≥ 50	41 (75.9)	13 (24.1)	1.68 [0.69-4.09]	0.243
Gender				
Male	42 (66.7)	21 (33.3)	1	
Female	147 (72.4)	56 (27.6)	0.72 [0.41-1.40]	0.379
Instruction				

Yes	114 (76.5)	35 (23.5)	1.82 [1.07-3.11]	**0.026**
No	75 (64.1)	42 (35.9)	1	
Religious life				
Yes	10 (71.4)	4 (28.6)	1.01 [0.31-0.35]	0.975
No	179 (71.0)	73 (29.0)	1	
Sharing status with spouse and family				
Yes	106 (66.3)	54 (33.7)	1	
No	83 (78.3)	23 (21.7)	1.83 [1.04-3.27]	**0.034**
Spouse support				
Yes	114 (68.7)	52 (31.3)	2.57 [1.54-4.29]	**<0.001**
No	46 (46.0)	54 (54.0)	1	

Table 4: Relationship between socio-demographic characteristics and adherence to ARV treatment.

We got a significant statistical association was found between the circumstance of HIV discovery (p=0.042) and ARV adherence (Table 5).

	Adhérence (%)			
	Yes	**No**	**OR [95% CI]**	**p**
Level of knowledge about HIV				0.825
Not well informed	3 (75.0)	1 (25.0)	1.20 [0.12-11.78]	0.871
Fairly well informed	2 (50.0)	2 (50.0)	0.40 [0.05-2.90]	0.351
Very knowledgeable	184 (71.3)	74 (28.7)	1	
Circumstance of discovery				**0.042**
Clinical suspicion	84 (63.2)	49 (36.8)	0.40 [0.21-0.74]	**0.003**
Voluntary screening	77 (81.1)	18 (18.9)	1	
Blood donation	5 (83.3)	1 (16.7)	1.16 [0.12-10.62]	0.889
Pre-operative check-up	2 (100.0)	0 (00.0)	–	–
Prenatal check-up	21 (70.0)	9 (30.0)	0.54 [0.21-1.38]	0.199

Table 5: Relationship between the level of knowledge about HIV, the circumstances of discovery of HIV, and adherence to ARV treatment.

Patients who were in stage I adhered 3.7 times (p=0.031) more to ARVs than those in stage IV ; patients taking one tablet (p<0.001), two tablets (p=0.001) and three tablets (p<0.001) adhered significantly more to ARV treatments than those taking five tablets (Table 6).

	Adherence (%)			
	Yes	**No**	**OR [95% CI]**	**p**
Initial clinical stage				**0.001**
Stage I	93 (83.8)	18 (16.2)	3.69 [1.05-12.92]	**0.031**
Stage II	50 (61.0)	32 (39.0)	1.11 [0.32-3.82]	0.861

Stage III	37 (60.7)	24 (39.3)	1.10 [0.31-3.87]	0.880
Stage IV	7 (58.3)	5 (41.7)	1	
Number of tablets				**< 0.001**
1	52 (74.3)	18 (25.7)	7.70 [3.28-18.07]	**< 0.001**
2	22 (62.9)	13 (37.1)	4.51 [1.73-11.71]	**0.001**
3	103 (88.0)	14 (12.0)	16.61 [8.24-46.69]	**< 0.001**
5	12 (27.3)	32 (72.7)	1	
Duration of treatment				0.121
< 38	79 (71.2)	32 (28.8)	1.67 [0.82-3.41]	0.154
[38-69]	28 (59.6)	19 (40.4)	1	
[69-99]	82 (75.9)	26 (24.1)	2.14 [1.03-4.44]	0.039

Table 6: Relationship between initial clinical stage, number of tablets per day, duration of treatment, and adherence to ARV treatment.

Patients who did not report side effects were more adherent to ARV treatment (p<0.001) than the others (Table 7).

	Adherence (%)			
	Yes	**No**	**OR [95% CI]**	**p**
Side effects				
Yes	121 (63.7)	69 (36.3)	1	
No	67 (88.2)	9 (11.8)	4.24 [1.99-9.04]	**< 0.001**
Initial CD4 count				
< 500 cells/mm^3	184 (70.7)	76 (29.3)	1	
≥ 500 cells/mm^3	5 (83.3)	1 (16.7)	2.06 [0.23-17.97]	0.502
CD4 count at baseline				
< 500 cells/mm^3	105 (61.0)	67 (39.0)	1	
≥ 500 cells/mm^3	82 (87.2)	12 (12.8)	4.36 [2.21-8.59]	**< 0.001**
Viral load				
Detectable	10 (14.3)	60 (85.7)	1	
Undetectable	175 (89.3)	21 (10.7)	50 [22.28-112.18]	**< 0.001**

Table 7: Relationship between the existence of side effects, CD4 count, viral load, and adherence to ARV treatment.

Discussion

We used the CASE Adherence Index to assess overall patient adherence. With this tool, we found an adherence rate of 69.9%. This adherence rate is suboptimal (<95%), but it is higher than that reported by Potchoo, et al. (62.6%) in Lomé and Sokodé in 2010 [5], and higher than that found in southern Nigeria by Oku AO, et al. in 2014 which was 50.4% [6], similarly to that found in 2011 by Hansana V, et al. 60% [7]. This finding is also consistent with that found in a meta-analysis in sub-Saharan Africa in 2014 which reported an adherence rate of 72.9% [8]. Our rate is lower than that found in Ethiopia by Tsega B, et al. in 2014 who found an adherence rate at 80.9% [9], also that found in Kenya in 2011 by Wakibi SN, et al. 82% [10]. This disparity in adherence rates between studies may depend on the context and methods of measuring adherence, which may vary from one study to another. Our study therefore found that 39.1% of patients were not adherent to ARVs. According to the patients, this non-adherence is mainly due to forgetfulness.

Of the 266 patients who constituted the population of this study, 76.3% were female and 23.7% male, i.e., a sex ratio of 0.31. This high proportion of women in our population could be explained by the fact that women visit health facilities much more often for various health problems (family planning, prenatal consultation, gynecological consultation) and are therefore mostly screened. This proportion of women in our study is in line with that of Nachega, et al. in South Africa (61%) [11] and Oumar AA, et al. in Burkina Faso [12]. The most represented age group was between 30 and 50 years, i.e. 63.5%, with extremes of 19 and 69 years. The average age was 39.6 years. This average is close to that found by Ware NC et al in 2009 in sub-Saharan Africa which was 38 years [13].

Overall, socio-demographic variables do not interfere with adherence: gender (p=0.379), age (p=0.507), and religion (p=0.975) are not significantly associated with adherence to ARV treatment. This is in line with the results of Philippe Delmas, et al. in France in 2003 [14]. Nevertheless, the level of education interferes with adherence to ARV treatment (p=0.026). Our study shows that PLWHIV who attended school were more adherent to ARV treatment. Indeed, education surely plays a major role in the understanding and communication of health care information. This is similar to the results of Yaya I, et al. in Togo (p=0.008) [15] and Uzochukwuet B, et al. in Nigeria in 2008 (p=0.007) [16]. However, this result is not the same as that reported by other studies in developing countries [7,17] which found that the majority of patients with poor adherence to antiretroviral therapy were literate. In these studies, the authors argued that the situation could be due to the fact that these categories of PLHIV had been employed in occupations that hindered the taking of antiretroviral drugs.

Patients reporting side effects were less adherent than others. This result is consistent with that found by Mbonye M, et al. in Uganda in 2011[18]. Our study found that the initial clinical stage was associated with adherence to treatment (p=0.006). Patients received at the early stage (stage I) had better adherence (83.8%) compared to those seen at a more advanced stage (stage IV: 58.3%). This could be explained by the fact that patients in the early stage were physically and psychologically fit and accepted the treatment; while those received in the late stage, often bedridden, started the treatment with the help of their parents before recovering their health. This result is not in line with most studies that have found the initial clinical stage not to be associated with adherence. This is the case of the study conducted by Yaya I, et al. in Togo (p=0.242) [15].

Our study found an association between adherence and sharing of serological status with the spouse (p<0.001) and family (p=0.034). This could be explained by the attention patients receive when those around them are informed of their HIV status. Several studies have shown that serological disclosure is a known predictor of increased adherence to ART [19-22]. Actually, disclosure of HIV status could be the first step in creating a supportive relationship with the sexual partner and family, which would facilitate acceptance and continuation of ART. In a study conducted in Ibadan, Nigeria, Olowookere, et al. [23] reported that HIV-positive patients who did not want to disclose their HIV status were more likely not to adhere to ART.

CD4 count and viral load at the time of the survey were significantly associated with adherence to ARV treatment. The majority of patients with detectable viral load at the time of the survey had poor adherence (85.7%) and among those with CD4 count ≥ 500, the majority (87.2%) had good adherence. This could be explained by the fact that adherence to treatment is an indispensable factor for therapeutic success, the consequence of which is an increase in the body's defense cells (increase in CD4 count) and a decrease in the viral load that has become undetectable. This result is consistent with that found in most studies, such as that of Yaya I, et al. in Togo [15] and that of Cauldbeck MB et al in India in 2009 [24].

Conclusion

Factors associated with adherence were high level of education; absence of side effects of ARVs; disclosure of HIV status to sexual partners and family; and initial clinical stage (stage I). Good adherence to treatment is linked to an increase in CD4 count and a decrease in viral load. In view of the diversity of these factors, we think that it would be essential to continue strengthening therapeutic education and psychosocial care for patients on ARV treatment.

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