

Sociodemographic and Nutritional Factors Associated with Adherence to Antiretroviral Therapy in PLWHA in Benin

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Abstract Adherence to antiretroviral treatment (ART) is critical for suppression of viral replication, repletion of CD₄ cells, avoiding viral resistance, improving immune response and slowing HIV infection progression. This study sought to measure adherence to ART and to determine its associated sociodemographic, lifestyle and nutritional factors in HIV-infected adults taking antiretroviral (ARV). Using a cross-sectional study design, medical records of 991 HIV positive patients who started antiretroviral therapy from July, 1st 2011 to June, 30th 2012 were reviewed. Data were collected in 2014 in 46 HIV/AIDS therapy centers across Benin. The independent variables were sociodemographic, lifestyle, nutritional and therapeutic factors. The main dependent variable was the adherence to the ART. Chi-square test was used to determine the association between dependent and independent variables. A p-value < 0.05 was considered statistically significant. Out of 991 PWLHIV, 30.2% showed poor adherence to ARV. Factors associated with ART adherence were social network (p<0.001), gender (p=0.020) and nutritional status based on body mass index (p=0.006). The prevalence of non-adherence to ART was high in PLWHA taking ARV. Efforts are needed to improve adherence to antiretroviral therapy in PLWHA in Benin. Intensive adherence counseling should be provided to all patients before initiation of antiretroviral therapy. Health care providers must contribute to social networking in patients and ensuring nutritional support to them.

Keywords ARV Therapy, Benin, PWLHA, Therapeutic Adherence

1. Introduction

Acquired immune deficiency syndrome (AIDS) is now a manageable chronic illness. To achieve expected maximal results from antiretroviral therapy (ART), patient adherence to ART is critical [1]. The benefits of highly active antiretroviral therapy in the treatment of HIV infection have been well described including viral suppression, CD4 lymphocyte repletion, and reductions in AIDS related opportunistic diseases and death [2]. According to literature review, main factors that affects adherence to ART were social capital [3], stigmatization and discrimination [4; 5], barriers to accessibility to care (distantly health care facilities, costs of care, travel costs) [6], depression condition [7], educational level [8], overburden work load [7]. Factors that limit the success of ART include poor therapy adherence, regimen complexity, viral resistance, drug tolerability and toxicity, therapy costs, and presence of comorbid conditions such as substance abuse and addiction [1].

In Benin, ART began since February 2002 in three sites. In scaling up according to 3 by 5 initiative, Benin national AIDS control program (PNLS) opted for decentralized health centers for HIV/AIDS care [9]. In 2014, 1718, people living with HIV/AIDS (PLWHA) with highly active ART (HART) (6.3%) aged 15 years and over were reported drop out in 2014. Poor adherence severely impacted negatively on effectiveness of HART and was linked with the likelihood of the drug resistance [10]. To improve program performance and quality of services to PLWHA, we need to understand, in view of actual implementing experiences, the factors that influence patient adherence to ART.

2. Material and Methods

2.1. Setting

Patients were selected in 46 HIV/AIDS care sites in all parts of Benin.

2.2. Study Design and Population

The study was a cross-sectional one. The study population was PLWHA who started ART from July, 1st 2011 to June, 30th 2012. The present study is part of the study on PLWHA's one year survival.

2.3. Selection of ART Centers and Participants

Forty two (42) ART centers with active queue of more than 100 patients were randomly selected out of all 86 centers available in Benin in 2014. In order to take into account representativeness of sites, four complementary sites with fewer than 100 patients, were randomly selected. PLWHA whose medical records included complete information on adherence to ART participated in the study.

Inclusion criteria were: being HIV positive, start antiretroviral therapy from July, 1st 2011 to June, 30th 2012. Exclusion criterion was being pregnant woman taking ART for preventing mother to child HIV infection.

2.4. Study Variables

The independent variables were sociodemographic, lifestyles and nutritional factors. The main dependent variable was the adherence to ART. Adherence is defined as a patient's ability to follow a treatment plan, take medications at prescribed concerning times and frequencies. Adherence measurement in this study was based on the number of missed medication. Good adherence referred to compliance with medical recommendations with optimal regularity (≤ 1 missed medication in a month). Poor adherence meant patient not consistent with medical recommendations (>1 missed medication in a month). Patients whose medical reports pointed out one or more missed doses (forgetting of skipping medication) within a month were considered showing poor adherence [11].

2.5. Data Collection

Data were collected from patient medical record and regular patients' data base in each site. Investigators were divided in duo: each had to cover one or many HIV/AIDS care sites according to patients' active file in the site and distance between sites. Investigators were enrolled for two days training to be familiar with study procedure. National supervision of data collection was also set.

2.6. Statistical Analysis

Data are collected from regular patients' medical records

in each site and were analyzed using SPSS version 20.0. Chi square test was used to determine the association between dependent and independent variables

2.7. Regulatory Approvals

The study was approved by Benin National Health Research Ethics Committee before the operational stage beginning. The interviewer explained the purpose of the study and procedures and gained written informed consent before commencing the interview. The participants were also informed that their participation was voluntary and that they could withdraw from the interview/discussion at any time without consequences. The participants were assured that their responses would be treated in confidence and they were assured anonymity through the use of strict coding measures.

3. Results

A total 991 patient's medical records out of 3295 eligible had complete data regarding main dependent and independent variables.

3.1. Socio-demographic Characteristics

Table 1 summarizes socio-demographic characteristics of participants. The majority of the patients were female (69.6%) and 59.9% aged between 30 and 49 years. The mean age of participants was 36.4 ± 10.6 years. Most patients (66.4%) were married, 48.2% were with illiteracy and 28.0% were housewives. Participants were less involved in social network as 89.0% of them were not member of any association and 24.2% were living with their partner and infants.

3.2. Health Risk Behaviour Characteristics

Table 1 shows lifestyles and health risk factors in PLWHA in HART including currently smoking and drinking alcohol. Most of participants didn't smoke (98.2%) while almost 10% consumed alcohol and 23.8% were underweight (Body mass index < 18.5). Table 2 shows that participants in stage 2 and 3 of WHO AIDS classification represented 26.8% and 46.6% respectively and 99.4% of participants were taking first line ART.

3.3 Medical History and ART Treatment

The mean duration of receiving ART was 14.4 ± 7.6 months. The number of patients who reported being admitted in hospital after being infected with HIV during last 12 months due to poor health or opportunistic infection was 8%. The most common reasons for hospital admission were prolonged fever and chronic diarrhea.

Table 1. Factors associated with adherence to ART in PLWHA taking antiretroviral (n=991), Benin 2014

Characteristics	Poor adherence	Adequate adherence	p
Sex			
Women	690	69.6	0.020
Men	301	30.4	
Age			
16-29	276	27.8	0.909
30-49	594	59.9	
50 and above	121	12.2	
Education			
Illiterate	478	48.2	0.355
Writing in locale language	21	2.1	
Primary school	274	27.6	
Secondary school	198	20.0	
Occupation			
Housewife	277	28.0	0.592
Student	35	3.5	
Farmers	78	7.9	
Craftsmen, artists and traders	321	32.4	
Private staff/ Self employed	55	5.5	
Government staff	67	6.8	
Others	158	15.9	
Marital status			
Single	128	12.9	0.932
Married	658	66.4	
Widowed	115	11.6	
Others	90	9.0	
Family network			
Alone	100	10.1	0.507
Living with a partner	259	26.1	
Living with infants	145	14.6	
Living with partner and infants	416	42.0	
Living in extended family	61	6.2	
Others	10	1.0	
Social network			
Not a member an association	882	89.0	<0.001
Active member of an association	81	8.2	
Passive member of an association	28	2.8	
Smoking			
Yes	18	1.8	0.325
No	973	98.2	
Alcohol consumption			
Yes	97	9.8	0.434
No	894	90.2	
Body mass index			
<18.5	198	23.8	0.010
18.5-24.9	334	40.1	
25 and above	301	36.1	

p: p for Chi-square

Table 2. WHO HIV infection staging and antiretroviral treatment in PLWHA PLWHA (n=991), Benin 2014

Characteristics	Absolute frequency	Relative frequency(%)
Antiretroviral combination used		
First line antiretroviral therapy	985	99.4
Second line Antiretroviral therapy	6	0.6
WHO HIV infection staging		
Stage 1	160	19.6
Stage 2	219	26.8
Stage 3	381	46.6
Stage 4	58	7.1

4. Discussion

This study focused on determining the relation of sociodemographic, lifestyle and nutritional factors with adherence to ART among adult people living with HIV taking antiretroviral therapy in Benin. Based on the review of patients’ medical records, results indicated that almost one third of the PLWHA showed poor adherence to ART. Adherence to ART in this study was associated with sex, social networking and nutritional status.

4.1. Prevalence of Adherence to ART

The result of 69.2% ART adherence among PLWHA in the study is in convergence to those found in India and in Zambia [12;13], but lower than finding reported in China [14], and Vietnam [15]. Proportion of adherence to ART is also lower than those reported in developed countries [1; 16]. Some caution is needed in comparing adherence rates across studies since the methods of measuring adherence (medical records review, pill counts and blood analysis) can affect findings. Assessing ART adherence is difficult as patients may over or underestimate their adherence due to recall bias and the desire to avoid criticism [16].

4.2. Factors Associated with Adherence to ART

In the study, proportion of non-adherent in women was lower than proportion of non- adherent in men. In contrast, a study among Canadian cohort of HIV-positive, authors reported that female gender was independently associated with a lower likelihood of being adherent to ART (OR = 0.70; 95% CI: 0.53-0.93), after adjusting for clinical characteristics as well as drug use patterns measured longitudinally throughout follow-up [17].

In a gender-stratified multivariate analysis study in Montefiore Medical Center’s Substance Abuse Treatment Program in the Bronx, New York, authors reported that gender difference in adherence to ART was explained by others factors. Worse adherence in women was associated with problem of alcohol use and active heroin use. In contrast, for men, not belonging to an HIV support group and active

crack or cocaine use were associated with worse adherence [18].

In the present study, proportions of being member of an association were not significantly different between men and women. In contrast BMI status distribution differed significantly between men and women (p<0.001). This could partly explain gender difference in adherence to ART.

Being active member of an association was associated to adherence to ART. Social capital effect on therapeutic adherence has been shown by others [3]. In three countries (Nigeria, Uganda, Tanzania), social capital (link with neighbour and carers) and patients social responsibility or accomplishment lead the latter to adequate adherence of ART [3]. In our study, a survey with ARV site leaders has shown that near third (28.6%) of them hasn’t take any action of networking PLWHA, nor organizing adherence training for patients, family or community.

In the study, no effect of educational level on adherence was pointed out. In literature, educational level effect on therapeutic adherence was controversial. Hansana et al. [8] reported positive effect of the first on the latter while Getachew et al. [19] have shown that educational status of PLWHA taking ARV was negatively associated with adherence to ART.

Malnutrition which referred to BMI<18.5 Kg/m² in the study was significantly associated with non-adherence to ART. Malnutrition was more frequent in the non-adherent (38%) participants than in the adherent (28%) counterparts. This is in line with a quasi-experimental study in Zambia [20], in Uganda [21] which reported that better nutritional status improves adherence to ART. However, this is not in line with the cross sectional study in Ethiopia which reported that nutritional status showed no impact on adherence to ART [22]. This study reported that people with good nutritional status miss ARV doses more than those with poor nutritional status [22]. Difference in studies design may explain these results.

AIDS control programs managers and health careers can design and implement a set of feasible interventions basing on findings to maximize adherence. Indeed, according to World Health Organization, [23], some feasible interventions have proven their efficacy on therapeutic

adherence: networking PLWHA with voluntary or community workers, pairs support and adherence support groups, ensuring nutritional support to PLWHA taking antiretroviral therapy. At individual level, feasible interventions are SMS reminders, nutritional support, and adherence training for patients, their families and the whole community.

The study has some limitations. It hasn't examined the social representations that patients receive from antiretroviral treatment that can affect adherence to therapy. Also, the study didn't examine ARV stocks shortage and the quality of the relation between health workers and patient which were not included in the present study's objectives.

5. Conclusions

Adherence to antiretroviral therapy in Benin was suboptimal. Sociodemographic and nutritional factors were associated to adherence to ART. Intensive adherence counseling should be provided to all patients before initiation and during antiretroviral therapy. Health care providers should base their intervention on associated factors identified in the study.

Conflict of Interest

Authors declare no conflict of interest.

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Authors' Contribution

SJC and MTA wrote the proposal and supervised data collection. SJC, MNP and MTA did the analysis and wrote the draft of the report. All authors contributed to final version of the manuscript.

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