Original Article

Prevalence and determinants of nonadherence to highly active antiretroviral therapy among people living with HIV/AIDS in Ibadan, Nigeria

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Abstract

Objective: To determine the level of nonadherence to highly active antiretroviral therapy (HAART) and to explore the association of factors militating against adherence and nonadherence to therapy among people living with HIV/AIDS (PLWHA) at an Antiretroviral Clinic in Ibadan, Nigeria.
Design: A cross-sectional survey was employed to determine the prevalence of nonadherence.
Methodology: A structured interviewer-administered questionnaire was applied to consecutive PLWHA who had been on therapy for a minimum of three months. The completed questionnaires were entered into a computer and analyzed. Multivariate logistic regression was used to determine factors associated with nonadherence.
Results: Three hundred and eighteen people living with HIV/AIDS completed the questionnaire. Their mean age was 39.1±9.6 years. There were 173 (54.4%) females and 145 (45.6%) males. The median duration on HAART was 19 months (Range 3 to 28 months) and the prevalence of nonadherence was 118 (37.1%) using the less than 95% adherence profile. About a third (31.5%) of those missing therapy reportedly missed their medication because of fasting. Multiple logistic regression analysis revealed that patients who felt healthy or simply forgot to take their drugs and those not willing to disclose their HIV status were independently, significantly associated with less than 95% adherence.
Conclusion: The study showed that nonadherence to HAART is a problem in the ARV clinic and that the feeling of being healthy, forgetfulness, and unwillingness to disclose HIV status by PLWHA were significant barriers to adherence. Efforts to improve adherence in the clinic will have to address these issues among others.

Introduction

The Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) has spread to all the regions of the world with a most devastating effect in sub-Saharan Africa [1]. The first case of AIDS in Nigeria was reported in 1986 [2,3]. Since then the prevalence of HIV infection in pregnant women increased from 1.8% in 1991 to 5.4% in 1999. A slight decline to 5.0% was observed in 2003 [3]. Nationally, about 4.4% of women attending antenatal clinics were found to be infected with HIV in 2005, but prevalence among pregnant women exceeded 5% in almost a third of the 36 states in the country [3].

Highly active antiretroviral therapy (HAART) is the only proven treatment for HIV/AIDS. HAART is the combination of three or more drugs from at least two different classes of antiretroviral (ARV) therapy. A key determinant of successful HAART is drug adherence. Poor adherence can lead to treatment failure, evolution of drug resistance, and subsequent immunological and clinical failure [4]. More than 95% of the doses should be taken for optimal response while lesser degrees of adherence are more often associated with virological failure. Various studies have documented that the range for adherence to HAART is from 25% to 85% [5]. Adherent individuals have been shown to have reduced viral loads and increased CD4 counts, live longer, and have better quality of life [4,6,7].

Since the Antiretroviral Clinic, University College Hospital, started to prescribe and dispense the HAART

regimen to people living with HIV/AIDS (PLWHA) in 2004, the level of adherence to HAART and likely factors militating against good adherence to the HAART regimen had not been assessed among the clinic attendees. This assessment, however, is necessary for evaluating the antiretroviral treatment program and for finding solutions to identified barriers to adherence in order to prevent treatment failure and the development of drug resistance among these patients.

Materials and Methods

The study was conducted at the Antiretroviral Clinic of the University College Hospital (an 850-bed tertiary hospital), Ibadan, Nigeria. The ARV clinic was one of 25 other ARV clinics established and funded by the Federal Government in 2002 to provide Antiretroviral drugs to an initial 10,000 adults nationwide at a subsidized rate. Since 2004, President Bush's Emergency Plan for AIDS Relief (PEPFAR) had provided immense support for the scale-up of the nation's antiretroviral treatment programme initially at the government subsidized rate of 1,000 Naira per month ($7.0) but free since January, 2006. The ARV Clinic opens daily from 8:00 a.m. to 5:00 p.m. Monday through Thursday. The clinic serves the entire southwestern part of Nigeria and beyond.

A descriptive cross-sectional study aimed at documenting the level of nonadherence among patients living with HIV/AIDS who had been on HAART for at least three months in the clinic was conductedbetween June and August 2007. Consecutive patients were recruited into the study after consent. A pretested interviewer administered a questionnaire that was completed by each study participant with the assistance of the investigators. Clinical checklist data was obtained from the respondent's clinic records. This included co-morbidity history, CD4 count, and viral load of each study participant at baseline and at three months.

Degree of adherence by individual patients was estimated manually by means of drug pickup by patients at the clinic pharmacy and by patient self-report. The degree of adherence from patient self-report [8] was estimated using the following formula:

$$\% \text{ Adherence over last 7 days} = \frac{\text{\# doses should have taken - \# missed doses}}{\text{\# doses should have taken}} \times 100\%$$

From the formula, level of adherence by individual patients was classified into those with less than 95% adherence and those with equal to or more than 95% adherence. Nonadherent patients were defined in this study as individuals with less than 95% adherence level.

The prevalence of nonadherence was estimated for those who ever missed and those who missed more than 5% of their medication.

The data were entered into a computer, cleaned, and statistical analysis was performed using Statistical Package for Social Sciences SPSS version 12. Tables of frequency were generated, and tests of significance were conducted using appropriate statistical methods. Multivariate analysis was performed using logistic regression to evaluate the socio-demographic variables and other variables that were independently associated with nonadherence.

Informed consent was obtained from all respondents while, permission to conduct the study was sought from the ARV clinic research committee. Serial numbers and not names were used to maintain confidentiality.

Results

Three hundred and eighteen people living with HIV/AIDS on HAART participated in the study. The mean age of respondents was 39.1 years (SD±9.6). The largest proportion of the PLWHA (130; 40.9%) were in the age group of 30 to 39 years, followed by 93 (29.2%) in the 40 to 49 years age group. The majority of those interviewed (173; 54.4%) were females; 145 (45.6%) were males; 131 (41.2%) were traders; and 251 (78.9%) were of the Yoruba tribe. About half, 144 (45.3%), of the study population had secondary education while 103 (32.4%) had tertiary education. The majority of the study population (212; (66.7%) were married at the time of interview (Table 1).

Table 2 shows the distribution of respondents by month on highly active antiretroviral therapy. Over half of the study population had been on HAART for 18 months and above. The median duration on HAART was 19.0 months (range 3-28 months). Table 3 shows the prevalence of nonadherence to HAART. One hundred and eighteen respondents (37.1%) had less than 95% adherence, while 216 (67.9%) had ever missed their medication. Table 4 shows reasons for missing medication. One hundred and twenty (55.6%) study participants who ever missed their medication reported that they simply forgot to take their medication and 68 (31.5%) stated fasting as the reason for missing medication. Fifty-seven (26.4%) missed their drugs because they felt they were now well and hence no longer needed to take their medication again. Also 76 (35.2%) missed taking their drugs because they wanted to avoid side effects/toxicities of the drugs. Common side effects/toxicities reported included nausea/

vomiting (19.5%), skin rash (15.7%), diarrhoea (23.9%), dizziness (13.8%), paresthesia (11.9%) and bad dreams (14.5%).

Table 1. Demographic characteristics of PLWHA respondents.

Demographic characteristics	Sex Male n=145	Female n=173	Total n=318	*p value
Age group				
15-19	1 (0.7%)	2 (1.2%)	3 (0.9%)	p=0.000
20-29	9 (6.2%)	33 (19.1%)	42 (13.2%)	
30-39	54 (37.2%)	76 (43.9%)	130 (40.9%)	
40-49	46 (31.7%)	47 (27.2%)	93 (29.2%)	
50 and above	35 (24.1%)	15 (8.7%)	50 (15.7%)	
mean age	41.8±9.4years	36.8±9.1years		
age range	14-64 years	14-60 years		
Level of education				
None	6 (4.1%)	9 (5.2%)	15 (4.7%)	p=0.943
Primary school	25 (17.2%)	31 (17.9%)	56 (17.6%)	
Secondary school	65 (44.8%)	79 (45.7%)	144 (45.3%)	
Tertiary school	49 (33.8%)	54 (31.2%)	103 (32.4%)	
Marital status				
Single	17 (11.7%)	26 (15.0%)	43 (13.5%)	p=0.000
Married	113 (77.9%)	99 (57.2%)	212 (66.7%)	
Divorced	8 (5.5%)	23 (13.3%)	31 (9.7%)	
Widowed	7 (4.8%)	25 (14.5%)	32 (10.1%)	
Ethnic group				
Yoruba	112 (77.2%)	139 (80.3%)	251(78.9%)	p=0.923
Ibo	14 (9.7%)	14 (8.1%)	28 (8.8%)	
Hausa	6 (4.1%)	6 (3.5%)	12 (3.8%)	
Others	13 (9.0%)	14 (8.1%)	27 (8.5%)	
Occupation				
Civil servant	42 (29.0%)	53 (30.6%)	95 (29.9%)	p=0.000
Artisan	27 (18.6%)	15 (8.7%)	42 (13.2%)	
Trader	49 (33.8%)	82 (47.4%)	131 (41.2%)	
Soldier/police	18 (12.4%)	2 (1.2%)	20 (6.3%)	
Unemployed	9 (6.2%)	21 (12.1%)	30 (9.4%)	
Income				
Less than N4500	39 (26.9%)	97 (56.1%)	136 (42.8%)	p=0.000
4500 and above	106 (73.1%)	76 (43.9%)	182 (57.2%)	
Residence lived				
Ibadan	77 (53.1%)	98 (56.6%)	175 (55.0%)	p=0.527
Outside Ibadan	68 (46.9%)	75 (43.4%)	143 (45.0%)	

*Chi square was used to test differences between groups.

Table 2. Distribution of PLHWA by month on HAART.

Duration (month)	Frequency	%
3-5	26	8.2
6-11	74	23.3
12-17	57	17.9
18-23	76	23.9
24 months and above	85	26.7
Total	318	100.0

Table 3. Prevalence of non-adherence to highly active antiretroviral therapy.

Level of adherence	Frequency	%
<95.0%	118	37.1
≥95.0%	200	62.9
Ever missed	216	67.9
Never missed	102	32.1
Total	318	100.0

However, multiple logistic regression analysis (Table 5) shows that patients who felt healthy, those who simply forgot to take their drugs, and those not willing to disclose their HIV status were independently more likely to have less than 95% adherence level. A Hosmer and Lemeshow goodness of fit test resulted in a p=0.103 and an adjusted R^2 of 0.137, indicating a fair fit of the model.

Table 4. Reasons for missing HAART by PLWHA who ever missed therapy.

Reason	Frequency* n=216	%
Simply forgot	120	55.6
Wanted to avoid side effects	76	35.2
Were away from home	72	33.3
Lived too far away	70	32.4
Was fasting	68	31.5
Fell asleep/slept through dose time	58	26.9
Felt good/well	57	26.4
Ran out of pills	54	25.0
Unable to pay for transport	54	25.0
Do not like taking drugs	50	23.1
Did not want others to notice you taking medication	45	20.8
Felt depressed/sad/unhappy	43	19.9
Doubt that medication will work	28	13.0
Felt sick or ill	26	12.0
Had too many pills/tablet to take	25	11.6
Afraid of taking medication	19	8.8
Shared pills with others	16	7.4

*Multiple responses are possible.

Table 5. Multiple logistic regression analysis of risk factors for less than 95% adherence.

Independent Variable	P	Odds ratio	95% CI Lower	Upper
Felt good/well	0.005	2.39	1.3	4.4
Unable to pay for transport	0.06	1.83	0.98	3.4
Were away from home	0.59	1.76	0.98	3.2
Simply forgot	0.003	2.1	1.3	3.4
Not willing to expose HIV status	0.037	1.7	1.0	2.8

Discussion

The level of nonadherence to HAART and its determinants among patients attending the Antiretroviral Clinic in Ibadan was the focus of this study. About two-fifths (37.1%) of the respondents had less than 95% adherence. Various publications had shown that suboptimal adherence results in poor clinical response and thereby poor quality of life [1,3,8]. Our current findings show that nonadherence to HAART treatment is common among PLWHA in this centre and efforts should be made to reduce this problem. Emphasis has to be placed on 100% adherence during counseling sessions, though at least 95% adherence is required for optimal clinical response and complete viral suppression [9,10].

Various studies on drug adherence reported that forgetting to take a dose and side effects/toxicities are major reasons that people missed their medication. For example, in a diverse sample of antiretroviral recipients, 29 poorly adherent patients listed a total of 50 reasons for not adhering to their therapy. Over half were related to side effects/toxicity and forgetfulness, 28% and 24% respectively [11,12,13,14]. This observation is consistent with the findings in this study, where the major reasons for missing therapy reported included

forgetting to take drugs (55.6%), and side effects/toxicities (35.2%). Other reasons reported were living too far away (32.4%), fasting (31.5%), and the patients' feelings that they are well and therefore no longer need to take medication (26.4%).

The observation that about a third (31.5%) of nonadherence patients attributed their missing therapy to fasting is very instructive, especially in our environment where religious beliefs among muslims and Christians alike play an important role in determining health behaviour. Although Habib *et al.*, (2008) reported in a study on adherence to anti retroviral therapy (ART) during muslim Ramadan fasting that adherence on ART was similar among fasting and non-fasting patients [15], our findings suggest the need to routinely consider patients who are fasting and advise them on what to do regarding the taking of their medications during a fast, or place them appropriately on an ART regimen that will not undermine their fast.

The multivariate logistic regression showed that those who felt good or well have a 2.4 fold risk of having less than 95% adherence to HAART, followed by those who simply forget to take medication (2.1 fold risk) and those with unwillingness to disclose their status (1.7 fold risk). These findings are supported by various studies which reported that forgetting to take a dose as the most commonly seen predictors of poor adherence to therapy [12,16,17].

In conclusion, most PLWHA studied were in their prime and literate. The majority had been on HAART for more than 18 months. The study showed that nonadherence to HAART is a problem in the ARV clinic and that the feeling of being healthy, forgetfulness and unwillingness to disclose HIV status by PLWHA were significant barriers to adherence. Efforts to improve adherence in the clinic will have to address these issues among others.

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