Assessment of adherence to antiretroviral therapy among patients in a tertiary hospital, Ibadan, southwest Nigeria

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) infection remains a pandemic of global concern. The widespread use of antiretroviral drugs has made HIV/AIDS a manageable chronic illness. Adherence to antiretroviral therapy has emerged as a crucial issue in HIV/AIDS therapeutics.

Objectives: To assess adherence to antiretroviral therapy (ART) in adult out-patients attending the AIDS Prevention Initiative in Nigeria (APIN) clinic of Adeoyo Maternity Teaching Hospital Yemetu, Ibadan, Oyo State.

Method: A descriptive and prospective study in which 384 adult out-patients infected with HIV and attending antiretroviral clinic, on antiretroviral drugs for more than one month were invited to complete questionnaires which recorded sociodemographic data and other patient psychosocial variables in relation to adherence with prescribed medications. Adherence to antiretroviral therapy was evaluated using patient's self report.

Result: A good adherence level of 95.9% was recorded in this study. Some patient-factors that could affect adherence to therapy were pill burden 38.9%, drug's side effects 29.5%, forgetfulness 29.2%, hunger and time 0.6%, and fear of stigmatization 0.2%. Using bivariate analysis, there was no statistical significance between adherence level and sociodemographic characteristics of the respondents.

Conclusion: Adult out-patients on antiretrovirals were observed to adhere well to therapy.

Keywords: Antiretroviral therapy, adult out-patients, adherence, Ibadan

Évaluation de l'observance du traitement antirétroviral chez les patients d'un hôpital tertiaire, Ibadan, sud-ouest du Nigeria

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RESUME

Contexte : L'infection par le virus de l'immunodéficience humaine (VIH) demeure une pandémie de préoccupation mondiale. L'utilisation généralisée des médicaments antirétroviraux a fait du VIH/sida une maladie chronique gérable. L'observance de la thérapie antirétrovirale est devenue une question cruciale dans le traitement du VIH / SIDA.

Objectifs : Évaluer l'observance de la thérapie antirétrovirale (TAR) chez les patients ambulatoires adultes fréquentant la clinique de prévention du sida au Nigeria (APIN) du centre hospitalier universitaire de la maternité Adeoyo Yemetu, Ibadan, État d'Oyo.

Méthode : Une étude descriptive et prospective dans laquelle 384 patients adultes infectés par le VIH et fréquentant une clinique antirétrovirale, sous antirétroviraux pendant plus d'un mois ont été invités à remplir des questionnaires qui ont enregistré des données sociodémographiques et d'autres variables psychosociales du patient en relation avec l'observance des médicaments prescrits. L'observance de la thérapie antirétrovirale a été évaluée à l'aide de l'auto-évaluation du patient.

Résultat : Un bon taux d'adhérence de 95,9% a été enregistré dans cette étude. Certains facteurs liés aux patients pouvant influencer l'observance du traitement étaient la posologie de 38,9%, les effets secondaires des médicaments de 29,5%, l'oubli de 29,2%, la faim et le temps de 0,6% et la peur de la stigmatisation de 0,2%. En utilisant l'analyse bi-variée, il n'y avait pas de signification statistique entre le niveau d'adhésion et les caractéristiques sociodémographiques des répondants.

Conclusion : On a observé que les patients ambulatoires adultes sous antirétroviraux ont bien observé le traitement.

Mots-clés : Thérapie antirétrovirale, adultes ambulatoires, observance, Ibadan

INTRODUCTION

The WHO defines adherence as "the extent to which the persons' behavior (including medication-taking) corresponds with agreed recommendations from a healthcare provider".[1] Adherence to treatment is taking the correct dose of a medication every time, exactly as prescribed; and this is difficult to measure accurately. The most commonly used method in resource-limited settings is self-report or pharmacy refill records.[2] Adherence has been shown to be a major predictor of viral suppression of HIV replication,[3] emergence of ART drug resistance,[4] disease progressions,[5] and death.[6, 7] Adherence monitoring and evaluation of ART are, therefore, essential public health surveillance tools in the prevention of HIV in high, middle, and low income countries.

Antiretroviral adherence is the second strongest predictor of progression to AIDS and death, after CD4 count. [7-9] Incomplete adherence to ART, however, is common in all groups of treated individuals. The average rate of adherence to ART is approximately 70%, despite the fact that long-term viral suppression requires near-perfect adherence.[10-12]

In an overview of thirteen peer-reviewed studies measuring adherence to ART in Nigeria (a developing country), patient self report was used as the assessor.[13] Four basic techniques have been developed for quantifying adherence, all of which have limitations.[14] First and most common are patient self-reports. These have the advantages of low cost and flexibility of design (questionnaires suit individual language abilities). The data are easily collected and can help to determine the reasons why patients are non-adherent. They assume, however, that patients can accurately recall their behavior and are providing honest answers. A major limitation of self-reports is that they reflect only short-term or average adherence and may often overestimate it. Several medication adherence rating scales (MARS) are now also very useful tools which are mostly dependent on patient recall. With a widespread use of antiretroviral (ARV) drugs, the once fatal disease is now a manageable chronic illness.[15]

The drugs improve immune status; reduce viral load [16] and incidence of hospitalization and mortality.[11] Patients also take medications for managing opportunistic infections with these drugs. These can add up to 16–20 pills daily, some requiring specific food or fluid restrictions. Furthermore, ARV drugs have side effects that may be temporary-nausea, vomiting, diarrhea or longer lasting-neuropathy, lipodystrophy. All these increase adherence challenges for patients and healthcare providers. For the goals of highly active antiretroviral therapy (HAART) to be achieved, high levels of adherence are required; an adherent patient being one who takes >95% of prescribed drug doses.[14] Missing even a few doses of ARV medication can lead to HIV drug resistance.[17]

Antiretroviral agents are given in combination, usually of at least three agents, to improve efficacy and reduce the development of viral resistance. Treatment regimens are frequently complex and many of the drugs have significant toxicities and interactions with other drugs and with food. A high level of adherence to therapy is vital to ensure efficacy and prevent the emergence of resistant virus. A rate of adherence of approximately 90%–95% is required to avoid rapid development of drug resistance and treatment failure.[13] Non-adherence facilitates the emergence of drug-resistant variants, which in time will lead to virological treatment failure.[18] Even with the development of more potent and sophisticated anti-retroviral compounds, success will only be achieved when patients adhere adequately to the dosing schedules.[19] Adherence to treatment is pivotal to success. Studies from Canada and developed countries in Latin America and Europe demonstrate similar rates of suboptimal adherence.[20-25] In general, 10% of patients report missing at least one antiretroviral dose on any given day and 33% report missing at least one dose within the past month.[26] Rates of adherence also are known to decline over time.[27, 28] Some studies in different geopolitical zones of Nigeria reveal a decline (<50%) in adherence to ARTs already.
Through this study, we hope to assess the level of adherence to anti-retroviral therapy (ART) and to explore factors affecting them in adult out-patients on antiretroviral therapy at the AIDS Prevention Initiative in Nigeria (APIN) antiretroviral clinic of Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan, Nigeria.

METHODS

This descriptive study of adult out-patients on antiretroviral therapy, and a prospective investigation of patient factors impacting adherence to antiretroviral therapy was conducted at the AIDS Prevention Initiative in Nigeria (APIN) antiretroviral clinic of Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan, Nigeria from June to November, 2013. Ethical clearance (AD/13/479/393) was obtained from the Ministry of Health, Oyo State and the authorities of the APIN clinic, Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan.

The sample size was calculated using Leslie Kisch's formula: $n=Z^2pq/d^{2.}$

Where n= minimum sample size, Z=1.96 (the standard normal deviate usually set at 1.96 which corresponds to the 95% confidence level), p= 0.50 (i.e. 50%, the proportion in the target population estimated to have a particular characteristic.), q=1-p=0.50, d=5% level of significant (the degree of accuracy desired, usually set at 5% i.e. 0.05), $n= (1.96)^2(0.50)\ (0.50)/0.05^2$.

n=384 adult out-patients that are on antiretroviral therapy for more than a month.

Systematic random sampling technique was used to recruit participants for the study for a period of 6 months. All HIV-positive patients who have been on ART for at least 1 month and attending the clinic as well as all the patients on ART who consented to participate in the study where included, whereas the following categories of patients were excluded from the study: non-adults, all HIV-positive patients attending the clinic; but have not started ART, patients on ART for less than 1 month, patients who will not consent. All data collected from patients in the course of the research was held highly confidential. Names of patients were not required in this study.

There are several newer medication adherence rating scales (MARS), but patient's self report, which is the most common tool and easiest-to-use in a resource limited setting, was utilized. A structured interviewer-administered questionnaire consisting of 60 questions was used in this study. There were nineteen questions on socio-demographic data, five on substance use and medication belief respectively. Fifteen questions were on patients' knowledge of HIV/AIDS, ARV drugs, side effects and medication adherence. Eight questions were on pharmaceutical care, three on social support, two on diet intake, two on time factor and one on patient's suggestion/view to assessing ARV drugs. A total of 500 patients from the study population were invited to complete a pretested questionnaire which recorded the personal data and variables in relation to adherence to prescribed medication after obtaining their consents. Adherence to treatment was assessed using patients' self-report. Good adherence to ART was defined as taking of greater than 95% of prescribed drug doses.

Data analysis

Data was entered, edited, and analyzed with SPSS statistical software (version 20.0). This included the analysis of patient's socio-demographics data of age, marital status, number of children, occupation, educational level, accommodation type, ethnicity and religion. Frequency table diagrams for these data were computed. The main variables of interest were adherence level to antiretroviral therapy and the factors affecting adherence. Univariate analysis was employed to calculate frequencies and distributions of each variable. Chi-square test was used for bivariate analysis to test the significance of the association between categorical variables and the level of adherence to antiretroviral therapy.

RESULTS

Table 1 shows the demographic characteristics of the respondents. Three hundred and eighty four (384) questionnaires were administered in this study with a completion rate of 83%, giving a total of three hundred and nineteen (319) properly filled questionnaires. The mean age of respondents is 36.5 ± 9.31 (SD). Most of the respondents were female 221 (69.3%), while 98 (30.7%) were male. Two hundred and twenty five (70.5%) were married, 48 (15.0%) were single, 10 (3.1%) were divorced, 19 (6.0%) were separated and 19 (6.0%) were widowed. Two hundred and ten (65.8%) have 1 to 3 children, 98 (30.7%) have 4 to 6 children, while 11 (3.4%) have 7 to 9 children. Twenty three (7.2%) of the respondents stated that their children were HIV positive while 293 (63.0%) respondents did not have HIV positive children. Majority of the respondents were Nigerians 310 (97.2%) who had secondary school education 144 (45.1%), 62 (19.4%) had post secondary school education, 92 (28.8%) had primary school education, while 21 (6.6%) had no formal education.

Table 1: Respondents' demographic characteristics

Respondents' demographic factor	Frequency (%)
Sex	
Male	98(30.7)
Female	221(69.3)
Age groups	
18-25	38(11.9)
26-35	121(37.9)
36-45	92(28.8)
Over 45	68(21.3)
Mean Age(SD)= 36.5(9.31)	
Marital status	
Married	225(70.5)
Single	48(15.0)
Divorced	10(3.1)
Separated	17(5.3)
Widowed	19(6.0)
Number of children	
1-3	210(65.8)
4-6	98(30.7)
7-8	11(3.4)
HIV status of children	
Positive	23(7.2)
Negative	296(92.8)
Nationality	
Nigerian	310(97.2)
Non-Nigerian	9(2.8)
Religion	
Christianity	166(52.0)
Muslim	153(48.0)
Educational Level	
Post Secondary School	62(19.4)
Secondary	144(45.1)
Primary	92(28.8)
None	21(6.6)
Employment Status	
Salary earner	62(19.4)
Self-employed	231(72.4)
Unemployed	26(8.2)
Working Hours per day	
8hours	113(35.4)
More than 8 hours	167(52.3)
Less than 8 hours	13(4.1)
Do not work	26(8.2)
HIV Diagnosis Date	
2005-2007	16(5.0)
2008-2010	71(22.3)
2011-2013	232(72.7)

The bivariate analysis of the adherence level and socio demographic characteristics of respondents is shown in Table 2.

Table 2: Bivariate analysis of adherence level and sociodemographic characteristics of respondents

Sociodemographic characteristic	Do you take the right dose at the right time		Total	Chi square	P value (<0.05)
	Yes (%)	No (%)			
Sex					
Male	92(93.9)	6(6.1)	98(100)	1.517	0.218
Female	214(98.6)	7(3.2)	221(100)		
Marital status					
Married	217(96.4)	8(3.6)	255(100)	3.221	0.522
Single	46(95.8)	2(4.2)	48(100)		
Divorced	10(100)	0(0.0)	10(100)		
Separated	15(88.2)	2(11.8)	17(100)		
Widowed	18(94.8)	1(5.3)	19(100)		
Age					
18-25	38(100.0)	0(0.0)	38(100)	2.716	0.430
26-35	114(94.2)	7(5.8)	121(100)		
36-45	88(95.7)	4(4.3)	92(100)		
>45	66(97.1)	2(2.9)	68(100)		
Religion					
Muslim	145(94.8)	8(5.2)	153(100)	1.001	0.317
Christian	161(97.0)	5(3.0)	166(100)		
Educational level					
Post Secondary	58(93.5)	4(6.5)	62(100)	2.117	0.549
Secondary	138(95.8)	6(4.2)	144(100)		
Primary	89(96.7)	3(3.3)	92(100)		
None	21(100.0)	0(0.0)	21(100)		
Employment status					
Salary earner	61(98.4)	1(1.6)	62(100)	2.478	0.290
Self employed	221(95.7)	10(4.3)	231(100)		
Unemployed	24(92.3)	2(7.7)	26(100)		
Living condition					
Good	66(95.6)	3(4.4)	69(100)	0.778	0.678
Average	222(96.1)	10(3.9)	232(100)		
Indigent	18(100.0)	0(0.0)	18(100)		
House distance to hospital					
Close	117(97.5)	3(2.5)	120(100)	1.054	0.590
Far	136(95.1)	7(4.9)	143(100)		
Very far	53(94.6)	3(5.4)	56(100)		

Table 4: Bivariate analysis of daily frequency of antiretroviral drug intake (dosing) and sociodemographic characteristics of respondents

Sociodemographic Characteristic	How many times do you take them daily (%)			Total (%)	Chi Square	P value (<0.05)
	Once	Twice	Thrice			
Sex						
Male	65(66.3)	33(33.7)	0(0.0)	98(100.0)	32.622	0.000
Female	71(32.1)	149(67.4)	1(0.5)			
Marital status						
Married	97(43.1)	127(56.4)	1(0.4)	225(100)	5.286	0.727
Single	18(37.5)	30(62.5)	0(0.0)	48(100)		
Divorced	3(30.0)	7(70.0)	0(0.0)	10(100)		
Separated	6(35.3)	11(64.7)	0(0.0)	17(100)		
Widowed	12(63.2)	7(36.8)	0(0.0)	19(100)		
Age						
18-25	14(36.8)	24(63.2)	0(0.0)	38(100)	17.822	0.007
26-35	43(35.5)	78(64.5)	0(0.0)	121(100)		
36-45	37(40.2)	55(59.8)	0(0.0)	92(100)		
Over 45	42(61.8)	25(36.7)	1(1.5)	69(100)		
Educational level						
Post secondary	18(29.0)	44(71.0)	0(0.0)	62(100)	24.207	0.000
Secondary	51(35.4)	93(64.6)	0(0.0)	144(100)		
Primary	53(57.6)	38(41.3)	0(0.0)	92(100)		
None	14(66.7)	7(33.3)	0(0.0)	21(100)		
Employment status						
Salary earner	18(29.0)	44(71.0)	0(0.0)	62(100)	6.514	0.164
Self employed	105(45.5)	125(54.1)	1(0.4)	231(100)		
Unemployed	13(50.0)	13(50.0)	0(0.0)	26(100)		

DISCUSSION

From the results obtained, a good adherence level of 95.9% was recorded (306 of the 319 respondents take their medication adequately). Good adherence to antiretroviral therapy is defined as taking of greater than 95% of prescribed drug doses.[14] This is higher than adherence level 87.9% to ARVs in a study in Jos [29] and 49.2% in the Niger-Delta region.[30] Average estimates of ARV non-adherence in the United States range from 50% to 70%.[11] The dosage regimen of the ART observed in this study might have enhanced better medication adherence.

Majority of the respondents, 311 (97.5%) see taking their antiretrovirals as a necessity. Three hundred and eight (96.6%) have felt better since the commencement of ARVs. Most of the respondents 280 (87.8%) do not feel stigmatized. Two hundred and twenty six, 226 (70.8%) do not worry if people are aware of their positive HIV status; and also, 301 (94.4%) of the respondents have the support of their family members.

Adequate pharmaceutical care practiced at the APIN clinic (a health-care provider factor other than patient-factor) was observed to have possibly enhanced the high level of adherence to ARVs in this study. Three hundred and fifteen, (98.7%) of the respondents were aware that the clinic has a pharmacy department where they collect their medication(s). Three hundred and seventeen (99.4%) of them said the pharmacist handover their drugs to them. Three hundred and ten, (97.8%) attested to patient-counseling by the pharmacist on how to take their drugs, expected side-effects etc. Three hundred and sixteen (99.0%) respondents attested that the pharmacist is of a professional and friendly attitude. Three hundred and nine, (96.9%) of the respondents also attested that they can freely discuss any problem they develop while taking their drugs with the pharmacist.

Diet is known to play a major role in HIV patients, 39 (12.2%) of the respondents are on special diet, while 280 (87.8%) are not. Majority of the respondents 165 (51.7%) attested that they cannot afford special diet even when placed on it. Most of the respondents 273 (78.6%) also suggest that they should be more time conscious at the ARV clinic, as about 67 (21.0%) of them have lost income/wages because they attended the clinic.

Using bivariate analysis, there was no association (statistical significance) between adherence level and sociodemographic characteristics of the respondents which include age, sex, marital status, religion, educational level, employment status, living condition and house distance to the clinic.

However, significant association was observed between daily frequency of drug intake (dosing) and some socio demographic characteristics like sex, age and educational level. Other demographic characteristics like marital status and employment status were not associated with the daily dosing of ARV drugs.

Self-report and healthcare professional assessments are the most common tools used to rate adherence to medication.[31] The most common drawback is that patients tend to under report non-adherence to avoid disapproval from their healthcare providers.[32] Many authors believe that these subjective methods are the least reliable among all.[33] Nevertheless, their low cost, simplicity, and real-time feedback have contributed to their popularity in clinical practice.[34-36] Another limitation was the confidential nature of the clinic.

CONCLUSION

A good adherence level of 95.9% was recorded in this study. Some patient factors that could affect adherence to ART were pill burden, drugs' side effects, forgetfulness, hunger, time and fear of stigmatization. There was no significant association between adherence level to antiretroviral therapy and socio-demographic characteristics like age, sex, religion, marital status and employment status. A higher level of adherence to antiretroviral therapy in ARV clinics could still be achieved than what was observed in this study. Pharmaceutical care practice should be improved upon for better patient-medication compliance. Better time management skills should be utilized by health-care professionals at the ARV clinic to reduce the time patients spend at the clinic. Some of the patients have lost wages/income because they attended clinic and this could discourage subsequent attendance.

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