Full Length Research Paper

Adherence to highly active antiretroviral therapy and its challenges in people living with human immunodeficiency virus (HIV) infection in Keffi, Nigeria

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Adherence to highly active antiretroviral therapy (HAART) is pivotal in reducing viral transmission, preventing viral drug resistance and improving life expectancy of patients. A baseline cross-sectional survey of the level of adherence to ART and its challenges was carried out among adults accessing this service at Federal Medical Centre, Keffi, Nigeria. This was to assess the level of adherence and identify factors militating against it. Two hundred and fifty consenting human immunodeficiency virus (HIV) positive patients were recruited and interviewed using a structured questionnaire. The level of adherence to ≥ 95% of the prescribed medication within the 7 days preceding the interview in this population was 62.8% and only 31.2% of them in this category reported 100% adherence. Adherence was the highest (77.6%) and significantly associated with disclosure of HIV status to family members (p ≤ 0.05) and similarly among those living with their families (85.8%) (p ≤ 0.05). Neither the use an alarm, other people or self was found to be associated with better adherence to medication (p > 0.05). Common reasons for non-adherence were found to be forgetfulness (51.5%), avoiding drug side effect (14.5%), living far away from the medical centre (8.1%) and inability to afford the cost of transportation to the medical centre (6.5%). Patient's educational level, marital status and occupation were found to be significantly associated with adherence ART in this study (p ≤ 0.05). On the whole, the level of adherence to HAART in this study population still needs improvement. The decentralization of HAART services to primary healthcare facilities and the intensification of patients' education and counseling are advocated.

Key words: Human immunodeficiency virus (HIV), antiretroviral therapy, adherence, non-adherence, Nigeria.

INTRODUCTION

The human immunodeficiency virus (HIV) has remained a public health burden especially in sub-Saharan Africa which habours 68% of the world infected population and Nigeria which carries 10% of the world burden (Bello, 2011).

In response to this pandemic, the highly active antiretroviral therapy (HAART) has been made available to those that require it. However, it has to be taken throughout life (Lal et al., 2010). An adherence level of ≥

95% to this therapy is critical in obtaining its full benefits like maximum and durable suppression of viral replication, reduced destruction of CD4 cells, prevention of drug resistance, promotion of immune reconstitution, slow progression of disease and reducing transmission rates (Bangsberg et al., 2006; Chesney et al., 2006; Mills et al., 2006; Chabikuli et al., 2011). Adherence is the patient's ability to take drugs correctly, that is, in the right dose, with the correct frequency and at the right time daily (Bello, 2011). Although there is no gold standard for measuring adherence, the commonly used methods include: patient self report, pill counts, pharmacy refill records, electronic drug monitoring, biochemical markers, therapeutic drug monitoring and physician assessment

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(Monjok et al., 2010). However, the most common method used in resource-limited settings is self report or pharmacy refill records (Chesney et al., 2006). A notable reduction in HIV-related mortality and morbidity has also been reported to be associated with adherence to HAART (Hardon et al., 2007; Ukwe et al., 2010; Rachlis et al., 2011).

Adherence to HAART and barriers to adherence have been reported to vary from one country to another and even from one setting to another within the same country (Mills et al., 2006). The prevailing level for sub-Saharan Africa is 77% (Chabilkuli et al., 2010). Other studies have reported levels of 68% in Uganda (Byakika-Tusiime et al., 2005), 22% in Cote D' Ivoire (Eholie et al., 2007) and 71% in South Africa (Chabilkuli et al., 2010). In Nigeria, adherence of 49.2% has been reported in Kano (Nwanche et al., 2006), 85% in Sagamu (Idigbe et al., 2005) and 58% in Benin City (Erah and Arute 2008). Systematic reviews in developing countries have noted that factors militating against adherence include cost, stigma, alcohol abuse, pharmacy stock-out and distance from dispensing centers (Monjok et al., 2010).

Despite the importance of adherence as the fulcrum of the success of any HIV treatment initiative, it has some challenges for many patients in the different domains. The study is aimed at studying adherence to HAART and evaluating factors militating against it among adult infected patients accessing this healthcare service in a Federal Medical Centre in Nigeria. This is with a view to advice on the improvement of service delivery to this study population.

METHODOLOGY

Setting

This study was a cross-sectional study conducted in a Sexually Transmitted Disease clinic within a Federal Medical Centre in North Central Nigeria. The clinic provides healthcare for people living with HIV and other sexually transmitted infections and HAART is provided free of charge.

Study population and data collection

The study was carried out among 250 HIV positive consenting adults who had been enrolled for ART in the clinic for not less than 6 months. A structured interviewer administered questionnaire (designed for this study) with closed ended questions on general demography, self-reported adherence, and factors influencing adherence was used for the study.

Adherence was assessed by the self-reporting method of participants. It was defined as taking at least 95% of the prescribed medication in the preceding 7 days before the interview (Adoption of this short period was to avoid recall bias). The percentage adherence was calculated as the number of times the patient recalled to have taken medication (morning and evening) in the preceding week, divided by the total number of doses prescribed for the week, multiplied by 100 (Chabikuli et al., 2010).

Patients were classified as non-adherent if they missed more than 5% of their doses within the stated period. Using a checklist, participants also indicated the common reasons for skipping their

medication.

Inclusion and exclusion criteria

Patients aged ≥18 years on HAART for more than 6 months and willing to take part in the study were eligible for inclusion. Pregnant women and diabetes patients were excluded.

Ethical approval

Approval for this study was granted by the Federal Medical Centre, Keffi Ethical Review Committee on Human Research.

Statistical analysis

Data was entered into Microsoft excel and analyzed using Statistical Package for Social Sciences (SPSS) 10.0. Chi square test was used to determine the degree of associations. A p value of ≤ 0.05 was considered significant.

RESULTS

A total of 250 people living with HIV and accessing healthcare in Federal Medical Centre, Keffi volunteered to participate in the study. Sixty-two percent of them were from outside Keffi town. There were more females (61.6%) than males (38.4%) and most of the participants were of age 25 to 34 (36.8%). About 70% of the volunteers had at least an elementary education and were into various endeavors (Table 1). The level of adherence in this study population was 62.8%, although among these only 31.2% had not missed taking their HAART in the one week preceding the study. More females missed their medication (65.7%) than their male counterparts (34.3%). Among those that had 100% adherence (never missed taking their drugs), 51.1% were males while 44.9% were females (p ≤ 0.05) (Table 2).

Adherence was the highest (77.6%) among HIV positive patients who disclosed their status to members of their family (p > 0.05) while no particular method of reminder was related to a better adherence (p ≥ 0.05) (Table 3). Table 3 also shows that participants living with their families were the most adherent to their treatment regimens while those that lived alone were the most non-adherent to HAART (p ≤ 0.05).

The most common reason for non-adherence in this study population was forgetfulness (51.5%) and the least was inability to pay for transportation to the medical centre (Figure 1).

Occupation, educational level and marital status were found to be positive predictors to adherence (p ≤ 0.05) while gender, age and place of aboard had no association with adherence (p > 0.05) (Table 4).

DISCUSSION

Of the 250 patients recruited for this study, only 62.8%

Table 1. Demographic characteristics of the study population.

Demographic characteristic	Sex		Total (%)
	Male (%)	Female (%)	
Age (years)			
18- 24	13 (13.5)	34 (22.1)	47 (18.8)
25- 34	33 (34.4)	59 (38.3)	92 (36.8)
35- 44	27 (28.1)	37 (24.0)	64 (25.6)
45- 54	18 (5.2)	17 (11.0)	35 (14.0)
≥ 55	5 (5.2)	7 (4.5)	12 (4.8)
Residence			
Keffi	39(40.6)	56 (36.4)	95 (38.0)
Out of Keffi	57 (59.3)	98 (63.6)	155 (62.0)
Marital status			
Married	57 (59.3)	79 (51.2)	136 (54.4)
Single	24 (25.0)	34 (22.1)	58 (23.2)
Divorced	0 (0.0)	20 (8.0)	20 (8.0)
Tertiary	15 (15.6)	21 (13.6)	36 (14.4)
Occupation			
Civil servants	18 (18.8)	23 (14.9)	41 (16.4)
Unemployed	16 (16.7)	19 (12.3)	35 (14.0)
House wife	0 (0.0)	65 (42.2)	65 (26.0)
Business	19 (19.8)	18 (11.7)	37 (14.8)
Labourer	25 (26.0)	0 (0.0)	25 (10.0)
Others	12 (12.5)	35 (22.7)	47 (18.8)
Level of education			
None	25 (26.0)	48 (31.2)	73 (29.2)
Elementary	19 (19.8)	37 (24.0)	56 (22.4)
Secondary	34 (35.4)	40 (26.0)	74 (29.6)
Widow	18 (18.8)	29 (18.8)	47 (18.8)

Table 2. Level of adherence to HAART among the study population.

Level of adherence	Sex		p value
	Male (%)	Female (%)	
< 95.0%	36 (38.7)	57 (61.3)	0.006
$\geq 95.0\%$	60 (38.2)	97 (61.8)	
Have skipped medication	69 (34.3)	132 (65.7)	0.007
Have never skipped medication	27 (55.1)	22 (44.9)	

reported ≥ 95% adherence in the 7 days preceding the interview while 37.2% did not achieve this required level of adherence. The reported adherence to HAART of 62.8% in this study is similar to reports from Ibadan a city in Southern Nigeria (Olowoorekere et al., 2008) and among children in Kano a city in Northern Nigeria (Zubayr et al., 2011) where 62.9 and 65.6% were reported, respectively. Higher levels of adherence have been reported from other parts of Nigeria as 70.8% (Salami et al., 2010) and 73.3% (Bello, 2011) from Ilorin, 78.3% among pregnant women in Nnewi (Igwegbe et al., 2010), 86% in South-Eastern Nigeria (Ukwe et al., 2010) and 80% in Kano (Muktar-Yola et al., 2006). Similarly, 88 and 80% adherence has been reported during Ramadan

Table 3. Relationship between HIV status disclosure, method of drug reminder living companion and adherence among patients in   Federal Medical Centre Keffi

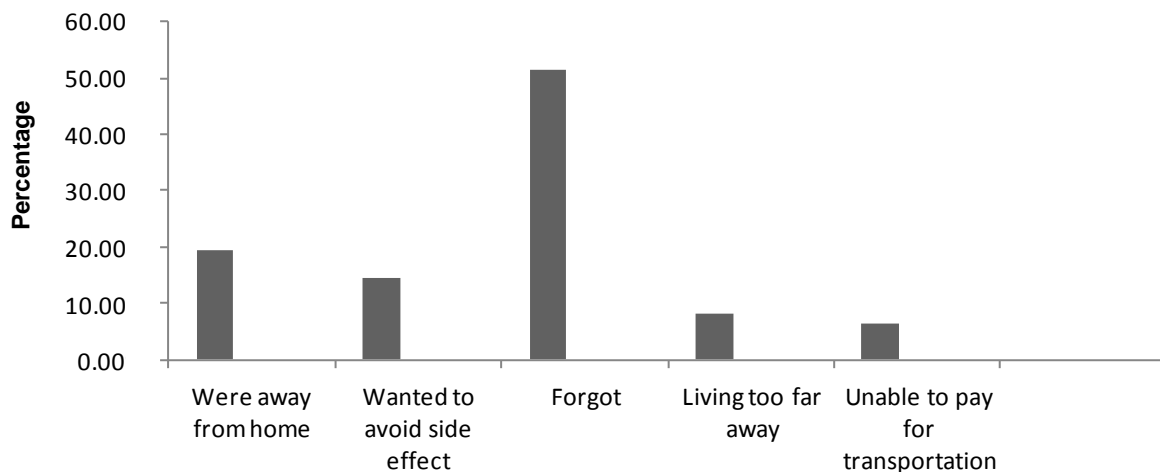| Parameter	Adherence status		p value
	Adherent (%)	Non adherent (%)	
Disclosure status			
Family	173 (77.6)	50 (22.4)	
Friends	9 (50)	9 (50)	0.028
Did not disclose	6 (3.2)	3 (4.8)	
Method of reminder			
People	87 (76.3)	27 (23.7)	
Alarm	95 (74.4)	33 (25.8)	0.931
None	6 (75.0)	2 (25.0)	
Company			
Alone	18 (46.2)	21 (53.8)	
With Family	157 (85.8)	26 (14.2)	0.000
With others	13 (6.9)	15 (24.2)	

Figure 1. Reasons for non adherence by HIV positive patients accessing HAART in Federal Medical Centre, Keffi.

among non-fasting and fasting Muslims, respectively (Habib et al., 2009). A similar study among HIV patients without depressive disorder found an adherence level of 78.9% (Olisah et al., 2010). Some African countries have also reported levels higher than observed in this study. These include reports of 71% in Rustenburg, South Africa (Chabikkuli et al., 2010) and 82% in Nairobi, Kenya (Wakibi et al., 2011). However, some studies in Nigeria have reported lower adherence as compared to what was reported in this study. There have been reports of 58% in Benin City (Erah and Arute, 2005), 44% in Ile-Ijesha (Afolabi et al., 2009), 49.2% in Niger-Delta (Nwauche et al., 2006) and 36.3% among patients with a depressive disorder (Olisah et al., 2010).

These various levels of adherence in different places

might have been as a result of the fact that there is no gold standard in the measurement of this parameter. For example, different studies used different periods of recall time to determine adherence. Another important factor is the difference in healthcare service provided to the patients. For example, most of the studies failed to state whether or not ART was given free of charge to patients. This is an important information because Bello (2011) posited that an improvement in adherence in their study could be traced to the free health care service for their patients.

The prevalence of non-adherence in this study is similar to the 37.1 and 37.4% reported by Olooworeke et al. (2008) and Shaahu et al. (2008), respectively in Ibadan, Nigeria but higher than 21.7% reported among

Table 4. Influence of socio-demographic characteristics on adherence to HAART among PLWH accessing HAART in Federal Medical Centre, Keffi.

Demographic characteristic	Sex		Total (%)
	Male	**Female**	
Age (years)			
18- 24	13 (13.5)	34 (22.1)	47 (18.8)
25- 34	33 (34.4)	59 (38.3)	92 (36.8)
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Tertiary	18 (18.8)	29 (18.8)	47 (18.8)

*Significant ($p \leq 0.05$).

pregnant women in Nnewi, Nigeria (Iwegbe et al., 2010). In fact, even among the adherents, only 31.2% of them reported 100% adherence whereby they did not skip their medication in the 7 days preceding the study. More males achieved this feat than women. The reason for this is not very obvious.

This study was carried out in a facility where ART is given free of charge, therefore, the impediment to low uptake due to cost did not arise. The reason given by majority of the patients for not taking their medication was forgetfulness (51%). This is similar to reports from Ibadan (Olowookere et al., 2008) and Nnewi (Iwegbe et al., 2010). To forestall skipping their drugs, some patients in this study admitted using some form of reminder. Common among both adherents and non-adherents was the use of people (parents, children, friends) and an alarm. Paradoxically, in this study, 53.2% of non-

adherents also reported the use of an alarm as a reminder. The problem with this is the fact that you need to be in a place where your attention can be drawn by the alarm otherwise the aim is easily defeated. Electronic devices and telephone support services have been effectively used in some parts of the world (Katz and Rice, 2009; West, 2012). However, these are not yet very effective in the study area, because of challenges emanating from the partial availability of the required social services. Iwegbe and colleagues (2010) also noted that the use of these technology supported services may not be feasible in the West African sub-region. It is pertinent to lay emphasis on the importance of adherence although patient's participation in treatment decision has been variously suggested (Nwauche et al., 2006) hoping this will also forestall forgetfulness. On the whole, there was no method of reminder that was related to better

adherence (p > 0.05) in this study.

Being away from home (19%), wanting to avoid the drug side effect (16%), living too far away from the service center (8%) and unable to afford getting to the service center (6%) were the other reasons affecting adherence in the study population. People who live far away from the service providing centers and those economically challenged are very likely to be inconsistent or even abandon treatment. In some cases, they may end up with traditional medicine which is usually within reach. Another likely scenario is that travel cost and time required to get to the service center may lead to borrowing of medication from other patients. And non-adherence by 16% of the participants just for wanting to avoid the drug side effect is worrisome. It is very important that medical personnel are encouraged to discuss possible side effects of administered drugs with patients. And ART service centers should be encouraged to float Pharmacovigilance Committees to monitor cases of drug adverse reactions among patients on HAART. Groh et al. (2011) posited that normally a patient will not stop taking the drug if he/she is aware of possible side effects.

The disclosure of HIV status to family members and also living with them were found to be positive predictors for adherence (p ≤ 0.05). Studies have indicated that disclosing one's HIV status helps to reduce stress and isolation with a consequent increase in social support and adherence (Palva et al., 2011). Family members and friends can play the role of treatment partners and will usually be willing to provide moral and material support. It also helps negotiation for safer sex which impacts positively in controlling the spread of the HIV scourge. However, non- disclosure of HIV status has been reported from a meta-analysis in Africa as a predictor of poor adherence (Reda and Biadgiliga, 2012).

Marital status was significantly associated with adherence whereby married people recorded the highest level of adherence (81.6%) as compared to singles (69%), widows (69%) and divorcees (60%). A similar observation was reported by Nwauche et al. (2006). This might not be unconnected with the fact that having a partner especially one who is on the same medication or to whom your HIV status has been disclosed has an advantage, because you can remind each other. Also, some of these participants have children and feel they must do their best to live and remain healthy for the sake of the children (personal communication). In contrast, an earlier study in Nigeria had reported a non-association between marital status and adherence (Afolabi et al., 2009).

The literacy level of the participants was found to be significantly associated with adherence (p < 0.05). Adherence was found to be higher (82.6%) among literate participants than those of them that were not literate (61.7%). This difference was statistically significant (p ≤ 0.05). Level of education is an important index in all spheres of public health (Adams, 2002; Feistein and

Hammond, 2004; Cowell, 2005). This is because it is generally assumed that educated people have an added advantage of being able to source for information from various places and are more likely to make better informed decisions on their own. In fact Iwegbe et al. (2010) posited that education may impact on adherence in ways which consequently result in enhancing the implementation of the recommendations regarding adherence. In a study in Kano, patients with formal education were 4 times more likely to be adherent than those without formal education (Iliyasu et al., 2005). Similarly, low education level was also found to be associated with non-adherence (Nwauche et al., 2006; Iwegbe et al., 2010; Hegazi et al., 2010; Bello, 2011).

With respect to occupation, civil servants were found to be the occupational group with the highest adherence level (95.1%). This is probably because in the study area, the educated people are generally the civil servants. It was therefore not surprising that the degree of adherence was higher among them.

Age and sex were not positive predictors of adherence in this study and also in an earlier study by Afolabi et al. (2009). However, in a study in Ilorin being female and older age were reported as positive predictors of adherence (Salami et al., 2010).

Conclusion

The 37.2% non-adherence in this present study population is a cause for alarm. It also underscores the urgent need for any intervention that will improve adherence in these patients, because apart from the harm to themselves, the development of resistant viral strains is a major public health concern. Also, based on the reasons reported for failure to achieve adherence, it is imperative that the issue of decentralization of treatment centers to primary healthcare facilities which are usually within the communities be considered. Worthy of note also is the need for alternative regimens for patients experiencing adverse side effects. Re-strategizing on improving patient education and counseling will go a long way in improving ART adherence especially as it is free of charge in this study area. Adherence studies should be carried out from time to time even within the same group of patients especially after interventions to determine the success. There is also a need to develop a gold standard for methods of accessing adherence.

LIMITATION

There are limitations to our study, because of its cross-sectional design and the convenience of the sample used. Being an intended baseline study, we assessed only adherence to therapy at a single time point. This therefore makes it impossible to evaluate variations in

adherence over time for an individual.

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