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Factors Associated With Level of Adherence to Antiretroviral Therapy in People Living with HIV/AIDS at Adama Hospital Medical College Art Clinic, Oromiya Regional State, Ethiopia

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Abstract: Both Human Immunodeficiency Virus (HIV) infection and Acquired Immunodeficiency Syndrome (AIDS) remain major public health problems in Ethiopia. Good adherence to antiretroviral therapy is necessary to achieve the best virological response, lower the risk of treatment failure and drug resistance, and reduce morbidity and mortality. There are many alterable factors known to affect the treatment adherence. In this regard, there have been very limited researches particularly in Adama. Therefore, this study was aimed to determine the adherence level and its associated factors among adult people living with HIV and attending their clinical care in Adama Hospital Medical College. A hospital based cross sectional study was conducted from October 1, 2016 - January 30, 2017 G. C in Adama Hospital Medical College among 190 PLWHA on ART. Systematic sampling method was used to select study participants. Data was collected by interviewing the clients and review of their medical records using structured questionnaire and checklist. Data entry and analysis was performed using SPSS for windows version 20.0. Descriptive statics was used to summarize socio-demographic and other variables. Bivariate and multivariate analysis was used to evaluate the association between dependent and independent variables. Level of adherence in the week before interview was 92.6. Patients whose initial ART regimen was TDF-3TC-NVP, were 8 times (COR=8.444 (1.678, 42.501)), chance of <95% adherence than patients those started ART with TDF-3TC-EFV regimen. Patients with opportunistic infection were about 8 times (COR=7.593 (2.196, 26.248)) chance of <95% adherence than their counter group respectively. Patients whose waiting time >30 minutes were 8 times (AOR=8.019 (1.161, 55.390)) chance of <95% adherence than their counter group. The level of adherence to ART was relatively higher when compared to others studies done in Ethiopia and other developing countries. But it was sub optimal to WHO adherence level (≥ 95%). The major reasons for missing doses were forgetfulness, away from home (travel) and lack of awareness. The level of adherence was significantly associated with variables like history of opportunistic infection, longer waiting time and starting treatment with TDF-3TC-NVP. This implicates further effort are still needed to push up the adherence to the level of WHO recommendation.

Keywords: Adherence, ART, PLWHA, OI

1. Introduction

The AIDS pandemic is currently the world's most deadly "war" which has killed 25 million people since it was first recognized in 1981, making it one of the most destructive epidemics in recorded history [1]. In 2010 there were 34 million people living with HIV (PLWHIV) worldwide and the majority of them were from sub-Saharan Africa [2, 3].

According to HIV Related Estimates and Projections for Ethiopia, the national prevalence of HIV infection in 2014 is

1.2% (1.6% for females and 0.8% for men) among adult population.

ART was introduced in Ethiopia in 2003, and in 2005 the Ethiopian Government launched free access in different health sectors to improve quality of life of PLWHIV [4, 5]. The increased availability of ART has essentially improved the survival rates through lowering incidence of opportunistic infections among people living with HIV. An infectious disease with an almost universally fatal outcome has been transformed into a manageable chronic infectious disease [6].

Even though access to ART is vital; ensuring the patients' adherence to the prescribed regimen is equally important [7, 8]. Adherence is defined as the extent to which a person's behavior in terms of taking medications, following a diet, and executing lifestyle changes follows agreed recommendations from a health care provider [9]. To obtain a successful treatment outcome the current treatment for HIV/AIDS requires adherence levels of greater than 95% [10].

There are many alterable factors known to affect the treatment adherence. Studies have reported a range of factors influencing ART adherence at various levels; however, the findings were varying depending on the contexts of the studies. Early identifying patients with poor adherence can improve survival time and prevent treatment failure.

2. Methods and Materials

2.1. Study Area and Period

The study was conducted at Adama Hospital Medical College, East Shoa Zone, Oromia Region, central, Ethiopia from October 1 to January 30, 2016 G. C.

2.2. Study Design

Hospital based cross sectional study design was used to determine the level of ART adherence and associated factors in the study area.

2.3. Source Population

Source population was all adult PLWHA started ART and on follow up in Adama hospital medical college ART center.

2.4. Study Population

Study population was all adult PLWHA on ART follow-up during data collection time in Adama hospital medical college ART center.

2.5. Study Unit

All adult PLWHA on ART follow-up during data collection time and selected by systematic sampling method.

2.6. Sample Size Determination and Sampling Technique

The sample size was determined by using single population proportion formula by considering adherence proportion from other study

$$n = \frac{z^2 p(1-p)}{d^2} \qquad (1)$$

Where n= sample size

Z=Z score at d= 95% Confidence level =1.96, p =0.85,

Since population number was known from ART clinic, N (total target population) = 6808, is less than 10,000, the sample size should be corrected using the formula:

$$\text{Corrected sample size (n}_{final}) = \frac{n \times N}{n + N} = 190 \qquad (2)$$

The sampling frame was a list of all ART patients at Adama Hospital Medical College, at a specific time who meets the inclusion criteria.

Study participants was selected by using systematic sampling techniques from constant K=15.

2.7. Data Collection and Analysis

Data was collected using structured data collection format; interview of clients and reviewing available patient chart and standard national HIV care ART clinic intake and follow-up form.

Data was entered and analyzed using SPSS version 20 for descriptive, bivariate and multivariate analysis to evaluate the association between dependent and independent variables. Association between dependent and independent variables was taken as statically significance at p-value less than 0.05 at 95% CI.
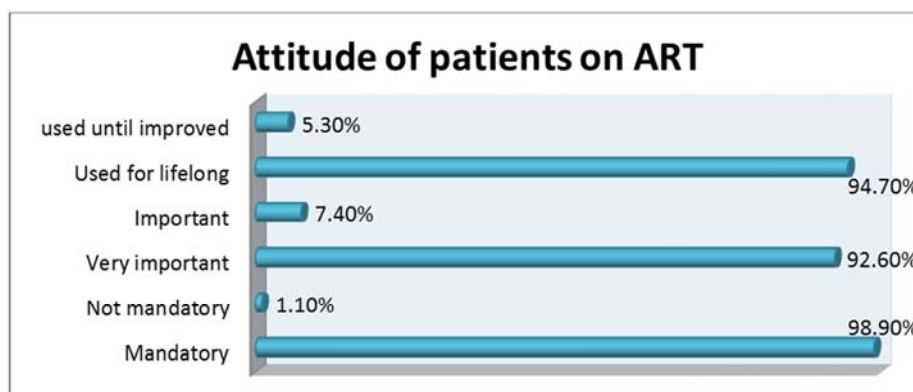

Figure 1. *Attitude of patients to ART among PLWHA on follow up in AHMC; 2016 (N = 190).*

2.8. Ethical Consideration

Ethical clearance was obtained from research publication office and formal letter was written from hospital administrator. Confidentiality of the information was assured and privacy of the respondents was maintained by avoiding all identifiers and using codes to identify records at analysis and participant was participating voluntarily.

3. Results

A total of 190 adult HIV patients on ART participated in the study with response rate of 100%. The median age of study participants was 38 years (SD±9.6).

Most of study participants were responding as ART drugs are mandatory, very important for them and should take lifelong (Fig. 1).
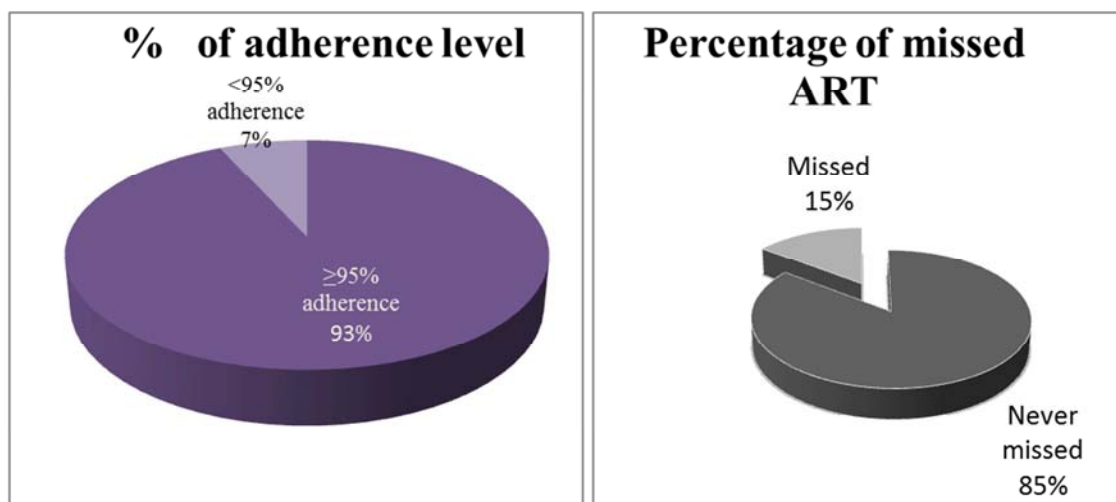

Figure 2. *Magnitude of missed ART and Adherence to ART among PLWHA on follow up in AHMC; 2016 (N = 190).*

The level of good ART adherence (>95%) was 92.6%; whereas, the rest 7.4% had <95% ART adherence (Fig. 2).

Factors affecting level of adherence

After binary logistic regressions; initial ART regimen, opportunistic infection and waiting time for service were the significant factors that affect adherent to ART treatment. Patients whose initial ART regimen was TDF-3TC-NVP,

were 8 times (COR=8.444 (1.678, 42.501)), chance of <95% adherence than patients those started ART with TDF-3TC-EFV regimen. Patients with opportunistic infection and waiting time >30 minutes were about 8 times (COR=7.593 (2.196, 26.248)) and 7 times (COR=8.667 (1.883, 39.897)) chance of <95% adherence than their counter group respectively (Table 1).

Table 1. *Associations of baseline, medication and service factors with level of ART adherence using binary logistic regression in AHMC among PLWHA (N = 190).*

Variables		Adherence		COR (95% CI)	P-value
		≥95% [N (%)]	<95%[N (%)]		
Baseline WHO stage	Stage I	21 (11.9)	2 (14.3)	1	
	Stage II	38 (21.6)	1 (7.1)	.276 (.024, 3.231)	.305
	Stage III	99 (56.2)	9 (64.3)	.955 (.192, 4.742)	.955
	IV+ unknown	17 (9.7)	2 (14.3)	1.167 (.149, 9.141)	.883
Baseline CD4 count	<200	90 (51.1)	5 (35.7)	1	
	200-350	69 (39.2)	9 (64.3)	2.348 (.753, 7.321)	.141
	>350+ Unknown	17 (9.7)	0 (0.0)	.000	.999
Initial ART regimen	TDF-3TC-EFV	76 (43.2)	3 (21.4)	1	
	TDF-3TC-NVP	12 (6.8)	4 (28.6)	8.444 (1.678, 42.501)	.010
	AZT-3TC-EFV	34 (19.3)	3 (21.4)	2.235 (.429, 11.646)	.340
	AZT-3TC-NVP	14 (8.0)	0 (0.0)	.000	.999
	d4T-3TC-EFV	13 (7.4)	0 (0.0)	.000	.999
	d4T-3TC-NVP	27 (15.3)	4 (28.6)	3.753 (.789, 17.861)	.097
No of tablets/day	≥3	28 (17.1)	1 (0.6)	1	
	2	62 (35.2)	8 (57.1)	3.871 (.463, 32.381)	.212
	1	84 (47.7)	5 (35.7)	1.786 (.200, 15.910)	.603
Frequency/day	Once	85 (48.3)	5 (35.7)	1	
	Twice	91 (51.7)	9 (64.3)	1.681 (.542, 5.218)	.369
OI	No	164 (93.2)	9 (64.3)	1	
	Yes	12 (6.8)	5 (35.7)	7.593 (2.196, 26.248)	.001
Other drugs	Yes	10 (5.7)	2 (14.3)	1	
	No	166 (94.3)	12 (85.7)	.400 (.079, 2.014)	.267

Variables		Adherence		COR (95% CI)	P-value
		≥95% [N (%)]	<95%[N (%)]		
Waiting time	≤30 minutes	104 (59.1)	2 (14.3)	1	
	>30 minutes	72 (40.9)	12 (85.7)	8.667 (1.883, 39.897)	.006
Recent CD4 count	>350	126 (71.6)	11 (78.6)	1	
	200-350	36 (20.5)	2 (14.3)	.636 (.135, 3.003)	.568
	<200	11 (6.2)	0 (0.0)	.000	.999
	Unknown	3 (1.7)	1 (7.1)	3.818 (.366, 39.858)	.263
Disclosure	Yes	151 (85.8)	13 (92.9)	1	
	No	25 (14.2)	1 (7.1)	.465 (.058, 3.710)	.470
Family support	Yes	144 (81.8)	13 (92.9)	1	
	No	32 (18.2)	1 (7.1)	.346 (.044, 2.742)	.315
BMI	<18.6	26 (14.8)	3 (21.4)	1	.
	18.6-24.99	142 (80.7)	9 (64.3)	.549 (.139, 2.166)	.392
	>24.99	8 (4.5)	2 (14.3)	2.167 (.306, 15.333)	.439
Daily dietary item	<4	154 (87.5)	13 (92.9)	1	
	4-5	22 (12.5)	1 (7.1)	.538 (.067, 4.321)	.560

In order to control the effect of confounding factors those variables with p value ≤ 0.25 on association of each independent variables on dependent variable were entered in to multivariate analysis. After multiple logistic regressions; waiting time for service was the most significant factors that affect adherent to ART treatment. Patients whose waiting time >30 minutes were 8 times (AOR=8.019 (1.161, 55.390)) chance of < 95% adherence than their counter group (Table 2).

Table 2. *Associations of socio-demographic, patient, economic, medication and environmental factors with level of ART adherence using binary and multiple logistic regression in AHMC among PLWHA (N = 190).*

Variables		Adherence		COR (95% CI)	AOR (95% CI)
		≥95% [N(%)]	<95% [N (%)]		
Marital status	Single	25 (14.2)	1 (7.1)	1	1
	Married	104 (59.1)	11 (78.6)	2.644 (.326, 21.446)	⊕
	Separated	7 (4.0)	2 (14.3)	7.143 (.562, 90.802)	⊕
	Divorced	14 (8.0)	0 (0.0)	.000	⊕
	Widowed	26 (14.8)	0 (0.0)	.000	⊕
Educational status	above grade 12	29 (16.5)	1 (7.1)	1	1
	grade 7-12	70 (39.8)	7 (50.0)	2.900 (.341, 24.637)	⊕
	grade 1-6	44 (25.0)	6 (42.9)	3.955 (.452, 34.576)	⊕
	Illiterate	33 (18)	0 (0.0)	.000	⊕
Occupation	Gove. employee	53 (30.1)	4 (28.6)	1	1
	Farmers + ^	31 (17.6)	0 (0.0)	.000	⊕
	House wife	28 (15.9)	3 (21.4)	1.420 (.297, 6.793)	⊕
	Private worker	34 (19.3)	7 (50.0)	2.728 (.742, 10.027)	⊕
	Daily laborer	30 (17.0)	0 (0.0)	.000	⊕
Initial ART regimen	TDF-3TC-EFV	76 (43.2)	3 (21.4)	1	1
	TDF-3TC-NVP	12 (6.8)	4 (28.6)	8.444 (1.678, 42.501)*	⊕
	AZT-3TC-EFV	34 (19.3)	3 (21.4)	2.235 (.429, 11.646)	⊕
	AZT-3TC-NVP	14 (8.0)	0 (0.0)	.000	
	d4T-3TC-EFV	13 (7.4)	0 (0.0)	.000	
	d4T-3TC-NVP	27 (15.3)	4 (28.6)	3.753 (.789, 17.861)	⊕
No of tablets/day	≥3	28 (17.1)	1 (0.6)	1	1
	2	62 (35.2)	8 (57.1)	3.871 (.463, 32.381)	⊕
	1	84 (47.7)	5 (35.7)	1.786 (.200, 15.910)	⊕
OI	No	164 (93.2)	9 (64.3)	1	1
	Yes	12 (6.8)	5 (35.7)	7.593 (2.196, 26.248)**	⊕
Baseline CD4 count	<200	90 (51.1)	5 (35.7)	1	1
	200-350	69 (39.2)	9 (64.3)	2.348 (.753, 7.321)	⊕
	>350+Unknown	17 (9.7)	0 (0.0)	.000	⊕
Waiting time	≤30 minutes	104 (59.1)	2 (14.3)	1	1
	>30 minutes	72 (40.9)	12 (85.7)	8.667 (1.883, 39.897)**	8.019 (1.161, 55.390)*

*p-value <0.05 ** p-value<0.01 ⊕ not significant
^ Commercial sex workers, no job.

4. Discussion

ART adherence was assessed by revising the patient chart patients self-report within the past 7 and 30 days prior to interview. Based on this, 92.6% individuals had good adherence to their ART drugs, which is lower than the recommended level of adherence. Despite the adherence level is less than the recommended level; the obtained result of this finding is higher than studies done in Addis Ababa in which adherence to ART medication was 81.2% [11]. The

reason for this difference could be that the studies in Addis Ababa involve many Hospitals while this study involves only one Hospital. The level of adherence in this study was also higher than those findings reported in Debre Markos [12] and Wolaita Soddo referral Hospitals [13] where the level of adherence was 88.6% and 87.4% respectively, 90% in Dessie [14], and Jimma where 36.19% of the respondents had poor adherence (less than 95%) [15].

The main reason for missing ART was forgetting to take ART, which was about 61%. This was also the main reason for missing ART as shown on other studies done in Ethiopia, eastern Ethiopia [16], Gobba [17], Jimma [15] and Kenya [18]. The reported reasons implicate a strong message for future intervention that can be tailored to each of them. For example, it is possible to craft an innovative way like reminding them through message using mobile phone technology.

Factors significantly associated with the ART adherence were initial ART regimen, opportunistic infections and waiting time. Patients who were started their ART management with TDF+3TC+NVP were more prone to <95% adherence than those on TDF+3TC+EFV. This might shows most patients with relative higher CD4 count may have adverse effect of the drug beyond the level of tolerance, which influence adherence.

On this study weiting time is the most significant factor, patients who are subjected to longer time (>30 minutes) in ART clinic during their follow up had <95% adherence than those spent ≤ 30 minutes, which is not comparable to the study done in eastern Ethiopia [16], which shows this variable was not significant and the reverse of this result. This might show that the service is boring to patients and missed their subsequent appointments appointment.

5. Conclusion and Recommendation

The level of adherence to ART was relatively higher when compared to others studies done in Ethiopia and other developing countries. But it was sub optimal to WHO adherence level (≥ 95%). The major reasons for missing doses were simple forgetfulness, away from home (travel) and lack of awareness. The level of adherence was significantly associated with variables like starting treatment with TDF-3TC-NVP, history of opportunistic infection and longer waiting time. This implicates further effort are still needed regarding reminding patients to take their treatment on time; prevent, screening, and early treatment of opportunistic infections and advance the service more to push up the adherence to the level of the WHO recommendation. Time management should be considered on care provision not to be boring to patients and to make them avail in subsequent appointments.

6. Strengths and Limitations

The study also include institutional and Health profession related effect on none adherence, but may be subjected to biased since the data was collected by trained nurses from ART clinic. Secondary data was reviewed to identify the clinical markers in addition to primary data and 7 day recall was used to minimize this recall bias to a minimum.

References

[1] Disease Prevention and Control Department AIDS in Ethiopia, 5th edn. Addis Ababa: Disease Prevention and Control Department, Ministry of Health 2005.

[2] Asefa T, Taha M, Dejene T, Dube L. Determinants of defaulting from antiretroviral therapy treatment in Nekemte Hospital, Eastern Wollega Zone, Western Ethiopia *Public Health Research*. 2013; 3 (5): 130–135.

[3] Ekouevi DK, Balestre E, Ba-Gomis FO, et al. Low retention of HIV-infected patients on antiretroviral therapy in 11 clinical centers in West Africa. *Trop Med Int Health*. 2010; 15 Suppl 1: 34–42.

[4] Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, Ministry of Health, Ethiopia; March 2014.

[5] Meloni ST, Chang C, Chaplin B, et al. Time-Dependent Predictors of Loss to Follow-Up in a Large HIV Treatment Cohort in Nigeria. 2014; 1 (2): ofu 055.

[6] ART failure and strategies for switching ART regimens, Report of the WHO expert consultation Copenhagen, 7 December 2007.

[7] Sabate E. Adherence Meeting Report. Geneva, World Health Organization 2001; 1: 1.

[8] Sibhatu B, Ayalu A. Adherence to Antiretroviral Therapy in sub-Saharan Africa: Challenges and Prospects. Addis Ababa, Ethiopia 2013; 2: 15-38.

[9] World Health Organization. Global update on HIV treatment 2013: results, impact and opportunities. World Health Organization; 2013. Available from: http://www.who.int/hiv/pub/progressreports/update2013/en/.

[10] World Health Organization, Adherence to Long-Term Therapies Evidence for Action World Health Organization; 2013; XII: 92-106.

[11] Abelti E. Determinant Factors Affecting Adherence to Antiretroviral Therapy Among HIV Infected Patients in Addis Ababa; November 2013.

[12] Asmare M. Level of ART Adherence and Associated Factors among HIV Sero- Positive Adult on Highly Active Antiretroviral Therapy in DebreMarkos Referral Hospital, Northwest Ethiopia. 2014: 120-126.

[13] Alagaw A, Godana W, Taha M, Dejene T (2013). Factors Associated with Antiretroviral Treatment Adherence among Adult Patients in Wolaita Soddo Hospital. J Trop Dis 1: 125. doi: 10.4172/2329-891X.1000125.

[14] Birhanu D. et al. Adherence to antiretroviral therapy and associated factors among patients living with HIV/AIDS in Dessie Referral Hospital, Northern Ethiopian. International Journal of Pharma Sciences and Research (IJPSR)2014; 5 (09) Sep.

[15] Abera A, Fenti B, Tesfaye T, Balcha F (2015). Factors Influencing Adherence to Antiretroviral Therapy among People Living With HIV/AIDS at ART Clinic in Jimma University Teaching Hospital, Southwest Ethiopia. J Pharma Reports 1: 101.

[16] Letta S. et al. Factors associated with adherence to Antiretroviral Therapy (ART) among adult people living with HIV and attending their clinical care, Eastern Ethiopia. BMC International Health and Human Rights 2015; Letta et al. BMC International Health and Human Rights (2015) 15: 33 DOI 10.1186/s12914-015-0071-x.

[17] Bikila L. et al. Adherence to Antiretroviral Therapy and Associated Factors among People Living with HIV/AIDS at Gobba Hospital, Southeast Ethiopia: Un Institutional based study, 2015.

[18] Langebeek N, Gisolf EH, Reiss P, Vervoort SC, Hafsteinsdottir TB, et al. (2014) Predictors and correlates of adherence to combination antiretroviral therapy (ART) for chronic HIV infection: a meta-analysis. BMC Med 12: 142.