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ORIGINAL ARTICLE

Determinants of Adherence to Anti-Retroviral Therapy (ART) medication among HIV infected patients: A snapshot study at ART Centre, Odisha

Swetaleena Ashe[1] | Dipanweeta Routray[2*] | Suchismita Mohapatra[3]

[1]Post graduate trainee, Department of Community Medicine, SCBMCH, Cuttack

[2]Assistant Professor, Department of Community Medicine, SCBMCH, Cuttack

[3]Senior Resident, Department of Pediatrics, SCBMCH,Cuttack

Abstract

Highly active anti-retroviral therapy (HAART) has now transformed HIV pandemic from "virtual death sentence" to a "chronic manageable disease". An adherence rate of 95% to ART decreases viral suppression to nearly 78% and is thus ear marked as an optimum therapy for viral suppression. The objectives are to estimate the level and associated factors of adherence (with respect to the five WHO dimensions) to ART among HIV positive patients.

It was a cross-sectional study carried out at the ART center of a tertiary care teaching hospital. Simple random sampling was done from the new enrollment list of the previous 6 months. A total of 120 respondents were interviewed by a pre-designed semi structured questionnaire and analyzed using SPSS.

Majority of the participants (55.1%) aged 26 to 40 years and 57% of them were found to be adherent. Patients aged more than 40 years (OR 11.55), distance < 100 kms from the ART Centre (OR 2.75), dissatisfied with family support (OR 3.42), and those with decreased CD4 count from the previous count (OR 6.56) were found to be highly significantly associated with the probability of being adherent to ART.

Adherence to ART was found among 57% among the study subjects. Elderly patients residing nearer to service delivery centre and those at higher risk of morbidity due to lower CD4 count were found to be some of the major determinants of adherence to ART. Link ART centres and LAC Plus Centres with community level awareness programs are recommended.

Keywords: Adherence, Anti-retroviral therapy, HIV, Non-adherence, ART, AIDS

1 | INTRODUCTION

In the era of "Ending the AIDS" epidemic by 2030, nearly 38 million people are living with HIV/AIDS worldwide at the end of 2019.[1] In September 2003 WHO declared the lack of access to ART for HIV/AIDS and acclaimed it as "Global Health Emergency". Hence, an emergency plan was

announced to scale up access to ART in order to cover at least three million people by the end of 2005. This joint WHO/UNAIDS announcement popularly came to be known as "3 by 5". The prevalence of HIV among adults (15-49 years) in India is estimated at 0.26% (0.22%-0.32%).[2] It has been documented that people living with HIV have longer and healthier lives now as a result of the effective ART.[3] The efficacy of highly active anti-retroviral therapy (HAART) has now curbed the HIV pandemic and has transformed it from a "virtual death sentence" to a "chronic manageable disease". Hence the marked decrease in viral load and thereby increase in immunity has led to a reduction in mortality and morbidity. India has documented to have halved the new infection since 2001. [4,5]

The certainty of providing a better life to PLHIV is adherence to ART which has already proven to be the most efficacious treatment.[6–10] Adherence to medication is defined as the 'extent to which patients take medications as prescribed by their healthcare provider'.[11,12] An adherence rate of as high as 95% decreases viral suppression to nearly 78%. However, if there is a reduction in adherence to 80%, viral suppression rate can be as low as 20%.[13] Hence an adherence rate of 95% and above has been ear marked as an optimum therapy for viral suppression.[14,15] The World Health Organization (WHO) has ascertained adherence to ART as a multidimensional phenomenon governed by interplay of five sets of factors, known as "dimensions".[16] It depends on patient related factors, socioeconomic factors, clinical-condition related factors, therapy related factors and healthcare system related factors.[17,18] Poor adherence to treatment often leads to poor health outcomes and increased expenditure on healthcare and gradually paves the way for antimicrobial resistance.

Supplementary information The online version of this article (https://doi.org/10.15520/ijmhs.v10i11.3144) contains supplementary material, which is available to authorized users.

Corresponding Author: *Dipanweeta Routray*
Assistant Professor, Department of Community Medicine, SCBMCH, Cuttack
Email: drdipanweeta@gmail.com.

Despite the systematic approach of these dimensions, very few studies have been carried out regarding adherence to ART especially with a reference to this part of India. So this study is taken up with the following objectives: 1) to estimate the adherence to ART among HIV patients and 2) to find the determinants of adherence to ART among the five WHO dimensions.

2 | METHODS

Study setting:

This was a hospital based cross-sectional study carried out at the ART center of the tertiary care hospital and associated government college of Central Odisha from August 2019 to April 2020. All HIV infected individuals aged 18 years and above taking ART from ART center of the institution were eligible for the study. All those 1) patients who had taken ART for less than six months 2) patients on 2nd line ART and 3) any history of documented psychiatric condition were excluded from the study.

Sampling:

Simple random sampling was done to obtain the required number of samples. We obtained the enrolled patient's register and found nearly 1110 patients attending the ART centre in the previous six months. Hence, we interviewed 10% (i.e 111 + 10% extra for non-response nearing 120) subjects for data collection. Names and telephone numbers of all the patients were maintained in a register and those names selected by lottery method were called and enquired about their next visit. Then, these patients were interviewed on the day they came to the hospital.

Study instruments:

A face to face interview was conducted using a predesigned and pre-tested semi structured questionnaire which contained few open ended questions. Interview was done by the principal investigator in the local language. The determinants of adherence were analyzed for five WHO dimensions.

Mean of adherence to ART of previous three months was calculated for estimating the adherence to ART

over the past three months. Patients were considered "adherent" only if the mean adherence measure was 95% and above. Depression was measured using patient health questionnaire-9 which has been validated for Indian settings.[19] Modified BG Prasad's classification was used for determining socio-economic status.

Statistical analysis:

Data was entered using Microsoft excel 2010 and analyzed using statistical package for social sciences (SPSS) version 21. The risk factors were dichotomized into two categories i.e Adherant and Non-adherant.

Ethical considerions:

Approval was obtained from the institutional ethical committee before commencing the study. An informed written consent in their local language was obtained from all the study participants. The participants were made sure of their privacy and confidentiality and the purpose of the study.

3 | RESULTS

We enrolled a total of 120 HIV positive patients availing medication from ART centre of our institution. Out of the total study population, eight patients took medications for less than six months, hence were excluded from the study. This was done to study the long term cause and effects that could be responsible for adherence or non-adherence. Two of them were on second line ART and two of them denied to give consent for participation in the study respectively. We excluded people on second line ART to maintain uniformity in the health status among the study subjects. Only one was found to have documented psychiatric illness (Fig 1). Patients with psychiatric illness were excluded as validity of the interview and consent of patient becomes questionable. We excluded patients taking ART for less than six months as CD4 counts were done every six months and we would not be able to know the status of CD4 as well as the progression and health status in these patients.

Sociodemographic and clinico-behavioral characteristics:

Out of the total 120 patients, we finally obtained 107 patients (39 males, 64 females and 4 transgender) as our study subjects. Mean age of the study subjects was 35.05 ± 11.96 years. Majority of them (55.1%) were of the age group of 26 to 40 years and 76.6% of them were married. Very few 10 (9.3%) belonged to lower/ lower middle socio-economic class. On interviewing, 88(82.2%) and 95(88.8%) patients respectively reported to be satisfied with family and social support. On the contrary, many patients (51.4%) reported of feeling of stigma for them in family. Nearly 47% of people travelled for more than 100 kms to fetch ART and 60 (56.1%) of them incurred more than 200 INR as out of pocket expenditure each time they attended the centre. Majority (58.9%) of them had to wait for more than 30 minutes to meet the doctors for their health check-up. Although all were very satisfied with the services, but only 41(38.3%) of them were counselled in the previous month. Mainly TLE (Tenofovir, Lamivudine, Efavirenz) regimen was given to majority of them (72.9%) and only 1.9% of them had any adverse effects due to drugs. CD4 status was improved when compared to the last CD4 count done 6 months back in 67(62.6%). Substance abuse in any form of tobacco or alcohol was reported among 17.8% of them. Few subjective questions were administered regarding their knowledge about HIV and ART prior to detection of their disease and only 30(28%) knew about it. Disclosure of the HIV status to the family was present among 65(60.7%) of them. Depression as measured by the PHQ-9 screening tool, found 16(15%) of them having some form of depression.

Adherence to ART Medication:

Determinants of Adherence to ART medication:

WHO has grouped factors determining adherence to ART into 5 dimensions. These dimensions were analyzed using univariate analysis to find the association of risk factors responsible for non-adherence among the people living with HIV (PLHIV). Among the various dimensions considered, patients staying at a distance less than 100 kms from the ART centre (OR 2.75, 95% CI 1.25-6.07), aged more than 40 years (OR 11.55; 95% CI 2.54-52.4), with education

maximum till 10th grade in school (OR 2.91; 95%CI 1.31-6.44), belonging to lower/lower middle socio-economic class (OR 2.69, 95%CI 2.08-3.49), and not satisfied with family support due to their HIV positivity (OR 3.42; 95%CI 1.05-11.13) were found to be significantly associated with the probability of being adherent to ART. Factors related to Healthcare system and therapy related dimensions were found to have no significant association for being adherent to the therapy. Among the condition related factor dimension, patients who were asymptomatic (OR 3.76; 95% CI 1.37-10.27) and those with decreased CD4 count from the previous CD4 count (OR 6.56, 95% CI 2.54-16.96) were highly significantly associated with adherence to ART medication [Table 2, only significant factors are provided in table].

4 | DISCUSSION

Adherence to ART is the key to the aim of "Ending the AIDS" epidemic by 2030. The mean age of our study participants is 35.05 ± 11.96 years which is similar to study conducted by Yu et al.[13] The prevalence of adherence to ART among our study subjects was found to be 57% which is quite low contrary to the findings of Alvi et al[20] and Saha R et al.[21]

However, adherence to ART in other studies is basically taken as adherence in last month, whereas we measured adherence computing it on basis of adherence over the last 3 months. Various other studies have used different methods and tools to assess adherence, hence it is difficult to compare these differences.

We found people who travelled from nearby places i.e <100 kms were found to be nearly three times more adherent as compared to those who stayed far off which is similar to other studies. [22–23]

All the transgenders were found to be non-adherent to ART which was significantly different from the other counterparts. This could be due to their attitude or social conditions which needs further exploration. Nearly 8 out of 10 individuals who were found to be dissatisfied with family support were seen to be more adherent to their medication. This might be due to their pressure on themselves to remain asymptomatic to gain confidence and love of their family members.

Among the five dimensions of adherence, we could not find any significant bearing of therapy related factors with adherence to ART. As most of our study subjects followed a TLE regimen and had very few side effects, we did not get any association with adherence to ART. Studies from different parts with larger sample size have found side effects and those on ZLN therapy (Efavirenz) to be lesser adherent to ART as compared to their counterpart.[24,25]

Among the patient related factors, every four out of 10 did not disclose their HIV status to their family members however those who did not disclose their HIV were found to be nearly seven times more adherent to ART; which is contrary to the findings of Elopre et al.[26] Adherence to ART is likely to reduce the symptoms and further worsening of HIV patient and this might be a positive reinforcement to avoid social stigma. Awareness among people regarding HIV being a chronic manageable disease has also instigated people who faced more stigma to adhere more to ART and remain asymptomatic.

Among the various condition related factor dimension, those who were asymptomatic were seen to be nearly four times more adherent to ART. This could be contributed to the lack of temporality in cross sectional study and hence adherence to ART led more individuals to be asymptomatic. Every eighth individual who reported with a lower CD4 count as compared to previous CD4 count, were now found to be seven times more adherent to ART. Decrease in CD4 count might lead to being symptomatic and is surely an alarming note for the individuals to stick more to the ART.

LIMITATIONS & STRENGTHS:

Temporality of associated factors could not be established due to the study design, however; the external validity of the findings is more due to sampling design. A multicentric study would have added more to the validity of the study. However, our study was conducted in a tertiary care teaching hospital of Central Odisha where patients from all the 10 districts of the zone avail the services. Our exclusion of patients

TABLE 1: Determinants of Adherence to ART medication amongthe study subjects (N=107)

Sl no	Characteristics		Adherence (n, %)	Non-adherence (n, %)	P value	OR (CI)
I	Socio-economic dimension					
1	Age	>40 years	21 (91.3)	2 (8.7)	0.00	11.55
		<= 40 years	40 (47.6)	44 (52.4)		2.54-52.40
2	Gender	Transgender	0 (0)	4 (100)	0.01	0.40
		Male/female	61 (59.2)	42 (40.8)		0.32-0.51
3	Literacy	Till 10th grade	41 (68.3)	19 (31.7)	0.008	2.91
		Intermediate and higher	20 (42.6)	27 (57.4)		1.31-6.44
4	Socio-economic status	Lower/LM	0 (0)	10 (100)	0.00	2.69
		Middle class and above	61 (62.9)	36 (37.1)		2.08-3.49
5	Family support (emotional)	Dissatisfied	15 (78.9)	4 (21.1)	0.03	3.42
		Satisfied	46 (52.3)	42 (47.7)		1.05-11.13
6	Distance from ART centre	≤100 KM	39 (68.4)	18 (31.6)	0.01	2.75
		>100 KM	22 (44)	28 (56)		1.25-6.07
IV	Condition related factor dimension					
7	WHO Staging	Asymptomatic	22 (78.6)	6 (21.4)	0.007	3.76
		Symptomatic	39 (49.4)	40 (50.6)		1.37-10.27
8	CD4 status (last 6 months)	Decreased	33 (82.5)	7 (17.5)	0.00	6.56
		Increased	28 (41.8)	39 (58.2)		2.54-16.96
V	Patient related factor dimension					
9	HIV status disclosure in family	No	35 (83.3)	7 (16.7)	0.00	7.50
		Yes	26 (40)	39 (60)		2.89-19.41
10	Stigma in family	Yes	37 (67.3)	18 (32.7)	0.02	2.39
		No	24 (46.2)	28 (53.8)		1.09-5.25

taking ART for less than six months might have caused a systematic bias but it was quite necessary to know the CD4 count of patients which is usually done at a 6 months interval.

5 | CONCLUSION

Nearly 60% of patients were found to be adherent to ART was appalling low. Those patients residing near to the tertiary care availed medications at the right time. Thus, the accessibility and functionality of Link ART Centres and LAC Plus Centres is of utmost importance. Elderly patients have been seen to be adherent to ART, hence they can be urged to induce behavior change through community level awareness programs among the complacent young generation. Patients with lower CD4 count were found to be more adherent but this needs further qualitative exploration to understand the temporality and reasons for their adherence.

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