

Evaluation of Factors Influencing Drug Adherence to Anti-Retroviral Therapy (ART) in a Tertiary Care Hospital, Vizag**Bheemesh Naidu Mattam¹, Srinivas Kandrapa¹, Venkateshwarulu Devarakonda¹, Chitra Karuppiyah¹, Aditya Ambady²**¹Assistant Professor, Department of Pharmacology, Andhra Medical College, Vizag, Andhra Pradesh, India²1st Year Post-graduate, Department of Pharmacology, Andhra Medical College, Vizag, Andhra Pradesh, India

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Abstract**Background:** Antiretroviral therapy (ART) adherence is a primary determinant of the effectiveness of HIV/AIDS treatment and is also considered a major predictor of survival among patients living with HIV/AIDS. The present study measures the level of adherence to antiretroviral drug therapy in Vizag district using MARS-5 and various factors influencing the degree of adherence.**Methods:** This was a cross sectional, semi structured questionnaire based study conducted over a period of 6 months at AMC. Medication adherence report scale-5 was used to assess the degree of adherence. A semi-structured questionnaire was designed to assess the factors influencing adherence.**Results:** A total of 354 patients participated in the study. 126(36%) patients were highly adherent, 126(36%) patients were moderately adherent and 102(29%) patients were low adherent according MARS-5 score. Statistical analysis has shown that using the reminder tools, patients living with family had shown significant adherence to ART (p value<0.001).**Conclusions:** people who are taking ART in Vizag district are found to be moderate to high adherent according to MARS-5. Degree of adherence to ART is found to be influenced by simplified treatment regimen, patient counselling and family support.**Keywords:** ART, Drug Adherence, MARS-5This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

India has the third highest number of HIV infected people living in the world[1]. As per the latest HIV estimates report (2019) of the Government, India is estimated to have around 23.49 lakh people living with HIV/AIDS (PLHIV). Andhra Pradesh state got over 3 lakh cases of PLHIV[2-3].

Antiretroviral therapy (ART) plays an important role in improving the prognosis and quality of life of HIV/AIDS patients, and in reducing the rate of disease progression and death[4-5]. Antiretroviral therapy (ART) adherence is a primary determinant of the effectiveness of this treatment and is also considered a major predictor of survival among patients living with HIV/AIDS[6].

The definition of adherence used by the World Health Organization (WHO) is “the extent to which a person’s behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider”[7].

Adherence is “the ability to take prescribed drugs in the recommended dosages and schedules and following any special instructions e.g. empty stomach, after meals etc”[8].

Medication adherence is a major challenge in treating chronic ailments. Non adherence to anti-retroviral therapy is about 50-70% in western countries[9-10]. Studies are needed to measure the degree of adherence and to evaluate the various factors influencing the degree of adherence.

The present study measures the level of adherence to antiretroviral drug therapy using MARS 5- Item Medication Adherence Report (MARS-5)[11] and evaluates various factors influencing drug adherence using a predesigned semi structured questionnaire.

Methods

This was a cross sectional, semi structured questionnaire based study. Study was conducted

from December 2021 to December 2022. Institutional ethical committee clearance was obtained prior to starting of the study. All HIV patients using antiretroviral therapy for more than 3 months and attending the OP in AMC were included in the study after taking the informed consent.

Patients who were not willing to give the consent were excluded from the study. Eligible patients were interviewed for 15-20 min, required data was collected and they were counselled according to their problems.

Medication adherence report questionnaire (MARS-5) was used to calculate drug adherence.

The self-reported measure of medication taking was developed from a previously validated 10-item scale and addressing the circumstances surrounding adherence behaviour 5 item MARS scale was designed[12]. The theory underlying this measure was that failure to adhere to a medication regimen could occur due to several factors such as “problems in remembering to take the medication”, “forgetting to take medication,” and problems with

the complexity of the medical regimen such as, “feeling hassled about sticking to the treatment plan”. The scale is designed to avoid the “yes saying” bias by using Likert scale. Patients might experience failure in following their medication regimen since there is a tendency for patients to give their physicians or other health care provider's positive answers. Each item is measuring a specific medication-taking behaviour and not a determinant of adherence behaviour.

Response categorised as a 5-point Likert scale. The items are summed to give a final score. Degree of Adherence is graded as high, medium, and low depending on scores[13]

To evaluate the factors influencing degree of adherence a semi structured questionnaire was designed, taking patient awareness, and socio-demographic data into consideration. The information collected from patients were sorted, coded, and entered in a data sheet and final results were statistically analyzed using 2*3 chi-square contingency test.

Results

Table 1: Characteristics of the patients enrolled in the study

Patient characteristics	No. of patients (N= 354)
Gender	
Male	258 (73.5%)
Female	96 (27%)
Marital Status	
Married	336 (95%)
Unmarried	18 (5%)
Literacy	
Literates	156 (36%)
Illiterates	198 (60%)
Regimens being used	
Zidovudine + Lamivudine + Nevirapine	163 (46%)
Stavudine + lamivudine + nevirapine	145 (41%)

Table 2: MARS-5.

Item	Always	Often	Sometimes	Rarely	Never
“I forget to take them”	1	2	3	4	5
“I alter the dose”	1	2	3	4	5
“I stop taking them for a while”	1	2	3	4	5
“I decide to miss out a dose”	1	2	3	4	5
“I take less than instructed”	1	2	3	4	5

The MARS-5 score was calculated by summing the numeric score (range 1-5) from each question for out of 25 (range 5-25). A higher score indicates better adherence.

Table 3: Factors influencing degree of adherence

Factors	low	medium	high	total	chi square	P Value
Gender						
Male	30	36	30	96(27%)		
Female	72	90	96	258(73%)		
Total	102(29%)	126(36%)	126(36%)	354		
Age						
<40 years	54	78	60	192(54%)		

>40 years	66	48	42	156(44%)		
Marital status						
Married	90	120	126	336(95%)	16.208	0.00030233
Unmarried	12	6	0	18(5%)		
Literacy						
Literate	42	54	60	156(40%)	1.066	0.5868
Illiterate	60	72	66	198(60%)		
employment status						
Employed	72	60	66	198(60%)	13.066	0.00145464
Unemployed	30	66	60	156(40%)		
family status						
With family	72	108	114	294(83%)	16.825	0.00022207
Without family	30	18	12	60(17%)		
alcohol addiction						
Yes	12	12	12	36(10%)	0.399	0.81914022
No	90	114	114	318(90%)		
travel time						
<30 mins	30	48	72	150(42%)		
>30mins	96	78	30	204(58%)		
other treatment methods						
Followed	18	120	30	168 (47%)		
Not followed	84	6	96	186 (53%)		
use of reminders						
Yes	18	36	6	150(45%)	94.379	0
No	84	90	30	204(55%)		
complex dosing schedule						
Yes	0	6	0	6(2%)	11.044	0.00399784
No	102	120	126	348(98%)		
forgetfulness						
Yes	78	36	12	126(36%)	114.411	0
No	24	90	114	228(64%)		
fear of adverse effects						
Yes	54	72	18	144(41%)	56.82	0
No	48	54	108	210(59%)		
Experienced adverse effects						
Yes	78	90	78	246(70%)	5.987	0.05011174
No	24	36	48	108(30%)		
Trust on treatment regimen						
No	18	6	12	36(10%)	10.334	0.00570165
Yes	84	120	114	318(90%)		

Study profile

A total of 354 patients participated in the study of which 258(73.5%) were females and 96 (27%) were males . 54% patients were of age less than 40 years. 336 (95%) were married and 18(5%) were unmarried. 156(40%) were literates and 198(60%) were illiterates . 102(29%) patients were low adherence, 126(36%)patients were moderately adherent and 126(36%)patients were highly adherent according MARS-5 score.46% patients are using the regimen zidovudine+lamivudine+nevirapine .41% patients are using stavudine+lamivudine+nevirapine. (table 1 and table 2).

Various factors influencing drug adherence (table 3)

Role of reminders

Among the patients who are using reminders, 64% were highly adherent and 24% were moderately adherent and 12% were low adherent to ART. Patients who are not using reminders showed poorer degree of adherence: 4% - high adherence, 44% - medium adherence and 41% - low adherence. Use of reminders increased the degree of adherence significantly (p-value <0.001).

Role of living with family

Among 294 patients who are living with family, 45% were highly adherent and 42% were moderately adherent and 28% were low adherent. Whereas patients who are not living with family showed 20%,30% and 50% high ,moderate and low

adherence respectively. patients living with family showed significant adherence to ART (p-value < 0.001).

Role of adverse drug reactions

70%of patients experienced adverse drug reactions. 59%patients accepted the drug outcomes. 90% of patients expressed trust on treatment regimen?

Others

CD4 count: 88% patients had CD4 count >200cells/mm³

Discussion

The advent of newer antiretrovirals, treatment has moved from monotherapy

and bi-therapy to triple drug therapy or Highly Active Antiretroviral Therapy (HAART) which consists of three or more antiretroviral medicines to be taken in combination¹⁴.

In order to achieve the goal of antiretroviral therapy of undetectable levels of the virus in the blood, patients are required to maintain more than 90 – 95 % adherence¹⁴. Adherence to the HAART regimen appears to be the single most important variable that predicts a patient's ability to achieve and maintain good health. In this study, based on MARS scale results, Large percentage of people who were using ART in Vizag district are found to be coming under moderate to high adherent groups, may be due to better counselling methods being followed in ART centre.

Gender, literacy and alcoholism are not significantly affecting the degree of adherence. Similar results were found in Anu jose et al which states "Socioeconomic status, age, gender, place of residence, distance travelled to ART centre, duration of treatment etc had no effect on adherence."^[15]

According to the present study patients living with family showed significant adherence. Similar results were found by Carrieri et al., "Living alone and a lack of support have been associated with non-adherence to ART."^[16] and Eraker, et al., "patients not living alone, having a partner, social or family support, peer interactions and better relationships are characteristics of adherent patients."^[17]

In this study patients using reminders were more adherent than patients not using reminders. According to Ananth gokarn et al., study patients who were using alarm watches / alarms on their mobile phones to remind themselves were more adherent¹⁸.

Exposure to adverse drug reactions is not significantly limiting (p value>0.001) adherence because 90% of patients expressed trust on

treatment regimen, may be due to better counselling facilities in ART centres. Adherence to long-term therapies - Evidence for action. Geneva: World Health Organization; 2003 says that "The level of adherence in the HIV population is higher than in most other chronic diseases."^[19]

An in-depth understanding of patients' health seeking behaviour and health care delivery system may be useful in improving ART adherence and retention of patients in care continuum and program^[20].

Conclusion

Illiteracy and gender are not influencing degree of adherence because of simplified treatment regimen, reminders and counselling. Counselling is needed to be extended to patients family members to increase drug adherence. Effective feedback system is needed to be built to improve adherence. Further research is needed to validate this measurement scale in other settings and with other health problems.

Declarations

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