Original Research Article

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Anti retroviral therapy adherence and its determinants among patients attending ART centre, Bhopal

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ABSTRACT

Background: Antiretroviral drugs delay progression of HIV disease and improve the quality of life in the HIV infected people. A very high levels of adherence is required for ART to be effective long term and to prevent the emergence of resistant viral strains. The objectives were to assess the adherence of anti-retro viral treatment and its determinants and to estimate the status of CD4 count before and after ART in HIV patients.

Methods: The study was a cross sectional study conducted in ART center Hamidia hospital at Bhopal, Madhya Pradesh. 256 participants with HIV who had registered in the center and receiving ART for the past 6 months were included in the study. A predesigned questionnaire was used for the study. Data was analysed using Epi Info. The significance of proportion were calculated using chi square test (p<0.05).

Results: All the respondents knew that unprotected sexual contact, contaminated Blood transfusion and infected syringes were the major modes of transmission of HIV. About 60 (41.96%) in 143 patient with CD4 count <200 improved to >350. Majority of respondents 195 (76.17%) missed the dose often and 61 (23.83%) did not miss the dose at all. The major reasons for missing dose of ART regimen were forgot to take medicines (57.95%), alcoholic state (26.15%) and long duration of treatment (47.17%).

Conclusions: The majority of patient missed the doses due to socio demographic and treatment related factors. A good treatment adherence is linked with the good quality drug and better environment in the clinics throughout the treatment period.

Keywords: HIV, ART, CD4 count, Adherence, Counselling

INTRODUCTION

Human immunodeficiency virus (HIV) causing acquired immunodeficiency syndrome (AIDS) is a disorder of immune deregulation that leads to various manifestations ranging from excessive and inappropriate immune response to severe cellular immunodeficiency. ¹⁻³

Since the identification of first case in 1981, HIV / AIDS epidemic continues its expansion across the globe with approximately 5000 new HIV infections per day and 36.7 million HIV infected people living across the globe. The first case of HIV infection in India was reported from Chennai in 1986. According to 2016 estimates, people living with HIV in India recently was 2.1 million. Out of which 80000 are new cases and 62000 deaths in a year.

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Around 50% of new infection of HIV occurs in younger age group.⁴

Quality of life would be improved with delaying the progression of HIV disease if antiretroviral drugs are initiated early. In 2004, ART programme was launched. With the advent of combination ART, and access to ART for majority of people living with HIV, this disease transformed into a chronic treatable condition. But it is challenging that in countries where there is resource limited settings including India, there has been emergence of drug resistant strains due to lack of compliance to the drugs.⁵ Better adherence (>95%) is required for prevention of emergence of resistant strains and long term effectiveness of drugs.⁶ Fixed dose combinations and combination therapies of anti-retroviral drugs (ARV) could increase the adherence and long-term survival chances.

Psychiatric illness including depression, lack of social support, substance abuse and higher pill burden were found to be associated with decreased compliance. However, previous studies reported that there has been influence of gender, ethnicity, age, income, literacy status and trust with service provider with adherence. ^{7,8}

The objectives of the study were to assess the adherence of anti-retro viral treatment and its determinants and to estimate the status of CD4 count before and after ART in HIV patients.

METHODS

Study site and design

The study was cross sectional type of study conducted in ART Centre of Hamidia Hospital, a tertiary care hospital at Bhopal, Madhya Pradesh.

Study population

The study population consists of people living with HIV (PLHIV) who had registered in ART Centre Hamidia Hospital Bhopal.

Study period

The study was conducted for a period of one year from August 2013 to July 2014. Inclusion criteria included patients who had registered in ART centre of the hospital before 6 months and were receiving treatment for the past 6 months.

Sample size

Sample size included all the patients fulfilling inclusion criteria with the above study period. A total of 256 patients were included in the study.

Study tool

Pre testing of study was done in 20 patients of another ART centre of the same district and necessary changes were made. A predesigned pretested schedule was used to interview the respondents when they turn out of the clinics after consultation. The Questionnaire consisted of following subdivision: (i) sociodemographic information, (ii) knowledge and risk factor, (iii) CD 4 count status, (v) adherence question and (iv) reason for non adherence

Adherence criteria

To measure level of adherence following criteria was used according to number of doses missed in period of 30 days criteria for adherence adopted:

- (1) > 95% adherence = <3 dose missed in period of 30 days.
- (2) 80-95% adherence = 3-12 doses missed in a period of 30 days.
- (3) <80% adherence = >12 doses missed in period of 30 days.

Statistical analysis

Data was entered in Microsoft Excel Spread Sheet. Data was analysed with Epi info software. Quantitative variables were described in the terms of mean and standard deviation. The qualitative variables were described in the form of proportions. Normality of data was assessed before applying appropriate tests of significance. Significance of difference in proportions (qualitative variables) was calculated using chi square test. Significance of p value was taken as p<0.05.

Ethical consideration and confidentiality

Institutional Ethical Committee approval was obtained before starting of the study. Other permissions included permission from ART centre nodal officer in-charge and Madhya Pradesh State AIDS Control Society. (MPSACS) Confidentiality of study participants was maintained in all the phases of the study.

RESULTS

Among 256 respondents 154 (60%) were male and 102 (40%) were female. Of these majority of patients were in age group of 19-45 year, male 113 (73.37%) and female 74 (72.54%), next major group belongs to in age 15-18 year male 21 (13.69%) and 16 (15.68). Out of 256 respondents 108 (42.19%) went up to Primary school, 74 (29.90%) went up to secondary school, 18 (7.03%) respondents were graduates and above whereas 10 (3.91%) of respondents had education up to middle school. Illiterates comprised 46 (17.79%) of the study

group. Nearly more than half i.e. 147 (57.43%) respondents were married, while 72 (28.12%) were single and 37 (14.45%) respondents were widowed. In present study out of 256,majority of 123 (48.05%) respondents belonged to upper middle class followed by upper class 72 (28.12%). Thus majority of respondents 143 (55.86%) were from middle class (Table 1).

Table 1: Baseline characteristics of study participants (n=256).

^{*}Modified BG Prasad scale classification 2012.

Knowledge about HIV/AIDS

Table 2 highlighted that all the respondents knew that unprotected sexual contact, contaminated transfusion and infected syringes were the major modes of transmission of HIV. 233 (91.02%) respondents knew that infected mother was able to transmit the virus to the child, 13 (5.08%) said that infected mother did not transmit the virus to the child while 10 (3.90%) did not know about it. Two hundred and forty (93.75%) respondents knew that using condoms was an effective way of preventing transmission of HIV, 237 (92.58%) had knowledge that sterile syringes decreased risk of transmission of infection while 19 (7.42%) did not know about it. None of the respondents had any knowledge regarding giving ART coverage to mother and conducting caesarian section was an effective way of preventing transmission of infection from mother to the child (Table 2).

CD4 counts

Out of 256 patients who came for treatment, more than half 143 (55.86%) patients had CD4 count <200 whereas, 82 (32.03%) patients had CD4 count ranging between 201-350 while remaining 31 (12.11%) patients had CD 4 count >350. There has been a significant improvement in CD 4 count status after the 6 month of treatment. Of these 143 patient 60 (41.96%) improved to >350, 32 (22.38%) improved to 200-350. Among those who had CD 4 count between 200-350 62 (75.69%) patients improved to >350. Among 31 patient who had initial CD 4 count >350 all remain same with CD 4 more >350 after 6 month of ART. Out of 143 patients 51 (35.66%) did not show any improvement, similarly out of 82 patients, 20 (24.39%) also did not show any improvement (Table 3).

Adherence to treatment

Out of 256 respondents, majority of respondents 195 (76.17%) missed the dose often and 61 (23.83%) did not miss the dose at all. Out of 195 respondents who missed the dose 175 (89.74%) respondents missed <3 dose in period of 30 days whereas, 20 (10.26%) respondents missed 3-12 doses in a month and none of them missed for more than 12, dose.

Out of 61 who did not miss the dose 52 (85.25%) were residing in nuclear family while 7 (11.48%) in joint family and remaining 2 (3.27%) living alone. Among 195 patients who missed dose 82 (42.06%) educated up to primary whereas 56 (28.71%) educated up to secondary 8 (4.10%) up to middle class, 5 (2.56%) educated up to graduation and above while 44 (22.57%) were illiterate. Out of 195 who missed the dose majority of 109 (55.90%) patients belongs to upper middle class, while 15 (7.69%) belong to lower middle class and 38 (19.49%) belongs to upper class, 25 (12.82%) belongs to upper lower class and remaining 8 (4.10%) belongs to lower class (Table 4). Among 195 respondents who had missed

their doses in the last one month, more than half 147 (75.38%) respondents were residing with family but not receiving monetary support, 26 (13.33%) were living

alone, 10 (5.13%) respondents living with relatives without monetary support. 12 (6.15%) respondents did not state any specific reason for missing the dose.

Table 2: Distribution of study participants according to knowledge of HIV/AIDS (n=256).

S. No.	Knowledge domain	Yes n (%)	No n (%)	Don't know n (%)
1.	Exposure			
	Unprotected sexual contact	256 (100)	0	0
	Contaminated blood transmission	256 (100)	0	0
	Infected mother to child	233 (91.03)	13 (5.08)	10 (3.9)
	Infected syringes	256 (100)	0	0
2.	Preventive measure			
	By using condoms	240 (93.75)	0	16 (6.25)
	By using sterile syringes	237 (92.58)	0	19 (7.42)
	By giving ART to Mother &delivery by caesarean section	0	0	256 (100)
	Blood from certified blood bank	256 (100)	0	0

Table 3: Distribution of patients according to status of previous CD4 count and present CD4 Count after 6 month (n=256).

		CD4 status after 6 month			
S. No	CD4 status at start of ART	<200/mm ³ (n=143) n (%)	200-350/mm ³ (n=82) n (%)	>350/mm ³ (n=31) n (%)	
1	<200/mm ³	51 (35.66)	II (/0)	II (/0)	
2	200-350/mm ³		20 (24 20)	-	
2		32 (22.38)	20 (24.39)	-	
3	$>350/\text{mm}^3$	60 (41.96)	62 (75.69)	31 (100)	

Table 4: Distribution of patients according to determinants of non adherence of ART.

S. No.	Variables	Non adherence to ART	Adherence to ART	X ² test	P value
	Type of family		•		
1	Nuclear family	163 (83.58)	52 (85.25)		0.042
1.	Joint family	8 (4.1)	7 (11.48)	8.055	
	Living alone	24 (12.31)	2 (3.27)		
	Education		•		
	Iiliterate	44 (22.57)	2 (3.28)		0.026
2.	Primary	82 (42.06)	26 (42.62)		
4.	Middle	8 (4.1)	2 (3.28)	32.93	
	Secondary	56 (28.71)	18 (29.51)		
	Graduation and above	5 (2.56)	13 (21.21)	_	
	Socioeconomic class*		•		
	Upper	38 (19.49)	34 (55.74)		0.014
3.	Upper middle	109 (55.9)	14 (22.95)	32.62	
3.	Lower middle	15 (7.69)	5 (8.2)		
	Upper lower	25 (12.82)	6 (9.83)		
	Lower	8 (4.1)	2 (3.28)		

Chi square test applied, p<0.05 is significant

Reasons attributed to non adherence

There were various reason quoted by the respondents for missing doses of ART regimen. Majority, 113 (57.95%) said that they had forgot to take their medicines, 51

(26.15%) stated being alcoholic made them unstable, 21 (10.77%) were depressed/had low mood which led them to miss dose. 92 (47.17%) respondents reported that life long duration of treatment was the major reason for missing doses with respect to treatment status. 143

(73.33%) was unsuitable time for coming to the center resulting in loss of work; whereas distance of center from home was cited as a reason by 21 (10.77%) respondents;

11 (5.64%) said that they were physically weak and could not go alone to the center.

Table 5: Reason for non adherence to ART regimen (n=195).

S. No.	Causes attributed to non adherence*	No	%
1.	Low mood/depression due to disease is a demotivation	21	10.77
2.	Alcoholic boozing makes unstable	51	26.15
3.	Forgot to take medicine	113	57.95
4.	Life long treatment is demotivating	92	47.17
5.	Difficulty to refill medicines as loss of wages on the day visiting ART centre	143	73.33
6.	Farther distance of the centre	21	10.77
7.	Physically weak to come all alone	11	05.64

^{*}Multiple options.

DISCUSSION

The study was conducted among 256 patients who had taken treatment for atleast 6 months in ART center of Hamidia Hospital Bhopal for a period of one year. Majority of the patients were males (60%) in the age group of 19-45 years (73%) belonging to Hindu religion (89.07%) from rural areas (55.86%). This is similar to various studies conducted across the globe. 9-12 Most of the patients were literates atleast having education upto primary level (82.21%). Our study falls in line with finding of other observation that depicts concentration of HIV/AIDS in unskilled worker living away from home, and in females either because of commercial sex activity or contracted from their husband. 9,12-14 Our study follows the similar trends of HIV/AIDS from other regions that HIV/AIDS is more in married male followed by single widowed that indicates extramarital promiscuous behavior of respondents outside and later on spreading HIV/AIDS to their family. 10-12,14 A study by Subramanian et al showed that 59.6% of the study participants were single, 25.8% were from joint family and 15% staying alone. 12 Contrary in our study it has been shown that the chances of HIV/AIDS are higher in residents of nuclear family than those are single. Duration of stay away from home follow similar trends like previous studies that increase in the number of HIV/AIDS cases is seen with increase in duration. 15 Various study have shown high level of knowledge of risk factor among the population, in our study similar trends observed where people are highly aware of route of transmission but have little knowledge on prevention of transmission from mother to child. 15-

Among the 195 patients who missed the doses 89.74% respondents missed <3 dose in period of 30 days whereas, 10.26% respondents missed 3-12 doses and nobody missed more than 12 dose. This pattern of adherence is similar to the findings by Wang X et al in 2007 and Wang et al both of them reported more than 80% of patients have $\geq 90\%$ adherence to treatment. Adherence to treatment is usually high for long duration of treatment

but those who missed <3 doses in duration of one month may be because of interference of drug schedule with routine work. Lack of social support, forgetfulness, alcohol use, longer duration of treatment and distance of drug distribution centre were the major reasons for non adherence. These findings were similar to various studies across different countries which established that poverty, unemployment, lack of social support. Drug abuse, forgetfulness were the major reasons for non adherence. ^{19,20} Family support was observed to be high in case of joint family, hence the treatment adherence was also high. Non adherence gradually decreases as the literacy increases. Among the illiterate and literate, it is higher in illiterate whereas in case of literate it decreases as the level of education increases, which is in concurrences to the observation made by other observers in similar socioeconomic and geographical condition. Bimodal pattern of adherence in different socioeconomic strata depicts different kind of treatment seeking behavior in PLHA, first peak falling in lower socioeconomic group indicates lack of availability and utilization of free ART treatment available whereas there is a gradual increase in acceptance of treatment because of knowledge and understanding in the upper income group. This shows that for different reasons people of different socioeconomic strata utilizes the health service available. The above findings were similar to the study by Cauldbeck et al which showed that the non-adherence was more in patients from nuclear family and it decreases with increase in level of education with a bimodal pattern seen in different socioeconomic class people.²¹ Our study showed the similar trend of CD-4 count status pattern like other studies and it's improvement with ART.

Recommendations

At the level of treatment, the patient is all alone but at the level of understanding and dealing with disease, family as unit should be counselled. The treatment adherence is linked with the good quality drug and better environment in the clinics throughout the treatment period, so the continuation of effort in this direction should be made.

CONCLUSION

On the basis of observation, study concludes that the resultant outcome of adherence to the treatment of ART among PLWHA depends on various factor that are broadly categorized into socio-demographic factor and the factors related to the treatment. Among sociodemographic factors, important is the literacy status which reflect that either illiterate or low level of education is prevalent in majority of patients. Treatment related factor includes most important availability of drugs that relieved the patients from their chief complaints of weakness and fever. Majority of patients have history of either smoking or alcohol or both. Majority of patients showed a dramatic improvement in CD-4 cell count status after 6 month of ART. Although patients were satisfied with services but majority of patient missed the doses, Most common reason of missing dose were forgetfulness, living alone, poor monetary support of family, depression, long duration of treatment, alcoholism, unsuitable time of ART OPD and distance from the home.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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