

ADHERENCE TO ANTIRETROVIRAL THERAPY IN A TERTIARY CARE HOSPITALMuralidhara Panigrahi¹, Chandra Sekhar Maharana², Pradyut Kumar Pradhan³¹Assistant Professor, Department of Pharmacology, MKCG Medical College, Berhampur, Odisha.²Professor, Department of Pharmacology, MKCG Medical College, Berhampur, Odisha.³Assistant Professor, Department of Pharmacology, MKCG Medical College, Berhampur, Odisha.**ABSTRACT****BACKGROUND**

The Million Death Study Collaborators in the British Medical Journal have estimated that the people living with HIV/AIDS population to be between 1.4-1.6 million. Development of Antiretroviral Therapy (ART) has been one of the dramatic advances in the history of medicine. Among several factors that can affect the ART outcome, adherence to the ART has been cited as a major factor associated with poor outcomes. For ART to have maximum effect greater than 95%, adherence has been suggested. Additionally, non adherence to ART is a major cause of HIV drug resistance. Especially, in the Indian context, adherence to ART is very important due to the sheer number of HIV/AIDS cases, the socioeconomic status, diversity of the population and regions. That is, the socioeconomic challenges faced by patients contribute to nonadherence to ART in India. With this background, this study was done with the primary objective of assessing the level of adherence to the given regimen of ART as per the NACO guidelines and factors influencing adherence.

MATERIALS AND METHODS

This is a prospective patient record-based study conducted in the Antiretroviral Therapy Centre at MKCG Medical College, Berhampur, from January 2016 to June 2016. Simple random sampling technique was used to select 150 patients' records from the ART Centre of the medical college. The data was collected in a predesigned case record form from the patient card available at antiretroviral therapy centre. The patients were followed up through the patient card for six months from their recruitment. The adherence to treatment was evaluated using the adherence score adopted by NACO where a score of 1, 2 and 3 implied that 95%, 80-95% and <80% of the medication were taken respectively. The adherence score were further analysed with reference to the sociodemographic characteristics and the adverse drug reactions encountered during the therapy. Descriptive statistics was used to analyse and report the data Graph Pad Prism V 2.0 (trial version).

RESULTS

There was a predominance of male patients over females with the maximum number of cases were in the age group of 35 to 44 years and majority of the subjects are uneducated, married and unemployed. More than 90% patients had an adherence score of 1 (>95% medication taken). Persons with primary education, married individuals and persons without employment had better improvement in adherence score than other groups. Anaemia was the predominant adverse drug reaction encountered.

CONCLUSION

The findings of this study imply that, to increase the adherence to therapy and reduce dropout the nonadherent groups need to be targeted. This will prevent the development of drug resistance and treatment failure.

KEYWORDS

Adherence, Antiretroviral Therapy, Adverse Drug Reaction.

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BACKGROUND

According to National AIDS Control Organization of India, the prevalence of AIDS in India in 2013 was 0.27, which is down from 0.41 in 2002. While the National AIDS Control Organisation estimated that 2.39 million people live with

HIV/AIDS in India in 2008-09, a more recent investigation by the Million Death Study Collaborators in the British Medical Journal (2010) estimates the population to be between 1.4-1.6 million people.¹ Development of Antiretroviral Therapy (ART) has been one of the dramatic advances in the history of medicine. However, for the vast majority of people living with HIV/AIDS, ART is still light years away largely inaccessible in resource-poor countries where HIV continues to devastate families, communities and societies, especially the poor and the socially marginalised. Among several factors that can affect the ART outcome, adherence to the ART has been cited as a major factor associated with poor outcomes.^{2,3,4} For ART to have maximum effect, greater than 95% adherence has

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Corresponding Author:

Dr. Muralidhara Panigrahi,

Assistant Professor, Department of Pharmacology,

MKCG Medical College, Berhampur, Odisha - 760004.

E-mail: mdpanigrahi@gmail.com

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been suggested. Additionally, nonadherence to ART is a major cause of HIV drug resistance.^{5,6} Especially, in the Indian context, adherence to ART is very important due to the sheer number of HIV/AIDS cases, the socioeconomic status and diversity of the population and regions. That is, the socioeconomic challenges faced by patients contribute to nonadherence to ART in India. With this background, this study was done with the primary objective of the present study was to study the level of adherence to the given regimen of ART as per the NACO guidelines and factors influencing adherence. The secondary objectives were to analyse the sociodemographic profile of the patients living with AIDS.

MATERIALS AND METHODS

This is a prospective, record-based study conducted in the antiretroviral therapy centre at MKCG Medical College, Berhampur, from January 2016 to June 2016.

Sample Size Calculation and Sampling Technique

Assuming an adherence of 90% and a precision of 5 at a confidence level of 95%, the sample size was calculated to be 138. Further assuming a loss to follow up 8%, the final sample size was calculated to be 150. Simple random sampling technique was used to select 150 patient records. The source population was the record of the patients who were attending the ART centre of the medical college. The sampling frame was the drug dispensing register of the ART centre. Any patient of either gender and treated at ART centre, Berhampur, was eligible for inclusion in the study. Irregularly treated case records were excluded from the study.

Study Tool

The data was collected by the investigators themselves in a predesigned Case Record Form (CRF) from the patient card available at antiretroviral therapy centre. The patients were identified by the patient ID number given by ART centre, Berhampur. The patients were followed up for six months from the starting of study through the patient card.

The adherence to treatment was evaluated using the adherence score adopted by NACO where a score of 1, 2 and 3 implied that 95%, 80-95% and <80% of the medication were taken, respectively. The adherence score were further analysed with reference to the sociodemographic characteristics and the adverse drug reactions encountered during the therapy.

Descriptive statistics was used to analyse and report the data GraphPad Prism (trial version).

Ethical Approval

The study was approved by the Institutional Ethics Committee, MKCG Medical College, Berhampur. As per the guidelines of National AIDS Control Organization (NACO) waiver of written consent was granted by the IEC and written consent was not obtained from the case record-based study participants. The investigators undertook that they shall not divulge the personal details of patients and

that the data shall be used solely for the research purposes.

RESULTS

Of the study subjects, 58.52% were males, whereas 41.17% were female patients. Majority of the males were of the age group >44 years (87.5%) and most of the females were from the age group 15-24 years (77.78%). It was observed that 64.51% of the subjects were literate. Of the male patients, 66.67% are married, whereas 63.49% female patients were found to be married. Around 32% of the cases were found to be widowed and 7.45% were divorced. 10% of the patients were found to be separated from their spouses. In the present study, 99 patients (64.70%) patients were unemployed.

WAB status (working, ambulatory, bedridden) used to record the functional capability of the patient during the study showed that no patient was bedridden. The WAB score kept on increasing from 71.24% to 95.42% from starting of therapy to end of study period (Table 1). In the present study the adherence score upgraded from 2 (80-95% of medication taken) and 3 (<80% of medication taken) with consecutive visits (Table 2). In 98% of unemployed persons, adherence score improved, but only in 85% of employed patients, score improved and this difference was found to be statistically significant (p<0.001) (Table 3). The adherence score improved in 95% of primary educated patients followed by 91% secondary educated, whereas 72% of illiterate patients improved their adherence score. Though the number of patients who were college educated were very small that is 8, all of them showed an improved adherence score (Table 4). 97% of married patients have improved adherence score, whereas 90% of separated patients have improved adherence score. Improved adherence score was low for unmarried patients (66.67%) and also for widowed (65.38%). 80% divorced patients improved their adherence score (Table 5). Anaemia was the predominant adverse drug reaction (39%), followed by vomiting 10%. Maximum numbers of ADR cases were during the second visit. The ADR cases decreased as treatment progressed. 54 cases of ADR were reported out of 150 subjects (Table 6).

WAB Status	1 st Visit	2 nd Visit	3 rd Visit
Working	109 (71.24%)	127 (83%)	143 (93.46%)
Ambulatory	44 (28.75%)	26 (17%)	10 (6.53%)
Bedridden	0	0	0
Total	153	153	153

Table 1. WAB Score at Successive Visits

Adherence Score	1 st Visit	2 nd Visit	3 rd Visit
1 (>95%)	112 (73.20%)	123 (80.39%)	138 (90.19%)
2 (80-95%)	25 (16.33%)	23 (15.03%)	9 (5.88%)
3 (<80%)	16 (10.45%)	7 (4.57%)	6 (3.92%)
Total	153	153	153

Table 2. Adherence Score at Successive Visit

Employment Status	Improvement in Adherence Score	Degradation in Adherence Score	Total
Unemployed	53 (98.18%)	1 (1.86%)	54
Employed	85 (85.85%)	14 (14.14%)	99
Total	138	15	153

Table 3. Employment Status and Change in Adherence Score between 1st and 3rd Visit

Education Status	Improvement in Adherence Score	Degradation in Adherence Score	Total
Non-Literate	34 (72.34%)	13 (27.65%)	47
Primary	59 (95%)	3 (5%)	62
Secondary	33 (91.66%)	3 (8.33%)	36
College	8 (100%)	0	8
Total	134	19	153

Table 4. Educational Status and Change in Adherence Score between 1st and 3rd Visit

Marital Status	Improvement in Adherence Score	Degradation in Adherence Score	Total
Married	97 (97%)	3 (3%)	100
Unmarried	8 (66.67%)	4 (33.33%)	12
Divorced	4 (80%)	1 (20%)	5
Widowed	17 (65.38%)	9 (34.61%)	26
Separated	9 (90%)	1 (10%)	10
Total	135	18	153

Table 5. Marital Status and Change in Adherence Score between 1st and 3rd Visit

Type of ADR	1 st Visit	2 nd Visit	3 rd Visit	Total
Anaemia	15 (39.47%)	1 (12.5%)	1 (12.5%)	17
Drowsiness	3 (7.89%)	0	1 (12.5%)	4
Hypersensitivity	2 (5.26%)	0	0	2
Skin rash	3 (7.89%)	2 (25%)	1 (12.5%)	6
Neuropathy	3 (7.89%)	2 (25%)	0	5
Joint pain	3 (7.89%)	0	0	3
Vomiting	4 (10.52%)	2 (25%)	0	6
CNS	1 (2.63%)	0	0	1
Others	4 (10.52%)	1 (12.5%)	5 (62.5%)	10
Total	38	8	8	54

Table 6. Adverse Drug Reactions Encountered During Visits to ART Centre

DISCUSSION

In the present study, there were 90 males (58%) patients. Similar was the observation in a study by San Lio et al.⁷ In a study by Rajesh et al done at Manipal University in 2010, it showed that out of total 130 patients, 100 are male patients (76.29%), whereas 30 were female subjects (23%).⁸ A study done by Perkins et al in the Department of Health Policy, Harvard University, Cambridge, Massachusetts, United States of America, in 2009 shows that majority cases are from male gender 58.9%.⁹

In the present study, majority of subjects were middle-aged persons in the age group of 35-44 years (43.79%) followed by young age group, which consists of 39.86% in 25-34 years. But, in the study by San Lio MM et al in 2008 at Mozambique, the predominant age group was 25-34 years with a percentage of 58.92%,⁷ whereas in study by Rajesh et al done at Manipal university in 2010 shows similar result with predominant age group of 41-60 years (51%), followed by age group 18-40 years 58 (44.6%).⁸ In the study by Perkins et al, Department of Health Policy, Harvard University, Cambridge, Massachusetts, United States of America, in 2009 found that 25% of subjects were in the age group of 30-34 years closely followed by age group 25-29 years (22%) and 35-39 years (20%).⁹

In this study, majority of patients were married. 66.67% male patients are married, whereas 63.49% female patients were found to be married. Around 32% of the cases were found to be widowed and 7.45% were divorced. 10% of the patients were found to be separated from their spouses. In a similar study done by Perkins et al, Department of Health Policy, Harvard University, Cambridge, Massachusetts, United States of America had found that 73% cases were married, whereas only 9.81% are not married. Rest were cases of divorce, widowed or separated.⁹

The number of unemployed patients is more than employed patients. 64.70% patients were unemployed, whereas 35.94% patients are employed. In the study done by Perkins et al in the Department of Health Policy, Harvard University, Cambridge, Massachusetts, United States of America, it was found that overwhelming majority of patients are employed (80%) contrary to the findings of our study.⁹ During the study, it was observed that most of the subjects were literate (64.51%) and only 30.63% are uneducated. 40.78% subjects are primary educated, which constitutes the largest group. The study done by Perkins et al in the Department of Health Policy, Harvard University, Cambridge, Massachusetts, United States of America, 2009 shows that 34% are not literate, whereas 36% cases are secondary educated.⁹ WAB status (W-Working, A-Ambulatory, B-Bedridden) is used to record the functional capability of the patient to do day-to-day function. During the study, no patient was found as bedridden. The score W kept on increasing from 71.24% to 95.42% from starting of therapy to end of study period, whereas the score A came down from 28.75% to 4.57%.

This adherence score scale is used at ART centre, Berhampur, and approved by NACO. There are three scores, i.e. score 1 (>95% medication taken), score 2 (80-95% of medication taken), score 3 (<80% of medication taken). In our study, it was found that the scores were upgraded from 2 and 3 with consecutive visits and adherence score of 1 became better and better (73.20%-90.19%). In all the three visits, the score 1 was predominant. A study done by Talam et al in Moi Teaching and Referral Hospital in Eldoret, Kenya, showed 90% cases showed adherence score of 1.¹⁰ Another study done by Mills et al showed that the 55% subjects showed adequate

adherence in North America.¹¹ A study done by Sullivan et al showed 16% nonadherence (<95% medication taken).¹² In a similar study by Marazzi et al at Mozambique, 82% patients showed adherence of 90%.¹³

95% of primary educated patients improved their adherence score followed by 91% secondary educated, whereas 72% of non-literate patients improved their adherence score. Though the number of patients who were college educated are very small that is 8, all of them improved adherence score. A study done by Talam et al in Moi Teaching and Referral Hospital, Eldoret, Kenya, showed 90% primary educated cases showed improvement of adherence score, followed by 93% for secondary educated and only 60% non-literate improved the score.¹⁰ Employment status has a peculiar outcome contrary to tradition. 98% of unemployed persons improved adherence score, but only 85% of employed patients improved adherence score. 97% of married patients have improved adherence score, whereas 90% of separated patients have improved adherence score. Improved adherence score was low for unmarried patients (66.67%) and also for widowed (65.38%). 80% divorced patients improved their adherence score.

Anaemia is a leading adverse drug reaction (39%) followed by vomiting 10%. Skin rash, neuropathy, joint pain, drowsiness all were ADR at frequency of (7.89%). Maximum number of ADR cases are during second visit. The ADR cases decreased as progression of treatment. Total 54 cases of ADR were reported out of 153 subjects (35%). A study done by Harminder Singh et al in Chhattisgarh shows that 86% patients showed ADR in some form or other.¹⁴ In a study by Sharma et al from Gujarat, they have observed 71% incidence of side effects in their patients who were on HAART, although their study included all ADRs irrespective to the fact whether the treatment required any change of therapy or lead to noncompliance in patient.¹⁵ Other ADRs in their study were Peripheral Neuropathy (PN) in 22.2% and anaemia in 20%. Another study from South India by Kumarasamy et al reported a 15.2% incidence of rash, 9% incidence of peripheral neuritis, 5.4% anaemia and 3.5% hepatitis.¹⁶ Lactic acidosis, a potentially fatal complication has been reported from India as well by studies of Patel et al¹⁷ from Ahmedabad and Sundaram et al¹⁸ from Chennai. Although, their incidence is not as high as and has been observed in the study by Sivadasan et al¹⁹ who reported lactic acidosis as the major ADR in their cohort with an incidence of 8.7% and also the onset of this ADR in their cohort is quite early. In the study, it was found that 33 (61.11%) male patients encountered ADR, whereas 38.89% patients experienced ADR. So, maximum number of cases was found in male patients. A study done by Harminder Singh et al¹⁴ at Chhattisgarh shows that 55% of ADR documented in male patients. The result shows same trend as our result. It was also found that maximum number of cases of ADR was found in the age group of 35-44 years (42.59%) closely followed by 25-34 years age group 37.07%. Least number of case was found in the age group of 15-24 years 1.85%,

whereas 18.51% of cases were in >44 years. A study done by Harminder Singh et al¹⁴ at Chhattisgarh shows that 54% cases were above age group of >35 years.

CONCLUSION

There was a predominance of male patients over females with the maximum number of cases were in the age group of 35 to 44 years and majority of the subjects are uneducated, married and unemployed. With treatment, the WAB status improved and more than 90% patients had an adherence score of 1 (>95% medication taken). Persons with primary education, married individuals, persons without employment had better improvement in adherence score than other groups. Anaemia was the predominant ADR encountered. The findings of this study imply that, to increase the adherence to therapy and reduce dropout, the nonadherent group needs to be targeted. This will prevent the development of drug resistance and treatment failure.

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