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Adherence to Anti-retroviral treatment among HIV cases attending ART centre in North Coastal Andhra Pradesh.

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Abstract
Background: *Since the start of the AIDS epidemic, more than 78 million people have been infected with HIV and 39 million have died. With the inventions of newer antiretroviral drugs, the use of highly active antiretroviral therapy (HAART) has been considered as gold standard treatment for HIV. There is limited information regarding levels of adherence and predictors of suboptimal adherence to treatment among PLHA receiving ART in India and high-risk states like Andhra Pradesh. The objective of the study was to assess the adherence to treatment and identify the factors related to adherence, after a period of six months of initiationof ART.*

Methods:*This study was conducted at an ART Centre attached to King George Hospital in Visakhapatnam District, Andhra Pradesh. Study period was from November' 2018 to October' 2019. HIV infected patients who were above 18 years of age and were newly registered for ART constituted the study population.*

Results:*The mean age of the study population was 35.98 ± 9.58 years, rangingfrom 19 to65 years.Adherence to treatment was assessed for only 146 participants. Adherence to treatment was 74% and that of non-adherence was 26%. About two-thirds of the participants in clinical stage III and IV were non-adherent to treatment.Belief in treatment followed by helpfrom relatives, faith in doctor and knowledge about side effects are the responses by patients which increased adherence to treatment.*

Keywords: *AIDS, HAART, ART centre, PLHA, Adherence to treatment.*

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I. Introduction

Acquired immune-deficiency syndrome (AIDS), sometimes called "slim disease", is a fatal illness caused by a retrovirus known as the human immuno-deficiency virus (HIV) which breaks down the body's immune system, leaving the victim vulnerable to a host of life-threatening opportunistic infections, neurological disorders or unusual malignancies. AIDS can be called our modern pandemic, affecting both industrialised and developing countries[1]. Since the start of the AIDS epidemic, more than 78 million people have been infected with HIV and 39 million have died. The number of people who were newly infected with HIV was declining in most parts of the world.Six countries—China, India, Indonesia, Myanmar, Thailand, and Vietnam— account for more than 90% of the people living with HIV in the Asian region[2].

India has the third largest number of people living with HIV in the world—2.1 million [1.7 million-2.7 million] at the end of 2017—and accounts for about 4 out of 10 people living with HIV in Asia and the Pacific region[3]. Andhra Pradesh (united history with 23 districts) was considered as one of the high prevalence states in India for HIV infection. According to the government survey in 2017, about 2 - 3.5 lakh people were living with HIV/AIDS in Andhra Pradesh constituting more than 20% of the PLHA in India (21 lakhs)[4].According to 2017 reports, Visakhapatnam stands 9th in the state of Andhra Pradesh with 16,068 total cases. Since 2004, 34,105 have registered, more than 10,000 have died and 16,068 are currently under treatment[5].

Although medications have been available to treat patients with HIV and increase their $CD4^+$ cell count, the frequency and dosage of the available medications needs to be strictly followed by the patients. Adherence to medication is one of the most important factors which results in a better/worse prognosis in HIV patients. Many different factors can lead to decreased adherence among the patients infected with HIV.

This study intends to assess the adherence of HIV patients to ART medication at an ART centre, where free treatment and care is available under the guidelines of National Aids Control Organization (NACO). The

main objective of the study is to assess the adherence to treatment and identify the factors related to adherence, after a period of six months among people living with HIV/AIDS (PLHA).

II. Materials And Methods

This study is an observational analytical follow up study which was conducted at an ART Centre attached to King George Hospital inVisakhapatnam District, Andhra Pradesh.HIV infected patients who were above 18 years of age and were newly registered for ART constituted the study population. The study was conducted fromNovember' 2018 to October' 2019.Sample size estimation was done considering the prevalence of adherence from previous studies[6,7] which was 73%. The sample size calculated was 148 with 10% allowable error. To account for attrition/loss to follow up in the study, 20% has been added to the sample size obtained (148+30). The final sample size obtained was 178. It has been rounded off to 180.

Inclusion criteria for the study population consisted of all newly registered HIV patients,eligible for initiation of ART, based on the National Aids Control Organization guidelines(Clinical Stage I, II – if CD4 count <350 cells/mm^3 and for Clinical Stage III, IV – irrespectiveof CD4 count) and patients who gave informed consent for participation. Exclusion criteria for the study consisted ofpatients who were not willing to participate in the study, transferred - in patients, patients who were put on treatment after discontinuation,pregnant women taking ART, patients taking Post exposure prophylaxis and patients below 18 years of age.

After obtaining permission from the Institutional Ethics Committeeand from the Nodal Officer, APSACS, Visakhapatnam district division, Andhra Pradesh, the study was commenced. Informed written consent in the local language Telugu was taken from all the patients who were included in the study. For those who were illiterates, the consent was read out & explained to them and consent was obtained by taking their thumb impression in the presence of a witness.

Baseline information about socio-demographic characteristics, was collected from a sample of 180. Follow up information on adherence to ART was collected from the participants available after six months. Adherence to treatment – included details of the regimen, the number of dosestaken and theprescribed number of doses. It also included the factors for adherence and non-adherence in theform of a semi-structured interview schedule. Adherencepercentage of >95 was considered as adherent and <95 as non-adherent to treatment[8]. The factors associated with adherence and non-adherence were assessed bypersonal interview. Adherence was checked from the records provided by eachpatient at the ART centre at the end of 6 months.

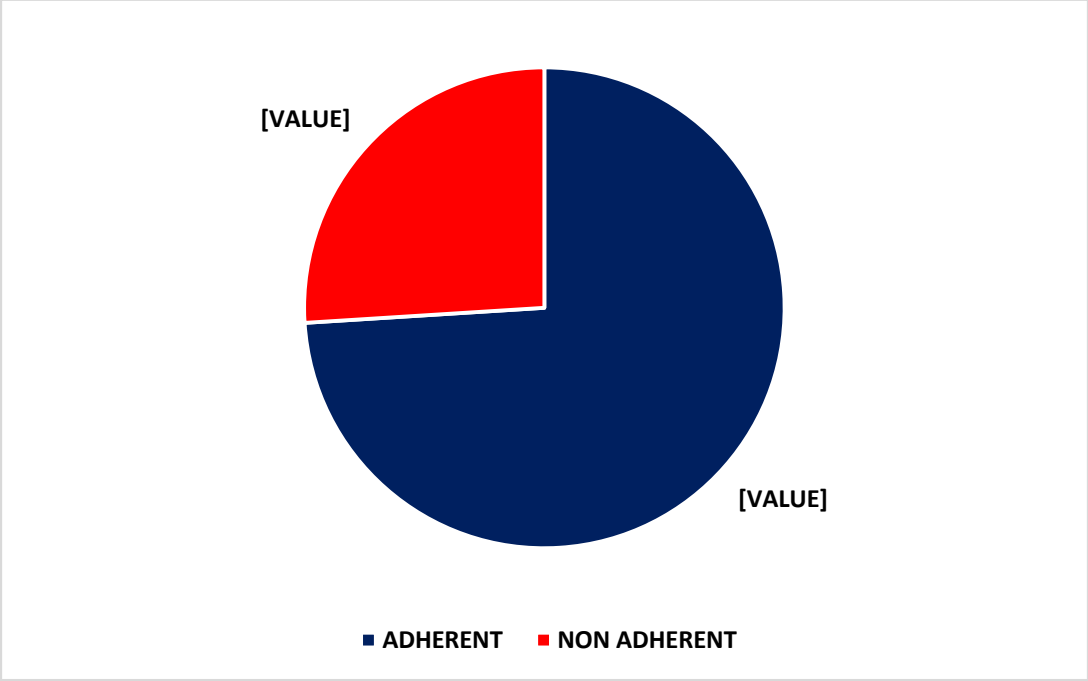
Data analysis was performed using SPSS software (version 21) and MicrosoftExcel worksheet 2013.Categorical variables were represented as proportions/percentages andquantitative variables were represented as means and standard deviation. Chi square test was used as test of significance for categorical data. P value < 0.05 is considered as statistical significance at 95% confidenceintervals.

III. Observation And Results

Of the total 180 study population, 97 (53.9%) were males, 80 (44.4%) were femalesand the rest 3(1.7%) were transgender. The mean age of the study population was 35.98 ± 9.58 years, rangingfrom 19 to65 years. The median age was 35 years. About 40% of study participants were in theage group of 26-35years and 34% of study participants were in the age group of 36-45 years.

Majority (63.3%) of the study population were from urban area. Around 62% of the study population were currently married. 11% were single, 22% were widowed and 5% were divorced.Regarding educational status, 41.1% of the study population were illiterates. Morethan half (55%) of the female participants were illiterates. Majority (67%) of studyparticipants belonged to low economic groups (Lower middle 33.3%, upper lower 31.1% and lower classes 3.3%) according to Modified BG Prasad's economic classification. About 73% of the study population were involved in some kind of employment orother and 27% were unemployed.Majority (68%) of the study population were Hindus, followed by Christians (25%)and Muslims (7%). Most of the of the study population belonged to backward caste(57%).

Out of the total 180 study participants, 34 participants were not available for follow up (19 cases were loss to follow up, 4 cases were transferred out and 11 cases died) after 6 months and could not be assessed for adherence. Hence adherence to treatment was assessed for only 146 participants. Adherence to treatment was 74% and that of non-adherence was 26%.



Adherence to ART among study participants after six months (n=146)

Adherence was more among tribal patients (77.7%) as compared to rural (74.7%) and urban (71.4%), but this difference was not found to be statistically significant (Chi square= 0.238, df= 2, p> 0.05).

Female patients had higher levels of adherence (79.7%) as compared to males (69.3%) and trans genders (50%), but this difference was not found to be statistically significant (Chi square= 2.615, df= 2, p> 0.05).

Adherence to treatment was more among Muslim patients (88.8%) as comparedto Christians (80%) and Hindus (71.2%), but this difference was not found to bestatistically significant (Chi square= 4.921, df= 3, p> 0.05).

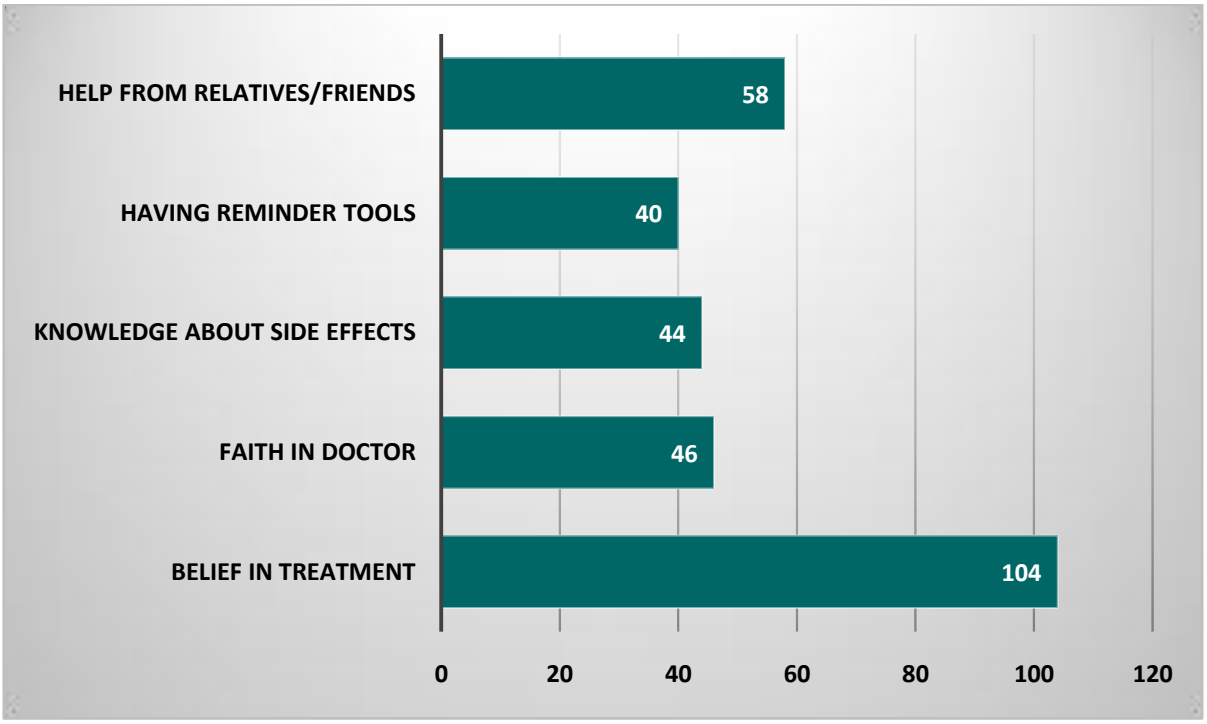
Adherence to treatment was more among divorced patients (100%) as compared to widowed (82.3%), married (71.1%) and single patients (64.7%), but this difference was not found to be statistically significant (Chi square= 4.140, df= 3, p> 0.05).

Adherence was more among those patients who had education up to intermediate (83.3%) as compared to other patients, but this difference was not found to be statistically significant (Chi square= 7.499, df= 4, p> 0.05).

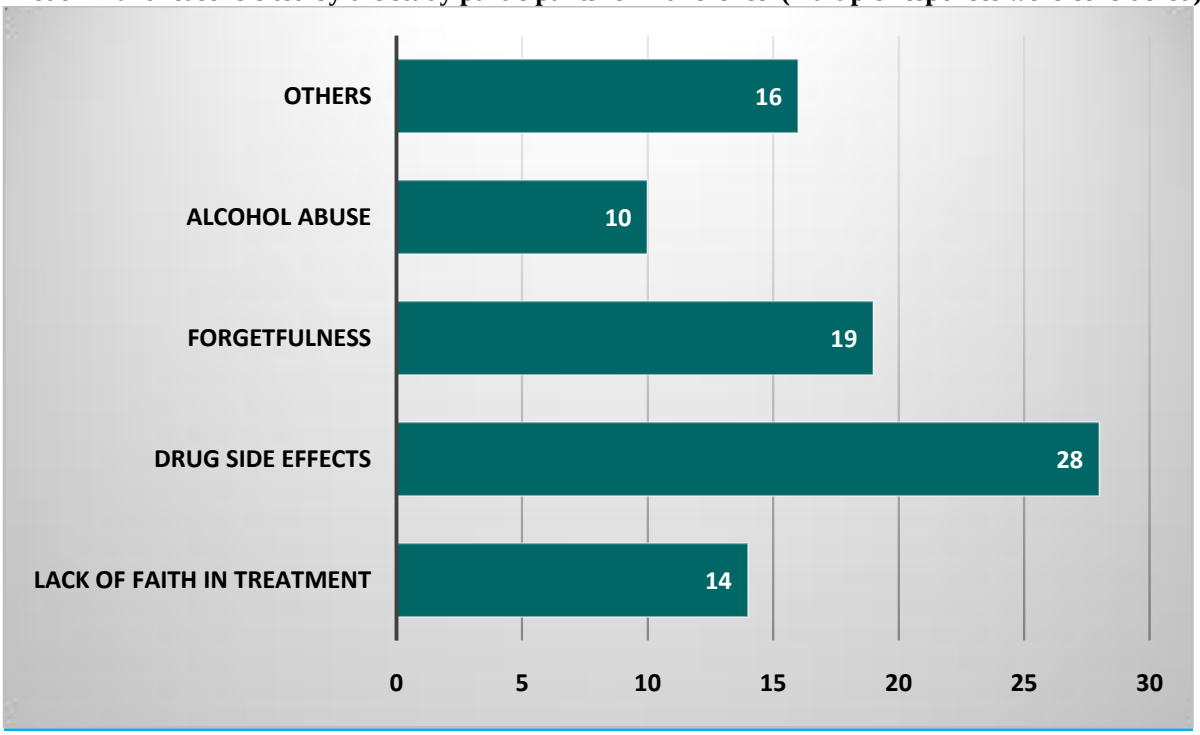
Adherence was more among Professional job holders (100%) as compared to other patients, but this difference was not found to be statistically significant (Chi square= 11.566, df= 6, p> 0.05).

Adherence was more among patients in clinical stage I (81.8%) as compared to advanced clinical stages i.e., stage II (71.4%), stage III (37.5%) and stage IV (33.3%). On analysis this difference was also found to be statistically significant (Chi square= 16.887, df= 3, p< 0.05).

Adherence was more among those patients belonging to lower class (100%) of modified BG Prasad classification as compared to other classes, but this difference was not found to be statistically significant (Chi square= 3.937, df= 4, p> 0.05).



Predominant reasons cited by the study participants for Adherence*(multiple responses were considered)



Predominant reasons cited by the study participants for Non - adherence *(multiple responses were considered)

When adherent participants were asked about reasons for being adherent totreatment, the most common reason cited was, belief in treatment followed by helpfrom relatives, faith in doctor and knowledge about side effects (multiple responseswere considered).

When non-adherent participants were asked about reasons for not adhering totreatment, the most common reason cited was, side effects to drugs followedforgetfulness (multiple responses were considered).

IV. Discussion

The present study was conducted to assess levels of adherence among HIV/AIDS patients undergoing antiretroviral therapy at an ART Centre located in King George Hospital, Visakhapatnam under the guidelines of NACO.

1. Socio demographic characteristics of the study population

In the present study, of the total 180 study population, 53.9% were males, 44.4% were females and 1.7% were transgender. Study conducted by Basavarajaiah et al[9] in Karnataka showed that 58.12% of the study population were males, 41.25% were females and 0.625% were trans-genders.

In this study, of the 180 study participants, 73.4% were between 26 to 45 years of age. The median age of the study population was 35 years. The mean age was 35.98 ± 9.58 years ranging from 19 to 65 years. Anand et al[10] in their study in New Delhi, found that majority of the study population (84%) belonged to the age group of 21 to 40 years. Basavarajaiah et al[9] reported that 80.3% of the total study population in their study were between 21 - 40 years of age. These observations were also in consensus with the studies done by Folasire et al[11], Fatiregun et al[12] and Marzieh Nojomi et al[13]. This confirms that most of the HIV cases occur among the sexually active and economically productive population who are responsible for childbearing and bread winning for the family. Hence this problem results in economic loss to the country.

In the present study, it was noted that among the study population, 62% clients were currently married, 22% were widowed, 5% were divorced and 11% were single. The present study findings about the marital status of the participants corresponds with Bach Xuan Tran[14], Gowda et al[15], Fatiregun et al[12] and Nirmal et al[16] where, majority of the study participants were married. However, this differed from Marzieh Nojomi et al[13], BriongosFiguero et al[17], Shin-Woo Kim et al[18] and AminiLari et al[19] where majority of the study participants were living singly.

In the current study, 41.1% of the study population were illiterates. The findings of the present study regarding the educational status of the HIV patients were in concurrence with Anand et al[10], Basavarajaiah et al[9] and Gowda et al[15] where majority of patients were illiterate (about one third to more than half) and was inconsistent with studies done by Bach Xuan Tran[14], Marzieh Nojomi et al[13] and AminiLari et al[19] where majority of the participants had education up to high school level.

The total study population was categorised into different economic groups as per modified B.G. Prasad's classification, which is based on the per-capita monthly income. Majority (67%) of study participants were of low economic groups (class III, IV and V). The distribution of the study population based on the socio-economic status of the participants correlates with that of studies done in India by Basavarajaiah et al[9], Gowda et al[15] and varies with the study conducted in Vietnam by Bach Xuan Tran[14]. This variation might be due to different economic conditions in different countries.

In the current study, about one fourth (27%) of study population were unemployed. Among unemployed, majority were females as they were mostly housewives. In the study done by Gowda et al[15], it was found that among the study population, 75.3% were employed and 24.7% were unemployed similar to the findings of our study. In contrast, about 58% of the study sample were unemployed in the study done by NyotoWidyoAstoro et al[20] in Indonesia.

Adherence to treatment

The level of adherence in this study was 74%, which is in line with the findings in similar studies done in India at Chennai, Mumbai and Delhi[6,21,22]. But the level of adherence was low compared to other studies done in China[23], Thailand[24], New York[25] and Hong Kong[26] where the level of adherence reported was high (80 – 96%) which may be due to different study settings. Also, higher levels of adherence of 90-96% was reported in some studies where they have assessed for short term adherence i.e. where the adherence was checked for last 3 to 7 days[25,27,28]. The levels of adherence decreased with longer duration of treatment as evident in some studies[27]. Lower levels of adherence ranging from 50 to 60% was also reported in some studies[29,30,31].In this study it was found that females had a higher level of adherence compared to males. It was also found that education and economic status were not significantly associated with adherence as in many other studies[7,24,26] while some studies have reported that higher education had influenced the adherence to ART[6,27,30]. It was observed that with increasing adherence the clinical status also improved, and it was also statistically significant.

The most common reason for adherence in the present study was belief in treatment followed by family/friends support, having strategies like reminder tools and knowledge about side effects, which were also the common reasons stated among the studies in Chennai, Mumbai and other regions of the world[6,22,23]. Presence of social support or the lack of it was an important factor associated with adherence and non-adherence in most of the studies[6,22,30]. The most common reason for non-adherence was side effects of drugs followed by forgetfulness, lack of faith in treatment and alcohol abuse which was consistent with various studies[22,26]. Similar to our study, drug side effects was the most common reason for non-adherence in other studies[22,26,27,33]. The

other common reason for non- adherence reported by other studies[7,22] was high cost which does not apply to this study. Having a busy work life and forgetfulness were some other reasons found in studies[21,23,26] with an urban background in developed countries which was similar to the present study.

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