ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 15, Issue 3, 2022

Online - 2455-3891
Print - 0974-2441

Research Article

PHARMACOEPIDEMIOLOGICAL EVALUATION OF HIV PHARMACOTHERAPY AT DISTRICT ART CENTER IN SOUTH TELANGANA

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Received: 15 December 2021, Revised and Accepted: 02 February 2022

ABSTRACT

Objective: Objective of the study was to assess the drug utilization pattern of antiretroviral drugs, and medication adherence behavior among human immunodeficiency virus (HIV) patients attending a local ART center, Suryapet, South Telangana.

Methods: This was a prospective observational study approved by institutional ethics committee. Demographic, clinical, laboratory, and the treatment details were collected on daily basis for new cases and the data add on was collected for old cases. Medication adherence behavior was assessed through Morisky Medication Adherence Scale-8.

Results: During the study period, a total of 505 HIV patients were enrolled. Among them, majority patients were women (61%), in the age group of 31–45 (49.7%). Illiterates (52.6%). Major mode of transmission identified was intimate contact (74%), and majority patients were in Stage I (49%). TLE regimen was prescribed in 69.9% patients and for children the prescribed regimen was ABC, 3TC, EFV (5.1%). About 43% patients were found with medium adherence.

Conclusion: This study concludes that the most prescribed regimens were combination of TLE, and majority of the patients were found with medium adherence.

Keywords: Antiretroviral therapy, Prescription pattern, Adherence behavior, Pharmacoepidemiological survey.

 DOI: http://dx.doi.org/10.22159/ajpcr.2022v15i3.43907. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Pharmacoepidemiology is the study of use, effects and adverse drug reactions of medication in large number of populations with the purpose of supporting the rational and cost-effective use of medications in the population to improve the desired health outcomes [1]. The human immunodeficiency virus (HIV) is a retrovirus affects the immune system, destroying or impairing their function. As the infection progress, the immune system becomes weaker, and the person becomes susceptible to infections [2]. Most advanced stage of HIV infection is called as acquired immunodeficiency syndrome (AIDS) and takes 10–15 years for an HIV-infected person to develop as AIDS case [3].

Use of HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART) substantially decreased death rate and translated AIDS as manageable condition. UNAIDS and WHO estimated AIDS death tolls as more than 25 million in 1981, when it was first recognized. [1] An adherence of 95% to ART is essential to achieve maximal viral suppression and minimize the opportunistic infections (OI) rate [4]. However, in clinical practice, maintenance of optimal ART adherence is challenging. A meta-analysis of 84 studies estimated that only 62% of HIV patients had achieved optimal adherence (of >90%) [5].

The present study aims at understanding prescribing patterns and medication adherence behavior of HIV patients visiting a district ART center. This helps in assessing the rational use of the antiretroviral drugs and strategies to reduce the infection rate and prolong the patient survival. Worldwide, more than twenty antiretroviral drugs belonging to Fusion inhibitors, NNRTI's, NRTI's, Chemokine receptor antagonist, Protease inhibitors, and Integrase inhibitors are licensed for formal therapy [6].

HAART is known as triple drug therapy. Studies have corroborated the combination therapy as very effective and reduce the viral load in the patients below detectable levels implying that HIV replication is ceased [2]. In the absence of HAART, progression from HIV infection to AIDS has been observed to occur with a median survival time of 9.2 months. However, HAART sometimes achieves far less than optimal results, in some circumstances being effective in less than 50% of patients due to medication intolerance/adverse effects, ineffective antiretroviral therapy, and infection with a drug-resistant strain of HIV [6]. However, inadequate adherence to medication results in less or no benefit from HAART.

Reasons for non-adherence and non-persistence with HAART are varied and overlapping. Poor access to medical care, inadequate social support, and drug abuse contribute to non-adherence. The complexity of the HAART regimens, increased pill number, dosing frequency, meal restrictions, and side effects create intentional non-adherence also contribute to this problem [7].

HIV prevalence in 2018 among adult population was estimated by National AIDS Control Organization (NACO), as 0.22%. In 2018, about 69,000 people died in India due to AIDS-related causes. The scale-up of free ART and rapid expansion of ART access since 2004 has saved cumulatively around 4.5 lakhs lives in India until 2014 [1-2].

However, in rural and semi-urban areas, HIV stigma is still prevailing. Many AIDS patients do not visit ART centers regularly and adhere to their regimens. Thus, the present study was initiated to assess the severity of infection, prescription regimens, adherence behavior among the AIDS patients registered at a district ART center.

METHODS

This observational, prospective, interview-based single-center study was approved by Institutional Human Ethical Committee and conducted for 6 months at Suryapet district ART center, Telangana. This center has about 8,000 registered HIV-infected patients and this center dispenses ARV drugs free of cost, on monthly basis to about 3,500 registered

HIV-infected patients including men, women, pregnant, children, and transgender visiting from nearby villages. This center works from Monday to Saturday between 9.00 am and 1.00 pm excluding Sunday and national holidays. On average, 100 registered patients visit daily the ART center for medical consultations and ART drug refills. HIV-positive patients of either sex including pregnant women and children who were treated as outpatients at the ART center were included in this study and patients with critical illness, psychiatric disorders, and not willing to participate in the study were excluded from the study.

Patient demographics, social history, educational level, socio-economic status, past medical and medication history, CD4 count, medicines prescribed, and their adherence behavior rate was recorded in a suitable data collection form. Morisky Medication Adherence Scale-8 (MMAS-8) was administered to determine the adherence behavior levels in the study patients. The collected data were entered into Microsoft Excel 2013 for analysis. Written informed consent from all the patients was obtained before enrollment into the study. Around 30 min time was spent on each patient during the interview to collect the details. The prescription pattern was analyzed using the NACO guidelines and patients prescribed with different regimens were assessed. Information regarding CD4+ cell count was obtained through patient medical lab reports. The CD4+ count information was used to assess the stage of HIV of the patient, and staging was done as Stage I (500 cells/mm^3 or more), Stage II (200–499 cells/mm^3), Stage III (50–199 cells/mm^3or AIDS) and Stage IV (<50cells/mm^3or AIDS).

Patients were enquired about the missed dose or to recall their intake of prescribed doses of the past 14 days. In an attempt to minimize recall bias, patients were asked about their adherence over the previous day, previous 3 days, the previous week, and up to the past 14 days and missed doses during their travel, forgetfulness, or stopped taking medicines without telling to a doctor due to inconvenience or felt hassled about sticking to treatment or adverse effects. Scoring was done using MMAS-8 and adherence scores were given as High [0], Medium [1-2], and Low [3-8]. The collected data were analyzed with the help of MS Excel and suitable statistical tools.

RESULTS

Demographics, clinical, lab, and therapeutic details were collected for 505 HIV+ patients enrolled into the study. Majority patients were females (61%) and one transgender and many were illiterates in the age group of 31–45 years, married and daily wage workers. The demographics of the enrolled patients are presented in Table 1.

Social habits of the enrolled patients such as smoking, alcoholism, and diet are presented in Table 2.

Based on the recorded CD4 count, patients were distributed in to various stages. The results reveal that out of 505 HIV positive cases, majority patients 250 (49%) were in stage I, followed by 201 (40%) in stage II, 44 (9%) in stage III and 10 (2%) patients in stage IV. All the findings are presented in Fig. 1.

Mode of transmission was assessed. Main route of infection contract was through intimate contact (75.2%), 85 patients (16.8%) were through to mother to fetus transmission, 30 patients (5.9%) were due to blood product transmission, and 10 patients (1.9%) were through shaving blades and needles. Details of mode of transmission are presented in Fig. 2.

Prescription pattern-wise distribution of the patients recruited in the study was also analyzed. Results reveal that a total of 10 regimens were prescribed. The majority of patients 353 (69.9%) were on TLE (Tenofovir + Lamivudine + Efavirenz) regimen, followed by 96 (19%) were on ZLN (Zidovudine + Lamivudine + Nevirapine) and 26 (5.1%) patients were on ABC, 3TC, EFV regimen. All the findings are presented in Fig. 3.

Table 1: Demographic details of study patients

Parameter	No of patients (n=505%)
Gender	
Male	196 (38.8)
Female	308 (60.9)
Transgender	1
Age	
0–15 year	28 (5.5)
16–30 year	109 (21.5)
31–45 year	251 (49.7)
46–60 year	108 (21.3)
>60 year	10 (1.98)
Educational status	
Primary School	80 (15.8)
Secondary School	115 (22.7)
Others	44 (8.7)
Illiterate	266 (52.6)
Employment status	
Daily wage earner	271 (53.6)
Employed	15 (2.9)
Business	93 (18.4)
Unemployed	93 (18.4)
Studying	33 (6.5)
Marital Status	
Married	384 (76)
Unmarried	56 (11)
Divorced	3 (1)
Widow	60 (12)
Pregnant	2 (1)

Table 2: Social habits of the study patients

Social habits	
Alcoholic	42 (8%)
Non alcoholic	368 (73%)
Past alcoholic	53 (11%)
Social drinker	42 (8%)
Smoker	21 (4%)
Non smoker	460 (91%)
Past smoker	24 (5%)
Diet	
Mixed	493 (98%)
Vegetarians	12 (2%)

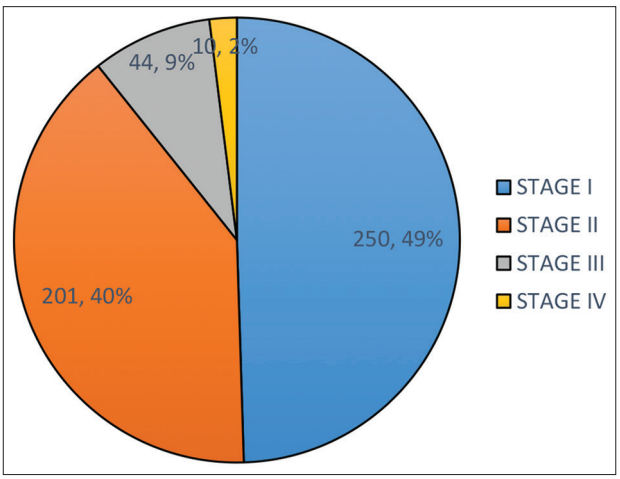

Fig. 1: Stagewise distribution of study patients

The results of MMAS-8 reveal that the majority of patients 220 (43%) were with medium adherence, followed by 185 patients (37%) with high adherence. All the findings are presented in Fig. 4.

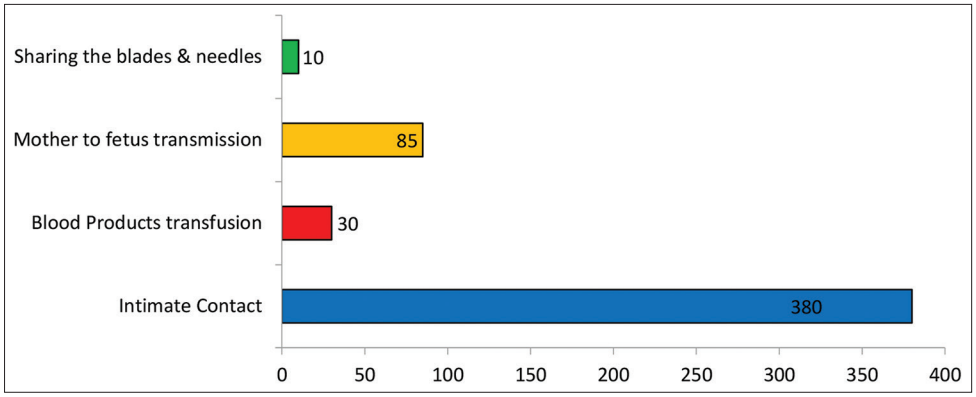

Fig. 2: Distribution of mode of transmission

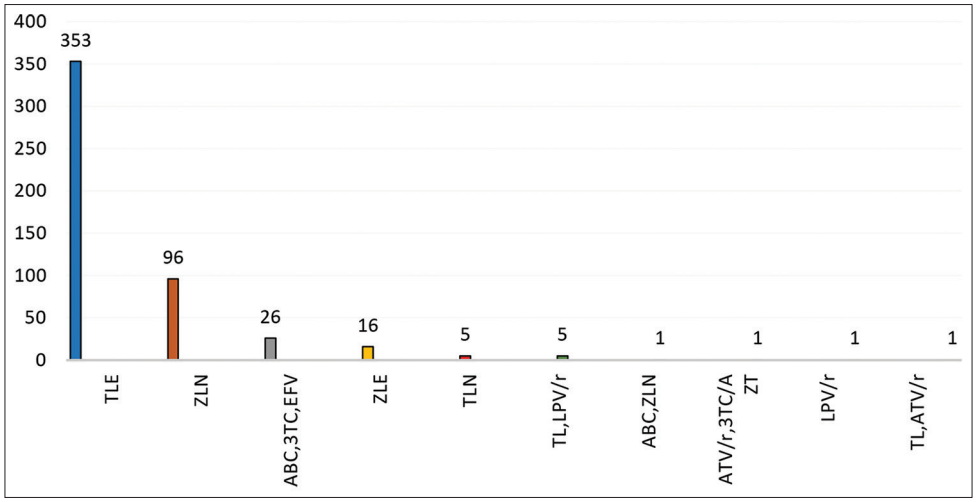

Fig. 3: Prescription pattern wise distribution

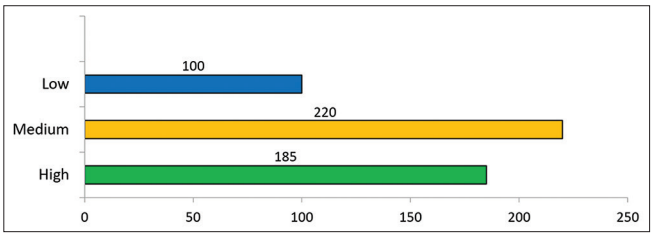

Fig. 4: Levels of medication adherence behavior

DISCUSSION

In our study, majority patients were in the age group of 31–45 years and 61% were females. Although people believe that men were infected with HIV/AIDS, women actually become victims at a faster rate than men. Mahathir M and his team stated that women are more vulnerable than men to infection because of the greater mucus area exposed to HIV during penile penetration. Women under age 17 years are even at greater risk because they have an underdeveloped cervix and low vaginal mucus production [8]. Gender inequalities in society, social and economic pressures of poverty exacerbate women's risk. Early marriage practices increased the women's risk of becoming infected due to inadequate information to young women about reproductive anatomy and safe sex practices or reproductive health services. Men having multiple sex partners, and failing to use condoms during intercourse enhanced infection risk [9]. Stall and Catania team of the national AIDS behavioral study reported that adults >50 years of age are at high risk of HIV infection when compared to their 20s' because of compromised immunity [10-11].

Despite many treatment options, the majority of patients in our study received a TLE combination (69.9%). Nidhi S. Chauhan and their team revealed that on comparing the two most commonly used regimens, that is, TLE and ZLN, ADRs were more common and serious in nature with ZLN as compared to patients treated with the TLE regimen. ZLN regimen-related ADRs have commonly affected blood and skin, whereas the TLE regimen has precipitated ADRs affecting the neurological and renal systems [12]. ZLN and SLN were reported to have more ADRs [13,14] and a smaller number of ADR were reported with the TLE regimen.

Jigar P. Modi team in their study on prescribing pattern of second-line ART regimen explained that Tenofovir + Lamivudine + Atazanavir/Ritonavir was a highly prescribed regimen (64.29%) due to fewer adverse effects [15]. Changes in the regimen are observed in pediatric patients where the commonly prescribed regimen is ABC+3TC+EFV (Abacavir + Lamivudine + Efavirenz) which is in accordance with the NACO guidelines. However, patients with OI are also being treated for their infections along with the ART. Above drug regimens were also observed to be highly prescribed as combinations in Nigeria [13]. Our study was found in accordance with the NACO therapeutic guidelines.

The majority of patients were found on non-PI-based regimens. The findings of our study are in accordance with other studies [13-15]. The PI-based regimen is recommended as second-line therapy. However, PI-based regimens can pose challenges, such as complex dosing schedules, drug interactions, toxicities, and high cost. Although HIV is the initial causative agent, OI are responsible for morbidity and mortality in AIDS. Our study found tuberculosis and oral candidiasis as OI.

Our findings revealed a statistically significant association between medication adherence and therapeutic outcomes. Only 210 patients (41.5%) out of 505 patients adhered to their medications. This poses concerns about suboptimal adherence among the other patients. The analysis signals that most patients try to avoid ART medications due to adverse effects. Other reasons contributing to poor adherence are financial constraints, forgetfulness, lack of family care, depression, alcohol use, and social stigma [7]. Our findings are in line with the findings of the Basavaprabhu Achappa study with respect to primary failure of ART due to suboptimal adherence [16]. A meta-analysis of 569 studies revealed that 24.8% of subjects were nonadherent [5]. However, studies from India have reported adherence rates of 76-93% [7,17]. Another Meta-analysis of ART adherence found that 77% of patients in Africa achieved adequate adherence of 95% compared to 55% of patients in North America [18]. Another study by the Woldesellassie M Bezabhe team [19] reveals that 95% of patients achieved an optimal level of adherence in Northwest Ethiopia.

In our study, the majority of patients were in Stage I (49%) and about 40% were in Stage II. Several cohort studies and clinical trials have shown that the CD4 count is the predictor of disease progression and survival [20-21] and also critical for determining patient's disease stage and short and midterm risk for OI and to initiating appropriate antiretroviral therapy and for outcome assessment [22-24].

CONCLUSION

This study concludes that women are at greater risk of HIV infection compared to men. The most prescribed regimen is TLE [Tenofovir + Lamivudine + Efavirenz] (69.9%) at ART center. The majority of prescribed ART regimens were as per the WHO and NACO guidelines suggesting adherence to therapy guidelines. This study has also observed a medium level of adherence of patients to ART. This finding suggests the need for intensive efforts such as patient counseling to improve medication adherence behavior to achieve good therapeutic outcomes.

ACKNOWLEDGMENT

The authors sincerely thank Vikas College of Pharmaceutical Sciences administration, Dr. Kavitha, duty doctor, Mr. Srikanth, pharmacist, ART Center for their encouragement and support, and most importantly the patients for their cooperation in data collection.

AUTHOR CONTRIBUTION

Drug utilization evaluation of ART was assessed and the need for intensive efforts such as patient counseling to improve medication adherence behavior to achieve good therapeutic outcomes was identified.

CONFLICT OF INTEREST

Nil.

AUTHOR FUNDING

Nil.

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