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Reasons for Antiretroviral Regimen Change among HIV/AIDS Patients at Jimma University Specialized Teaching Hospital, at Art Clinic: Four Years Retrospective Study

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Abstract: *Background*: Hen Kaposi's sarcoma, a rare neoplasm and pneumocystis carinni pneumonia, an unusual opportunistic infection only seen in severely immune-compromised patients during 1981 in the USA in previously healthy homosexuals. In 1984 the association between infection with the human immune deficiency virus (HIV) and AIDS was established. The hall mark of HIV infection is depletion of CD4 lymphocytes, macrophages and dendrites cells. Two types of HIV: HIV-1 and HIV-2. HIV-1c type is predominating in Ethiopia. According to WHO/UNAIDS (2007) report, about 33 million people living with HIV/AIDS in the world. Among 2.5 million are new infections. According to the latest reports, about 2.2 million people living with HIV/AIDS in Ethiopia. HAART in Latin America and the Caribbean has increased from approximately 210, 000 in 2003 to 390, 000 patients in 2007. *Objective*: To assess reasons for ARV regimen change and contributing factors among HIV/AIDS patients on HAART at Jimma University Specialized teaching hospital. Method: The study was conducted using a retrospective institution-based study, by reviewing cards and using retrospective Cohort Study using the patient information from patient follows up chart. *Result*: The majority of clients were Females 111(57.22%) with media age of 32.4 years, 86(44.33) were married; 104 (53.61%) were Orthodox by religion. The main reasons for ART switch was toxicity 96(49.48%), Lipoatrophy was the Major toxicities 29(30.21%) due to D4T/3TC/NVP; clinical failure27 (65.85%) was the most; 115(59.27%) were on D4T/3TC/EFV at initial; clients were on their first regimen for >108 weeks and 4.12% were switched two times. *Conclusion*: The toxicity 96(49.48%) was main reason for modification; Treatment failure 41(21.13%). Lipoatrophy 29(30.21%) was the leading toxicity (Adverse effect). The commonly switched was D4T/3TC/NVP to AZT/3TC/NVP87 (77.68%). Health professionals should be updated accordingly. The responsible body should consider viral load services at ART clinic to Strengthen system for monitoring regimen switches and special attention to adverse drug reaction. Further prospective study is recommended.

Key words: Hen Kaposi's sarcoma · Antiretroviral · HIV/AIDS Patients · Regimen

INTRODUCTION

At beginning of an epidemic termed as acquired immune deficiency syndrome (AIDS) was marked by a reporting of cases of Kaposi`s sarcoma, a rare neoplasm and pneumocystis carinni (jerovecii) pneumonia and un usual opportunistic infection only seen in severely immune compromised patients during 1981 in the USA in previously health homo-sexual. In 1984 the association between infection with the human immune deficiency virus (HIV) and the development of AIDS was established. The hall mark of HIV infection is depletion of CD4 lymphocytes, macrophages and dendrites cells. There are two types of HIV; HIV-1 and HIV-2. HIV-1c type is predominating in Ethiopia. According to WHO/UNAIDS (2007) report, there are about 33 million people living with HIV/AIDS in the world. Among those 2.5 million are new infections. According to the latest reports there are about 2.2 million people living with HIV/AIDS in Ethiopia [1].

Highly active antiretroviral therapy (HAART) has dramatically reduced the morbidity and mortality associated with human immunodeficiency virus (HIV) infection and has improved the prognosis for people

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living with HIV infection/AIDS (PLHA). About 33.2 million people worldwide are estimated to be living with HIV infection, the large majority of them in developing countries of Asia and Africa. Since 2001, the World Health Organization (WHO) has advocated a "public health approach" to HAART to rapidly improve access to this life-saving intervention in resource-poor settings. This approach focuses on maximizing survival at the population level through standardized sequencing of available antiretroviral drugs, Delivered to individuals by means of simplified approaches to clinical decision making [2].

Anti-retroviral drugs act by interfering with viral replication, then they decrease viral load. They are broadly classified by phase of retro virus life cycle that the drug inhibits. These are nucleoside reverse transcriptase inhibitors (NRTIs) which inhibits by being incorporated into synthesize viral DNA and preventing elongation. These groups includes drugs like Zidovudine (AZT) or (ZDV), stavudine(D4T), Lamuvidine (3TC), Abacavir(ABC), Didanosine(DDI), Tenofavir (TDF).

The second groups of drugs are NNRTIs, Such as, EFV, NVP. The NNRITs binds to reverse transcriptase in a way that inhibits the enzymes activity [2].

The third groups of drugs are protease inhibitors (PIs example: Lopinavir, Ritonavir, Atozanavir and Saquinavir- is selective, competitive, reversible inhibitor of HIV protease, an enzyme that plays an essential role in HIV replication and the formation of infections virus [2].

Because of the need for sustained viral suppression, adherence to HIV therapy is paramount importance. Given the high rate of viral replication and the long-term survival of HIV reservoirs within treated patients, it has been estimated that minimum of 95% adherence with therapy is required to maintain HIV viral suppression and to prevent the emergence of drug resistance [3-5].

Statement of the Problems: Once antiretroviral therapy (ART) is initiated, patients generally remain on medications indefinitely. A switch in the antiretroviral (ARV) regimen is often necessary because of both acute and chronic toxicities, concomitant clinical conditions and development of virologic failure. The approach to patients who need to switch ART will differ depending on several issues, including the reason for change, the amount of previous ART experience and the available treatment options. For example, when patients develop an adverse effect to a drug during their first ARV regimen, effective treatment may be easily accomplished by substituting another agent for the offending drug in the regimen. At the opposite end of the spectrum are patients with advanced HIV disease who have experienced toxicities, virologic failure and drug resistance during multiple past treatment regimens and thus require a new treatment regimen. This article reviews these circumstances and provides clinical evidence and strategies for switching ART [6].

After introduction of ART on all over Ethiopia any related adverse reaction and other co-morbidity attributed to ART regimen switch. Among the major cause of regimen change and contributing factors most frequently encountered are toxicity, pregnancy, treatment failure, lack of adherence, co morbid condition, pill burden, patient factor are dominant [7].

Study conducted in sub-Sahara Africa has shown that viral suppression and improvement in immune status can be achieved among patients with near perfect adherence to ART. It has been observed, however that prolonged exposure to HAART may result in unwanted effects such as adverse reaction, poor adherence and the emergency of any resistant mutants [8].

Reasons for treatment switch may be the risk of long term toxicities, a desire for pregnancy, treatment failure(clinical failure, virologic failure and immunologic failure) and its contributing factor such as comorbidity (opportunistic infection and others (patient factor, pill burden , lack of adherence), Toxicity or adverse drug reaction is creating adherence problem and affect patients willingness to take drugs. some study shows that ADR staring from simple rash up to life treating Stephen Johnson syndrome and other life treating adverse effects like hepatotoxicity, rash, mitochondrial damage and bone marrow damage toxicity are factors for regimen change, due to the absences of clear standard guideline for regimen change availability of alternative and consistent of the patient. Basically the cause of toxicity of ARV drugs is low adherence, so working on adherence will bring change admission of patients due to drug related toxicity [9, 10].

The other reason for treatment failure is pregnancy i.e. treatment with EFV should be avoided in the first trimester the period of which organogenesis occurred. Among pregnancy observed prospectively to an ARV pregnancy registry in United State, birth defects were observed live birth following exposure of EFV based regimens in the first trimester of pregnancy [11].

And most drugs crosses placenta and cause deleterious effect on neonates and infants. E.g. PIs like Lopinavir, Ritonavir, Saquinavir and others have an ability to increase serum of glucose level of women which will

cause hyperbilirubenmia results in kern ictus in neonates and young infants. NNRTIS like EFV is also a teratogenic ARV drugs while that NRTIS like AZT and NVP have better toxicity profile for pregnant women [12].

The other common reason for regimen change is treatment failure in including virologic, clinical and immunologic failure. Virologic failure defined as either viral load rebound from undetectable, not reaching undetectability and / or an increase of the viral load when considering an ART regimen on patients with virologic suppression, it is critical to examine the patient's treatment history. Previous virologic failure on an NNRTI, whether or not resistance testing was performed or documented resistance to this class of agents is contradiction to switching to NVP or EFV [13, 14].

Immunologic failure occur when patients starting ART may fail to have a significant increase in CD4 cell despite control of viral replication but in some cases, the particular ART regimen may be problematic. Several studies have shown suboptimal increase, or even decrease in the CD4 count [15].

Clinical failure new or recurrent WHO stage 4 conditions must be differentiated from immune reconstitution syndrome (IRIS).certain WHO clinical stage conditions e.g.: pulmonary TB, severe bacterial infections may be an indication of treatment failure (clinical failure) [16].

Contributing factor for the above could be such as co morbidity, lack of adherence and others (patient factors, pill burden and professional factor). TB is the most common higher opportunity infection in HIV patients in developing countries and is it the foremost cause of death in such patients. Immune suppression due to HIV not only causes TB reactivation but also contributes to new infection [17].

Treatment adherence should be very strict. The optimal quoted 95% adherence to recommended regimens should be emphasized to prevent ART resistance. This means that missing more than 3 doses per month with BID dose is associated with high risk of development of resistance [18].

Treatment regimen should be simplified by reducing the number of pills, reducing the number of dosing and minimizing side effect. Fixed dose combinations are very useful. Only officially approved drugs should be used. Adherence may be measured by patient self-report, pill count and report of primary care [19].

Non-adherence can lead to poor clinical, immunological and virological outcomes. At an individual level the consequences of non-adherence include: incomplete viral suppression, continued destruction of the immune system decrease of CD4+ cell count, progression of disease, emergence of resistant viral strain and limited future therapeutic option and higher cost for individual treatment which translates to higher program cost [20].

Proper education of patients before the initiation of and during ART is important for the success of adherence. Strategies such as education should cover basic information about HIV and its manifestations, the benefits and side effects of ARV medications, how the medications should be taken and the importance of not missing any doses. Adherence assessment should be combined with adherence counselling at each visit [21].

Significance of the Study: The human immunodeficiency virus (HIV) has killed more than 25 million people since the first diagnosis in 1981.After the introduction of antiretroviral therapy (ART), the overall acquired immune deficiency syndrome (AIDS)-related morbidity and mortality have been markedly decreased. However, it is still high in sub-Saharan Africa, including Ethiopia [21].

There are now more than 16 approved therapeutic agents for infection with HIV. Approved antiretroviral (ARV) drugs include the nucleoside analogs (NRTIs), the non-nucleoside analogs (NNRTIs) and protease inhibitors (PIs). Entry inhibitors and integrase inhibitors are also currently in use. However, these advances have not been without their cost in terms of drug-resistance and side effects [22].

The first-line antiretroviral regimen in Ethiopia included a triple therapy, including either two NRTIs and one PI or an NNRTI, or a triple therapy included three NRTIs. These were D4T plus 3TC plus EFV, or D4T plus 3Tc plus NVP, or Zidovudine (ZDV) plus 3TC plus EFV or ZDV plus 3TC plus NVP [23].

A treatment switch, which may be either because of the risk of long-term toxicity, poor adherence, a desire for pregnancy, a sub-optimal regimen, co-morbidity with other chronic diseases or virological failure [24].

After the introduction of ART overall the Ethiopia; HIV/AIDS mortality and morbidity have been markedly decreased. But it is still high in sub-Sahara Africa. Once ART is initiated, patients generally remain on medication indefinitely. A switch in the ART regimen is often necessary because of acute and chronic toxicity, co morbidity condition, development of treatment failure, drug interaction and pregnancy. So, the approach to patients who need to switch ART will differ depending on several issues. Such as ART experience and the available

treatment options. This happens when a patient develops an adverse effect to a drug during their first ART regimen. At the opposite end of the spectrum are patients with advanced HIV disease that have experienced toxicities, treatment failures, drug resistance and lack of adherence during multiple past regimens and thus require a new treatment regimen [24].

With the scaling up access to ART in our country, there is an opportunity to better understanding the benefit and drawback of the regimen. Data on medication of initial ART are scarce among patients of Ethiopia. So that data can potentially providing a long term strategic approach to initial and subsequent decision regarding ART. This study was conducted to assess the underlying cause of switching the ART and contributing factors related to the patient's personal condition on which the necessary improvement will be made. It also provides an available assistance to the concerned organization especially for health facilities in handing the cause for switching and contributing factors and making the possible amendment. The study also helps the different bodies like governmental and nongovernmental organization to make use of results in decision related to ART. Therefore, the objective of this study was to assess reasons for ARV regimen change and contributing factors among HIV/AIDS patients on HAART at Jimma University Specialized Teaching Hospital at ART clinic.

MATERIALS AND METHODS

Study Area and Period: The study was conducted at ART clinic in Jimma University Specialized Teaching Hospital, South west Ethiopia, Oromia Region, Jimma. The Hospital is located 336km away from Addis Ababa.

Study Design: The Study was conducted using retrospective Cohort Study using the patient information from patients follows up chart. Including the patient information sheet; demographic data; starting and changing regimen, duration on initial therapy, CD4 count and reason for changing and contributing factor was collected.

Populations

Source Population: All patient information record cards of HIV/AIDS patients those are on follow up at ART clinic in Jimma University Specialized Teaching Hospital, South west Ethiopia, Oromia Region, Jimma and the study was conducted from Jan 28-Feb 08, 2014 in Jimma University specialized, Teaching hospital, from January 2010 to December 2013.

Target Population: A patient information record cards of HIV/AIDS patients who switch or change their previous ARV regimen.

Study Population: The study population consists of 194 patient information record cards that were selected systematically from target population.

Sampling

Sample Size and Sampling Technique: The sample size of this study population was determined based on the sample size calculation for the retrospective cohort study. The formula is:

$$N = 1/[p(1-p)]^{2}[Z_{1-\alpha}\sqrt{\left(1+\frac{1}{k}\right)U(1-U)} + Z_{1-\beta}\sqrt{P\sqrt{\left(1+\frac{1}{k}\right)U(1-U)R^{(1-Rp)+P(1-p)/K}}}]2$$

where:

R = Minimum relative risk
P = Incidence of the disease in unexposed
α = Type I error
β = Type II error
$Z_{1-\alpha/2}$ and $Z_{1-\beta}$ = The unit normal deviates corresponding to α and β.
K = the ratio of number of control subjects to the number of exposed subjects α = 0.05; β = 0.02 (power = 80%); exposed: exposed ratio = 1: 1, R= 0.2; P= 0.15 N = 97 + 97 = 194

The sample population was include 194 HIV/AIDS patients who were systematically selected from those who undergone switching or changing regimen or drug(s) from January 2010 to December 2013.

Inclusion Criteria

HIV Patients Who Were Switch Their Initial ART Regimen

Exclusion Criteria: Patients who were on HAART for less than 6 months; Incomplete and illegible patient record cards; Patient who did not switch HAART regimen were the exclusion criteria.

Variables

Independent Variables: Age, Sex, CD4 + count, WHO clinical stage, ART regimen, Duration of therapy, Co-morbidity, Adherence, Resistance and Toxicity were the independent variables.

Dependent Variable

Reason for Regimen Change

Data Collection: Data was collected using data collection instruments; questionnaires, check list and pen by using information sheet from pharmacy record (physician records) as a source of data.

Data Processing and Analysis: After collecting data it was clearly categorized and analysed manually. The estimated prevalence of HAART modification and contributing factor was reported as percentage. In addition the result was presented by tables and graphs.

Quality Assurance: Before starting the actual data collection pilot study will under-taken on five patient record cards to ensure patient information sheet and physician diagnosis card for their completeness and to evaluate the data collection format for its validity, reliability and consistency.

Ethical Consideration: Ethical consideration was strictly followed. Prior to data collection a formal letter was written from Jimma University student research program. The name of the patient was not written to keep confidentiality.

RESULTS AND DISCUTIONS

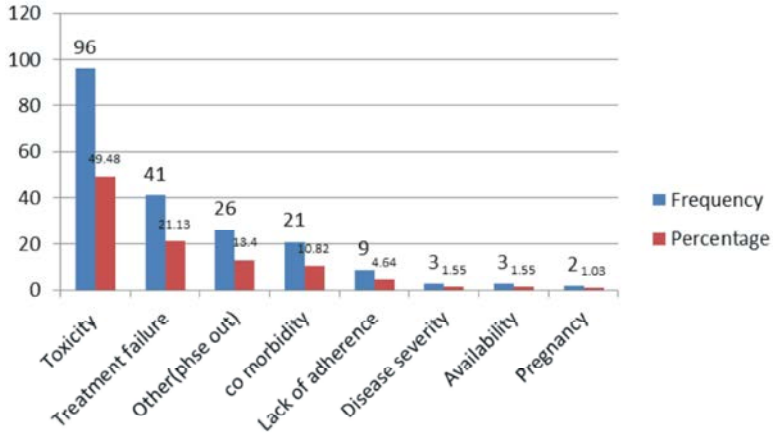
From 2525 patients record assessed who changed their initial anti-retroviral treatment regimen only 194 patients have selected at Jimma University specialized Teaching Hospital and the majority of clients were Females accounted for 111(57.22%) with media age of 32.4 years. This result is consistent to the study done in South Ethiopia, (69.29%) were females [25]. But contrast the study in Latin America and the Caribbean which is 35% were female, median age at HAART initiation was 37 years [26].

The data on marital status reviewed was 86(44.33) were married, 45(23.20%) of the patients were single, divorced and Widow were 39(20.10%) and 24(12.17%), respectively. This find is contrast to the study done at two hospitals in South Ethiopia; the Hawassa Referral Hospital and the Shashemene Referral Hospital over half (54.11%) of them were single [25]. The Religion Orthodox 104(53.61%) was the commonest religion found in patients who were on ART followed Muslim, protestant, catholic and others(Adventist, Waaqeeffataa and Apostolic) were 63(32.47%), 18(9.28%), 6(3.09%) and 3(1.55%), respectively. According to the study done in southern Ethiopia Orthodox Christianity (47.06%) was the most common religion found in patients who were on ART followed by Muslims (20.88%) [21]. concerning educational background level, majority 55(28.35%) of the patient were 9-12 grades followed by 1-4 grades 45 (23.20%), Illiterate 34(17.53%), 5-8 Grades 30(13.46%), Read and Write 17(8.76%) & College and above was 13(6.7%). It is contrast to the result of the Hawassa Referral Hospital and the Shashemene Referral Hospital (37.06%) was illiterate [25].

The weight at switch was increased mostly than at initiation 150(77.32%) and decreased 44(22.68%). Most of clients were living in Urban 160(82.47%) and Rural 34(17.53%).

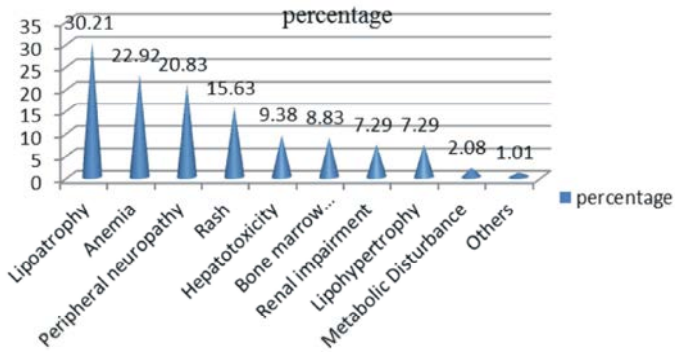
Table 1: Socio-demographic distribution of the study population with ART switching Jimma University Specialized Teaching hospital, South West of Ethiopia, Oromia Region, Jimma

Variables		
Sex	Frequency	(%)
Female	111	57.22%
Male	83	42.78%
Total	194	100%
Age group		
< 15	6	3.09%
16-30	70	36.08%
31-45	93	47.94%
46-62	20	10.33%
> 61	5	2.58%
Religion		
Orthodox	104	53.61%
Muslim	63	32.47%
Protestant	18	9.28%
Catholic	6	3.09%
Others	3	1.55%
Educational Level		
9-12 grade	55	28.35%
1-4 grade	45	23.20%
Illitrate	34	17.53%
5-8 grade	30	15.46%
Read and write	17	8.76%
Collage and above	13	6.70%
Marital Status		
Single	45	23.20%
Married	86	44.33%
Divorced	39	20.10%
Widowed	24	12.37%
Weight lost / gained during treatment Change.		
Increased ≤ 5	87	44.85%
Increased ≥ 5	63	32.47%
Decreased ≤ 5	24	12.37%
Decreased ≥ 5	20	10.31%
Patient Source		
Rural	34	17.53%
Urban	160	82.47%



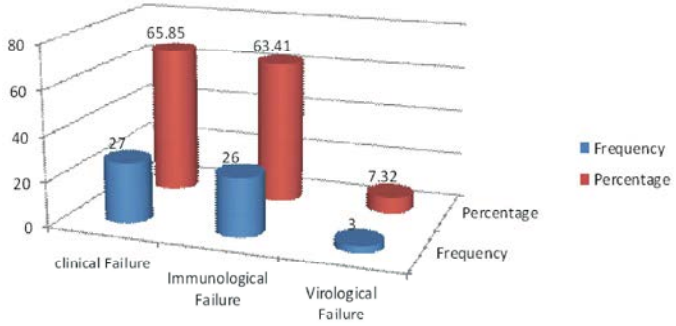
Note: There were multiple responses

Fig. 1: Reason for treatment regimen changes in Jimma University Specialized Teaching Hospital, South West of Ethiopia, Oromia Region, Jimma



Note: There were multiple responses

Fig. 2: Toxicities identified as a reason for ART switch in Jimma University Specialized Teaching Hospital, South west of Ethiopia, Oromia Region, Jimma



Note: There were multiple responses

Fig. 3: Types of treatment failure among HIV patients in Jimma University Specialized Teaching Hospital, South West of Ethiopia, Oromia Region, Jimma

The main reasons for ART switch and its contributing factors were toxicity among 96(49.48%) of the clients, which is consistent with the study conducted in UK (60%) [19]. South India (64%) [22)]. Uganda (71.8%) [17], Argentina, INNSZ-Mexico, or IMTAvH-Peru and Dessie Hospital (66%) [12], followed by treatment failure, 41(21.13%) Potential causes include insufficient ARV levels, inadequate potency of individual ARVs or a combination of ARVs and pre-existing resistance. Insufficient drug levels may stem from suboptimal adherence (owing to toxicity, tolerability, or personal issues), poor absorption, host genetics that influence

drug metabolism, incorrect dose, or drug interactions, others (phase out) 26(13.4%), comorbidity, 21 (10.83%), Lack of adherence 9(4.64%), Disease severity 3(155%), Availability 3 (1.55%) and due to pregnancy was the least one 2(1.03%) of the studied population. It is also the same to the study done seven sites throughout the Caribbean and Latin America reasons for change were failure (1.3%), the availability of a better regimen or simplification (1.5%), drug supply problems (1.8%) and abandonment (adherence) failures (1.1%). Of the patients who initiated HAART, 2.9% changed regimens for an undocumented reason [27].

Treatment failure is also one main reason for ARV regimen change in this study and it is not consistent with the study done in Dessie referral hospital co morbidity was also one main reason for ARV regimen change from that TB was the only predominant disease. This study was also consistence with that in UK, six patients out of ten patients with co morbidity switch due to TB. Due to co morbidity 11(26.8%) patients switched from D4T/3TC/NVP to D4T/3TC/EFV whereas 23(38.9%) patients switched from AZT/3TC/NVP to AZT/3TC/EFV since they develop disseminated TB.

From all toxicities identified, Lipoatrophy accounts for 29(30.21%) of the toxicities due to D4T/3TC/NVP was the most common followed by Anaemia 22(22.92%) was due to AZT in AZT/3TC/NVP and AZT/3TC/EFV, peripheral neuropathy 20(20.83%) was due to D4T in D4T/3TC/NVP and D4T/3TC/EFV regimens. Rash 15(15.63%) Rash was mainly due to NVP in D4T/3TC/NVP and AZT/3TC/NVP, Hepatotoxicity 9(9.38%) it is mainly due to Nevirapine (NVP)-containing regimens of D4T/3TC/NVP and AZT/3TC/NVP. Bone Marrow Suppression was 8(8.33%), renal impairment 7(7.29%), Lipohyperthrophy 7(729%), metabolic disturbance 2(2.08) and the others 1 (1.01%). This Finding is contrast to the result done in Dessie Referral hospital, anaemia is the most common reason from drug point of view, 50% toxicity is due to AZT/3TC/EFV, from this anaemia is the only adverse effect resulted, AZT/3TC/NVP (28%) is the second more cause of toxicity for switching [28]. Efavirenze-based regimens had the lowest hazard for change, relatively.

From the types treatment failure identified clinical failure 27 (65.85%) was the most one and also Immunological failure 26(63.41%) and a virological failure 3(7.32%) was the least one. According to the study in Uganda, immunological failure alone predicated virological failure in 56% of the patients. This may be due to lack of the viral load measuring device, lack of continuous monitoring of patients with a CD4 count and on the occurrence of opportunistic infection in the study setting of this study. Cost was one of the major reasons for discontinuation and modification of ARV drugs according to the study conducted in India (64%) and Uganda (23%). However, it was not a reason for modification of ARV drugs in this study, due to the cost-free (fee-free) provision of ARV drugs for the patients in Ethiopia [21].

According to this finding majority of D4T/3TC/EFV switched to TDF/3TC/EFV 25(60.97%) is due to, Thymidine analogue use has been associated with lipoatrophy and, in particular, d4T use has been identified as a risk factor in several studies. Although fat loss was once thought to be irreversible, small proof-of-concept studies have suggested that substituting ZDV or ABC for d4T was an approach worthy of further examination [29] followed by AZT/3TC/EFV, AZT/3TC/NVP, were TDF/3TC/NVP 9 (21.95%), 3(7.32%) and 2(4.88%), respectively. That of the D4T/3TC/NVP changed to AZT/3TC/NVP 87(77.68%), TDF/3TC/NVP 9(8.04), TDF/3TC/EFV 8(7.14), D4T/3TC/EFV 7(6.25) and AZT/3TC/EFV 1(0.89). That of the AZT/3TC/NVP was switched to TDF/3TC/NVP 14(45.16%), AZT/3TC/EFV 9(29.03%) and 7(22.58%). AZT/3TC/EFV was changed to TDF/3TC/EFV 1(50) and AZT/3TC/NVP 1(50). That of TDF/3TC/EFV was mostly to TDF/3TC/NVP 3(75%) that only due to Programming for Pregnancy in Dec 2012 and TDF/3TC/NVP mostly changed to TDF/3TC/EFV 3(75%).

A majority of the patients 115(59.27%) were on D4T/3TC/EFV at the beginning of the antiretroviral treatment and the rest were on D4T/3TC/NVP 43(22.16%), AZT/3TC/NVP 27(13.92%) and AZT/3TC/EFV, TDF/3TC/EFV, TDF/3TC/NVP were equally 3(1.55%). This is similar to that of Brazil. The majority were started HAART in between 2002–2005 although 26% of patients from HUCFF-Brazil initiated prior to 2000. Across sites, NNRTI-based initial regimens were most common (84%) with Efavirenze (EFV) the most frequently used (58.5%) but in IMTAvH-Peru [26]. And that of the research done in Southern India were D4T/3TC/NVP accounts for 63% and with that in Asia (on Treat Asia HIV observational Data base, TAHOD) where D4T/3TC/NVP accounts for 37%. But contrast to Hawassa Referral Hospital and the Shashemene Referral Hospital and with that in Dessie Referral Hospital (14) where AZT/3TC/EFV regimen accounts for (36%) [12]. The probable reason for this difference is treatment options variation and prescribing professional competency in relation with when to choose specific drug; which again may be due to variation in ART drug related information.

Table 2: Initial ART regimen by types of ART switch in Jimma University Specialized Teaching Hospital, South West of Ethiopia, Oromia Region, Jimma

	Regimen switched to, N(%)						
Initial regimen	TDF/3TC/NVP	TDF/3TC/EFV	AZT/3TC/NVP	AZT/3TC/EFV	AZT/3TC/L/rv	D4T/3TC/EFV	D4T/3TC/NVP
D4T/3TC/EFV	2(4.88)	25(60.97)	3(7.32)	9(21.95)	1(2.44)	--	1(2.44)
D4T/3TC/NVP	9(8.04)	8(7.14)	87(77.68)	1(0.89)	--	7(6.25)	--
AZT/3TC/NVP	14(45.16)	7(22.58)	1(3.23)	9(29.03)	--	--	--
AZT/3TC/EFV	--	1(50)	1(50)	--	--	--	--
TDF/3TC/EFV	2(50)	--	--	1(25)	1(25)	--	--
TDF/3TC/NVP	--	3(75)	1(25)	--	--	--	--

Table 3: Types of initial treatment regimen in Jimma University Specialized Teaching hospital at ART clinic, South West of Ethiopia, Oromia Region, Jimma

Initial regimen	Frequency	Percentage (%)
D4T/3TC/EFV	115	59.27%
D4T/3TC/NVP	43	22.16%
AZT/3TC/NVP	27	13.92%
AZT/3TC/EFV	3	1.55%
TDF/3TC/EFV	3	1.55%
TDF/3TC/NVP	3	1.55%

Table 4: Duration on an initial ARV therapy before first switch in Jimma University Specialized Teaching hospital, South West of Ethiopia, Oromia Region, Jimma

Duration	Frequency	Percentage (%)
Start – 12 weeks	13	6.70%
12-36 weeks	23	11.86%
36-60 weeks	30	15.46%
60-84 weeks	24	12.37%
84-108 weeks	22	11.34%
> 108 weeks	82	42.27%

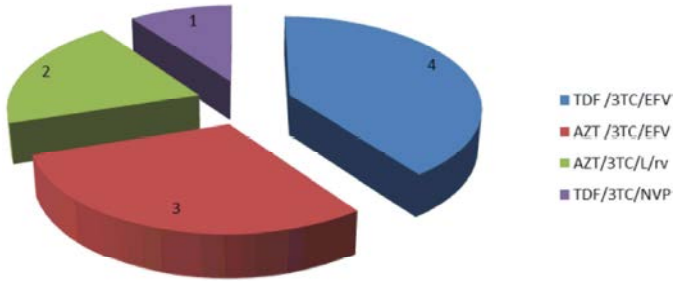


Fig. 4: The second switch identified in ARV patients in Jimma University specialized Teaching Hospital, South West of Ethiopia, Oromia Region, Jimma

From all study population the clients staid mostly on their first regimen for >108 weeks followed by 36-60 weeks, 60-84 weeks, 12-36 weeks were 15.46%, 12.37% and 11.86%, respectively, but changing within the first 12 weeks was the least. This study contrast to the multi-cohort study in Latin America and the Caribbean to describe rates of and reasons for changing initial HAART regimen was high rates of change early after treatment initiation with substantial variation across sites, ranging from 8–28% in the first 3 months and 18–41% in the first year [30].

From the study population those were switched at second time their regimen, the majority of clients switched TDF/3TC/EFV 4(40%) were four from ten peoples, followed by AZT/3TC/EFV AZR/3TC/L/rv, TDF/3TC/NVR 3(30%), 2(20%) and 1(10%), respectively.

CONCLUSIONS

The results of this study indicated toxicity 96(49.48%) as the main reason for modification of ART among the study population. Treatment failure 41 (21.13%), phase-out of D4T containing Regimen (By revised National Guideline on HIV/AIDS management as recommended WHO), comorbidity and Lack of Adherence were the rest major reasons for ART switch.

According to this, Lipoatrophy 29 (30.21%) was the leading toxicity (Adverse effect) and anemia, peripheral neuropathy, Rash and Hepatotoxicity were contributing to modification of ART regimen. The commonly switched ARV regimen was D4T/3TC/NVP to AZT/3TC/NVP87 (77.68%). Therefore, the following points were forwarded as a recommendation: The health professionals those work at JUSH ART clinics should adhere to National and WHO guidelines. The responsible body should consider viral load services at ART clinics. Strengthen system for monitoring regimen switches at the facility and national level with special attention to an adverse drug reaction. Improve the clinical recording of patients on ART by keeping complete clinical records including initial and follow-up laboratory investigation results. Finally, further prospective study is recommended to investigate the factors associated with modification of ART and to overcome the limitation of the retrospective cross-sectional study and use of secondary data from clinical records with the existing clinical record-keeping conditions.

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