# Compliance of healthcare providers with National treatment guidelines for HIV/AIDS.

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**ABSTRACT**

**Background:** Evidence had shown that low compliance with treatment guidelines by healthcare providers may result in incomplete care of patients thereby defeating the aim of HIV disease management and control.

**Objectives:** This study was conducted to compare the compliance of a site ART treatment team with the National Guidelines' recommendation on criteria for treatment initiation and regimen change among HIV/AIDS experienced patients.

**Methods:** In a retrospective observational double cohort study, the medical records of all adults HIV/AIDS positive and treatment experienced patients (N=267) whose ART regimen were either substituted or switched between January 2008 and June 2009 were evaluated for the fulfilment of criteria required before treatment initiation and change of therapy.

**Results:** The level of compliance with guidelines' recomendations for therapy initiation ranged from 0% - 84.3% (mean= 31.4%; median = 23.2%; SD =21.5%) while compliance with guidelines' recommendations for regimen change ranged from 0% - 61.4% (mean= 31.4%; median = 3.8%; SD =21.5%). **Th**ere was 100% and 89.2% compliance with 'what to start' and 'when to start' respectively.

**Conclusions:** Majority of the patients were given appropriate ART regimen at the right time based on the guideline recommendations but compliance with guideline's recommendations for therapy change was poor. The extent of compliance with guideline's recommendations is critical to success of HIV/AIDS control programme.

**Key words:** treatment-guideline, HIV/AIDS, compliance, antiretroviral-therapy, healthcare-providers.

# Conformité des professionnels de la santé avec les directives nationales portant sur le traitement du VIH/SIDA.

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**RESUME**

**Contexte:** C'est évident qu'une faible conformité aux directives de traitement par les professionnels de la santé peut aboutir à un soin incomplet des patients, contrariant ainsi le but de la gestion et du contrôle de la maladie du VIH.

**Objectifs:** Cette étude fut conduite pour comparer la conformité de l'équipe d'un site de traitement avec la recommandation des directives nationales sur les critères pour l'initiation du traitement et le changement du régime chez les patients expérimentés de VIH/SIDA.

**Méthodes:** Dans une étude de double cohorte rétrospective observationnelle, les dossiers médicaux de tous les adultes séropositifs au VIH /SIDA et le traitement de patients expérimentés (N=267) dont les régimes ART étaient soit substitués soit changés entre janvier 2008 et juin 2009 étaient évalués pour la réalisation des critères requis avant l'initiation du traitement et le changement de thérapie.

**Résultats:** Le niveau de conformité avec les recommandations de directives pour l'initiation de la thérapie varie entre 0% - 84,3% (moyenne= 31,4%; médiane = 23,2%; SD =21,5%) alors que la conformité aux recommandations de directives pour le changement des régimes entre 0% - 61,4% (moyenne= 31,4%; médiane = 3,8%; SD =21,5%). Il y avait une conformité de 100% et 89,2% avec 'quoi commencer' et 'quand arrêter' respectivement.

**Conclusions:** La majorité des patients avaient reçu des régimes ART appropriés au bon moment selon les recommandations de directives, mais la conformité avec les recommandations de directives sur le changement de thérapie était faible. L'importance de la conformité aux recommandations de directives est essentielle pour le succès du programme de contrôle du VIH/SIDA.

**Mots-clés:** Directives de traitement, VIH/SIDA, conformité, thérapie antirétrovirale-, professionnels de la santé.

## INTRODUCTION

The HIV prevalence in Nigeria increased from 1.8% in 1991 to 5.8% in 2001 before gradually going down to 4.1% in 2010. The 2005 National Guideline for HIV and AIDS treatment and care in adolescents and adults was revised to produce the 2007 edition of the guideline with the aim of combating the spread of the disease. Meanwhile, Nigeria lost about 220,000 people to this dreaded disease in 2009.[1] In 2010, the 2007 treatment guideline was reviewed to produce 2010 edition of National Treatment Guidelines. Even though over 300,000 persons were on treatment as at 2010,[2] Nigeria recorded 388,864 new infections and 217,148 AIDS related deaths in 2011.[3] Evidence had shown that low compliance by healthcare providers to guidelines for treatment may result in incomplete care of patients[4] and is associated with mortality and lack of virological response.[5] While extents of adherence to prescribed regimen by HIV/AIDS patients had been documented by many workers, [6,7,8,9,10,11] there is little information on extent of compliance of Healthcare providers with specific recommendatons of the National Guidelines for HIV/AIDS with respect to treatment monitoring or maintainance in Nigeria. The focus of this study was to evaluate the extent of compliance by healthcare providers with the 2007 National Guidelines' recommendations on 'when to start', 'what to start' and ART monitoring among HIV/AIDS experienced patients at National Institute for Pharmaceutical Research and Development (NIPRD) Health Center. The knowledge of compliance with guidelines may produce a tool for monitoring and evaluation of healthcare providers in the management HIV/AIDS.

## METHODS

The study design involved a retrospective observational double cohort and was carried out at the antiretroviral therapy (ART) section of the NIPRD Health Center located within the NIPRD Research Complex, in a semi-rural area of Abuja, the capital city of Nigeria. Abuja falls within the Guinean forest-savanna mosaic zone of the West African sub-region and has an annual rainfall of 1221.2 millimeters in 2010.[12] The NIPRD Health Center is the Clinical Research Facility of National Institute for Pharmaceutical Research and Development. The facility caters for over 5,000 patients presenting with different ailments annually from which willing subjects are pooled for Phase I clinical trials of suspected therapeutic agents or phytomedicines under development in the laboratories. The ART team comprise three medical doctors, two nurses, two pharmacists, three adherence counsellors and two treatment support specialists who caters for over 3,500 HIV/AIDS patients out of which over 2,700 patients are on highly active antiretroviral therapy (HAART).

The 2007 National guideline for HIV and AIDS treatment and care in adolescents and adults recommends that Highly Active Antiretroviral Therapy (HAART) should include one Non nucleoside reverse transcriptase inhibitor (NNRTI) and two nucleoside reverse transcriptase inhibitor(NRTI) for intial or first line regimen.[13] The second line regimen consist of at least two NRTIs with a boosted protease inhibitor (PI). [13] Replacement of one or two of the component drugs in the first line regimen with drugs of the same class due to adverse or sensitivity reaction is referred to as regimen substitution while replacement of the NNRTI drug by a protease inhibitor due to treatment failure is referred to as regimen switch.[13] The ART team is assumed to have complied with the guideline recommendations if there is documentary evidence to attest to it by way of recording of values for parameters checked before, during and after therapy initiation, substitution and switch. This study was approved by the NIPRD Ethical Committee.

The medical records of all patients totaling 267 (102 males and 165 females) whose HAART regimen were either substituted or switched between January 2008 and June 2009 were evaluated to assess the extent of compliance with recommendations contained in the 2007 National Guideline for treatment initiation, substitution of regimen and regimen switch. The recommendations evaluated for compliance by ART team were as follows:

1. CD4 count check of all patients before therapy initiation, substitution and switch
2. Consideration for hepatic toxicity due to nevirapine
3. Pregnancy test for all females lying within child bearing age (18-45years) before therapy initiation, substitution and switch
4. Clinical and immunological staging of all patients before treatment initiation
5. Hematological considerations of patients before therapy initiation, substitution and switch.
6. Weight monitoring of all patients for ART monitoring.

The number of patients for whom recommendations were complied with (n) was scored against the total number of patients ($\sum$n) for whom recommendations ought to be complied with to reflect the level of compliance with the National Guideline. Data obtained were analysed using graphPad and Excel software and

the data were presented in descriptive statistics.

**RESULTS**

Baseline Characteristics: Between January 2008 and June 2009, 267 patients comprising 102 males and 165 females on HAART, had their drug regimen substituted or switched. The age of the patients ranged between 21 – 60 years for 260 patients whose age were documented at therapy initiation. (21 – 59years for females and 26-60years for males). The mean age for the male patients was higher than that of the female patients (P<0.0001). The modal class for age (35 years) was 30-39years.

The initial CD4 ranged from 4-971cells/µl at therapy initiation for 225 patients whose CD4 count was documented but there was no significant difference between median female CD4 count and male CD4 count (219vs 193; P=0.1984). (see Table 1)

**Table 1: Baseline profiles of the study population**

| | Female N(%) | Male N(%) | P value |
|---|---|---|---|
| No of Patients | 165 (61.8) | 102 (38.2) | |
| 21 - 29 years | 53 (19.9) | 5 (1.9) | |
| 30-39 years | 83 (31.1) | 44 (16.5) | |
| 40-59 years | 26 (9.7) | 47 (17.6) | |
| > 60 years | 0 (0) | 2 (0.74) | |
| Mean Age + SEM | 32.98±0.51 | 39.96 ± 0.72 | <0.0001 |
| Mean Initial Wgt ± SEM | 62.10 ± 1.302 | 68.72 ± 1.451 | 0.0009 |
| Median Initial CD4 count | 219 | 193 | 0.1984 |

CD4 count check: Out of the 267 patients evaluated, only 225 patients (84.3%) had their initial CD4 count checked before theray initiation. At the first regimen substitution of 262 patients, 69 patients (26.3%) had their CD4 count checked before the substitution. Sixty-nine (69) patients had their therapy substituted or switched for the second time but only 16 patients (23.2%) had their CD4 checked before the substitution or switch took place. At the third therapy substitution or switch, only three out of 12 patients (25%) had their CD4 count checked before their regimen were substituted or switched.

Out of the 267 patients evaluated, all patients received the correct drug regimen at therapy initiation (compliance level=100%) but 29 patients (10.9%) whose CD4 count was above 350cells/µl were started on therapy contrary to the guidelines' recommendations on 'when to start' giving a compliance level of 89.2% to the site ART team.

Consideration for hepatic toxicity due to nevirapine: Out of 48 women with initial CD4 count greater than 250cells/µl, only one (2.1%) was started on non-nevirapine containing regimen. All men (100%) whose initial CD4 count was greater than 400cells/µl were given nevirapine containing regimen contrary to the guideline recommendations.

Pregnancy test: Only 3.8% women (6/157) of child bearing age (18-45 years) were tested for pregnancy before being placed on ART. Meanwhile, two women out 25 (8%) had therapy substitution to EFV based regimen after pregnancy test.

WHO clinical/immunological staging: From a total of 267 patients, none had a documented clinical/immunological staging (0%).

Haematological considerations for patients on zidovudine based regimen: 12 patients were placed on zidovudine based regimen with only six (50%) having prior check of their packed cell volume (PCV).

At first therapy substitution or switch, 22.2% of patients had prior PCV check before being placed on zidovudine

based regimen (6/27). 8.8% (3/34) and 0% (0/2) had thier PCV checked before undergoing second and third therapy substitution or switch respectively.

Weight considerations for anti-retroviral therapy (ART) monitoring: 65.5% (175/267) of the patients had thier initial weight checked before therapy initiation. At first therapy substitution or switch, 61.6% (162/263) of the patients had their weght checked while 50% had thier weight checked before being introduced to the second therapy (34/68) and third therapy (6/12) substitution or switch respectively.

All the patients evaluated received the correct drug regimen at enrollment but only 89.2% started their therapy at the right time. Healthcare providers at NIPRD Health center had a median compliance level of 3.8% (Mean=31.4%; SD=40.2) and 23.2% (Mean=25.2%; SD=21.5) with 2007 National Guideline criteria for treatment initiation and regimen change respectively. The overall Median compliance level with 2007 National Guideline's recommendations for HIV/AIDS treatment and care was 22.7% (Mean=26.9; SD=26.7) (See Table 2A & 2B).

**Table 2A: Compliance level of ART Treatment Team with 2007 National Guideline Recommendations for Treatment initiation in adult HIV/AIDS patients at NIPRD ART Clinic.**

| Recommended Pre-Therapy Assessment | No. of patients pre-viewed | No of patients compliant | Percentage level of compliance (%) |
|---|---|---|---|
| Initial CD4 check | 267 | 225 | 84.3 |
| Patients with CD4>350cells/µl | 30 | 1 | 3.6 |
| Pregnancy test before therapy initiation | 157 | 6 | 3.8 |
| WHO clinical/immunological staging | 267 | 0 | 0 |
| Initial weight check. | 265 | 173 | 65.3 |

**Table 2B: Compliance level of ART Treatment Team with 2007 National Guideline Recommendations for Treatment monitoring in adult HIV/AIDS patients at NIPRD ART Clinic.**

| Recommended Assessment for monitoring | No. of patients pre-viewed | No of patients compliant | Level of compliance (%) |
|---|---|---|---|
| CD4 check at 1st regimen change | 262 | 69 | 26.3 |
| CD4 check at 2nd regimen change | 69 | 16 | 23.2 |
| CD4 check at 3rd reg change | 12 | 3 | 25 |
| Women with CD4 more than 250cells/mm/mm$^3$on Non-Nevirapine containing regimen. | 48 | 1 | 2.1 |
| Men with CD4 more than 400cells/mm$^3$ on Non- Nevirapine containing regimen. | 5 | 0 | 0 |
| Pregnancy test for women on EFV | 25 | 2 | 8 |
| Weight check at 1st regimen change. | 264 | 162 | 61.4 |
| Weight check at 2nd regimen change. | 68 | 34 | 50 |
| weight check at 3rd regimen change | 12 | 6 | 50 |
| PCV check for patients on AZT based regimen at 1st regimen change | 12 | 6 | 50 |
| PCV check for patients on AZT based regimen at 1st regimen change | 27 | 6 | 22.2 |
| PCV check for patients on AZT based regimen at 2nd regimen change | 34 | 3 | 8.8 |
| PCV check for patients on AZT based regimen at 3rd regimen change | 2 | 0 | 0 |

*Note: PCV= Packed cell volume; EFV=Efavirenz; AZT=Zidovudine; WHO=World Health Organisation*

**DISCUSSION**

While all the patients evaluated received the correct drug regimen at therapy initiation and 89.2% of the patients started therapy at the right time, the compliance level (mean=26.9%;median=22.7%; sd=26.7%) with the guidelines' specific recommendations on treatment monitoring such as considerations for pregnacy, haematological status, nevirapine toxicity and weight monitoring was poor.

The level of compliance with 'what to start' (100%) obtained in this study was higher than the values obtained in the Spanish[5] and French[14] cohorts where 91.5% and 89.1% were obtained respectively. However, the level of compliance with 'when to start' (89.2%) recommendations was similar to the value (89%) obtained in the French cohort.[14]

If adherence rates exceeding 95% are necessary in order to maximize the benefits of ART, [2, 13] median compliance level of 22.7% with guidelines specific recommendations on ART monitoring by Healthcare provider may not guaranty the maximum quality of care to the patients; thus no matter how hard the HIV/AIDS patients adhere to medication, their healthcare providers are likely to miss opportunities to modify their therapy or care to achieve the goals of therapy.[2,4,5,13] Therefore, the definition of adherence to therapy might

have to be modified from missing of dose by patients to include extents of non-compliance with treatment guidelines by healthcare providers,[14, 15] especially now that we know that patient mortality is related to level of compliance with treatment guidelines.[5] According to the 2007 guideline, initiation of therapy depends on CD4 cell count and WHO clinical staging,[13] however studies have demonstrated that in the absence of viral load facilities, CD4 cell count monitoring can be used to assess patients' response to HAART.[16, 17] Thus clinical assessment should be complimented with immunological assessment before substitution or switch of patients' drug therapy.

The risk of nevirapine toxicity is minimised by avoiding placing patients with higher CD4 cell count (females > 250cells/µl; Males >400cells/µl) on nevirapine based regimen. Compliance with this recommendation was only for 2.1% of all the patients considered. Thus over 90% of the patients may have complications of hepatotoxicity (due to nevirapine) while on therapy.[17,18,19] Zidovudine is known to cause anaemia thus the need to check patients hematocrit before therapy initiation or substitution with zidovudine containing regimen.[13]

Weight checks are needed to calculate creatinine clearance for the purpose of dose adjustments to compensate for impaired renal function.[13] HIV/AIDS patients may develop various renal disease due HIV associated nephropaties, HAART associated nephropaties, viral hepatitis, drug abuse, and dehydration.[20, 21] The low compliance rate recorded at this site may be due to shortage of manpower; one way of overcoming the challenge of human resources for health is task shifting.[22,23]

The study being a retrospective study had some missing data which could not be traced easily. Also, the researchers assumed that whatever is not documented was not done, this may not be true for all missing data as individuals may have taken decisions on patients' health without appropriate documentation. However, this practice in itself underscore the low compliance with the treatment guideline.[13] Compliance with treatment guidelines can be improved by deployment of electronic medical record systems(EMRs). Studies had showed that the use of EMRs increases the likelihood of adherence to pre-antiretroviral therapy guidelines.[24] Furthermore, EMRs guarantees data accessibility by multiple users and continuous data processing as well as automatic data back up and storage at different locations outside the hospital or clinics so that in case of disaster, access to the record will not be denied. [25, 26, 27] However, the design of such EMRs should take into cognisance the healthcare providers' perceptions of clinical documentation methods that will be used in order to design an efficient computer-based documentation tools. [28]

**CONCLUSION**: The results from this study showed that there was 100% and 89.2% compliance with 'what to start' and when to start recommendations. However, the site team compliance with the guidelines' specific recommendations for therapy change was poor. The extent of compliance with guideline's recommendations is critical to success of HIV/AIDS control programme.

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