Availability of antiretroviral and non-antiretroviral medicines in the management of HIV/AIDS patients in public hospitals in a North-Central State of Nigeria

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ABSTRACT

Background: Availability of antiretroviral medicines (ARVs) and non-antiretroviral medicines (NARVs) in the management of HIV/AIDS patients is a key determinant of the HIV progression and prognosis.

Objective: This study examined the availability of medicines in the management of HIV/AIDS patients in public hospitals, Kwara State.

Methods: It involved triangulation of research methods comprising a review of 780 prescriptions issued to eligible HIV/AIDS patients, observational checks of dispensed medicines to these patients, observational checks of key medicines in the Pharmacies of HIV Treatment Centers using a checklist and in-depth interviews of prescribers and dispensers who provided healthcare to these patients. The pilot study was conducted at Civil Service Hospital, Ilorin. Quantitative data analysis was done using Statistical Package for Social Sciences version 17.00 while in-depth interviews were audio-taped, transcribed and developed into ethnographic summary.

Results: Over 10% of prescribed medicines were out-of-stock of which 4.8% were antiretroviral medicines (ARVs) and 95.2% were non-antiretroviral medicines (NARVs). Analgesics, antimalarials and antimicrobials other than co-trimoxazole accounted for 13.1%, 13.5% and 28.7% of the out-of-stock respectively. The mean percentage score of available key medicine in the Pharmacies was 55.6%. Also, the prescribers and dispensers reported insufficient availability of ARVs and NARVs.

Conclusion: Availability of ARVs and NARVs in HIV/AIDS patients' management in public hospitals, Kwara State did not meet up with the set goal of the Nigerian National Drug Policy. Measures to ensure adequate availability of ARVs and NARVs are recommended.

Key words: HIV/AIDS patients, antiretroviral and non-antiretroviral medicines, availability, in-depth interviews, Nigerian National Drug Policy

Disponibilité de médicaments antirétroviraux et non-antirétroviraux dans la prise en charge des patients du VIH/SIDA dans les hôpitaux publics d'un Etat du centre-nord du Nigeria

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RESUME

Contexte: La disponibilité de médicaments antirétroviraux (ARV) et de médicaments non-antirétroviraux (NARV) dans la prise en charge des patients atteints du VIH/SIDA est un facteur déterminant de la progression et du pronostic du VIH.

Objectif: Cette étude a examiné la disponibilité des médicaments dans la prise en charge des patients atteints du VIH/SIDA dans les hôpitaux publics de l'Etat de Kwara.

Méthodes: Il s'agissait d'une triangulation de méthodes de recherche consistant en une revue de 780 prescriptions délivrées aux patients admissibles atteints du VIH/SIDA, des contrôles d'observation des médicaments distribués à ces patients, des contrôles d'observation des principaux médicaments dans les pharmacies des centres de traitement du VIH en utilisant une liste de contrôle et des entrevues approfondies des prescripteurs et des dispensateurs qui ont fourni des soins de santé à ces patients. L'étude pilote a été menée à Civil Service Hospital (Hôpital de la fonction publique) d'Ilorin. L'analyse quantitative des données a été effectuée à l'aide de la version 17.00 du logiciel de statistique pour les Sciences Sociales (SPSS), tandis que les entrevues approfondies ont été enregistrées, transcrites et développées en synthèse ethnographique.

Résultats: Plus de 10% des médicaments prescrits étaient en rupture de stock, parmi lesquels 4,8% étaient des médicaments antirétroviraux (ARV) et 95,2% étaient des médicaments non-antirétroviraux (NARV). Les analgésiques, les antipaludéens et les antimicrobiens autres que le co-trimoxazole représentaient respectivement 13,1%, 13,5% et 28,7% des médicaments indisponibles. Le pourcentage moyen de médicaments clés disponibles dans les pharmacies était de 55,6%. En outre, les prescripteurs et les dispensateurs ont signalé une disponibilité insuffisante d'ARV et de NARV.

Conclusion: La disponibilité des ARV et des NARV dans la prise en charge des patients atteints du VIH/SIDA dans les hôpitaux publics de l'Etat de Kwara n'a pas atteint l'objectif fixé par la législation pharmaceutique nationale du Nigéria. Des mesures visant à assurer une disponibilité adéquate des ARV et des NARV sont recommandées.

Mots-clés: Patients atteints du VIH/SIDA, médicaments antirétroviraux et non-antirétroviraux, disponibilité, entrevues approfondies, législation pharmaceutique nationale du Nigéria

INTRODUCTION

One of the preconditions to universal access to medicines is the availability of medicines.[1] Medicines play a key role in the health care delivery system. They are one of the vital tools needed for the promotion and maintenance of good health. Medicines are very useful for the prevention, treatment and alteration of most leading causes of morbidity, mortality, discomfort and disability.[2] Indeed, the availability, affordability and appropriate use of quality essential medicines is a simple cost-effective solution to many health problems.[3] Apart from the medical impact, medicines constitute major recurrent public health expenditures (second to salaries). They also account for over half of all private health expenditures.[2] Availability of medicines play key role in providing and accessing quality healthcare; and consequently, improving individual and population health.[4-6]

With regards to management of HIV/AIDS patients, within 25 years of introduction, antiretroviral medicines (ARVs) have changed the HIV from being an inherently untreatable infection to a controllable, chronic disease.[7-9] However, antiretroviral therapy (ART) is life-long and a high level of adherence to prescribed ARV regimen (greater or equal to 95%) is required in order to achieve and maintain suppression of viral replication[10-13] and subsequently prevent microbial resistance. Adequate adherence to non-antiretroviral medicines (NARVs) for opportunistic infections (OIs) is also required to prevent microbial resistance. Thus, availability of antiretroviral medicines (ARVs) and non-antiretroviral medicines (NARVs) in the management of HIV/AIDS patients is a key determinant of the HIV progression and prognosis. The recommended antiretroviral treatment regimen is at least triple antiretroviral medicines (ARVs) combination therapy called HAART.[14,15] Use of mono and dual therapies are no more recommended due to development of resistance (FMOHN, 2010).[15] In Nigeria, HAART involves the use of ARVs such as tenofovir, emtricitabine, efavirenz, zidovudine, nevirapine, lamivudine and abacavir (first line); lopinavir, atazanavir and ritonavir (second line).[14,15] In addition, morbidity and mortality associated with HIV/AIDS are greatly reduced by active management of opportunistic infections (OIs) as adjunct to HAART in HIV/AIDS patients through the use of co-trimoxazole preventive therapy (CPT), Isoniazid Preventive therapy (IPT) and other antimicrobial agents.[14]

Although the World Health Organization (WHO) has a high bench mark (80%) for availability of medicines in order to ensure equitable access and the rational use of medicines[16,6] and the laudable goal of the Nigeria National Drug Policy (NNDP) to make available at all times to the Nigerian populace adequate supplies of effective, affordable, safe and good quality medicines[17], there are reports of inadequate, poor or non-availability of medicines in the management of different disease conditions, in different health facilities and different countries. For example, majority of essential medicines such as antibiotics, common analgesics and antihypertensives were out-of-stock for a period of one month in a study conducted in Kenya.[5] ARVs and antimalarial medicines also had 1 and 2 month's stock-out though less frequent. Another study conducted in Sri Lanka showed that the mean availability of essential medicines for non-communicable diseases was 58% (±0.32) in the public sector and 74.3% (±0.13) in the private sector.[1] In another study, the availability of cardiovascular medicines was compared across 36 countries using World Health Organization/Health Action International methodology.[18] The results showed overall poor availability of cardiovascular medicines (26.3% in the public sector and 57% in the private sector). Another survey of availability of 32 medicines used for chronic diseases in six low- and middle- income countries showed that 7.5% of these medicines were available in the public sector except for Sri Lanka and Brazil where 28% and 30% of the medicines were available respectively.[19] Also, a survey of available medicines in public sector health facilities of 2 Northern Indian States showed that the overall availability of medicines was 45.5% and 51.1% in Punjab and Haryana respectively[20] while a survey conducted in Delhi, India showed that the overall mean availability of surveyed medicines in facilities under State Government, Municipal Corporation of Delhi and three tertiary care facilities operated by the Federal Government were 41.3% , 23.2% and 49.3%, respectively.[21] Moreover, a survey of differences in availability of medicines for chronic and acute conditions in public and private sectors of developing countries showed that medicines for the treatment of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS), tuberculosis and malaria were notably absent[6] despite these, treatments are usually provided through vertical programmes that address specific health problems. The percentage availability of medicines obtained in previous studies in North West Ethiopia and Bhopal were 89% and 75% respectively.[22, 23]

In Nigeria, a cross-sectional survey of the prescription pattern at a secondary healthcare facility involving 303 randomly sampled prescriptions issued to patients attending out-patients clinics over three months period showed that only 40.9% of the prescribed drugs were

available in the facility.[24] In another study, the availability of medicines was 80%.[25] Also, a study of the situation of antiretroviral drug in Nigeria which involved twenty five (25) tertiary HIV treatment centers over 12 years ago, revealed that eight (8) of the facilities had suffered stock-out of some or all of the three ARVs (nevirapine, stavudine and lamivudine) since the inception of the programme in January 2002.[26] Despite the many studies on availability of medicines in different disease conditions, health facilities and countries, there is no study on availability of ARVs and NARVs. Also none of the studies used triangulation of research methods to examine the availability of medicines in the given facilities. The triangulation of quantitative and qualitative research methods provided more holistic findings. Moreover, it is necessary to conduct a current situation analysis of the availability of medicines used in the management of HIV/AIDS patients since availability affects patient adherence to medication use and consequently the progression and prognosis of the disease. This study therefore examined the availability of ARVs and NARVs used in the management of HIV/AIDS patients in public hospitals in Kwara State.

METHODS

Study location

This cross-sectional study was conducted in seven (7) public hospitals that provided healthcare to adult HIV/AIDS patients. These hospitals were located in six (6) local government areas representing the three (3) Senatorial Districts of Kwara State: Kwara Central, Kwara North and Kwara South. As at time of the study, there were ten public hospitals that provide health care for adult HIV/AIDS patients which were located in eight Local Government Areas (LGAs) of Kwara State, namely, Edu, Ilorin West, Ilorin East, Ilorin South, Offa, Oyun, Irepodun and Kaiama LGAs. However, two of the public hospitals in Oyun and Kaiama LGAs had low HIV/AIDS patient enrolment on Antiretroviral Therapy (ART) being two and one respectively. Thus, the study sites were: University of Ilorin Teaching Hospital, Ilorin in Ilorin East Local Government Area (LGA); Specialist Hospital, Sobi, Ilorin in Ilorin South LGA; General Hospital, Lafiagi in Edu LGA; Comprehensive Health Center, Shonga in Edu LGA; General Hospital, Offa in Offa LGA; General Hospital, Omuaran in Irepodun LGA and Cottage Hospital, Adewole, Ilorin in Ilorin West LGA. The pre-testing of the research instruments was conducted in Civil Service Hospital (CISH), Ilorin in Ilorin South LGA. Kwara State was created on 27th May 1967 and has 16 Local Government Areas.[27] The state is located in the North-Central geopolitical zone of Nigeria and is the gateway between the Southern and Northern parts of Nigeria. The socio-economic exchanges are facilitated through easy accessibility to Lagos and Abuja. The state is bounded in the North by Niger State, in the South by Ekiti, Osun and Oyo states, in the East by Kogi State and in the West by the Republic of Benin. Kwara State has population projection of 2,748,100 million based on the 2006 National population census.[28] There are agricultural activities in the state.[27] Baruba, Fulani, Nupe, and Yoruba are the main ethnic groups in the state. Other tribes are Ebira, Igbo, Igala, Gobirs, and Urhobo. The indigenes practice Islamic religion. But, there are Christians and few traditional religionists also. The state has public and private healthcare and educational institutions, pharmaceutical manufacturing industries, pharmaceutical wholesaling and pharmaceutical retailing organizations.

Study design

The study design involved triangulation of both quantitative and qualitative research methods. There were four (4) components:

1. Seven hundred and eighty prescription sheets based on Fisher's formula which has a 95% power to identify a difference of 5%[29,30] and antiretroviral therapy coverage of 23%[31] for Nigeria were proportionately allocated to the 7 hospitals. The prescriptions issued to the eligible HIV/AIDS patients who received their medicines from the Pharmacies of the HIV Treatment Centers of the public hospitals were obtained and reviewed.
2. Observational checks of the medicines that were dispensed to these 780 eligible HIVAIDS patients when they were about exiting the clinics.
3. Observational check of the available medicines based on a checklist of 34 key medicines used in the management of HIV/AIDS and HIV related OIs in HIV/AIDS patients. The checklist was based on Federal Republic of Nigeria Essential Medicine List and WHO Essential Medicine List[32, 33], Guidelines for the use of Antiretroviral (ARV) Drug in Nigeria[14,15] and list of medicines on the adult pharmacy order form obtained from Kwara State public hospitals. The observational check of the available medicines was conducted on non-clinic days.
4. In-depth interviews of purposively sampled prescribers (Physicians and Nurses) and dispensers (Pharmacists and Pharmacy Technicians) who were focal persons in the HIV Clinics of the HIV Treatment Centers were conducted with the aid of interview guide

at a time convenient to the interviewees.

Inclusion criteria

The inclusion criteria were:

i. Public hospitals that provided health care for adult HIV/AIDS patients and had more than 20 HIV/AIDS patient enrolment on Antiretroviral Therapy (ART).
ii. HIV/AIDS patients who attended public hospitals in Kwara State, with age range 18 – 70 years, who gave voluntary informed consent to participate in the study.
iii. HIV/AIDS patients who attended public hospitals in Kwara State, with or without co-morbidities who gave voluntary informed consent to participate in the study.
iv. HIV/AIDS patients who attended public hospitals in Kwara State and were on highly active antiretroviral therapy (HAART)
v. Prescribers who were focal persons in the HIV Treatment Centers who provided healthcare for the eligible HIV/AIDS patients and consented to participate in the study.
vi. Dispensers who were focal persons in the HIV Treatment Center who provided healthcare for the eligible HIV/AIDS patients and consented to participate in the study.

Exclusion criteria

i. Public hospitals that did not have HIV Treatment Center or public hospitals that provided health care for adult HIV/AIDS patients but had less than 20 HIV/AIDS patient enrolment on Antiretroviral Therapy (ART) or public hospitals that provided health care for paediatric HIV/AIDS patients.
ii. HIV/AIDS patients who were too ill to participate in the study.
iii. HIV/AIDS patients who had psychiatric illness that might have impaired ability to give voluntary informed consent.
vii. Prescribers who provided healthcare for the eligible HIV/AIDS patients but had spent below one year in the HIV treatment center.
iv. Dispensers who provided healthcare for the eligible HIV/AIDS patients but had spent below one year in the HIV treatment center.

Pretesting of study instruments

The study instruments which comprised prescribing indicator form, dispensing indicator form, interview guide and an observational checklist of 34 medicines used for the management of HIV/AIDS patients were adapted from those of previous studies[26, 34], assessed by 4 scholars (2 clinical pharmacists, 2 epidemiologists with medical background) and pre-tested at Civil Service Hospital Ilorin. Ten percent (n =78) of the study sample size was used for the prescription review and observational checks of dispensed medicines. One of the researchers and four trained research assistants conducted the pre-testing.

Data collection

Seven hundred and eighty prescriptions of the eligible HIV/AIDS patients were obtained and reviewed on non-clinic days, observational checks of available medicines in the Pharmacies of HIV Treatment Centers were checked based on a checklist of key medicines used in the management of HIV/AIDS patients on non-clinic days while the observational checks of the medicines that were dispensed to these 780 eligible HIVAIDS patients were conducted when they were about exiting the clinic. Also, in-depth interviews of the prescribers and dispensers were conducted at a time convenient to the interviewees. The interviews were audio-taped and notes were taken.

Data analysis

Quantitative data entry and analyses were done through the use of Statistical Package for Social Sciences (SPSS) version 17.00. The in-depth interviews were audio-taped, transcribed verbatim, analyzed and developed into ethnographic summary with illustrative quotes.

Ethical issues

Ethical approvals were sought and obtained from the Ethical Review Committees of the University of Ilorin Teaching Hospital, Ilorin (UITH) and Kwara State Ministry of Health. Relevant cooperation and assistance of the various heads of the departments were sought and obtained. Voluntary informed consent was obtained from the patients, prescribers and dispensers before inclusion into the study. Confidentiality of the data and information obtained was ensured. All research ethics such as anonymity and freedom to decline or consent to participate in the research were observed.

RESULTS

A total of 2365 medicines were prescribed to the eligible HIV/AIDS patients of which 2114 (89.4%) were actually available as shown in Figure 1. More than 10% of the prescribed medicines were out-of-stock of

(o/s) as shown in Table 1.

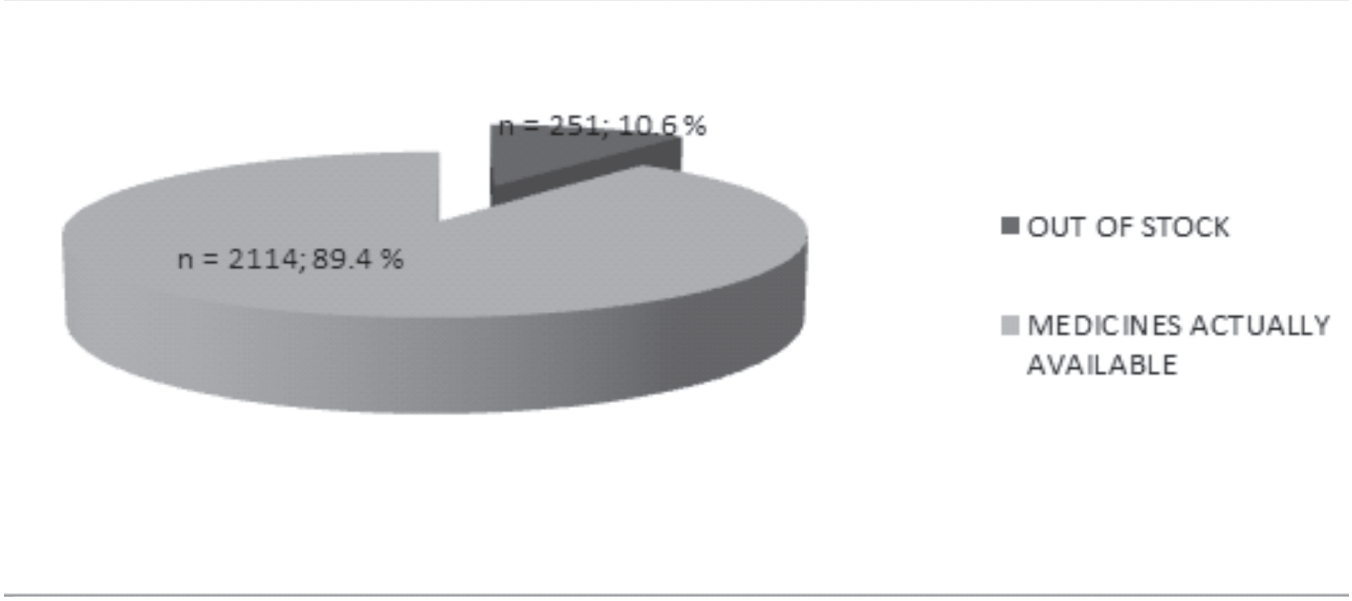

Figure 1: Percentage of medicines that were out of stock

Antiretroviral medicines (ARVs) contributed 4.8% to the o/s. On other hand the contribution of non-antiretroviral medicines (NARVs) to the o/s was 95.2% (Table 1).

Table 1: Availability of ARVs and NARVs in the management of HIV/AIDS patients in public hospitals Kwara State, Nigeria

Variables	Prescribed Medicines	Dispensed Medicines	Out-of-stock	% Availability	% out-of- stock	Relative out- of-stock (%)
Antiretroviral Medicines (ARVs)	1341	1329	12	99.1	0.89	4.8
Non-antiretroviral Medicines (NARVs)	1024	785	239	76.7	23.3	95.2
Total	2365	2114	251	89.4	10.6	100

With regards to the NARVs, the contributions of analgesics and antimalarial medicines to the o/s were 13.1% and 13.5% respectively. Also, antimicrobials other than co-trimoxazole and vitamins contributed 28.7% and 28.7% respectively to the o/s (Table 2).

Table 2: Availability distribution of NARVs in the management of HIV/AIDS patients in public hospitals Kwara State, Nigeria

Variables	Prescribed Medicines	Dispensed Medicines	Out-of-stock	% Availability	% out-of- stock	Relative out-of- stock (%)
Co-trimoxazole	439	432	7	98.4	1.6	2.8
Other antimicrobial medicines	109	37	72	33.9	66.1	28.7
Analgesics	140	107	33	76.4	23.6	13.1
Vitamines	138	66	72	47.8	52.2	28.7
Antimalarials	61	27	34	44.3	55.7	13.5
Others	137	116	21	84.7	15.3	8.4
Antiretroviral Medicines (ARVs)	1341	1329	12	99.1	0.89	4.8
Total	2365	2114	251			100

Observational checks of available medicines in the pharmacies of the HIV Treatment Centers (HTCs) showed that only one HIV Treatment Center (HTC 7) out of the seven HTCs had over 75% of the key ARVs. However, none of the seven HTCs had up to 75% of the key NARVs. Regarding availability of key medicines (combination of key ARVs and non-ARVs), none of the HTCs had up to 75%. The mean % availability of key ARVs; NARVs and ARVs + NARVs were 67.3% (±11.6), 47.1% (±19.3) and 55.6% (±14.9) respectively (Table 3).

Table 3: Observational check of available medicines in the pharmacies of the HIV treatment centers

Variable	Frequency (%)	Mean (%)	Set standard (%)
Available key ARVs using 14 medicines in the checklist			
HIV Treatment Center 1	8 (57.1)		
HIV Treatment Center 2	10 (71.4)		
HIV Treatment Center 3	10 (71.4)		
HIV Treatment Center 4	7 (50.0)	9.4±1.6 (67.3±11.6)	100
HIV Treatment Center 5	10 (71.4)		
HIV Treatment Center 6	9 (64.3)		
HIV Treatment Center 7	12 (85.7)		
Available key non -ARVs using 20 medicines in the checklist			
HIV Treatment Center 1	8 (40.0)		
HIV Treatment Center 2	7 (35.0)		
HIV Treatment Center 3	14 (70.0)		
HIV Treatment Center 4	3 (15.0)	9.4±3.9 (47.1±19.3)	100
HIV Treatment Center 5	9 (45.0)		
HIV Treatment Center 6	13 (65.0)		
HIV Treatment Center 7	12 (60.0)		
Available key medicines using 34 medicines in the checklist			
HIV Treatment Center 1	16 (47.1)		
HIV Treatment Center 2	17 (50.0)		
HIV Treatment Center 3	24 (70.6)		
HIV Treatment Center 4	10 (29.4)	18.9±5.1 (55.6±14.9)	100
HIV Treatment Center 5	19 (55.8)		
HIV Treatment Center 6	22 (64.7)		
HIV Treatment Center 7	24 (70.6)		

In-depth interviews of prescribers and dispensers

In-depth interviews were conducted for ten prescribers (P1 - P10) and seven dispensers (D1 - D7) from seven public hospitals providing healthcare for HIV/AIDS patients in Kwara State. The prescribers comprised 70 % males and 30% females. The age range was 30 to 51 years (± 7) while most of the interviewees (90%) were of Yoruba ethnic group. The minimum tertiary education attained by most (90%) of the interviewees was Bachelor of Medicine, Bachelor of Surgery (MB; BS). Sixty percent had postgraduate qualification of which 30% were Fellows of West African College of Physicians (FWACP) or National Postgraduate Medical College of Nigeria (NPMCN) and 30% had Masters in Public Health (MPH) or Public Administration (MPA). The interviewees' post qualification work experience duration in the hospital ranged 6 – 30 years (± 9.14) and years of contact with HIV treatment Center ranged 1- 14 years (± 5.34). Only one interviewee had worked in more than one HIV treatment center.

The dispensers comprised 5 males and 2 females. The age range was from 42 to 50 years (± 2.7) while majority of the interviewees (71.4 %) were of Yoruba ethnic group. The minimum tertiary education attained by more than half the interviewees was Bachelor of Pharmacy (57.1%), while only 28.8% had postgraduate qualifications (Masters in Public Health and/or Masters in Business Administration or Masters in Public Administration). The other dispensers (42.9%) had Certificate in Pharmacy Technician. The interviewees' post qualification work experience in the hospital ranged 13 - 26 years (± 5.0) and years of contact with HIV treatment Center ranged 3 - 7 years (± 1.6). Less than half of the interviewees (42.9%) had worked in two HIV treatment centers.

Theme 1: Opinion about the availability of antiretroviral medicines that are used in the treatment of HIV/AIDS patients

Half (50%) of the prescribers (P) and 30% of the dispensers (D) opined that as at the time of the study there was a challenge with availability of the ARVs. According to these respondents,

"Patients are given 2 weeks or 1 month hospital appointment. Currently, Efavirenz (EFV) is not available. This non-availability of ARVs is a medical disaster due to non-suppression of viral multiplication with consequent viral mutation and resistance" (P1);

"Currently ARVs are free but availability is a challenge. Previously, patients are given 3 months hospital appointment, but now only 1 month hospital appointment is given due to lack of availability". Moreover, some drugs are not available, for example Truvada® (Tenofovir+Emtricitabine)" (P3); "I have not had a challenge of non-availability of ARVs until I received a call from the second Doctor in the treatment center today that Truvada® and NVP prescribed for a patient newly transferred to my clinic are not available. However, the case of nationwide non-availability of EFV (April/May 2013) was whispered to me. Though, we had some EFV in my clinic that we were using." (P9); and "For the past six years, there was enough supply of ARVs. Currently availability of drugs is a big problem. For example abacavir (ABC), efavirenz (EFV) and zidovudine (ZVD) + lamivudine (3TC) + nevirapine (NVP) were out-of-stock (o/s) sometimes ago and we had to borrow from other health facilities. Currently EFV is out-of-stock and we have been looking for some for the past 3 weeks. This is an indication of tragedy for the country" (D1).

Of the 50% prescribers who responded that availability was good, 30% said there were occasional short supplies. Also, 70% dispensers who did not discern the challenge with availability of ARVs said that availability of ARVs was no challenge. According to these respondents, "We had to network with other HIV treatment centers to obtain ARV for use in this treatment center" (P6).

"No challenge with regards to availability of ARVs. Occasional stock-outs are overcome by networking with other HAART clinics to obtain affected drugs or contacting the implementing partners (IPs)" (D2, D3, D5 – D7).

"Sometimes, if the "FDC" are (o/s) we use the 'stand-alone medicines' (non-fixed dose combination). Though the patients always complain about the pill burden, we encourage them to endeavor to adhere since there is no other alternative for now". (D3)

Theme 2: Opinion about the availability of medicines for opportunistic infections (non-antiretroviral medicines) in the management of HIV/AIDS patients

All the prescribers and most (71.4%) of the dispensers opined that availability of medicines for opportunistic infections **(**non-antiretroviral medicines [NARVs]) was a challenge. As stated by the respondents,

"Availability of medicines for opportunistic infections (OIs) is a challenge and would begin to impact negatively on HIV/AIDS treatment outcome. Most of the time the medicines for OIs are out-of-stock and patients have to purchase them. The non-availability of these medicines can result in medical disaster which could jeopardize and even reverse the gains we have

attained in the HIV Control Programme" (P1).

"Most of the time, it is only cotirm® (co-trimoxazole) that is available and sometimes it is not available and we have to give them paracetamol" (P10);

"Sometimes patients get assistance from social welfare and the hospital personnel who contribute money to patients to purchase these drugs. Though, KWASACA donated some drugs of recent which would cushion the impact of non-availability of medicines for OIs". (P5).

"The NGOs (implementing partners) always focus on the availability of the ARVs. They do not normally care about the availability of drugs for OIs except cotrim® (co-trimoxazole) and paracetamol. The drugs for OIs that are out-of-stock (o/s) in the HAART pharmacy unit are written for the patients to buy. The donation of drugs for OIs by the Kwara State Ministry of Health helped to cushion the challenge of o/s of drugs for OIs" (D4); and

"Initially, there were various types of drugs for opportunistic infections (OIs) but now there is a challenge. The only drug available for opportunistic infections (OIs) is septrin® (co-trimoxazole). Other drugs for OIs are viewed as luxury" (D1).

However, 20% of the prescribers and about 30% 0f the dispensers said the challenge of non-availability of medicines for OIs in their HTC had been solved. According to these respondents,

"Annual registration with Community Health Insurance Programme, at the rate of N300/year per patient, ensured availability of all drugs needed by the enrollees" (P6 & P9).

"The challenge of non-availability of medicines for OIs in the facilities was curtailed through patients' registration with "Community Health Insurance Programme at the rate N300/year per patient. This ensured access to drugs for OIs" (D3 & D6).

DISCUSSION

Of the 2365 prescribed medicines, the 89.4% that were actually dispensed is below the recommended value. This availability of medicines is not in accordance with the recommended standard (100%) set standard of the Nigeria National Drug Policy (NNDP) and its goal to make available at all times to the Nigerian populace adequate supply of drugs that are effective, affordable, safe and good quality.[17] The percentage availability of medicines obtained in this study is similar to those of earlier studies in Nigeria: 80%[25] and North West Ethiopia: 89% [23] but higher than those obtained from previous studies in Ilorin: 40.9%[24]; Sri Lanka: 58%[1]; across 36 countries: 26.3% in the public sector and 57% in the private sector[8] and 2 Northern Indian States: 45.5% and 51.1% in Punjab and Haryana respectively.[20] The availability of medicines obtained in this study is also higher than that found in studies in Delhi, India: 41.3% , 23.2% and 49.3% for facilities under state government, Municipal Corporation of Delhi and three tertiary care facilities operated by the federal government[21], six low - and middle – income countries[19] and Bhopal: 75%[22]. The percentage availability obtained in this study could be due to HIV/AIDS treatments being donor-driven.

With regards to percentage availability of ARV, although the value obtained in this study is high (99.1%), 100% availability of ARVs is necessary since antiretroviral therapy (ART) is life-long and a high level of adherence to prescribed ARV regimen (greater or equal to 95%) is required in order to achieve and maintain suppression of viral replication.[10-13] Regarding NARVs, only 76.4%, 47.8%, 44.3 % and 33.9% of the prescribed analgesic, vitamins, antimalarial and other microbial medicines respectively were available. These findings support the qualitative findings that implementing partners focus more on the availability of ARVs. However, the high availability of co-trimoxazole (98.4%) in comparison with that for analgesics, vitamins, antimalarials and other antimicrobial medicines could be due to implementation of co-trimoxazole preventive therapy (CPT).

The non-availability or out-of-stock of the ARVs and NARVs used in the management of HIV/AIDS is supported by the findings of the observational check of available key medicines used in the management of HIV/AIDS patients in the HIV Treatment Centers. The mean percentage scores for key ARVs; NARVs and combined ARV + NARV medicines available for the management of HIV/AIDS patients in public hospitals, Kwara State were 67.3%; 47.1% and 55.6% respectively. The above findings were further supported by the qualitative data in which 50% of the prescribers and 30% of the dispensers who participated in the study opined that, as at the time of the study there was a challenge with availability of the ARVs. For example patients were given 2 weeks or 1 month hospital appointment instead of 3 months. As at the time of the study, Efavirenz (EFV) and Tenofovir (TDF) +Emtricitabine (FTC) were not available while abacavir (ABC), efavirenz (EFV) and zidovudine (ZVD)+lamivudine (3TC)+nevirapine (NVP) were out-of-stock in one of the HIV Treatment Centers before the commencement of the this study. This non-availability of ARVs may result in inadequate adherence to medication. This is medicine therapy problem leading to non-suppression of viral multiplication with consequent viral mutation and microbial resistance to

the particular ARV, ARV class resistance, cross resistance and resistance to ARV naïve individuals. This would also lead to non-adherence to hospital appointment due to loss of confidence in the healthcare delivery system.

With regards to the medicines for opportunistic infections, all the prescribers and most (71.4%) of the dispensers opined that availability of medicines for opportunistic infections (OIs) was a challenge. According to the interviewees, the implementing partners do not normally give attention to the availability of medicines for OIs except *cotrim® (co-trimoxazole) and paracetamol*. Availability of medicines is a critical issue in the management of HIV/AIDS patients. This is because poor/non-availability of medicines is one of the factors that negatively affect a patient's adherence to medication. For NARVs, patient adherence to medication is equally critical to the attainment of good therapeutic outcome and prevention of microbial resistance thereby reducing HIV/AIDS-related morbidity and mortality.

Comparison of the availability of ARVs with that for NARVs, showed that availability of ARVs is better than that for NARVs. This is confirmed by triangulation of research methods.

This study is limited by the fact that the observational checks of the availability of the ARVs and NARVs were conducted only once per HTC. Additionally, the observational checklist was based on WHO and Nigerian Essential Medicine Lists[32, 33]; Guidelines for the use of Antiretroviral (ARV) Drugs in Nigeria[14,15] and list of medicines on the adult pharmacy order form. However, this multi-center study combined triangulation of research methods in assessing the availability of ARVs and non-ARVs. This gave a holistic insight into the availability of medicines used in the management of HIV/AIDS patients in public hospitals in Kwara State, Nigeria.

CONCLUSION

There is 99.1% and 76.7% availability of ARVs and NARVs respectively in the management of HIV/AIDS patients in public hospitals, Kwara State. The availability of ARVs and NARVs in HIV/AIDS patients' management in public hospitals, Kwara State did not meet up with set goal of Nigeria National Drug Policy. The study therefore recommends that the Federal Government of Nigeria should network with Pharmaceutical organizations for donation of antiretroviral medicines (ARVs) and non-antiretroviral medicines (NARVs) for opportunistic infections (OIs) as part of their corporate responsibility. Also, Hospital Managements of the other five study sites should consider partnership with Community Health Insurance Scheme for provision of medicines for opportunistic infections.

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