

Full Length Research Paper

Prevalence of hepatitis B and C among HIV/AIDS patients attending Bingham University Teaching Hospital Jos Plateau State Nigeria: A retrospective study

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Received 27 December, 2017; Accepted 26 February, 2018

The prevalence of hepatitis B and C (HBV and HCV) among HIV infected persons is a major public health problem in Nigeria. The increasing number of people living with HIV in Nigeria has presented the health care system with new co-morbid infections such as HBV and HCV. This study was designed to investigate the prevalence of hepatitis B and C among HIV/AIDS patients attending Bingham University Teaching Hospital Jos Plateau State Nigeria. The study was a retrospective study that reviewed all clinical case records of HIV/AIDS patients seen from 1st January, 2012 to 31st December, 2016. Information such as age, sex, marital status, occupation, educational level, hepatitis B and C status, CD4 T lymphocyte count, signs and symptoms were retrieved using structured questionnaire. Data were analysed and presented in simple percentage while Chi-square test was used to test for associations between variables at $P < 0.05$. According to the results, more than two-third of the patients (1051, 68.10%) were females and 576 (37.30%) were in the age group of 38-47 years with a mean age of 42.60 ± 9.9 years. The prevalence of HBV was 56.70% while HCV was 30.30%. In addition, both HBV and HCV were significantly found among HIV infected females compared to HIV infected males. The mean CD4 cells/ μ l for HBV positive was 500.48 ± 101.81 while HCV positive was 557.33 ± 121.76 . The study showed the prevalence of hepatitis B and C among the HIV infected patients. Therefore routine screening for hepatitis B and C markers among HIV patients should be carried out regularly.

Key words: Prevalence, HIV/AIDS patients, hepatitis B, hepatitis C, CD4 count, Bingham University.

INTRODUCTION

Globally, an estimate of 36.7 million people was living with Human Immuno-Deficiency Virus (HIV) in 2016. Sub-Saharan Africa remains most severely affected with nearly 1 in every 25 adults (4.2%) living with HIV,

accounting for nearly two-thirds of the people living with HIV worldwide (World Health Organisation, 2017).

Furthermore, there were about 3.2 million people living with HIV as at 2016, with an estimated 160 000 Acquired

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Immune Deficiency Syndrome (AIDS) related death recorded (UNAIDS, 2017). These AIDS related death can be attributed to the increase in mortalities and morbidities from liver diseases amongst HIV patients which is partly due to co-infection with hepatitis B and C viruses (HBV and HCV) as these viruses promote liver fibrosis by increasing intra-hepatic apoptosis (Greub, 2000; Macias et al., 2005; Iser et al., 2011; Chiekulie Kevin Diwe et al., 2013).

Hepatitis which refers to an inflammation of the liver is becoming a major public health concern in sub-Saharan Africa including Nigeria. For instance, Sub-Saharan Africa has been shown to be endemic for hepatitis B with an estimated >8% prevalence in the population or in some 65 million people (Sonderup and Spearman, 2017). Furthermore, hepatitis C infection is prevalence in about 36 million people and the rates of co-infection with hepatitis B is up to 36% with the highest rate recorded in West and Southern sub-Saharan Africa (Matthews et al., 2014). Similarly, record from Nigeria reveals that over 35 million people have been estimated to live with hepatitis B and C viruses (Modi and Feld, 2007; Tremeau-Bravard et al., 2012; Madhava et al., 2002) while a pooled prevalence of HBV in Nigeria from studies carried out between 2000 and 2013 was 13.6% (Musa et al., 2015).

Thus, the study estimated the prevalence of HBV and HCV among HIV/AIDS patients as it remains the foundation for understanding the interrelationship between these viruses along with designing health promotion programs for the prevention and control of these epidemics. Therefore, the retrospective study investigated the prevalence of hepatitis B and C infection among HIV/AIDS patients seen from 1st January 2012 to 31st December 2016 at the Bingham University Teaching Hospital Jos, Plateau State, Nigeria.

MATERIALS AND METHODS

Study design

This study was a retrospective study that reviewed all clinical case records of HIV/AIDS patients seen from 1st January, 2012 - 31st December, 2016.

Study area

The study was conducted in Bingham University Teaching Hospital in the Jos North Area of Plateau State in North Central Nigeria.

Study population

The study population consists of all HIV/AIDS patients seen at Bingham University Teaching Hospital from 1st January, 2012 to 31st December, 2016. Bingham University Teaching Hospital is the second largest Teaching Hospital in Jos metropolis and offers a range of health care services including diagnosis and treatment of HIV/AIDS patients. The population of HIV/AIDS cases for the stated period were 1,544.

Inclusion criteria

HIV/AIDS positive patients seen only within the period of 5 years (1st January, 2012 to 31st December, 2016) who attended Bingham University Teaching Hospital were included in the study.

Exclusion criteria

Excluded from the study, were HIV/AIDS patients not seen within the period under review.

Instrument and method of data collection

A checklist was designed to collect information on the demographic characteristics of patients, HBV and HCV status, CD4 count, signs and symptoms. The data was abstracted by the researcher and three research assistants from the record of diagnosed HIV/AIDS patients, who were coming to the hospital from 1st January, 2012 to 31st December, 2016. Clinical data were collected from HIV-positive patients coming for CD4 monitoring from 1st January, 2012 to 31st December, 2016. Overall, a total of 1544 entries were retrieved for the retrospective study on the prevalence of HBV and HCV infection among HIV/AIDS patients. Information in the records includes patients' demographic information, HBV and HCV status, CD4 count, signs and symptoms the patients presented at the time of treatment. The data were sorted and extracted after obtaining approval from the ART clinic through the hospital management board. The CD4 count in micro litre (μ l) was classified according to the CDC Classification System for HIV-Infected Adults and Adolescents. Thus T-cells $\geq 500 \mu$ l was classified as category 1, T-cells 200-499 μ l classified as category 2 and T-cells $< 200 \mu$ l classified as category 3 (CDC, 1993).

Data analysis

The collected data were entered into the computer and analysed using Statistical Package for Social Sciences version 20 (IBM Corp., Chicago, USA). Simple percentage were used to describe the basic features of the retrieved data while inferences between variables of interest were drawn using Chi-Square test at $P < 0.05$. The data were collected to ensure confidentiality of patients' information as no identifiers were used and the results were used for research purpose only.

Ethical consideration

Ethical clearance was obtained from the Department of Public and Community Health, Novena University Ogume and from Bingham hospital management board to the ART clinic.

RESULTS

Socio-demographic characteristics of the respondents

According to Table 1, 624 (40.40%) of the respondents were married and more than two third (1051, 68.10%) were females. Most (576, 37.30%) were between the age group of 38-47 years. Furthermore, almost half of the respondents (775, 50.30%) were into business and 935 (60.30%) attained secondary education.

Table 1. Socio-demographic characteristics of HIV/AIDS patients in Bingham University Teaching Hospital from 1st January, 2012 to 31st December, 2016.

Variable	Frequency (N=1544)	Percentage
Marital Status		
Married	624	40.40
Single	311	20.10
Widow	142	9.20
Widower	64	4.10
Divorce	403	26.10
Sex		
Male	493	31.90
Female	1051	68.10
Age		
18-27	64	4.10
28-37	447	29.0
38-47	576	37.30
48-57	340	22.0
58-67	98	6.30
68-77	19	1.20
Occupation		
Civil servant	529	34.30
Business	775	50.30
Housewife	85	5.50
Retired	22	1.40
Student	133	8.60
Educational Status		
Primary	96	6.20
Secondary	497	32.20
Tertiary	935	60.30
None	16	1.0

Mean Age: 42.60±9.9.

Status of hepatitis B and C

According to Figure 1, 876 (56.70%) of the respondents were positive to hepatitis B virus and 668 (43.30%) were negative to hepatitis B virus. Furthermore, more of the respondents (1076, 69.70%) tested negative to hepatitis C infection while (468, 30.30%) were hepatitis C positive.

From Table 2, HBV were more common in patients aged 38-47 (26.90) and 28-37 (17.70%) years compared to patients in other age groups. Also, patients aged 48-57 years (183, 11.90%) were more positive to HCV than other age groups. Similarly, more females (621, 40.20%) than males (255, 16.50%) were HBV positive.

CD4 count of the patients

As shown in Figure 2, 781 (50.60%) of the patients were

in category 2 as they had T-cells of 200-499 μ l while 763 (49.40%) were in category 1 as they had T-cells of \geq 500 μ l and none of the patients recorded T-cells fell into category 3.

Patient current regimen

The regimen of the patients shows that more of them have a combination of lamivudine and Efavirenze (593, 32.0%) followed by a combination of Tenofovir and Lamivudine (528, 28.50%) while 394 (21.30%) had a combination of Efavirenze and Tenofovir (Table 3).

Signs and Symptoms of the patients

As shown in Table 4, more of the patients presented

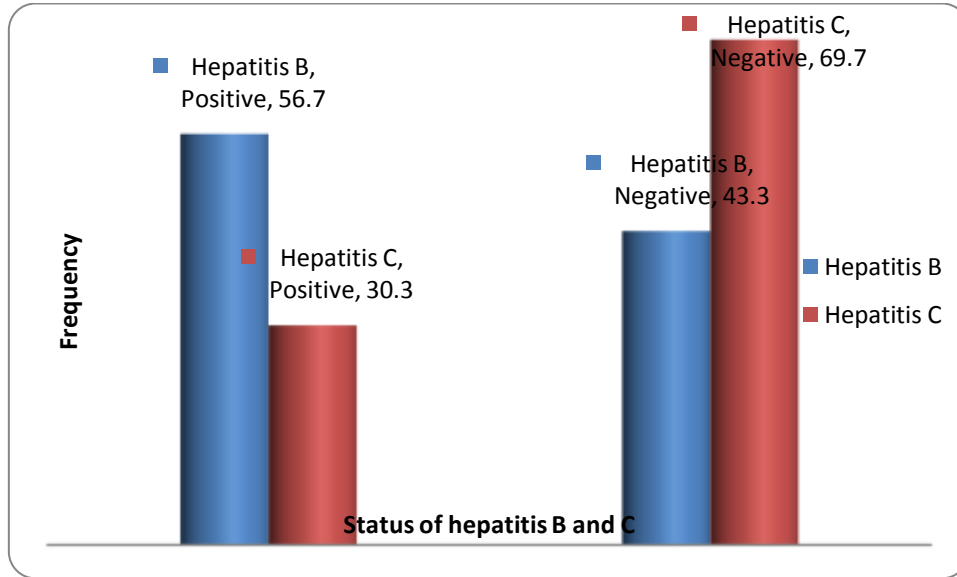


Figure 1. Status of hepatitis B and C among HIV/AIDS patients.

Table 2. Association of demographic variables and HBV and HCV.

Variables	Hepatitis B (N=1554)		Hepatitis C (N=1554)		P-Value
	Positive	Negative	Positive	Negative	
Age (Years)					
18-27	13(0.80%)	51(3.30%)	13(0.80%)	51(3.30%)	0.0001
28-37	273(17.70%)	174(11.30%)	86(5.60%)	361(23.40%)	
38-47	416(26.90%)	160(10.40%)	130(8.40%)	446(28.90%)	
48-57	130(8.40%)	210(13.60%)	183(11.90%)	157(10.20%)	
58-67	29(1.90%)	69(4.50%)	53(3.40%)	45(2.90%)	
68-77	15(1.0%)	4(0.30%)	3(0.20%)	16(1.0%)	
Sex					
Male	255(16.50%)	238(15.40%)	199(12.90%)	294(19.0%)	0.0001
Female	621(40.20%)	430(27.80%)	269(17.40%)	782(50.60%)	
Mean CD4 cells/ μ l	500.48 \pm 101.89	522.46 \pm 139.41	557.33 \pm 121.76	489.39 \pm 113.30	0.0001

abdominal pain (472, 10.20%) at the hospital, followed by heartburn (40, 8.70%), headache (363, 7.80), rashes (361, 7.80), waist pain (343, 7.40) and weakness (335, 7.20%).

DISCUSSION

Viral hepatitis (HBV and HCV) has become a major public health concern worldwide especially among HIV patients (WHO, 2008; WHO, 2011). Furthermore, the relationship in the mode of transmission between the three viruses; HIV, HBV and HCV has made it more pertinent to assess the prevalence of HBV and HCV among HIV patients. The study reported the prevalence

of both HBV and HCV among HIV/AIDS subjects. Furthermore, most of the respondents CD4 T lymphocyte were in Category 2 and 1 as their CD4 count was >200 μ l above.

The socio-demographic characteristics of the patients show that more of the patients were females representing more than two-third of the total cases of HIV patients reviewed in this study. This finding is similar to other studies which reported more females than males in their studies (Lacombe 2010; Muriuki et al., 2013; Tremeau-Bravard et al., 2012; Opaleye et al., 2014; Obadiah, 2011). The finding confirms previous assertions that women are more sexually vulnerable to HIV and other sexually transmitted infections than male (WHO, 2000). Furthermore, the majority of HIV infected patients were

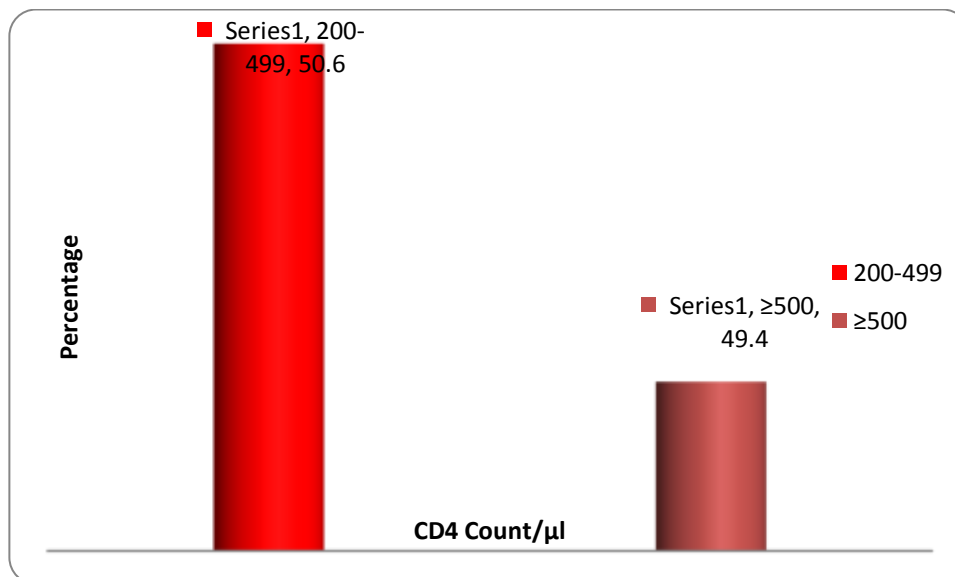


Figure 2. CD4 Count of the HIV/AIDS patients.

Table 3. The regimen of the patients.

Patients current regimen	Frequency*(N=1854)	Percentage
Tenofovir(TDF)/Lamivudine(3TC)	528	28.50
Efavirenze/Tenofovir(EFV/TDF)	394	21.30
Lamivudine(3TC)/Efavirenze(EFV)	593	32.0
Combivir(AZT)/Lamivudine(3TC)	135	7.30
Nevirapine(NVP)/Combivir(AZT)	111	6.0
Lamivudine(3TC)/Nevirapine(NVP)	10	0.50
Truvada(FDC)/Tenofovir(TDF)/Lamivudine(3TC)	72	3.90
Combivir (CBV)	2	0.10
Abacavir (ABC)	3	0.20
Emtricitabine (FTC)	3	0.20
Lopinavir/Ritonavir (LPV-r)	3	0.20

*Multiple responses.

between the ages 28-57 years old with a mean age of 42.60 ± 9.9 years. This signifies a higher HIV prevalence among adults and the age distribution is similar to previous studies (Balogun et al., 2012; Opaleye et al., 2014; Tremeau-Bravard et al., 2012).

The prevalence of hepatitis B virus from the study shows that more of the patients tested positive to HBV. This prevalence of HIV/Hepatitis B co-infection (56.70%) was higher than previous studies from Ikole-Ekiti South-West Nigeria (Opaleye et al., 2014), Niger-Delta South-South Nigeria (Ejele and Ojule, 2004), Lagos South-West Nigeria (Balogun et al., 2012), Ibadan South-West Nigeria (Otegbayo et al., 2008), Jos North-Central Nigeria (Adekeye et al., 2013), Ilorin North-Central Nigeria (Olatunji and Iseniyi, 2008) and Maiduguri North-Eastern

Nigeria (Baba et al., 1998). Furthermore, other studies with lower prevalence outside Nigeria include a study in South-Africa (Parboosing et al., 2008), Senegal (Diop-Ndiaye et al., 2008), France (Larsen et al., 2008) and Thailand (Sungkanuparph et al., 2004). This observed difference of prevalence of HBV of the current study as compared with other studies might probably be due to varying sample size and the study design of the current study which reviewed a 5 years clinical records.

In addition, the sex stratification prevalence of HBV shows that more females were HBV positive than males. This finding is similar to a previous study (Opaleye et al., 2014) but was however different from other studies (Mehmet et al., 2005; Muriuki et al., 2013). Furthermore, the statistically observed difference of HIV infection in

Table 4. Signs and symptoms presented by the patients.

Signs and Symptoms	Frequency*(N=4632)	Percentage
Fever	277	6.0
Headache	363	7.80
Abdominal pain	472	10.20
Heartburn	404	8.70
Waist pain	343	7.40
Weakness	335	7.20
Cough	226	4.90
Catarrh	188	4.10
Boil	117	2.50
Loss of Appetite	200	4.30
Backpain	198	4.30
Rashes	361	7.80
Vagina Discharge	261	5.60
Ear problem	207	4.50
Body pain	115	2.50
Painful Mic	61	1.30
Body Itching	41	0.90
Hyperpigmented patches	33	0.70
Swollen Armpit	27	0.60
Dizziness	18	0.40
Vomiting	45	1.0
Dysentary	19	0.40
Macular Rash	125	2.70
Diarrhoea	77	1.70
Jaundice	69	1.50
Dark Urine	27	0.60
Fatigue	10	0.20
Joint Pain	13	0.30

*Multiple responses.

both male and female in the current study reveals unequal exposure to HBV infection which is in line with previous studies (Opaleye et al., 2014; Agbede et al., 2007). In the same vein, the prevalence of 30.30% for HCV reported in the current study was higher than that reported in previous studies (Tremeau-Bravard et al., 2012; Muriuki et al., 2013; Forbi et al., 2007). Similarly, more females were positive to HCV than their male counterpart which is in line with result from previous studies (Muriuki et al., 2013; Lesi et al., 200); but at variance with other studies (Forbi et al., 2007; Agwale et al., 2004). Furthermore, there was a significant relationship between the sex of the patients and their HCV status. This was slightly different from a previous study (Muriuki et al., 2013).

Based on the Centre for Disease Control classification system for HIV infection which was used to categorise the severity of the HIV infection of the patients shows that almost all of the patients were in category 1 (T-cells of $\geq 500 \mu\text{l}$) and 2 (T-cells of 200-499 μl). This result shows that the patients were still in the asymptomatic, acute HIV

or persistent generalized lymphadenopathy stage of the infection. Although, the patients displayed some signs and symptoms consistent with category B symptomatic conditions and category C which is the AIDS-indicator conditions; it can be probably deduce that the various combination of antiretroviral drug regimen the patients were currently taking might have help to improve their CD4 count and also help in suppressing the manifestation of the full blown AIDS. This finding is slightly different from the study in Ikole-Ekiti South-Western Nigeria where almost one third of the patients from that study were in category 3 (Opaleye et al., 2014). Furthermore, the mean CD4 count was higher in HBV negative patients as compared with HCV patients which were higher in positive patients. The finding was also slightly different from the study in Ikole-Ekiti (Opaleye et al., 2014).

The main limitation of the study is that the study was solely depended on the clinical records of the ART clinic at the Bingham University Teaching Hospital in identifying HIV, HBV and HCV patients without carrying out any

confirmatory clinical laboratory test.

Conclusion

In conclusion, the study shows the prevalence of hepatitis B and C among the HIV infected patients. Therefore, we recommend that HIV patients should be routinely screened for hepatitis B and C markers. Also, intervention should be directed at implementing hepatitis B and C prevention strategies as part of HIV routine education among HIV patients. This will help reduce the severity of morbidity such as exposure to cirrhosis and mortality rate associated with hepatitis B and C infection including antiretroviral drug associated hepatotoxicity among these patients.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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