IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 7 Ver. 12 (July. 2018), PP 65-70
www.iosrjournals.org

Hepatitis B and C Co-Infections among Patients Accessing Antiretroviral Therapy in a Tertiary Health Facility in Lafia, North Central Nigeria.

Esther S. Audu[1], Abdulmajid A. Sharrif[1], Surajudeen Bello[1], Regina A. Aluko[2], Yakubu Ahmed Ashuku[3]

1. Special Treatment Clinic, DalhatuAraf Specialist Hospital,PMB 007, Lafia, Nasarawa State, Nigeria.
2. Laboratory Department, DalhatuAraf Specialist Hospital, Lafia
3. Department of Surgery, DalhatuAraf Specialist Hospital, Lafia
Corresponding Author: Esther S. Audu

Abstract: *The Human Immunodeficiency virus(HIV), Hepatitis B and C viruses are blood borne viruses that cause chronic infections. Because of their shared modes of transmission, coinfections with these viruses are commonly found in patients. The problem of coinfections in HIV infected patients are further compounded by the impact of the toxicity of the Antiretroviral drugs on the liver thus increasing the liver associated morbidity and mortality in these patients. Both hepatitis B and C are also reported to affect the outcome of HIV treatment. Our study aims to find the seroprevalence of markers of Hepatitis B and C viruses in HIV infected patients who are accessing HIV care in our facility as well as the HIV treatment outcomes in those who are coinfected. A total 249 patients were included in the study. Eighteen (7.2%) and 24(9.6%) of the were seropositive for hepatitis B surface antigen and Hepatitis C antibodies respectively. Coinfection with Hepatitis B or C did not affect treatment outcomes in these patients as more than 80% of those who are coinfected had most recent HIV viral load of 1000 copies or less. This study shows there is high occurrence of viral hepatitis B and C in HIV infected patients. We recommend routine screening for these viruses in HIV patientsand the provision of affordable treatment for hepatitis C infection to reduce morbidity and mortality in people living with HIV.*

Date of Submission: 10-07-2018 Date of acceptance: 27-07-2018

I. Introduction

Infections with blood-borne viruses is fast becoming a public health concern. The most common of the blood-borne viruses are Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV).[1] These viruses have shared common modes of transmission; hence it is common to find co-infections with one or more of the three viruses occurring in an individual at the same time.[2]

Co-infections between HIV and the Hepatitis viruses has been reported in many research publications with various prevalence stated in different demographic settings. HIV infected patients constitute a very important group to consider due to its progression resulting in the suppression of the immune system.[1] People living with HIV are disproportionately affected by viral hepatitis.[1]Human Immunodeficiency Virus patients are usually treated with a cocktail of antiretroviral agents, some of which are known to affect the liver. Hepatitis B and or C infections occurring in HIV infected patients needs to begiven serious attention to reduce morbidity and mortality associated with these viruses. Hepatitis B infection especially is equally treated with some of the antiretroviral drugs used in treating HIV.

Globally, the World Health Organization(WHO) estimated HIV and Hepatitis B Virus (HBV) co-infections in about 2.6 million peopleand HIV and Hepatitis C Virus (HCV) in about2.75 million people. Hepatitis C Virus is estimated to occur in 2-15% and Hepatitis B virus in 2-20% of people living with HIV/AIDS (PLWHA).[2]In Africa, PLWHA are reported to have co-infection rates of about 20% and 5% for HBV and HCV respectively.[3]

Nigeria which has the highest burden of HIV in Africa and the second highest in the world also has a high prevalence of hepatitis B and C infections. Co-infections of HIV and Hepatitis viruses in Nigeria range between13.3%-20.6% and 7% - 11.1% for HBV and HCV respectively in PLWHA while triple infections with HIV, HBV and HCV is between 0.6% - 5%.[4-7.]

Different researchers have reported that HIV infected individuals who are co-infected with hepatitis B or C have increased liver related morbidity and mortality.[8]HIV patients who are co-infected with Hepatitis B or C had lower CD4 count than those who were not co-infected.[7] Co-infections is also reported to lead to rapid decline in CD4 cell count, rapid progression of HIV infection which increases morbidity and mortality.[7,8] There

is also reported acceleration of the disease progression in both hepatitis B and C. In co-infected patients, treatment for the HIV and Hepatitis B and C are reported to decrease morbidity and mortality. Hepatotoxicity associated with Antiretroviral drugs is reported to occur more in hepatitis B or C co-infected HIV patients.[9,10.]

With the increasing number of HIV patients being placed on antiretroviral drugs(ARVs) due to the new guidelines of treating all HIV patients irrespective of CD4cell count, the concern for drug safety especially in hepatitis co-infected patients becomes paramount because of the effects the drugs can have on the liver. With various antiviral agents available for the treatment of Hepatitis B and C infections, focus should also go to issues of drug-drug interactions in co-infected patients to reduce adverse events which may contribute to morbidity.[8-12] This study seeks to know the prevalence of hepatitis B and Hepatitis C antibodies in HIV infected patients with a view to seeking novel approaches to manage these blood-borne viruses in the best way possible for the patients. This is because all three viruses are cause chronic infections that require long term follow up and adherence to medications.

II. Methodology.

Study Design: This was a retrospective study.

Study Location: This study was carried out at the Special treatment clinic of the DalhatuAraf Specialist Hospital Lafia which provides comprehensive care and treatment for patients infected with HIV. The hospital which is in Lafia, the capital of Nasarawa State is a tertiary health facility which provides services to patients from within the state as well as neighboring states including Benue, Taraba, Plateau, Kaduna, Kogi and the Federal Capital Territory.

Study Duration: The study was carried out between March 2018 to May 2018.Subjects and Selection method: The study population included patients who are on antiretroviral therapy and had routine screening for Hepatitis B and C conducted free of charge in the hospital in August to September 2017 with support from a Non-Governmental Organization- Clinton Health Access Initiative. Screening for Hepatitis B and C are usually paid for by the patients.

Sample Size: 249

Subjects and Selection Method: All those HIV infected patients in care at the facility who presented to the laboratory for the free hepatitis B and C testing were included.

Inclusion criteria: HIV infected patients accessing care in the facility.

Exclusion Criteria: HIV negative patients.

HIV positive patients not accessing care in our facility.

HIV infected patients accessing care in the facility but complete records not available.

Procedure Methodology:

Ethical approval for the study was obtained from the hospital Research Ethics Committee. This study was a retrospective study looking at the data of the patients who are accessing antiretroviral therapy in the hospital. Data was sourced from the Laboratory Registers and Patients' case notes. Data extracted from the laboratory Registers include the participant's age, sex, Hepatitis B surface Antigen and Hepatitis C antibody screening results. Data extracted from patients' case notes include the most recent HIV viral load result. Patients' HIV status were already known as they are already accessing HIV treatment in the facility. Blood samples were collected from the patients using standard venipuncture techniques. Two milliliters of blood werecollected from each HIV positive patient into a blood collection tube containing ethylenediaminetetraacetic acid (EDTA). The samples were stored at -200 c until time for testing. Testing for Hepatitis B and Hepatitis C was carried out at the DalhatuAraf Specialist Hospital, Immunology Laboratory using the Rapid Test kits for Hepatitis B andHepatitis C (ACON Laboratories Inc , San Diego CA) all based on immunochromatographic principles for the qualitative detection of Hepatitis B surface Antigen (HBsAg) and Hepatitis C Antibodies. HIV Viral load testing were carried out offsite at the regional Laboratory supported by Institute of Human Virology Nigeria.

Data Analysis:

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17 (Chicago SPSS. Inc). Chi square test was used to test the statistical association with 95% confidence level.

III. Results:

A total of 249 patients had their samples analyzed and their data extracted from their case notes, 44(17.7%) were males and 205(82.3%) were females. The patients were aged between 18 and 75 years. Two hundred and seventeen (87%) of the patients were aged between 21 and 50 years. (Table 1)

Table 1. Distribution of patients by Age and Sex.

Age in years	Sex		Total
	Male N (%)	Female N (%)	
15-20	0	2 (1.0)	2
21-30	1 (2.2)	49 (23.9)	50
31-40	11 (25)	96 (46.8)	107
41-50	21 (47.7)	39 (19.0)	60
51-60	9 (20.5)	17 (8.3)	26
61-70	2 (4.5)	1 (0.5)	3
>71	0	1 (0.5)	1
Total	44 (17.7)	205 (82.3)	249 (100)

A total of 18 (7.2%) were positive for Hepatitis B surface antigen (HBsAg) while 24(9.6%) were positive to Hepatitis C antibodies. None of those tested had dual infection of Hepatitis B and C in this study.Of the 18 who were positive for HBsAg, 16 (88.9%) were aged between 21 and 50 years. Similarly, 83.3% (20 out of 24) of those who are positive for Hepatitis C antibodies were aged between 21-50 years. However, most of those with coinfections were however in the 31- 40 years age group.(Tables 2&3).

Table 2. Distribution of Hepatitis B seropositivity by Age.

Age(years)	Positive N (%)	Negative N (%)	Total
15-20	0	2 (0.9)	2
21-30	5 (27.8)	45 (19.5)	50
31-40	9 (50)	98 (42.4)	107
41-50	2 (11.1)	58 (25.1)	60
51-60	1 (5.5)	25 (10.8)	26
61-70	1 (5.5)	2 (0.9)	3
>71	0	1 (0.4)	1
Total	18 (7.2%)	231 (92.8%)	249 (100%)

P value> 0.05

Table 3. Distribution of Hepatitis C seropositivity by Age

Age(years)	Positive N (%)	Negative N (%)	Total
15-20	0	2 (0.9)	2
21-30	3 (12.5)	47 (20.9)	50
31-40	15 (62.5)	92 (40.9)	107
41-50	2 (8.3)	58 (22.2)	60
51-60	4 (16.7)	22 (9.8)	26
61-70	0	3 (1.3)	3
>71	0	1 (0.4)	1
Total	24 (9.6%)	225 (90.4%)	249 (100%)

P value > 0.05

Females had the highest seropositivity rates for both hepatitis B and C as they accounted for 72% (13 out of 18) Hepatitis B and 83% (20 out of 24) Hepatitis C cases while males accounted for only 27% (5 out of 18) and 16.7% (4 out of 24) Hepatitis B and C cases respectively. (Tables 4 &5). There was significant association between Hepatitis C and sex. (P value 0.018).

Table 4. Distribution of Hepatitis B seropositivity by sex.

Sex	Positive N (%)	Negative N (%)	Total
Male	5 (27.8)	39 (16.8)	44
Female	13 (72.2)	192 (83.1)	205
Total	18 (7.5%)	231 (92.8 %)	249 (100%)

P value > 0.05

Table 5. Distribution of HCV seropositivity by Sex.

Sex	Positive N (%)	Negative N (%)	Total
Male	4 (16.7)	40 (17.8)	44
Female	20 (83.3)	185 (82.2)	205
Total	24 (9.6)	225 (90.4)	249 (100%)

P value < 0.05

Eighty-three percent (15 out of 18) of those with Hepatitis B and 20 out of 24 (83%) of those with Hepatitis C had HIV Viral load of 1000copies per milliliters of blood or less at the time of the screening. Only 3 HIV/HBV coinfected and 4 HIV/HCV coinfected patients had HIV Viral load higher than 1000copies per milliliters of blood (Tables 6 & 7).

Table 6. Distribution of Hepatitis B seropositivity by HIV viral load.

HIV Viral load (copies/ml)	Positive N (%)	Negative N (%)	Total
<20	9(50)	120 (51)	129
20-1,000	6 (33.3)	61 (26.4)	67
1,000-10,000	1 (5.5)	19 (8.2)	20
10,000-1,000,000	2 (11.1)	30 (13)	32
>1,000,000	0	1 (0.4)	1
Total	18 (7.2)	231 (92.8)	249 (100)

P value > 0.05

Table 7. Distribution of Hepatitis B seropositivity by HIV viral load.

HIV Viral load (copies/ml)	Positive N (%)	Negative N (%)	Total
<20	11 (45.8)	118 (52.4)	129
20-1,000	9 (37.5)	58 (25.8)	67
1,000-10,000	2 (8.3)	18 (8)	20
10,000-1,000,000	2 (8.3)	30 (13.3)	32
>1,000,000	0	1 (0.4)	1
Total	24 (9.6)	225(90.4)	249 (100)

P value> 0.05

IV. Discussion

This study found a prevalence of 7.2% and 9.6% coinfection of Hepatitis B virus(HBV) and Hepatitis C virus (HCV) respectively among HIV infected patients in our facility. No case of triple infection with all the three viruses was found in this study.

The seroprevalence of 7.2% and 9.6% for Hepatitis B and C in this study generally fall within the range reported in most of the studies from Nigeria.Akyala et al[4] and Okwori et al[6] reported a prevalence of 13.5% and 10% for HBV/HIV and HCV/HIV coinfections with 5% seroprevalence of triple infection (HBV/HCV/HIV) in Keffi while seroprevalence rates of 13.4% and 3.9% were reported from Jos, North central Nigeria.[4,6,14] Various studies from Nigeria reported prevalence rates between 13-28% for Hepatitis B and HIV and 0.6-5.2% for Hepatitis C and HIV coinfections.[5,13,14]A study from India reported HIV/HBV and HIV/HCV coinfection rates of 15% and 8.3% respectively.[15]

The HCV coinfection rate of 9.6% in this study is far higher than those reported in many studies in Nigeria which showed rates between 0.6 – 5%.[5,13,14,16, 17] One study however found a higher seroprevalence of 14.7%HCV/HIV coinfection.[18]The higher prevalence in this study may be due to the method of testing used which is a rapid screening test that may give false positive.

Lower seroprevalence rates of HBV and HIV coinfections were reported by Chiekulie et al[5] from South-East Nigeria where they found an HIV and HBV coinfection rate of 2.2% among HIV patients in a suburban teaching hospital.[5]

None of the patients in this study had all three viruses. A few studies from Nigeria also reported finding no triple infections.[5,16] However, several studies in Nigeria found triple infection rates between 0.6%b and 5.2%.[4,6,13,17,18]

This study found that more females than males were coinfected. Thirteen(72%) of the 18 patients that had HBV and 20(83%) of the 24 who had HCV coinfections were female. Various reports show that men are more likely to be HBV and HIV coinfected and women on the other hand were more likely to be HCV and HIV coinfected. [13,16,17,18]Earlier studies involving HIV infected patients found a preponderance of females. This may be due to the general observation that suggests the occurrence of HIV in females more than males.[4,5,13-16.]Some reports suggest that these differencesmay be because men are more likely to have multiple sex partners while women have a higher chance of acquiring HCV through the vagina.[18]

Fifteen (83%) of those who had HBV coinfection and 20 (83%) of the 24 who had HCV coinfection in this study had normal HIV viral load (less than 1000 copies per milliliters). Only 3 (27%)and 4 (16%) of those with HBV and HCV coinfection respectively had HIV viral load over 1000 copies per milliliter, an indication of poor treatment outcome for HIV. Other studies reviewed looked at CD4+ lymphocyte count as markers of treatment outcome. This study however looked at the HIV viral load which is a direct assessment of HIV treatment outcome. In a study from north central Nigeria, Forbi et al[7] reported that HIV patients who had both HBV and HCV coinfections (triple infection) had lower mean CD4+ lymphocyte count than those who had only

one coinfection.[7,19]Reports from Asia found that HCV and HIV coinfections are associated with lower CD4 recovery which contributes to morbidity and mortality. Other reports also show that HBV and HIV coinfections delay immunological and virologic response thus contributing to high morbidity and mortality in HIV patients with viral hepatitis B and C.[8,9,19,20]

V. Conclusion

This study has further highlighted the problem of coinfections in people living with HIV. Apart from infection like tuberculosis which contribute to a high number of HIV associated mortality, Hepatitis Band C coinfections are also gaining prominence as major causes of HIV associated mortality. The wide range of prevalence rates being reported from Nigeria for viral hepatitis is a call for action to put in place a robust mechanism for getting accurate data on HIV, Hepatitis B and C infections.

HIV and Hepatitis B or HIV and Hepatitis C coinfection were more common among females than males. None had HIV, Hepatitis B and C triple infection.

VI. Recommendation:

Furthermore, routine screening of HIV patients for Hepatitis B and C markers is recommended to guide in the choice of Antiretroviral agents in the first instance and help in the management of the patients when coinfected. With the low HIV treatment uptake in many areas and the high cost of hepatitis C treatment in low income countries like Nigeria, there is need to put more resources in place to ensure early commencement of HIV treatment and availability of HCV treatment which is affordable. This will reduce mortality and increase survival of people living with HIV in Nigeria and other low-income countries.

Acknowledgements:

I wish to acknowledge the Institute of Human Virology Nigeria (IHVN) who are supporting the HIV care and treatment program in the facility with support from PEPFAR and United States Centers for Disease Control (CDC). I also wish to acknowledge the support of the Clinton Health Access Initiative (CHAI) for the support to the facility for Hepatitis B and C screening and Hepatitis C treatment.

References

[1]. HIV and Viral Hepatitis. June 2017. Https://www.cdc.gov/hiv/pdf/library/factsheets/hiv-hepatitis.pdf
[2]. HIV and Hepatitis coinfections. www.who.int/hiv/topics/hepatitis.en/
[3]. Nyirenda M, Beadsworth MB, Stephany P, Hart CA et al. Prevalence of infection with hepatitis B and C virus and coinfection with HIV in medical inpatients in Malawi. J infect.2008 Jul;57(1):72-7 doi:10.1016/j.infect.2008.05.004.Epub2008june13.
[4]. Akyala IA, Obande G, Ishaleku D. Seroprevalence of Hepatitis B and C coinfection among cohort seropositive HIV patients accessing health care in Nasarawa state, North Central Nigeria. British Journal of Psychological Research.Dec2013; Vol1; No.1pg15-24. www.ea-journals .org
[5]. Chiekulie KD, Emmanuel CO, Oguamanam OE, Jerome EA, Nathan CN. Seroprevalence of hepatitis B virus and hepatitis C virus among HIV patients in a Suburban University Teaching Hospital in South-East Nigeria. The Pan African Medical Journal.2013;16:7 doi.10.11604/pamj.2013.16.7.3077
[6]. Okwori AEJ, Alabi SS, Ngwai YB, Makut MD et al. The Seroprevalence of Hepatitis B and C virus coinfection among HIV-1 infected patients in Keffi, North Central Nigeria. IOSR journal of Dental and Medical Sciences. Vol.9 issue 5 (sept-oct 2013) pp 70-75. www.iosrjournals.org
[7]. Forbi JC, Gabadi S, Iperepolu HO, Entonu PE, Agwale SM. The role of triple infection with hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) type 1 on CD4+ lymphocyte levels in the highly HIV infected population of North Central Nigeria. Mem.Inst.oswaldocruz vol.102 no.4 Rio de Janeiro June 2007 Epub Apr 10 2007. http://dx.doi.org/10.1590
[8]. Rongwong Y, Xien G, Yong X, Shi-cheng G, Yajun X. Impact of hepatitis B virus infection on response to antiretroviral therapy in a Chinese antiretroviral therapy center. International Journal of Infectious Diseases Vol 28, Nov 2014, pg 29-34. https://doi.org/10/1016/j.ijid.2014.07.018
[9]. Georgios KN, Dimitrios P, Eleni H, Zissis MV et al. Impact of Hepatitis B virus infection on the progression of AIDS and mortality in HIV infected individuals: A cohort study and meta-Analysis. Clinical Infectious Diseases, vol 48 iss 12,15 June 2009, pg 1763-1771. https://doi.org/10.1086/599110
[10]. Klein MB, Rockstroh JK, Wittkop L. Effect of coinfection with Hepatitis C on survival of individuals with HIV-1 infection. Current Opinion in HIV and AIDS.11(5):521-526, SEP 2016 DOI: 10.1097/COH.0000000000000292, PMID:27716732
[11]. Highleyman L. Ongoing Hepatitis B replication raises mortality for people with HIV. AIDS 2016.https://www.hivandhepatitis.com.
[12]. WHO/HIV/AIDS- world health organization. https://www.who.int>hiv
[13]. Ojide CK, Kalu EI, Ogbaini-Emevon E, Nwadike VU. Co-infections of hepatitis B and C with Human Immunodeficiency Virus among adult patients attending Human immunodeficiency virus outpatient Clinic in Benin city Nigeria. Niger J Clin Pract. 2015;18(4) pg 516-21. https://www.njcponline.com/text.asp?2015/18/4
[14]. Peter YJ, Olayinka AT, Agbaji OO, Ogunsola FT. Epidemio;ogy of Hepatitis B and C infections among HIV counseling and testing clients in Jos, North central Nigeria. Afr.J.Clin.Exper Microbiol.16(3):92-96 http://dx.doi.org/10.4314/ajcem.v16i3.2
[15]. Naval C, Nayana J, Raju YSN, AJit K, Vijay DT. Hepatitis B and/or C co-infection in HIV infected patients: A study in a tertiary care center from South India. Indian J Med Res. 2013 Dec; 138(6)950-954. www.ncbi.nih.gov/pmc/articles/PMC3978987/
[16]. Hamza M, Samaila AA, Yakasai AM, Babasheni M, Borodo MM, Habib AG. Prevalence of hepatitis B and C virus infections among HIV infected patients in a tertiary hospital in North-western Nigeria. Nigerian Journal of Basic Clinical Sciences 2013. Vol 10(2) pg 76-81 DOI:10.4103/0331-8540.122765
[17]. Balogun TM, Emmanuel S, Ojerinde EF. HIV, Hepatitis B and C viruses' coinfection among patients in a Nigerian tertiary Hospital. The Pan African Medical Journal. 2012;12:100. www.panafrican-med-journal.com/content/article/12/100/full

[18]. Barth RE, Huijgen Q, Taljaard J, Hoepelman AIM. Hepatitis B/C and HIV in sub Saharan Africa: an association between highly prevalent infectious diseases. A systemic review and meta-analysis.International Journal of Infectious Diseases vol14 iss 12 Dec 2010 https://doi.org/10.1016/j.ijid.2010.06.013

[19]. De Luca A, Bugarini R, Lepri AC, Puoti M et al. Coinfection with hepatitis viruses and outcome of initial antiretroviral regimens in previously naïve HIV-infected subjects. Arch Intern Med. 2002 oct 14; 162(18)2125-2132. doi:10.1001/archinte.162.18.2125

[20]. Kumar R, Singla V, Kacharya SK. Impact and management of hepatitis B and hepatitis C co-infection in HIV patients. Trop Gastroentrol.2008 Jul-Sep;29(3):136-47 https://www.ncbi.nlm.nih.gov

Esther S. Audu "Hepatitis B and C Co-Infections among Patients Accessing Antiretroviral Therapy in a Tertiary Health Facility in Lafia, North Central Nigeria " IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 7, 2018, pp 65-70