

Research Article**A Survey of the Prevalence of Hepatitis B and Hepatitis C Antibodies amongst HIV Positive Patients in Tertiary Health Institution in South Eastern Nigeria****N. J. Okolie, Ulogu I.O., Obama Y. I*.**^{1,2}Department of Medical laboratory Science, Imo State University, Owerri, Nigeria³Department of Anatomical Pathology, College of Health Science, Niger Delta University Amassoma, Bayelsa state, Nigeria***Corresponding author**

Obama Y. I

Email: yoboma@yahoo.com

Abstract: Human immunodeficiency virus is a major pandemic in Nigeria and the growing prevalence of hepatitis of Hepatitis B and C admix infection in on increasing measure. A survey on the prevalence of hepatitis B and C amongst HIV infected patient was carried out between March and September 2011. A total of 720 whole blood samples were collected and out of these, 206 were males and 514 females. The samples were serologically assayed for the presence of antibodies to HBV (anti-HBsAg) and HCV using screening test strip. The overall prevalence of HBsAg, HCV and both viral infection among HIV positive subject studied is 126(17.5%) and 138(6.4%) among HIV negative (control). The age group, <1-20years had the highest prevalence of HBsAg (26.5%) and HCV (15.4%), followed by 41-60years; HBsAg (20.4%) and HCV (6.1%) and is statistically significant p<0.05. The gender related prevalence shows that males had a higher prevalence of HBsAg, 26(12.6%), HCV, 15(7.3%) and both viral infection, 15(2.4%) than females 57(11.1%); 19(3.7%) and 04(0.8%) respectively (p<0.05). Human immunodeficiency positive patients should be screened for both Hepatitis B and C on their initial visits to HIV –clinic, as this will help in antiretroviral therapy (ART) plan and treatment.**Keywords:** HBV, HCV, Antibodies, Prevalence, Tertiary, Institution

INTRODUCTION

Transmission of hepatitis B virus (HBV) is by direct contact with the blood or body fluid such as semen, vaginal discharge, breast milk and saliva of infected person [1, 2]. Sexual activity is the major route for viral transmission of hepatitis B. CDC (2003) [3] estimates that 30-60% of new HBV infection may be sexually transmitted and in addition, both HBV and HIV infections share common modes of transmission, predominantly blood transfusion and high risk of sexual activity [4, 5]. The hepatitis B virus, hepatitis C virus and Human Immunodeficiency virus (HIV) are devastating viruses that share certain epidemiological characteristics such as risk population and transmission routes [6]. The prevalence rate of HBsAg globally is 5% [7]. As at 2004 350 people were infected with HBV. National and regional prevalence ranges from 10% in Asia to under 0.5% in the USA and Northern Europe [8]. HBV has caused epidemics in parts of Asia, and it is endemic in china [9]. About a third of world population, more than two billion people has been infected [1]. This includes 350 million chronic carriers [10]. An estimated 1.5millions Americans are chronic HBV carriers and some 150 thousand newly infected, [11]. Infection with HIV and HBV viruses often co-exist

in the same patients as the viruses share similar modes of transmission. About 10% of HIV patients are infected with HBV, [7, 12]. Worldwide 40million people are infected with HIV and about 4million of then are infected with HBV [13]. There seems to be a considerable variation in the prevalence rate in HIV subjects. Perhaps, reflecting geographical or ethnic differences in transmission mode. A study by Poland *et al.*, reported a rate of 23.7% while another study has shown evidence of HBV infection in as high as 80% of those infected with HIV [14]. In Nigeria Umolu 2005 reported an HBs Ag of 5.8% among blood donors in Benin City, Edo State with a highest number of HBsAg positive cases (7.8%) among donors aged 18-25 year [5]. Also, Mustapha and Jubril, 2004 reported a HBV prevalence of 26.5% among HIV patients attending HIV clinic in Federal Medical Centre, Gombe Nigeria [30]. This was significantly higher (P<0.001) than the 10.4 % recorded among HIV infected individuals. Co-infection rate in males 24.7% did not differ significantly from the rate in females (28.2%). Co-infection was highest in the 40-49 years age group (41.6%), while no case of co-infection was recorded in ≤ 19years. Among the different occupational group, business men had the highest co-infection rate with 44% followed by long

distance drivers 39.5%. it is estimated that hepatitis has infected nearly 200 million people worldwide and infects 3-4 million people/year [15]. Annual death from HCV in USA ranges from 10,000-20,000; expectations are that this mortality rate will increase, as those with who were infected by transfusion before testing become apparent [15, 16]. Co-infection with HIV is common and rates among HIV positive population are higher. Approximately, 350,000 people (35% of patients) in the USA Infected with HIV are co-infected with HBV, mainly because both viruses are blood borne and are present in similar population [18]. Sulkowaski *et al*; 2000 reported that approximately 1/3 of HIV infected patient in United States have co infection with hepatitis C virus [19]. Co-infection rate differs from sub-population between 3-73%. Hepatitis C virus (HCV) prevalence is higher in some countries in Africa and Asia [16] with Egypt having the highest Sero-prevalence of up to 20% [20, 21], Dakar, Senegal 1.6% [22], Ghana and Guinea, 2.8-6.7% [23] and Nigeria 5.7% [24]. There infection present with organ damage and complication thereby altering the enzymatic functioning and equally deplete the immune status.

MATERIALS AND METHODS

Study Area and Population

This study was carried out at Orlu, Imo state, Southern Eastern Nigeria with consent from the ethical committee and patients. The study population comprises of 732 HIV positive and 2,160 negative control patients who attend two major hospital counseling and testing (HCT) units in Orlu metropolis. The survey was conducted between March and September 2011. A total of 732 whole blood samples were collected and 12 were rejected based on the

prevalence of blood clot and insufficient blood sample. Informed consent was obtained from the patients through a structured questionnaire, socio economic data such as age, sex, marital status and occupation recorded.

Data analysis was done using SPSS Version II (Chicago USA). The Chi-square test was used to evaluate the significance of the difference among the group. P value ≤ 0.05 was considered significant.

Collection and Processing of Samples

5ml of whole blood samples were collected from confirmed HIV-Positive patients using vacuenter plain containers. The plain containers were separated and serum used in hepatitis B surface antigen, hepatitis C virus. The population was confirmed positive for HIV using the approved National serial Algorithm. In the pattern, determine rapid Kit, Unigold rapid kit and Stat-pak rapid kit for discordant results. HBsAg and HCV were screened using CLINCOTECH and FICH TECH screening test strips.

RESULT

The total number of 720 HIV patients was examined. Out of these 126 (17.5%) were infected with HBsAg, HCV or both viral infection, specifically 83(11.5%) had HBs Ag, 34(4.7%) had HCV and 9(1.3%) had concomitant viral infection. Also a total of 2160 HIV negative patients were used as control. Of these 138(6.4%) were infected with any of the three viral infections. Analysis of data using chi-square test showed no significance difference between HIV positive and HIV negative patients (P.0.05).

Table 1: The Prevalence of HBsAg and Hcv amongst HIV Positive Patients Based on Gender and Age

Respond.	Sex	No examined	Age	No examined	HBV %infection	HCV	HCV&HBV
HIV positive	M	206	1-20	26	5(19.2)	4(15.4)	1(3.8)
			21-40	69	6(8.7)	4(15.4)	1(1.4)
			41-60	99	13(13.1)	6(6.1)	3(3.0)
			61-80	12	2(16.7)	1(8.3)	0(0.0)
	F	514	1-20	34	9(26.5)	5(14.7)	1(2.9)
			21-40	377	27(20.4)	9(2.4)	2(0.5)
			41-60	103	21(20.4)	5(4.9)	1(1.0)
			61-80	0	0(0.0)	0(0.0)	0(0.0)
Total		720		720	83(11.5)	34(4.7)	9(1.3)

Table-1 shows age related distribution, age group <i>i</i>-20 years had the highest prevalence of HBs AG (26.5%), HCV (15.4%) and concomitant hepatitis infection (3.8%). This is followed by age group, 41-60, having HBs Ag (20.4%) and concomitant hepatitis infection (3.0%). The age group 61-780 had no occurrence of concomitant hepatitis infection although 2(16.7% had HBs Ag while 1(8.3%) had HCV. The chi-square analysis done by SPSS, shown no significant relationships between age and infection (P>0.05) Table-2 shown distribution among HIV- negative patients, the

age group, k1-20 had the highest prevalence of HBs Ag, 13(7.3%) while 61->80 had the highest prevalence of HBs Ag, 1(4.8%).4.3 Gender related prevalence shown and revealed that 206 HIV positive male and 514 HIV positive females were examined. Of these, male had a higher prevalence, 26(12.6%) had HBs AG, 15(7.3%) had HCV and 0.5 (2.4%) had concomitant infection. A female shows a lower prevalence as follows, HBs Ag, 15(11.1%), HCV, 19(3.7%) and concomitant infection 04(0.8%). Analysis of data by chi-state square shows no significant relationship among the different age group

(P>0.05). However among HIV negative patients, 988 males and 1172 females were examined. Females had a higher prevalence of HBs Ag 60(5.1%), HCV 25

92.1%) and both viral infection 02(0.2%). Also analysis of data by chi-square test is insignificant at 1% level of significance P<0.01.

Table 2: The prevalence of HBsAg and HCV amongst HIV negative patients based on gender and age

Respondent	Sex	No examined	Age	No examined	HBV %Infect.	HCV	HBV&HCV
HIV Negative	M	988	<1-20	124	3(2.4)	2(1.6)	0(0.0)
			21-40	331	9(2.7)	3(0.9)	1(0.3)
			41-60	475	18(3.8)	11(2.3)	1(0.2)
	F	1172	<1-20	177	13(7.3)	4(2.3)	1(0.6)
			21-40	659	34(5.2)	13(2.0)	1(0.2)
			41-60	315	12(3.8)	7(2.2)	2(0.6)
			61-80	21	1(4.8)	1(4.8)	0(0.0)
Total		2160		2160	91(4.2)	4(1.9)	6(0.30)

Total number of HIV negative patient infected with HBsAg & HCV or both =138(6.4%)

Table 3: Gender related prevalence of HBsAg and HCV amongst HIV positive and negative patients in Orlu, South Eastern Nigeria

Resp.	Sex	No examined	HBV % infected	HCV	BOTH	HBV % uninfected	HCV	BOTH
HIV Pos.	M	206	26(12.6)	15(7.3)	5(2.4)	180(87.4)	191(92.7)	201(97.6)
	F	514	57(11.1)	19(3.7)	4(0.8)	457(88.9)	495(96.3)	510(99.2)
	Total	720	83(11.5)	34(4.7)	9(1.3)	637(88.5)	686(95.3)	711(98.8)
HIV Neg.	M	988	31(3.1)	16(1.6)	2(0.2)	957(96.7)	972(98.4)	986(99.8)
	F	1172	60(5.1)	25(2.1)	4(0.3)	1112(94.9)	1147(97.9)	1168(99.7)
	Total	2160	91(4.2)	41(1.9)	6(0.3)	2069(95.8)	2119(98.1)	2154(99.7)

Note: Total no. of HIV positive infected with HBsAg, HCV or both viral infections are 126(17.5%) while the total number of HIV negative infected with these viral infection are 138(6.4%)

DISCUSSION

According to WHO estimates the global burden of HIV, HCV and HBV is 33.2m, 170m and 400million respectively [25]. Also hepatitis Band C and related liver diseases are emerging significant health problems in patient living with HIV. In this research study, the total number of HIV positive patients infected with HBsAg, HCV or both is 126(17.5%). These patients have a prevalence of 17.5% (HBsAg), 4.7% (HCV) and 1.3% (HBsAg) and HCV concomitant infection. This is relatively in line with the work of Adewole *et al.* [6]; who reported a prevalence of 11.5% (HBsAg), 2.3% (HCV) and 1.5% for both infection among patients attending adult HIV clinic at the National Hospital, Abuja. Otegbayo *et al.* [26]; reported a prevalence of 11.9% (HBsAg), 4.8% (HCV) and 1% (both infection) among patients who presented at UCH Ibadan, Nigeria while Denu *et al.* [28], report prevalence of 12.3% (HBsAg), 0.5% (HCV) and 0% (both infection) among HIV positive patients attending infection disease clinic, General outpatient and those admitted at the medical ward of university of Maiduguri teaching hospital Bornu state, Nigeria. However Adewole *et al.* [6] had a lower overall prevalence (15.4%) compared to the 17.5% recorded in this study. This may be due to the fact that the researches selected only adults and their

study population excluding children 0-17 years, also, as a control study in this research, HIV negative patients were also tested and a total of 138(6.4%) were found to be either infected with HBsAg, HCV, or both viral infections. These HIV negative patients had a prevalence of 91 (4.2%) for HBsAg, 41(1.9%) for HCV and 06(0.3%) for both HBsAg and HCV concomitant infection. This result is not significant (P=0.439). This corresponds with the findings of Denu *et al.*, at the department of medicine, university of Maiduguri teaching hospital Bornu state [28]. These researches recorded a prevalence of 5.2% (HBsAg), 1.4% (HCV) and 0% for both viral markers among HIV negative respondents who donated blood or came for routine premarital testing within a period of their study. HBsAg and HCV or both viral markers are more prevalent in HIV positive patients than HIV negative patients although not significant (p>0.001). This may be attributed to reduce immunity (immune suppression) of HIV positive patients which make more vulnerable to infectious disease. Also HIV, HBV, HCV share similar routes of transmission with sexual, parental and perinatal transmission being the most frequent mode of acquiring the infection [25]. In line with this Bernard (2002) suggested that sexual transmission is responsible for an increasing proportion of HCV and HBV infection

among people with HIV [27]. Also CDC (2008) and health cares (2008) reported that HIV infected persons are more at risks of acquiring HBV and HCV. In gender related prevalence males had higher prevalence for HBs Ag, HCV, and concomitant infections than females although not significant ($p=0.42$). This agrees with the work of Otegbayo *et al.* [26]; who reported that males had higher HBsAg (15.4% vs. 10.1%) and con concomitant infection (HBV and HCV) (2.2% vs. 0.4%) than females ($p.0.01$) while anti HCV were detected in similar proportion in both males and females. Denué *et al.*; detected a similar proportion of HBsAg in both males and females HIV positive patients [28]. Equally Inyama *et al.*; reported a higher anti HCV prevalence in males than females [24]. CDC (2010) reported that males have more rapid disease progression than females. This present study is in line with CDC (2003) [3].

HBV and HCV are higher in guy males and people with multiple sexual partners. However among the HIV negative patients studied females recorded a higher prevalence of HBsAg than males (5.1% vs. 3.1%); HCV (2.1% vs. 1.6%) and both viral markers (0.3% vs. 0.2%) and there exists a significant relationship. This corresponds with the findings of Denué *et al.* [28]; who reported a higher prevalence of HBsAg in HIV negative females than males. This incidence may be due to the fact that that HIV negative females contacted the infections through other routes other sexual transmission and this may include blood transfusion, delivery and through the use of sharp objects in saloon.

Age related prevalence shows that the age group <1-20 years had the highest prevalence for HBsAg, HCV and concomitant infection among HIV positive patient and is statistically significant ($p.0.05$) also the same age group recorded the highest prevalence of HBs Ag (7.3%) among HIV negative patients and this may be due to the fact that this age range is sexually active and due to ignorance may not indulge in safe sexual practice. Also infants who contacted these infections during pregnancy or delivery via mother to child transmission are part of this study. The study age group 41-60years had a higher prevalence of HBsAg than the age groups 21-40 and 60->80years among HIV positive while among HIV negative patients age groups 60->80years recoded the highest prevalence of HCV (4.8%) and this may be because of the association of increasing age with rapid progression of HCV.

CONCLUSION

The results shows that hepatitis B virus and hepatitis C virus exist amongst HIV positive and negative patients in Orlu southeastern Nigeria. Although more prevalence was recorded among HIV positive patients preferably due to compromise immune status, there is need to create a public awareness on the prevalence of HBV and HCV on the mode of transmission and prevention. Finally since co infection with HBV and HCV is higher in HIV positive patients; it should be

included as a routine screening check in the management of HIV positive patients in Nigeria and most especially in the initiation and choice of chemotherapy.

REFERENCES

1. W.H.O.; Hepatitis B. 2009. Available from <http://www.who.int/mediacentre/factsheets/fs204/en/index.htm>
2. Mittal J; Hepatitis B and hepatitis C infection. 2010. Available from <http://www.aidsshivs.com/goto/http://www.articlesbase.com>.
3. C.D.C.; The Twin Epidemics. Centre for Disease Control and prevention, USA, 2003. Available from www.cdcinfo@cdc.gov
4. Lodenyo H, Schoub B, Ally R, Kairu S, Segal I; Hepatitis B and C Virus infections and liver function in AIDS patients at Chris Hani Baragwaneth Hospital, Johannesburg. East African Medical, 2000; 77(1):13-15.
5. Umolu I, Okoror LE, Orhue P; Human immunodeficiency Virus (HIV) Sero- positivity and Hepatitis B surface antigenemia (HBsAg) among blood donors in Benin City, Edo state, Nigeria. African journal of Health sciences, 2005; 5 (1): 55-58.
6. Adewole OO, Anteyi E, Ajuwon Z, Wada I, Elegba F, Ahmed P *et al.*; Hepatitis B and C virus co- infection in Nigerian patients with HIV infection. J infects Dev ctries, 2009; 3(5): 369-375.
7. Lunel-Fabian F; Interactions between Human immunodeficiency Virus and Hepatitis Viruses B, C and D. In Sarin SK, Hess G editors; Transfusion Associated Hepatitis, CBS publishers, New Delhi. 1998: 289-294.
8. Custer B, Sullivan SD, Hazlet TK, Iloeje U, Veenstra DL, Kowdley KV; Global epidemiology of hepatitis B virus. Journal of clinical Gastroenterology, 2004; 38(10suppl 3):158-168.
9. Williams R; Global challenges in liver disease. Hepatology (Baltimore, Md), 2006; 44(3):521-526.
10. Stanford D; FAQ about Hepatitis B Stanford School of Medicine. 2009. Available from <http://liverstandford.edu/education/faq.html>.
11. Chung R; New developments in the management of Hepatitis B Virus/HIV co-infection. Medscape HIV/AIDS. Available from <http://www.medscape.com/viewarticle/440517>
12. Choudhuri G; Treatment of chronic hepatitis B in HIV patients. Hep B Annual, 2004; 1: 217-218.
13. Alter MJ; Epidemiology of viral hepatitis and HIV Co infection. Hepatol., 2006; 44(suppl 1): 56-59.
14. Halder JC, Judson FN, O'Malley PM; Outcome of hepatitis B virus infection in homosexual men and its relation to prior immunodeficiency virus infection. J infects Dis., 1999; 63:454-9.
15. W.H.O.; Guidelines for prevention of mother- to-child HIV transmission in Zimbabwe. 2010.

- Available from
www.ncbi.nlm.nih.gov/pubmed/21655097.
16. C.D.C.; Hepatitis C: FAQ-CDC Viral Hepatitis. 2008. Available from
<http://www.cdc.gov/ncidod/diseases/hepatitis/c/faq.html#5d>.
17. Campbell JV, Hagan H, Latka MH; High prevalence of alcohol use among hepatitis C virus antibody positive infection drug users in three US cities. *Drug and Alcohol Dependence*, 2006; 81(3): 259-265.
18. Falconer K., Sandberg JK, Richard O, Alaeus A; HCV/HIV Co-infection at a large HIV outpatient clinic in Sweden: Feasibility and results of hepatitis C treatment, *Scandinavian Journal of Infectious Diseases*, 2009; 41(11-12): 881-885.
19. Sulkowski MS, Mast EE, Seeff LB, Thomas DL; in Egypt. 2010. Available from
<http://www.albawaba.com/en/news>.
20. Etard JF, Colbachini P, Dromigny JA, Perrier-Gros-Claude JD; Hepatitis C antibodies among blood donors, Senegal. *Emerg. Infect Dis.*, 2003; 19(11): 1492-1493. Hepatitis C Virus infection as an opportunistic disease in persons infected with human immunodeficiency Virus. *Clinical Infectious*, 2002; 30(1): 77-84.
21. Frank C, Mohammed MK, Strickland GT; The role of parental antischistosomal therapy in the spread of hepatitis C Virus in Egypt. *Lancet*, 2000; 355(9207): 887-891.
22. AL Bawaba; Highest Rates of Hepatitis C Virus Transmission Found
23. Wansbrough-Jones M, Frimpong E, Cant B, Harris K, Evans M, Teo C; Prevalence of and genotype of hepatitis C Virus infection in pregnant women and blood donors in Ghana. *Trans R Soc Trop Med Hyg.*, 1998; 92: 496-499.
24. Inyama U, Uneke P, Anyanwu C, Njoku G; Idoko and Julia H; Prevalence of antibodies to hepatitis C Virus among Nigeria patients with HIV infection. Abstract(On-line/unpaginated), 2005. Available from <http://cogprints.org/4551/>
25. W.H.O.; The World Health report Life in the 21st century: a vision for all: report of the Director-General, Geneva. Hepatitis- B fact sheet, No 164, Geneva, 1998. Available from
<http://www.who.int/mediacenter/factsheet/fs/164/en/accessed>
26. Otegbayo JA, Taiwo BO, Akingbola TS, Odaibo GN, Adedapo KS, Penugonda S *et al.*; Prevalence of hepatitis B and C Seropositivity in Nigeria cohort of HIV –infected patients. *Annals of Hepatology*, 2008; 7(2):152-156.
27. Bernard EJ; Sexual transmission of hepatitis C. *AIDS Treatment update*, 2002; <http://www.thebody.com/content/art13232.html>
28. Denué BA, Ajayi B, Abja AU, Bukar AA, Akawu C, Ekong E *et al.*; A survey of hepatitis B and C Virus prevalence in Human immunodeficiency virus positive patients in a tertiary health institution in North Eastern Nigeria. *International journal of medicine and medical sciences*, 2012; 4(1):13-18.
29. Health- Cares; Who is at the risk of hepatitis C? 2008. Available from www.health-cares.net
30. Mustapha SK, Jibrin YB; The prevalence of Hepatitis B surface antigenaemia in patients with human immunodeficiency virus (HIV) infections in Gombe, Nigeria. *Annals of African Medicine*, 2004; 3(1):10-12.