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*Research Paper*

# Prevalence of hepatitis- B virus infection among HIV patients seen in university of UYO teaching hospital (UUTH), UYO

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## Abstract

**Human Immunodeficiency Virus (HIV) co-infection with hepatitis B virus (HBV) is common, and different prevalence rates have been reported. In Nigeria, several studies have been conducted, but none so far in Uyo, Akwa Ibom State, despite the high HIV prevalence rate (10.9%) in the state. This study therefore aimed at determining the prevalence of HBV infection among HIV infected persons that attended the HIV clinic in University of Uyo Teaching Hospital, in Uyo. It was a cross sectional study, where all confirmed HIV positive patients who presented at the UUTH from January 2010 to February 2011(inclusive) were tested for hepatitis B surface antigen (HBsAg). The results showed that of the 239 HIV infected persons who were screened for HBV, 29 (12.1%) had HBV infection. More males were co-infected, 55.2% versus 44.8% females, p=0.01. Two (5.1%) of the 39 children in the study, were co-infected. It was concluded that HIV-HBV co-infection rate is high in Uyo, though not as it is in other parts of Nigeria.**

**Keywords:** Co-infection, Patients, Prevalence, Surface antigen, Virus.

## Introduction

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus. It is a major global health problem and the most serious type of viral hepatitis. It can cause chronic liver disease and puts people at high risk of death from cirrhosis of the liver and liver cancer. As at July this year, WHO fact sheet revealed that an estimated two billion people have been infected with the hepatitis B virus [1] and more than 300 million people worldwide suffer from persistent hepatitis B virus (HBV) infection, and about 600 000 people are reported to die every year due to the acute or chronic complications of hepatitis B infection, thus making the virus a common cause of morbidity and mortality [2].

In the general population, the prevalence of hepatitis B surface antigen (HbsAg) carriers is about 0.5% in UK and the USA, but rises to 10 - 15% in some parts of Africa, the Middle East and far Eastern populations [3]. The virus, just like the Human immunodeficiency virus (HIV), is transmitted through intravenous route (by transfusion of infected blood or blood products, use of contaminated body piercing

instruments like injection needles, tattooists, acupuncturists or manicure/pedicure instruments), contact with the blood or other body fluids of an infected person, during sexual intercourse, or vertically from mother to child during delivery [4]. However, HBV is reported to be 50 to 100 times more infectious than HIV [1].

Serological changes following HBV infection shows that during the acute phase of the infection, HBsAg appears in the blood from about six weeks to three months and then disappears. However, persistence of HBsAg till after seroconversion is an indication of a chronic infection (or carrier state) [4].

HIV and Hepatitis co-infection is becoming a public health problem, more so since the two infections are transmitted via similar routes. Results of several researches have shown that HIV/HBV co-infection can influence the progression of HBV infection, the outcome of treatment and the prognosis of the two diseases. For instance, the rate of progression and complications from viral hepatitis was reported to be accelerated in HIV infected patients [5, 6], and HIV infected persons were shown to be six times more likely to develop chronic hepatitis if they were infected with HBV, compared to HIV negative persons [7]. In addition, HIV is shown to hasten the progression of HBV related liver disease, as co-infected men were reported to be 17 times more likely to die from liver related causes, when compared to those mono-infected with HBV [8]. The impact of HBV/HIV co-infection is shown to be more in regions with widespread use of ART, as it is thought that liver disease from chronic HBV in HIV –infected populations may become a greater public health problem, as the use of ART becomes more universal, with improved survival rates and high HBV endemicity [9]. After commencing ART in a co-infected patient, immune reconstitution inflammatory syndrome (IRIS) may occur, which can lead to worsening liver disease [10], or after discontinuing ART containing anti-HBV agents, hepatitis can be re-activated [11] , and the risk of hepatotoxicity was 3-5 times higher in co-infected patients on ART [12] .

Globally, HIV infection is on the increase by the day and the proportion of HIV patients infected with hepatitis B virus is said to be ten times higher than that for the general population[13]. Prevalence rates of HBV infection among HIV infected people ranges from 5% in North America and Western Europe to 20% in South East Asia. In Africa the prevalence of HBV in HIV infected people is about 10% [14]. Several studies have been conducted in Nigeria with wide variations in the prevalence rates reported. For instance, in northern Nigeria, Kano precisely [15], a co-infection rate of 6% was observed, while a rate of 20.6% was reported by researchers in Keffi, Nassarawa State, still in the northern part of the country [16]. Rate as high as 25.9% was found in Jos [17]. In south western Nigeria the prevalence of HBV in HIV patients was somewhat lower, 11.9% in Ibadan [18], and 9.2% in Lagos [19], although another researcher had a higher rate (31.9%) in the same city the same year [20].

However there is no documented study conducted in Akwa Ibom State despite its high HIV prevalence rate (10.9%) [21].The obvious challenge is that HBV co-infection with HIV will erode the gains of HIV control. Therefore this study aimed at determining the prevalence of HBV among HIV infected patients in Uyo, Akwa Ibom State. The result will inform decision on HBV control among HIV patients specifically and the entire population in general.

## Materials and Methods

The study included HIV positive patients who were enrolled into care at the adult HIV unit of the University of Uyo Teaching Hospital (UUTH) from January 2010 to February 2011. It was a cross sectional study, where consecutive patients enrolled into HIV care over 14 months period at UUTH HIV clinic were included in the study population. All subjects were confirmed HIV patients, over 18 months of age, and not pregnant if female subjects. Those excluded from the study were, children less than 18 months of age (when HIV antibody screening test are unreliable), pregnant women who were seen in Obstetrics and Gyneacology department under the PMTCT programme, and those whose HIV status was yet to be confirmed.

Five milliliters of venous blood samples were collected from all HIV infected patients who had a positive confirmatory test with Western Blot method, during the study period, these were screened for Hepatitis B surface antigen by rapid screening method using First Response HBsAg Card Test and confirmation was

done with Enzyme linked immunosorbent assay (ELISA) micro plate from Dialab Company, USA, according to the manufacturer's instructions.

In collecting the blood samples, the arm of the subject was tied with a tourniquet below the elbow joint to make the veins prominent. A vein was selected and cleaned with cotton wood dipped in spirit, then a sterile 5 ml syringe was used to pierce the vein and collect 5 mls of blood, which was transferred aseptically into a sterile dry blood sample bottle with anticoagulants. All procedures for the test were based on the recommendations of the manufacturer. The steps were as follows: - the test was conducted at room temperature ($18^{o}C - 30^{o}C$), the test strip was removed from the foil pouch by tearing notch and then the strip was dipped in the blood sample, with the arrow pointing towards the sample, and left for 10 seconds, after which it was removed and place on a clean, dry, non absorbent flat surface. It was read after 15 minutes. The strips were not read after 30 minutes, and other precautionary measures outlined by the manufacturer were observed.

Data entry and analysis was done with SPSS version 17 by calculating simple percentages, association was determined by cross tabulations and chi-square test and statistical significance was set at $p < 0.05$.

## Results and Discussion

Two hundred and thirty nine (239) eligible HIV patients who were enrolled into HIV care in UUTH between January 2010 and February 2011 were tested for the presence of HbsAg.

The prevalence of HIV has consistently fluctuated between 12.7% when the first prevalence survey was conducted in 1999 and 10.9% in 2010 survey. Currently, the State has the 2nd highest HIV sero prevalence rate in Nigeria.

### Prevalence of HBV among HIV patients

The prevalence of HBV among HIV –infected patients in this study was 12.1%. This is lower than the 31.9%, 25.9% and 20.6% reported in Lagos, Jos and Kebbi respectively [20, 17, 16], but higher than the 11.9%, 9.2% and 6% of Ibadan, Abuja and Kano respectively [18, 22, 15]. The differences noticed could be due to differences in the routes of infection. Though HIV and HBV share similar routes of transmission, HBV has been shown to be transmitted more through the percutaneous route, while transmission of HIV in most Nigerian settings is via the heterosexual route [21].

### Sex differences in HBV-HIV co-infection

The result of this study showed that males were more likely to be co-infected (55.2% versus 44.8%) than females, and the male gender was associated with odds ratio of 1.8, p=0.005. This is similar to the findings of other studies in Nigeria, for instance in Keffi. Nassarawa State, 56.8% males versus 43.2% females were co-infected [16] . Also in Benin, Edo State, more males had a higher prevalence of HbsAg, (30.8%) than females (23.3%) [23]. The results of other researches in Nigeria showed that the prevalence of HBV in HIV was more in males than females, Jos, Plateau State-31.8% Vs 22.1%, Ibadan, Oyo State-15.4% vs 10.1% ( OR 1.8, CI 1.3-2.4) [17, 18]. However, though the prevalence of HIV-HBV co-infection in Kano was shown to be 6% only [15], more females were reported to be infected, just as in Abuja, the Federal Capital Territory, were the odds ratio for females being co-infected was reported to be 1.2 (25% versus 75%, p=0.03) [22].

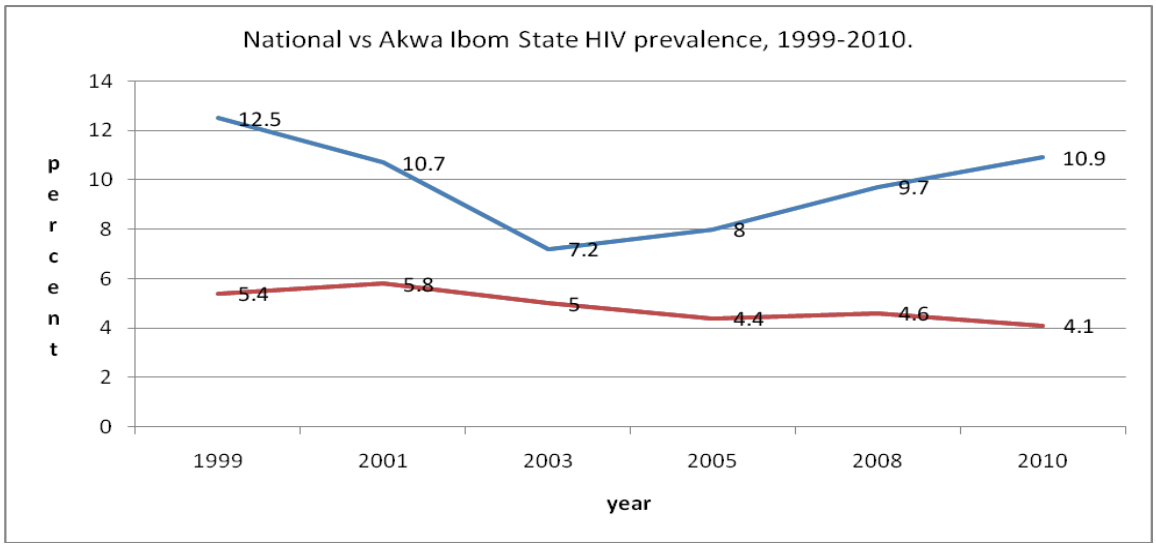


**Figure 1: The prevalence of HIV in Akwa Ibom State and national prevalence from 1999 to 2010 (source: FMOH, Report of national sentinel surveys).**

**Table 1: Prevalence of HBsAg among HIV infected patients in UUTH, Uyo**

| HBsAg | No. | % |
|---|---|---|
| Negative | 210 | 87.9 |
| Positive | 29 | 12.1 |
| **Total** | **239** | **100.0** |

**Table 2: Age distribution of HIV positive patients co-infected with HBV in UUTH, Uyo**

| Age group(years) | HBsAg negative (%)* | HBsAg positive (%)* | Total |
|---|---|---|---|
| <18 | 37 (94.9) | 2 (5.1) | 39 |
| 18-24 | 24 (85.7) | 4 (14.3) | 28 |
| 25-29 | 50 (92.6) | 4 (7.4) | 54 |
| 30-39 | 56 (84.8) | 10 (15.2) | 66 |
| 40-49 | 29 (80.6) | 7 (19.4) | 36 |
| 50-65 | 14 (87.5) | 2 (12.5) | 16 |
| **Total** | **210** | **29** | **239** |

*Figures in parenthesis are row percentage values.

The differences seen in the co-infection rates in the different age groups were not statistically significant.

**Table 3: Sex Distribution of HIV positive patients co-infected with HBV in UUTH, Uyo**

| Sex | HBsAg negative (%) | HBsAg positive (%) | Total |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Male | 62 (29.5) | 16 (55.2) | 78 |
| Female | 148 (70.5) | 13 (44.8) | 161 |
| **Total** | **210 (100.0)** | **29 (100.0)** | **239** |

$X^2$= 7.63, P= 0.006

The mean age of the subjects in this study was 29.2 years.

**Age differences in HBV-HIV co-infection**

The study rev**ea**led age differences in the prevalence of HBV among the subjects. For instance, the prevalence among children (age < 18 years) was 5.1%, which is lower than the 7.7% observed in the study that was conducted in Benin, Edo State [24] , the difference could be due to methodological differences . The Benin study was conducted exclusively on children. The findings of our study showed that the age group that was mostly co-infected was the 40-49 years (19%) group, which is younger than the 51-60 years age group with 44% co-infected rate reported by researchers in a Jos study [16]. However the difference in the proportion of HIV clients who were co-infected with HBV in the different age groups in our study was not statistically significant.

## Conclusion

In conclusion, the prevalence of HBV among HIV patients in Uyo is high, 12.1%, the gains of HIV control will be eroded by co-infection with HBV, therefore the time to tackle HBV infection through increased sensitization and awareness creation for uptake of HBV vaccination and other preventive measures is now. Also due to the impact of HBV on HIV infection and vice versa, there is need to give a special attention to patients who are co-infected by the two viruses.

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## References

1. World Health Organisation. Fact sheet No. 204, July (**2012)**.
2. Lee WM. Hepatitis B virus infection. N E.ngl J Med. 323: 1733- 45 **(1997).**
3. Tau KA, Sharaiha ZK, Abu ER, et al. The epidemiology of hepatitis B virus among family members in the Middle East. Am J Epidemiol. 132:220-32 **(1990).**
4. Kumar P, Clark M. Clinical Medicine, Elsevier Saunders, 365 **(2005).**
5. Pouti M, Torti C, Bruno R, Filice G, et al. Natural history of chronic hepatitis B in co-infected patients. J of Hepatol, 4: S 65–70 **(2006).**
6. Thio C. Hepatitis B and HIV co-infection. J of Hepatol, 49: S 138 – 45 **(2009).**

7. Gatanga H, Yasuoka A, Kikuchi Y, Tachikawa N, Oka S. Influence of prior HIV 1 infection on the development of chronic hepatitis B infection. Eur J Clin Microbiol Infect Dis, 19: 237 – 9 **(2000).**
8. Thio CL, Seaberg EC, Skolasky Hepatitis RL, et al. HIV-1, hepatitis B virus, and risk of liver-related mortality in the multi-cnter AIDS Cohort study (MACS). Lancet, 360: 1921 – 26 **(2002).**
9. Hoffman CJ, Thio CL. Clinical implications of HIV and hepatitis B co-infection in Asia and Africa. Lancet, 7: 402 – 9 **(2007).**
10. Drake A, Mijch A, Sasadeusz J. immune reconstitution hepatitis in HIV and hepatitis B co-infection, despite lamivudine as part of HAART. Clin Infect Dis, 39: 129 – 32 **(2004).**
11. Bellini C, Keiser O, Chave JP, et al. Liver enzyme evaluation after lamivudine withdrawal in HIV-hepatitis B virus co-infected patients: the Swiss HIV cohort study. HIV Med, 10: 12-18 **(2009).**
12. Pouti M, Tori C, Ripamonti D, et al. Severe hepatotoxicity during combination antiretroviral therapy treatment : incidence , liver histology, and outcome. J Acquir Immune Defic Syndr, 32: 259 – 67 **(2003).**
13. Alter MJ. Epidemiology of viral hepatitis and HIV co-infection. J of Hepatol, 44 (1 Suppl). S6-S9 **(2006).**
14. Bodsworth N, Danovan B, Nightingale BN. The effect of concurrent human immunodeficiency virus infection on chronic hepatitis B: A study of 150 homosexual men. J. infect Dis, 160 (4) 577 – 82 **(1989).**
15. Taura DW., Oyeyi TI., Hafsat MN. Prevalence of hepatitis B surface antigen(HbsAg) among HIV positive patients attending Aminu Kano Teaching Hospital, Kano, Nigeria. International Journal of Biomedical and Health Sciences, 4 (1): 33-39 **(2008).**
16. Forbi C., Gabadi S., Alabi R., Iperepolu HO., Pam CR., Entonu PE., Agwale SM. The role of triple infection with hepatitis B, hepatitis C and HIV-type 1 on CD4+lymphocyte levels in the highly HIV infected population of North central Nigeria. Mem. Inst. Oswaldo Cruz, 102:4 **(2007).**
17. Uneke CJ., Ogbu O., Inyam PU., Anyanwu GI., Njoku MO., Idoko JH. Prevalence of Hepatitis B surface antigen among blood donors and human immunodeficiency virus-infected patients in Jos, Nigeria. Mem.Inst.OswaldoCruz 100(1): 5181**(2005).**

18. Otegbayo JA, Taiwo BO, Akingbola TS, Odaibo GN, Adedapo KS Penugonda S, Adewole IF, Olaleye DO, Murphy R, Kanki P (2008). Prevalence of hepatitis B and C seropositivity in a Nigerian cohort of HIV - infected patients. Ann. Hepatol, 7 (2):152 – 6 **(2008).**
19. Lesi OA, Kehinde MO, Oguh DN, Amira CO. Hepatitis B and C virus infection in Nigerian patients with HIV/AIDS. Niger Postgrad Med.J, 14(2): 129-33 **(2007).**
20. Oyesile-Balogun TM. Epidemiology of hepatitis B virus co-infection among HIV infected patients in Lagos, Nigeria. Poster exhibition: 4th IAS conference on HIV pathogens, treatment and prevention: Abstract no. MOPEA 085 **(2007).**
21. Federal Ministry of Health. Technical Report. National HIV Sero-prevalence sentinel survey among pregnant women attending antenatal clinics in Nigeria, (**2010).**
22. Adewole OO, Anteyi E, Ajuwon Z, Wada I, Elegba F, Ahmed P, et al. Hepatitis B and C co-infection in Nigerian Patients with HIV infection. J Infect Dev Countries, 3 (5):369-375 **(2009).**
23. Omonkhelin J, Owolabi E, Ayanbueze E. A review of viral hepatitis in HIV positive patients using UBTH as a case study. Afr J of Health Sci. 16: 1-4 **(2010).**
24. Sadoh AE., Sadoh WE., Iduoriyekemwen NJ. HIV co-infection with hepatitis B and C viruses among Nigerian children in an antiretroviral treatment programme. South African Journal of Child Health, 5, 1 **(2011).**