

## Coinfection with Hepatitis B and C Viruses among HIV Positive Pregnant Women in Enugu South East, Nigeria

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### ABSTRACT

**BACKGROUND:** Hepatitis B and C viruses coinfection in HIV positive pregnant women is a common public health problem and recognized worldwide. The consequences of this problem in our poor resource setting with the risk of mother to child transmission is obvious with increased morbidity and mortality in our environment.

**OBJECTIVE:** To determine the prevalence of coinfection patterns of HBV and HCV among HIV positive pregnant women in Enugu Nigeria.

**METHODS:** A retrospective survey conducted on 401 Nigeria HIV positive pregnant women seen at Prevention of Mother To Child Transmission (PMTCT) clinic at the UNTH Enugu Nigeria over a 3 year period between 1<sup>st</sup> January 2007 and 31<sup>st</sup> December 2009.

**RESULTS:** The prevalence of hepatitis B and C viruses coinfection among HIV positive pregnant women in Enugu is 6.5%. HIV/HBV coinfection was commoner than HIV/HCV coinfection. There was no significant association between hepatitis B and C viruses coinfection and the age, ethnic group, marital or educational status of the women ( $P > 0.05$ ).

**CONCLUSION:** There is high prevalence of hepatitis B and C coinfection among HIV positive pregnant women in Enugu. This high burden of these hepatotropic virus coinfection calls for continued need to screen for these infections and vaccinate the affected babies for hepatitis B and/or C where appropriate.

**KEYWORDS:** HIV, Hepatitis B, Hepatitis C, PMTCT, pregnant women, Enugu Nigeria.

problem and is associated with increased risk of antiretroviral therapy related hepatotoxicity and increased risk of progression to liver disease which is a major cause of morbidity and mortality in HIV infected patients<sup>2,3,4</sup>.

The rate of HBV and /or HCV coinfection in HIV positive pregnant women varies according to geographic region and various risk group<sup>2,5</sup>. There is paucity of data on the prevalence of hepatitis B and C viruses coinfection in HIV positive pregnant women in Enugu and in African population in general<sup>5</sup>. We therefore investigated the coinfection patterns of HBV and HCV among HIV positive pregnant women who attended PMTCT clinics in Enugu, Nigeria to determine the prevalence of HBV/HCV coinfection in these women.

### MATERIALS AND METHODS

The case notes of HIV positive pregnant women who booked for antenatal care at the University of Nigeria Teaching Hospital (UNTH) Enugu Nigeria were reviewed retrospectively over a 3 year period between 1<sup>st</sup> January 2007 and 31<sup>st</sup> December 2009.

University of Nigeria Teaching Hospital (UNTH) is a federal tertiary care institution in Enugu south eastern region of Nigeria and designated for the management of people living with HIV/AIDS and for offering of free HAART (Highly Active Antiretroviral Therapy) for the infected patients.

The prevention of mother to child transmission (PMTCT) clinic of the hospital which started in February 2002 takes care of these HIV positive pregnant mothers. The clinic holds on Friday every week. In this PMTCT clinic, all the HIV positive pregnant women undergo some investigations like FBC, CD4 count, LFT, S/E/U/Cr etc. In addition, they are also screened for HBV, HCV etc. Every HIV positive pregnant woman is put on HAART for the purpose of PMTCT; however, the choice of drugs may differ and the drugs may be stopped after delivery.

The case notes of all HIV positive pregnant women seen in the PMTCT clinic within the study period were retrieved from the records department of the Hospital. Information sought were sociodemographic characteristics, risk factors (alcohol, smoking, multiple sexual partners, blood transfusion, IV drug-use etc),

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### INTRODUCTION

Coinfection with hepatitis B and C viruses in HIV positive women is a common public health problem and recognized worldwide<sup>1</sup>. The consequences for infected pregnant women in our poor resource setting is obvious with considerable impact and result in increased morbidity and mortality. These infections are important in pregnant women because of the risk of mother to child transmission. These viruses are blood borne pathogens and share similar routes of transmission<sup>1,2</sup>.

Coinfection with hepatitis viruses (hepatotropic viruses) are known to influence progression, management as well as outcome of HIV infection<sup>1,2</sup>. It is a growing

HBsAg (serological marker for HBV), anti-HCV (serological marker for HCV), hepatitis antibody status, CD<sub>4</sub><sup>+</sup> T lymphocyte count, FBC and liver enzymes. HCV serology was performed using an ELISA. Positive HCV serology results were confirmed by PCR test. The HBV serology was also performed using ELISA.

HIV/HBV, HIV/HCV and HIV/HBV/HCV coinfections were defined as positive HIV and HBV serology, positive HIV and HCV serology, and positive HIV and HBV and HCV serology results respectively.

**Statistical Analysis:** The distribution of coinfection among HIV positive pregnant women were shown according to several characteristics. Data were entered and analyzed by descriptive and inferential statistics using statistical software SPSS version 12.0. The chi-square( $X^2$ ) test was performed to determine the association between the presence of HIV/HBV/HCV coinfections and demographic variables. The Fishers

exact test was used where applicable. A multiple logistic regression analysis was performed to evaluate the influence of demographic factors on acquisition of these viruses HIV/HBV, HIV/HCV and HIV/HBV/HCV coinfections. A p value less than 0.05 was considered to be statistically significant.

## RESULTS

A total of 421 HIV positive pregnant women presented for PMTCT services over the 3 year period. 20(5%) case notes could not be retrieved from the records. The analysis was thus based on 401(95%) HIV positive pregnant women whose case notes could be retrieved. Twenty six women out of the 401 HIV positive women were coinfecting with hepatitis B and C viruses giving a prevalence of 6.5%. The distribution of these hepatotropic coinfections were as follows; [22(5.5%) for HIV/HBV, 3(0.7%) for HIV/HCV, and 1(0.3%) for HIV/HBV/HCV](Table 1).

**Table 1: Coinfection with HBV/HCV/HIV pregnant women in Enugu Nigeria**

Year	HIV positive but Negative HBV and HCV	HIV positive with HBV	HIV positive with HCV	HIV positive with both HBV & HCV	Total
2007	120	12	1	0	133
2008	131	4	2	0	137
2009	124	6	0	1	131
Total	375	22	3	1	401
Percent	93.5	5.5	0.7	0.3	100

**Table 2: Relationship Between hepatotropic viruses co-infection and socio-demographic characteristics**

	Co-infection	No co-infection	Total	X <sup>2</sup>	P-value
	(n=26)	(n=375)		0.133	0.99(NS)
<b>Marital Status</b>					
Never Married single women	8(5.3%)	143 (94.7%)	151		
Currently married	7(10.0%)	63(90.0%)	70		
Divorced	7(6.2%)	106(93.8%)	113		
Widowed	4(6.0%)	63(94.0%)	67		
<b>Educational Status</b>				0.251	0.88(NS)
1° Education	6(7.6%)	73(92.4%)	79		
2° Education	13(5.6%)	218 (94.4%)	231		
3° Education	7(7.7%)	84(92.3%)	91		
<b>Age</b>				0.145	0.93(NS)
< 20 years	3(7.5%)	37(92.5%)	40		
21 30 years	12(6.1%)	186(93.9%)	198		
> 30 years	11(6.7%)	152(93.3%)	163		
<b>Ethnic Group</b>				0.327	0.95(NS)
Ibo	22(6.4%)	323(93.6%)	345		
Hausa	1 (5.6%)	17(94.4%)	18		
Yoruba	1 (6.3%)	15(93.8%)	16		
Others	2 (9.1%)	20(91.0%)	22		

The mean age for HIV/HBV coinfection was  $36.2 \pm 3.3$  years (range=22-43 years). The mean age for HIV/HCV coinfection was  $42.4 \pm 4.1$  years (range=36-46 years).

The currently married women had the highest prevalence of HIV with Hepatitis B virus 7 (10.0%). The divorced and widowed subjects had 7 (6.2%) and 4 (6.0%) respectively for HBV, while never married single women had 8 (5.3%) prevalence for hepatitis B virus coinfection. These differences were however not statistically significant ( $X^2=0.133$ ,  $P=0.99$ ) (Table 2). There was also no significant association between hepatotropic virus coinfection and the age, educational status, or ethnic group of the women ( $P>0.05$ ). All these are illustrated in table 2.

## DISCUSSION

This study reveals a high burden of hepatitis B and C viral coinfection among HIV positive pregnant women who sought care at the PMTCT clinic in UNTH Enugu Nigeria. HIV/HBV was the most prevalent coinfection (5.5%) and this finding is in keeping with the report by Adewole et-al<sup>5</sup> 2008 at the University College Hospital, Ibadan which documented HBV seroprevalence of 7.1% among HIV positive pregnant women at Ibadan Nigeria. A high prevalence of HBV coinfection in HIV positive pregnant women may be as a result of the shared modes of transmission between HIV and HBV infections. Secondly, it may be due to the phenomenon of reactivation of HBV in the setting of HIV immunodeficiency and lastly, the unawareness of the population at large of the mode/route of transmission. The importance of awareness of the routes of transmission of hepatotropic viruses should be emphasized, such as intravenous drug use, sexual contact, percutaneous exposure or from mother to child during pregnancy or birth<sup>1,6,7</sup>.

The prevalence of HIV/HCV coinfection was 0.7% and that of triple coinfection was 0.3%. The finding that only one woman had both HBV and HCV is similar with that of a previous work done at Ibadan Nigeria by Adewole et-al<sup>5</sup>. The results of this present study are also consistent with previous studies done in Nigeria<sup>8-10</sup>, in the USA<sup>11,12</sup> and Western Europe<sup>13,14</sup>.

In this study, socio-demographic characteristics were not associated with hepatitis B and C coinfection. Thus, we observed no statistically significant association between hepatitis B and C viruses coinfection<sup>8-10</sup>. Despite this, what is more important is the finding of high rate of hepatitis B and C viruses in HIV positive pregnant women. Since these hepatotropic viruses have similar mode of transmission with HIV, there is then need to intensify risk reduction education programmes such as safe sex programme and other optimal models of

integrated care so as to reduce the risk of viral transmission of HIV and hepatotropic viruses<sup>2,15,16</sup>.

## CONCLUSION

HBV and HCV infections are common among Nigerian HIV positive pregnant women and should be considered during baseline workup of HIV patients. There is need for public enlightenment/education and continued routine screening for these viruses in our poor resource setting so as to identify these susceptible HIV positive pregnant women who may need immunization for themselves and/or their neonate.

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