

SERO-PREVALENCE RATE OF HEPATITIS B AMONG ASYMPTOMATIC HIV SERO-POSITIVE ANTENATAL ATTENDEES IN A MISSION HOSPITAL IN NIGERIA

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ABSTRACT

Background: Women with HIV/HBV co-infection have increased risk of both sexual and vertical transmission of HBV during pregnancy or delivery. They are also at risk of developing liver cirrhosis and hepatocellular carcinoma. Co-infection with the two viruses may complicate the delivery of HAART by increasing the risk of drug related hepatotoxicity.

Aim: To determine the sero-prevalence rate of HBV among asymptomatic HIV sero-positive antenatal attendees in a Mission Hospital in Nigeria.

Subjects/Methods: This was a cross-sectional study carried out at the Sacred Heart Hospital Obudu, Nigeria, from 1st January to 30th June 2010. Eight hundred and thirty six subjects were counselled and recruited serially into the study. HBsAg screening was done using a rapid ELISA test. HIV-1 was screened and confirmed using two rapid tests.

Results: Out of the 836 subjects, 38(4.5%) were positive for HIV-1 among which 5(13.2%) were positive for HBsAg (P=0.09). The mean age and mean parity of HIV sero-positive subjects were 26.7±4.8 (range 18-38 years) and 2.1±1.2 (range 0-4) respectively. Most of the subjects were engaged in commercial activities and had either none or low level of education.

Conclusion: The sero-prevalence rate of HBV among HIV pregnant women in the study is 13.2%. We advocate routine screening of HIV pregnant women for HBV. Public enlightenment campaigns, women education, economic empowerment, and mass vaccination will go a long way in reversing and halting the spread of the infection in pregnancy.

Keywords: Sero-prevalence rate, HIV, HBsAg, co-infection, immunization, vertical transmission.

INTRODUCTION

Human immunodeficiency virus (HIV) and hepatitis B virus (HBV) are common public health problems worldwide. Globally, an estimated 350 to 400 million people are chronically infected with HBV and 33 million are living with HIV infection today^{1,2}. United Nations reported that in 2008, there were 2.7 million new HIV infections and 2 million AIDS-related deaths³.

Sub-Saharan Africa remains the region most heavily affected by HIV. In 2008, Sub-Saharan Africa accounted for 67% of HIV infections worldwide. The same region had 68% of new HIV infections among adults and 91% of new HIV infections among children. The region also accounted for 72% of the world's AIDS-related deaths in 2008³.

The first case of HIV/AIDS in Nigeria was reported in a 13 year old girl in 1986. Since then the number of people living with HIV or AIDS steadily increased and the epidemic moved in a generalized state with an increase of sero-prevalence from 1.8%

in 1991 to 5.8% in 2001. The sero-prevalence of 5.0% and 4.4% were documented in 2003 and 2007 respectively⁴. Women account for half of all HIV infection worldwide. This percentage has remained stable for the past several years³. The implication of the feminization of the infection is increased in vertical transmission that accounts for over 95% of under-5 pediatric HIV infections with associated high mortality⁵.

Hepatitis B virus is a double stranded deoxyribonucleic acid (DNA) virus belonging to Hepadnaviridae family. The incubation period is six weeks to six months. HBV infections affect over 350 million people worldwide and over one million die

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annually of HBV-related chronic hepatic disease⁴. These chronically infected persons are at high risk of death from liver cirrhosis and hepatocellular carcinoma⁶.

Several studies have been conducted on Hepatitis B Virus infection in pregnancy. In the United States, HBsAg positivity was reported in 5.8% of the Asians, 1.0% in non-Hispanic blacks, 0.6% of non-Hispanic whites and 0.1% Hispanics. HBsAg rates in pregnancy were reported to be 1.7%, 0.29%, 1.1% in Brazil, France and Italy respectively⁶. Among the countries in the Persian Gulf, rates of 7.1%, 1.0%, 15%, 2.44% have been reported in Oman, Qatar, UAE and Saudi Arabia respectively^{6, 7}. In Africa, 5.6% and 25% have been reported in Sudan and Zimbabwe respectively. In Nigeria, rates of 2.2%, 4.6%, 4.3% and 6.08% have been reported in Benin, Enugu, Port-Harcourt and Lagos respectively⁵⁻¹⁰.

Persons at high risk of HIV are also likely to be at risk of other infectious pathogens including HBV. These are blood borne pathogens transmitted through similar routes such as injection drug use (IDU), sexual contacts, blood transfusion or from mother to child during pregnancy or birth. HIV/HBV co-infection is therefore not uncommon in most parts of the world. In some settings, the prevalence of co-infection is said to be very high¹¹.

Mothers co-infected with HIV have increased risk of both sexual and vertical transmission of HBV during pregnancy or delivery than women with mono-infection¹². A study had documented that hepatitis in pregnancy is not reported to increase abortion rate, stillbirths or congenital malformations. However prematurity seems to increase if hepatitis is acquired in the last trimester¹². Sixty percent of pregnant women who acquire acute HBV infection at or near delivery will transmit the HBV to their offspring. Although infection is rarely symptomatic, 70 to 90% of the babies will remain chronically infected into adult life and be prone to cirrhosis and hepatocellular carcinoma¹².

Co-infection does alter the natural history of each of these viruses in a peculiar way. Further more, co-infection with viral hepatitis may complicate the delivery of Highly Active Antiretroviral Therapy (HAART) by increasing the risk of drug related hepatotoxicity and impacting the selection of specific agents (e.g. those dually active against HIV and HBV)^{13,14}.

Few studies have addressed the issue of co-infection with HBV and HIV in pregnancy. There are thus insufficient data on the prevalence of HIV/HBV in

antenatal populations in Nigeria. Understanding the epidemiology of HBV, and HIV co-infection in pregnant women is important because of vertical transmission risk and to inform clinical management. This study is therefore set to determine the sero-prevalence rate of HBV among asymptomatic HIV sero-positive antenatal attendees in a Mission Hospital in Nigeria.

METHODOLOGY

STUDY DESIGN / SETTING

This was a cross-sectional study involving the serial recruitment of 836 consented antenatal attendees at the Sacred Heart Hospital Obudu in Cross-Rivers State, Nigeria, from 1st January to 30th June 2010. The hospital has a 33-bed maternity unit that records more than 1000 deliveries per annum. The hospital management gave ethical clearance and approval for the study. Women who were known HIV and HBV positive subjects were excluded from the study. The studied subjects were pre-test and post-test counselled. Seven milliliters of blood were collected from each of the subjects for HBsAg and HIV tests. The samples were all coded and confidentially labelled.

SEROLOGY

HIV test was carried out using determine HIV-1/2 (Abbott laboratories, Illinois, USA) and Uni-gold HIV-1/2 (trinity biotech PLC, James town, New York, USA) test kits, while Stat-pak HIV-1/2 (chembio Diagno; systems Inc, New York, USA) test kit was used as a tie breaker for sero-discordant results according to the manufacturer's instructions. The HBsAg test was performed using a rapid Enzyme Linked immunosorbent Assay (ELISA) with test kit by Biotec Lab LTD, Ipswich, Suffolk, IP5 3TP UK; in accordance with the manufacturer's instructions. All the subjects who tested positive for HIV were screened for HBV to determine co-infection rate. Irrespective of sero-status subjects were counseled after test.

DATA ANALYSIS

Data collected include the serological status of subjects studied and their socio-demographic characteristics. The variables of sero-positive subjects were analyzed using EPI Info statistical software Version 3.2.2 (CDC Atlanta, Georgia, USA). Chi square was used as a test of statistics. P-value of 0.05 at 95% confidence interval was considered statistically significant.

RESULTS

Eight hundred and thirty six (836) subjects were screened for HIV and HBsAg. Out of this number, 38(4.5%) were positive for HIV. Among the HIV positive subjects, 5(13.2%) were positive for HBV. Among the 798 HIV negative subjects, 50(6.3%) were positive for HBV. The mean age and parity of HIV sero-positive subjects was 26.7 ± 4.8 (range 18-38 years) and 2.1 ± 1.2 (0 to 4) respectively. **TABLE I** showed that Six (15.8%) of the subjects had no formal education, another 6(15.8%) had primary, 16(42.1%) had secondary level of education and post-secondary 10(26.3%). Traders constituted 36.8%, civil servants 18.4%, farmers 18.4% among others. HIV/HBV co-infection was not statistically significant ($P > 0.05$) (**TABLE II**).

DISCUSSION

The study discovered the sero-prevalence of HIV/HBV co-infection of 13.2%. This is higher than the 5% reported in Europe and the 9.0% reported in India^{1, 15}. A study done in Benin City, Nigeria, five years ago did not find any dual infection with the two viruses⁵.

The sero-prevalence rate of HBsAg among HIV negative subjects was 6.3%. This is higher than the rates reported in Pakistan 4.6%, Brazil 1.64%, France 0.29%, Italy 1.1%, Saudi Arabia 2.44% and in Northern Turkey 2.1%^{6, 16}. The HBsAg sero-prevalence in the study is also higher than the previous rates of 2.2%, 4.3%, 4.6%, 6.08% reported in Benin, Port-Harcourt, Enugu and Lagos, Nigeria respectively⁸⁻¹⁰. There is obviously a rising trend when one compares the previous rates in these cities in the southern part of the country. This may be due to increase in socio-economic activities associated with rapid population growth and urbanization.

The HIV sero-prevalence in our study 4.5% is only marginally higher than the national value of 4.4%⁴. It is however lower than the rates of 6.7%, 9.0%, 6.7% reported in Cameroon, Cote'd Ivoire and Tanzania respectively⁵. The lower national HIV prevalence rate in Nigeria when compared with other west African countries may be attributable to the promotion of laudable programmes by all stake holders in the country as well as the efforts of Non-governmental organizations and support agencies which sustain the fight against the spread of HIV infection.

The findings of our study are an indication that HIV/HBV co-infection is not uncommon. A major concern is that of vertical transmission in infected

mothers, given the fact that this occurs much more readily in the setting of HIV/HBV co-infection¹³. Another worry is that of the development of liver disease. After the introduction of HAART, liver disease has emerged as a major cause of morbidity and mortality in HIV-infected persons¹³.

The treatment of HBV in HIV co-infected patients is complex. This is because the drugs used are associated with drug resistance, cross-resistance, hepatotoxicity and suboptimal response¹³. Treatment strategies for HBV infection include the use of nucleos(t)ide analogues with or without anti-HIV activity and/or peginterferons alfa (pegIFN)¹³. We found out from this study that younger and low parity women were more infected than the older multiparous women. This is another issue of concern due to the fact that more infants are going to be exposed to the infection, given that large family sizes are more favored in an African setting such as ours.

Also a large proportion of those infected had secondary and post-secondary education and were mostly engaged in commercial activities. This shows that exposure to the infection may most likely be through risky behavioral practices in the community. This is supported by the high HIV sero-prevalence rate among the studied obstetric population that is expected to be a low risk group.

Married women are usually considered to be in stable sexual relationships and are less likely to indulge in drug abuse and other vices that could expose them to the HIV infection. A study of HIV sero-prevalence in the general population will most likely reveal a very high rate of the infection.

Women and their infants may benefit from therapeutic interventions when hepatitis B virus and Human immunodeficiency virus infections are identified early during the prenatal period^{17, 18}. Expert guidelines developed in Europe and the United States recommend screening of all HIV-infected persons for infection with HBV and HCV and appropriate management of those found to be chronically infected¹⁹.

The Subjects in our study who were found to be HIV infected were enrolled into the PMTCT programme. Those with HBV mono-infection was referred to the physicians for appropriate treatment. HBV exposed babies were to be vaccinated and also administered 0.5ml HBIG within 12 hours of delivery based on clinical protocol of the World Health Organization^{20,21}.

Table I: Socio-demographic features of HIV subjects and their HBsAg serology

Age Group	HIV ⁺ / HBV ⁻	HIV ⁺ / HBV ⁺	TOTAL	P-Value
≤18	1	-	1	
19-23	9	-	9	
24-28	17	1	18	0.003
29-33	5	1	6	
34-38	1	3	4	
Occupation				
Farming	7	-	7	
Civil Service	5	2	7	0.43
Schooling	2	-	2	
Trading	11	3	14	
Teaching	5	-	5	
Others	3	-	3	
Educational Level				
None	6	-	6	
Primary	6	-	6	0.45
Secondary	13	3	16	
Post-Secondary	8	2	10	
Parity				
0	6	-	6	
1-2	15	2	17	0.46
3-4	12	3	15	

Table II: Serological status of 836 subjects studied

	HIV +	HIV -	TOTAL
+	5	50	55
-	33	748	781
TOTAL	38	798	836

Chi-Square= 2.80 (Mantel-Haenszel) P=0.09

CONCLUSION

With the high sero-prevalence rates of HBV among HIV positive pregnant women found in the study, we recommend a policy of routine screening for HBV in pregnancy especially for HIV positive women. Also modification of risky social behaviours, improvement of education /socio-economic status of women, mass vaccination of pregnant women and their infants as well as continuous public health enlightenment campaigns will go a long way in reversing/halting the spread of the infection in the obstetric population in Nigeria.

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