



Prevalence of Hepatitis B virus (HBV) and occult HBV infections among pregnant women co-infected with human immunodeficiency virus type-1 (HIV-1) in Malawi: the BAN Substudy

Charles Chasela^{1,6}, Patrick Wall¹, Eyasu Teshale², William Powderly¹, Sascha Ellington⁴, Denise Jamieson⁴, Patricia Fitzpatrick¹, Jan Drobeniuc², Mary Codd¹, Paul J. McKeown⁵, Athena Kourtis⁴, Mina Hosseini^{3,6}, Gerald Tegha⁶, Charity Chavula⁶, Dumbani Kayira⁶, Charles Van der Horst³ and the UNC Project BAN study team.

¹University College Dublin; ²Division of Viral Hepatitis, CDC, Atlanta, USA; ³University of North Carolina, USA; ⁴Reproductive Health Division, CDC, Atlanta, USA; ⁵Health Protection & Surveillance Centre, Dublin Ireland. ⁶UNC Project, Lilongwe, Malawi.

Contact: charles.chasela@ucd.ie

Background

Hepatitis B virus (HBV) and human immunodeficiency virus (HIV), are common infections world wide. With increased access to antiretroviral therapy, liver disease is emerging as a major cause of morbidity and mortality among HIV infected persons [1]. These viruses pose a serious public health problem in terms of prevention strategies amongst infants born from HIV/HBV infected mothers.

We describe the prevalence of HBV exposure, active HBV infection, occult infection and risk factors for HBV infection among HIV infected pregnant women participating in a large breast feeding clinical trial (BAN) in Malawi.

Methods

Study Population

HIV infected pregnant women screened and consented for a breastfeeding HIV intervention study in Lilongwe, Malawi.

Laboratory Procedures

In CDC laboratories, testing started with Hepatitis B core antibody (HbCAb) followed by hepatitis surface antigen (HBsAg) using chemiluminescent immunoassay (Vitros Eci, Ortho CD, Rochester, NY). Those positive for HBsAg and a subset of those HbCAb positive alone were tested for qualitative HBV DNA polymerase chain reaction (PCR).

Definitions

HBV exposure: Hepatitis B core antibody positive.

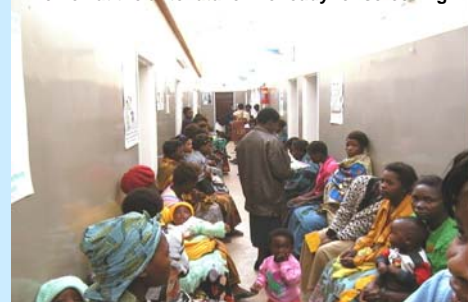
Active HBV infection: Hepatitis Surface antigen/HBV DNA positive

Occult HBV infection: HBsAg negative and HBV DNA positive

Statistical Analysis

Means (\pm Standard Deviation), median (Interquartile range), 95% confidence interval (CI), and frequencies were calculated to determine the characteristics of the population. Prevalence of HbCAb, HBsAg and occult HBV infection [HbCAb alone positive/HBsAg negative] was measured constructing 95% confidence intervals (CI). Odds Ratios were calculated using univariate and multivariate logistic regression.

Women at the antenatal clinic ready for screening



Results

Prevalence of the HBV markers

Of the 2052 serum samples tested - 48.3% (95% CI, 46.2-50.5%) were HbCAb positive thus defined as exposed to HBV infection. Of those HbCAb positive, 10.4% were HBsAg positive and a subset of 103 of these were tested for HBV/DNA, 68% were found positive (Figure 1). Occult infection was rare (2.2%).

Figure 1: Prevalence of HBV markers

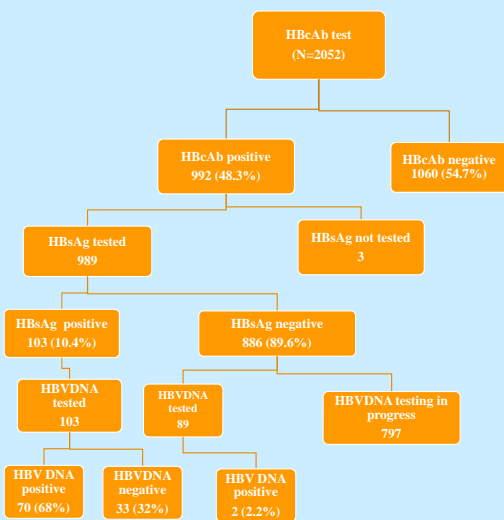


Table 1: Factors associated with Hepatitis Surface antigen

Variable	N	HbsAg (+ve) N (Col %)	HbsAg (-ve) N (Col %)	Crude OR (95%CI)	P	Adjusted OR(95%CI)	P
Age (years) - %	989	N=103	N=886				
<25		50 (48.5)	417 (47.1)	1.00			
25-34		46 (44.7)	415 (46.8)	0.9 (0.5,1.8)	NS		NS
>35		7 (6.8)	54 (6.1)	0.9 (0.5,1.8)	NS		NS
Education level	990	N= 103	N=889				
No Education		9 (8.7)	120 (13.5)	1.00		1.00	
Primary		63 (61.8)	459 (51.8)	1.83(0.9,3.8)	NS	2.3(1.0,5.2)	0.04
Secondary/Tertiary		31 (30.1)	308 (34.7)	1.3 (0.6,2.9)	NS	1.6(0.7,3.9)	NS
Marital status %	989	N= 103	N=886				
Single		1 (0.97)	19 (2.1)	1.00			
Married		98 (95.2)	817 (92.2)	2.3 (0.3,17.2)	NS		
Sep/div/widow		4 (3.9)	50 (5.6)	1.5 (0.2,14.5)	NS		
Electricity in the home (Yes) %	517	14 (24.6)	82 (17.8)	1.5(0.8,2.8)	NS		
CD4 count cells/mm³	990	N=103	N=887				
<250		19(18.5)	131(14.8)	1.0(0.6,1.8)	NS	0.9(0.5,1.6)	NS
250-499		39(37.9)	439(49.5)	0.6(0.4,0.9)	0.04	0.6(0.4,0.9)	0.03
500		45(43.7)	317(35.7)	1.00			
Jaundice (Yes) %	989	2(1.96)	3(0.34)	5.9(0.97,35.7)	0.05		NS

Factors associated with HBV infection

There was no difference in mean age(\pm SD) (25.9 VS 25.8), median CD4 count (421 vs 412) and ALT (13VS 13) between those HBV exposed and unexposed. There was no statistical significant factors in both univariate and multivariate analysis associated with HBV exposure. Primary education, and jaundice had increased odds for active HBV infection (HBsAg positive) and those with low CD4 count were more likely to be HBV active (Table 1).

Discussion and Conclusions

- The prevalence of HBV is in line with other findings in Malawi and within the Sub-Saharan region[2, 3]
- Occult HBV infection was quite low in this cohort compared to other studies that have been conducted in Sub-Saharan Africa, possibly due to the population having high CD4 counts[4].
- There was high HBV DNA amongst those HBsAg positive in this population, a risk for vertical transmission amongst this population.
- Low CD4 count is a determining factor for active HBV infection.
- Overt and occult HBV infection needs to be considered when implementing treatment and prevention programs

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