

## HIV AND HBV COINFECTION IN NIGER-DELTA, NIGERIA

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### Abstract

**Aim:** This study was conducted to ascertain the level of coexistence of Hepatitis B virus (HBV) and HIV and to determine their significant association. Both HBV and HIV share the same routes of infection.

**Methods:** The study was conducted on 500 persons consisting 250 subjects who tested positive to HIV and 250 subjects who tested positive to HBV. HIV positive individuals were further tested for HBV. Similarly, HBV positive individuals were tested for HIV infection. Each group had 125 males and 125 females.

**Results:** Individuals in the age group 31-50 years had the highest prevalence of HIV coinfection with HBV. The study shows a prevalence of 16.4% HBV among HIV infected persons and a prevalence of 12.8% HIV among HBV individuals in Niger-Delta area of Nigeria. Although, the two diseases have similar routes of infection, they are not significantly associated.

**Conclusion:** HBV infection should not be used as a presumptive diagnosis for HIV infection.

**Key words:** HIV, HBV, Hepatitis, Co infection

### INTRODUCTION

Hepatitis B is an infectious inflammatory disease of the liver caused by Hepatitis B virus (HBV). Also known as Hepatitis B surface antigen (HBsAg), it is a DNA virus and replicates through an RNA intermediate form by reverse transcription (Eugene et al., 2004). The virus is transmitted by exposure to infectious blood or body fluids such as semen, vaginal fluid and urine. Other routes of infection include blood transfusion, dialysis, acupuncture, tattooing of the body and perinatal (Sleisenger et al., 2006; Coopstead, 2010). Acute infection with Hepatitis B virus is associated with acute viral hepatitis, an illness that begins with general ill-health, loss of appetite, nausea, vomiting, body aches, mild fever, and dark urine and then progresses to

development of jaundice. The illness lasts for a few weeks and then gradually improves in most affected people. The infection may be entirely asymptomatic and may go unrecognized (Terrault et al., 2005). The risk of liver-related mortality has been found to be 2-3 times higher in HIV/HBV-coinfected patients than in HIV-monoinfected patients (Weber, 2006). HIV is a member of the retrovirus family that causes acquired immunodeficiency syndrome (AIDS) in humans. When CD4 T cell number declines below a critical level, cell mediated immunity is lost and the body becomes progressively more susceptible to opportunistic infections. HIV positive men with HBV infection are at increased risk of liver-related mortality (Thio et al., 2002). This is because Hepatitis B virus primarily interferes with functions of the liver by replicating in liver cells

(Tong et al., 1999). In the United States, it is estimated that 10% of HIV infected individuals are HBV surface antigen positive and that HIV infected individuals are 3 to 6 times more likely to develop chronic HBV infection than HIV uninfected individuals (Bodsworth et al., 1991). In Nigeria and other parts of sub-Saharan Africa, where HBV is endemic, prevalence of HBV among HIV infected individuals range from 6-20% (Harania et al., 2008; Hoffman et al., 2008). HBV can infect lymphocytes and produce a protein capable of activating HIV-1 replication. There are conflicting data regarding coinfection of HBV with HIV on humans. Some studies showed an increased rate of HIV progression to AIDS among individuals with HBV (Eskild et al., 1992) but others did not show any change in the progression of HIV disease or survival (Gilson et al., 1997). However, it is estimated that 10% of HIV-infected individuals have chronic hepatitis B (Alter, 2006). It was in view of this that this work was carried out and to ascertain the prevalence of HIV-HBV coinfection in the Niger-Delta area of Nigeria. The result will assist in the line of management of these diseases in the area.

## RESULTS

Table 1. Age and sex distribution of patients infected with HIV and HBV

Age	Age and sex distribution of HIV infected patients				Age and sex distribution of HBV infected patients			
	Males	Females	Total (Males and Females)	%	Males	Females	Total (Males and Females)	%
0-10	0	0	0	0	1	1	2	0.8
11-20	13	6	19	7.6	12	14	26	10.4
21-30	33	35	68	27.2	19	17	36	14.4
31-40	36	39	75	30	36	33	69	27.6
41-50	36	39	75	30	28	31	59	23.6
51-60	7	5	12	4.8	19	24	43	17.2
61-70	0	1	1	0.4	6	2	8	3.2
> 70	0	0	0	0	4	3	7	2.8
Total	125	125	250	100	125	125	250	100

The age group of 31-50 had the highest incident of HIV, and a sudden decline at the ages of 50 and above. This is similar to the result of HBV infection

## MATERIALS AND METHODS

### Collection of Samples

Blood samples were randomly collected from 250 HIV positive persons and another 250 blood samples were from collected from HBV positive persons living in the Niger Delta region of Nigeria from 2010 to 2013. The subjects were made up of 125 males and 125 females in each group. Blood samples were collected into EDTA anticoagulated containers, spun and plasma separated from the cells.

### Test

All 250 subjects who tested positive to HIV were tested for HBV. Similarly, all 250 subjects who tested positive to HBV were tested for HIV. Test for HBV was performed using commercial rapid immunoassay (ACON HBsAg). HIV was detected using commercial immunoassay (Determine HIV – 1/2). All samples that were positive for HIV 1 or 2 were further confirmed with STAT-PAK (Chembio HIV – 1/2 STAT PAK™ Assay). Positive and negative controls were included in the tests.

Table 2. HIV and HBV co-infection

Age	HIV patients having HBV		HBV patients having HIV	
	HIV	HBV	HBV	HIV
0-10	0	0	2	0
11-20	19	4	26	4
21-30	68	13	36	8
31-40	75	13	69	11
41-50	75	10	59	7
51-60	12	1	43	2
61-70	1	0	8	0
> 70	0	0	7	0
Total	250	41	250	32
%		16.4		12.8

Out of the 250 patients tested for HIV, 41 (16.4%) had HBV while out of the 250 patients tested for HBV, 32 (12.8%) had HIV.

## DISCUSSION

AIDS and hepatitis are major diseases of concern the world over with several countries investing heavily on the control and treatment of the diseases. This study shows a prevalence of 16.4% Hepatitis B surface antigen (HBsAg) among HIV infected persons and a prevalence of 12.8% HIV among HBsAg individuals in Niger-Delta area of Nigeria. Females are more infected with HBsAg (5.0%) than males (3.5%). Individuals in the age group 31-50 years had the highest prevalence. Co-infection is common and is an emerging concern in the clinical management of patients because of increased mortality and accelerated hepatic disease progression. HIV increases the risk of cirrhosis and end-stage liver disease in HBV coinfection (Thio et al., 2002). HBV and HIV share common routes of transmission. Therefore, markers of either active or past infection are present in many HIV infected patients. Serological markers of past or present HBV infection have been reported in up to 90% of HIV infected patients (Rodriguez et al., 2000). Two studies in Northern Nigeria have given contradictory findings. Sirisena et al., in Jos, recorded a HBsAg prevalence of 28.7% in patients with HIV-1 infection compared to 10.3% in the general population, while Baba et al., (1998) in Maiduguri found a HBsAg rate of 15% and 41% in patients with and without HIV

infection respectively, concluding that they were not significantly associated. Rodríguez-Méndez et al., (2000) stated that coinfection with HBV and HIV is common and that 70-90% of HIV-infected individuals in the United States had evidence of past or active infection with HBV, but we did not observe this in our present study. HBV is often acquired in adolescence or adulthood via sexual contact or injection drug use. Although, spontaneous clearance of HBV acquired in adulthood occurs in >90% of immunocompetent individuals, HIV-infected persons are half as likely as HIV-uninfected persons to spontaneously clear HBV. Therefore, chronic HBV infection occurs in 5-10% of HIV-infected individuals who are exposed to HBV, a rate 10 times higher than that for the general population (Bodsworth et al., 1989; Alter, 2006). In contrast, in Asia and sub-Saharan Africa, HBV prevalence is higher, the prevalence of HBV among HIV-infected individuals is estimated at 20-30% (Hoffmann et al., 2007; Uneke et al., 2005). Liver disease secondary to viral hepatitis is now the leading cause of morbidity and mortality among HIV-infected individuals (Palella, 2006). Although the routes of infection are similar, HIV infection should not be used as a presumptive diagnosis for HBV infection. Similarly, HBV infection should not be used as a presumptive diagnosis for HIV since the co-infection rates are 16.4% and 12.8% respectively, an indication that the two diseases are not significantly associated.

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