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THE PREVALENCE OF HEPATITIS B SURFACE ANTIGENAEMIA IN PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION IN GOMBE, NIGERIA

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Abstract
Background: Both Hepatitis Virus B (HBV) and HIV infection are highly endemic in Nigeria and are important causes of morbidity and mortality. Co-infection is known to occur since the two viruses share common modes of transmission. HBV is known to produce a protein X that can stimulate the replication of HIV in vitro, and it has been observed that HIV positive men with HBV infection are at increased risk of liver related mortality.
Methods: Two hundred consecutively recruited HIV-infected individuals comprising 97 males and 103 females were screened for HBsAg using ELISA. HIV-negative blood donors in the same area were used as controls.
Results: Fifty-three of the patients tested positive for HBsAg giving an overall prevalence rate of 26.5% which was significantly higher ($p < 0.001$) than the 10.4% recorded among non-HIV-infected individuals. Co-infection rate in males (24.7%) did not differ significantly from that of females (28.2%). Co-infection was highest in the 40-49 years age group (41.6%), while no case of co-infection was recorded in the ≤ 19 years. Among the different occupational groups businessmen had the highest co-infection rate (44%) followed by long distance drivers (39.5%). In relation to marital status, divorcees/widows had the highest proportion of those with co-infection (53%) followed by those who were unmarried (32.5%) and those married (21.6%).
Conclusion: This study confirms the high prevalence rate of HBV co-infection in HIV-infected patients compared to the non-HIV- infected population. Therefore, there is a need to screen all HIV-infected patients for HBV infection.

Key words: Hepatitis B surface antigen, HIV infection

Introduction

Infection with Hepatitis B virus (HBV) is a widespread problem. Epidemiological survey showed that about 5% of the world population are asymptomatic carriers. [1] Chronic HBV infection is a major cause of mortality in men and 50% of chronic carriers can be expected to die from disease due to liver cirrhosis or hepatocellular carcinoma. [1] Studies in Nigeria have shown that HBV is the major aetiological factor for liver cirrhosis and hepatocellular carcinoma. [2, 3] Reports of serum carrier rate of the surface antigen of hepatitis B virus (HBsAg) show that infection by the virus is prevalent in Nigeria. [4, 5] A recent survey of blood donors in Gombe showed a prevalence rate of 10.4%. [6]

The prevalence of HIV infection in Nigeria has been on the increase because preventive measures have not had adequate impact. From a prevalence rate of 1.4% in 1991, it has increased to 5.8% by 2002. [7]

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. [8] In addition, Treitinger et al [9] and Chimel et al [10] observed a significant association between detectable HBsAg and core antibody (anti-HBC) and sero-positivity for HIV-infection. These observations along with the description of an effect of the HBV protein X on HIV-1 replication in vitro, [11] had given credence to the speculation about concurrent HBV as a co-determinant for infection with HIV-1. It has also been reported recently HIV-positive men with HBV infection are at increased risk of liver-related mortality. [12] This further emphasises the importance of detecting those group of HIV infected individuals who are concurrently infected with HBV.

Two studies in Northern Nigeria have given contradictory findings. Sirisena et al [13] in Jos, recorded a HbsAg prevalence rate of 28.7% in patients with HIV-1 infection compared to 10.3% in the general population, while Baba et al [14] 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.

The purpose of this study was to determine the seroprevalence of HBsAg in patients with HIV infection seen at the Federal Medical Centre, Gombe.

Materials and Methods

A total of 200 consecutive patients with HIV infection seen at the Federal Medical Centre, Gombe were screened for HBsAg. Socio-demographic data such as age, sex, marital status and occupation were recorded. HIV-negative blood donors at the same hospital were used as controls based on the results of a recent study. [6]

HIV infection was confirmed using double ELISA test (Bio-Rad, California, USA) to detect the presence of HIV antibodies. Sera were also analysed for HBsAg using ELISA (Murex Diagnostic, LTD UK). The manufacturer's protocols were strictly adhered to. The chi-square test was used to assess the significance of the difference among the groups. A p-value of ≤ 0.05 was considered significant.

Results

A total of 200 HIV infected patients with age range of 18-65 years (mean 35.5 ± 9.8) were tested for HBsAg. This number was made up of 97 males and 103 females. Of these, 53 patients were positive for HBsAg, giving an overall prevalence of 26.5%. This value was significantly higher than the prevalence of 10.4% recorded among HIV negative blood donors ($p < 0.001$).

HBsAg seroprevalence rate among the males was 24.7%, while it was 28.2% among the females. This difference is not statistically significant (p-value > 0.5). The age and sex distribution of HBsAg seropositivity in the patients is shown in table 1. Co-infection rate was highest in the 40-49 years age group (41.6%), while no case of co-infection was recorded in those ≤ 19 years.

Table 2 shows the HBV co-infection rates among different occupational groups. Co-infection rate was highest among businessmen (44%) followed by long distance drivers (39.6%) and civil servants (37.5%).

In relation to marital status, divorcees/widows had the highest rate of co-infection (53%) followed by those who were unmarried (32.5%), while those who were married had 21.6%.

Table 1: Age and sex of HBsAg seropositivity among HIV-infected patients

Age (years)	Sex		Total number tested	Total number positive (%)
	M	F		
≤ 19	2	3	5	0 (0)
20 – 29	15	35	50	14 (28)
30 – 39	43	36	79	17 (21.5)
40 – 49	27	21	48	24 (41.6)
≥ 50	10	8	18	2 (11.1)
Total	97	103	200	53 (26.5)

Table 2: Distribution of HBsAg positivity in HIV infection among occupational groups

Occupation	No. positive (%)
Businessmen	9 (44.0)
Drivers	8 (39.5)
Civil Servants	11 (37.5)
Farmers	7 (35.7)
Housewives	13 (32.3)
Applicants	3 (25.0)
Students	2 (12.2)

Discussion

This study showed HBsAg prevalence rate of 26.5% among HIV infected patients. This is similar to the findings of Gordin et al [15] and Sirisena et al [13] but much higher than the 15% obtained by Baba et al. [14] Lodenyo et al [16] obtained a much higher HIV-HBV co-infection rate of 40%. It is important to note that HBsAg seropositivity indicates a carrier state or an active infection. Studies in which serological markers of past HBV infection such as anti-HBS and anti-HBC were done showed a much higher prevalence of HBV infection among HIV infected patients. [9, 10]. The fact that HIV and HBV share a common mode of transmission (predominantly blood and high risk sexual behaviours) attributes to the significant association between HBV and HIV.

HIV/HBV co-infection has raised a considerable interest regarding the direct or co-factorial role of HBV in HIV infection. [11]. Recent evidence has shown that HBV can infect lymphocytes and produce a protein capable of activating HIV-1 replication. [11] In addition, it has recently been found that HIV positive patients with HBV infection are at increased risk of liver related mortality. [12] There is therefore, a serious

need to consider anti-HBV therapy in addition to antiretroviral therapy in those with dual infection.

Although our study did not differentiate carriers of HBsAg from those with active infection, it is known that a significant proportion of carriers go on to develop chronic hepatitis, and some may even progress to hepatocellular carcinoma. [17]

The rate of co-infection between males and females did not differ significantly ($p > 0.5$), with males having 24.7% and females having 28.2%. This is in contrast to the findings of Baba et al [14] who found a significantly higher HBsAg seroprevalence in males than in females. The reason for this disparity is not clear. However it is known that males are less likely to clear HBsAg and have a higher risk of progression to cirrhosis. Age distribution showed that the highest rate of HBsAg positivity (41.6%) was in the 40-49 years age group. In keeping with the endemic nature of HBV in this environment, there is relatively high HBsAg positivity in all the age groups except in the ≤ 19 years age group in which no cases were recorded. This is surprising, as it is known that a significant number of HBV in this environment are acquired in childhood. The most likely explanation for this observation is the very low number of subjects (five) in that age group. Co-infection rate was higher in those who were unmarried or separated/widowed than among the married. This may probably be related to multiple sexual partnerships and patronising of commercial sexual workers. Occupational breakdown showed that itinerant businessmen and long distance drivers had the highest co-infection rate reflecting a high-risk sexual behaviour in these groups.

In conclusion, there is a relatively high HBV co-infection rate in our HIV-infected patients. Therefore, there is a need to screen all HIV-infected patients for HBsAg.

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