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Hepatitis B Virus and Human Immunodeficiency Virus Co-Infection in North-Eastern Nigeria

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Abstract: Immunodeficiency virus co-infection rate in North-Eastern Nigeria. Two hundred consecutively recruited HIV/AIDS patients comprising 69 males and 131 females were screened for Hepatitis B surface antigen using ELISA. The biodata of the patients were obtained. Out of the 200 HIV/AIDS patients tested, 30 were positive for Hepatitis B surface antigen giving an overall co-infection rate of 15.0% of the 69 males, who had HIV/AIDS, 13 (18.8%) were Hepatitis B surface antigen positive, while 17 (13.0%) of the 131 females with HIV/AIDS were positive. Co-infection rate was highest in the 30-39 years age group (46.7%), while no case of co-infection was found in the 10-19, 50-59 and 60-69 years age groups. This study confirms a high co-infection rate of Hepatitis B virus infection in patients with HIV/AIDS. Therefore, there is a need to screen patients with HIV/AIDS for Hepatitis B virus infection.

Key words: Hepatitis B virus, HIV/AIDS, HBsAg, co-infection

INTRODUCTION

Human Immunodeficiency Virus (HIV), the causative agent of Acquired Immunodeficiency Syndrome (AIDS) is found in pandemic proportions globally (Osmond and Dennis, 1994). HIV is a scourge, progressing and causing devastation to lives and the healthcare system worldwide (Carpenter *et al*., 2000) HIV accounted for 38.6 million infections worldwide at the end of 2005. As at 2003, there were about 5.8 million people infected with HIV in Nigeria, giving a national prevalence rate of 5.8% (Federal Ministry of Health, 2004). Hepatitis B Virus (HBV) which accounts for 400 million chronic infections worldwide (Alter, 2006), is hyper-endemic in sub-Saharan Africa and Asia (Gashau and Mohammed, 1991; Isselbacher and Wand, 1991). It is thought to be the main aetiological factor in over 75% of chronic liver disease (Isselbacher and Wand, 1991).

Human immunodeficiency virus and HBV have similar routes of transmission namely through blood and blood products, sharing of needles to inject drugs and sexual activity enabling co-infection with these viruses a common event (McNair *et al*., 1992; Horvath and Raffanti, 1994; Chung, 2006). HBV co-infection in patients with HIV/AIDS is of utmost importance due to the underlying consequences such as the hepatological problems associated with these viruses, which has been shown to decrease the life expectancy in the HIV infected patients (Chung, 2006). Among the HIV infected patients, 2.4 million are estimated to have chronic HBV co-infection.

Reports regarding, the prevalence of HIV co-infection in Nigeria is sparse especially in the North-eastern region. We, therefore, investigated the co-infection pattern of HBV amongst HIV/AIDS patients in the North-eastern Nigeria.

MATERIALS AND METHODS

The serum samples of all double ELISA confirmed HIV infected patients referred to the HIV/AIDS clinic were additionally screened for HBV using rapid test ELISA kits (Acon Laboratories, USA) to detect hepatitis B surface antigen (HBsAg).

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Their biodata was obtained. Verbal and written consent of patients were obtained.

Analysis: The data obtained were analysed using the statistical package for social sciences (SPSS, version 10.0) statistical software.

RESULTS AND DISCUSSION

At the conclusion of the study, 200 double ELISA confirmed HIV/AIDS patients were screened. Thirty (15%) were HBsAg positive.

Age: The age of the patients studied ranged from 18-64 years with a mean of 35.4+/-8.7 years. There was a steady increase in the age groups of the patients, with a peak in the 4th decade (43.0%) and a decline towards the 7th decade (1.0%). Majority of the patients were in the age group 30-39 years (i.e., 43.0%).

Out of the 30 patients, who were HbsAg positive, 13 (18.3%) were males, while 17 (13.0%) were females. Of the patients with co-infection of HIV and HBV, majority belonged to the age group 30-39 years age group. None of the patients in the age groups 10-19, 50-59 and 60-69 years had co-infection of HIV and HBV.

Total 7 out of the 52 patients (23.3%) in the age group 20-29 years were co-infected with HIV and HBV, while 14 out of the 86 patients (46.7%) and 9 out of the 46 patients (30.0%) within the age groups 30-39 and 40-49 years, respectively had co-infection (Table 1).

Sex: Out of the 200 patients screened, 131 patients (65.5%) were females, while 69 patients (34.5%) were males. Out of the 69 males screened, 13 of them (18.8%) had co-infection of HBV and HIV, while out of the 131 females screened, 17 of them (13.0%) had co-infection (Table 2).

A review of the literature shows that patients with co-infection of HBV and HIV have been reported (Burnett, 2005; Akolo, 2004; Saravanan *et al.*, 2007). There is evidence that HBV will contribute more to morbidity and mortality in HIV/AIDS patients because of increased use and accessibility to Highly Active Antiretroviral Therapy (HAART), since, these patients will live longer. The introduction of HAART has led to a significant decrease in the morbidity and mortality in the HIV/AIDS patients. This allowed the expression of liver related complications associated with HBV chronic infections which is mainly acquired before HIV infection (Vallet-Pichard and Stanislas, 2004). HBV is known to produce protein X that can stimulate the replication of HIV *in vitro*. An HBV and HIV co-infection rate of 15.0% was found in this study.

Table 1: HIV and HBV coinfection rate among various age groups

Age groups (years)	HIV positive (n)	(%)	Dual HIV/HBV positive (%)
10-19	2	1	-
20-29	52	26	7 (23.3)
30-39	86	43	14 (46.7)
40-49	46	23	9 (30.0)
50-59	12	6	-
60-69	2	1	-
Total	200		30

Table 2: HIV and HBV coinfection rate according to gender

Sex	Total HIV positive (%)	Total HIV/HBV positive (%)
Male	69 (34.5)	13 (18.8)
Female	131 (65.5)	17 (13.0)
Total	200	30 (15.0)

This is similar to the 15.0% found by Baba *et al.* (1998) in Maiduguri, Nigeria. However, this is lower than the 70.0% found in Kano, Nigeria by Nwokedi *et al.* (2006). It is also, lower than the 53.0% found by Otedo (2004) in Kenya, the 41.0% found by Lodenyo *et al.* (2000) in South Africa and the 30.8% found by Akolo (2004) in Jos, Nigeria. It is also, lower than 28.7% found by Sirisena *et al.* (2002) in Jos, Nigeria and the 26.5% found by Mustapha and Jibrin (2004) in Gombe, Nigeria.

However, the 15.0% co-infection rate found in this study, is higher than the 9.0% found by Saravana *et al.* (2007) in Southern India and the 12.5% found by Odama *et al.* (2004) in Abuja, Nigeria. A review of the co-infection rate shows a wide variation in the results obtained from various regions by various workers within and outside the country. The variations might be due to differences in geographical and climatic conditions, cultural practice, differences in methodologies adopted and test reagents and the differences in the periods of time the studies were carried out. The studies carried out by Lodenyo *et al.* (2000) and Otedo (2004) actually determined evidence of previous and present HBV infection. This may be responsible for the high values of 41.0 and 53.0%, respectively found by them. Similarly, Saravana *et al.* (2007) in their research also, distinguished between past and recent HBV infection even though he observed a lower value of co-infection of 9.0%. All the local studies in Nigeria did not distinguish between recent and past HBV infection.

We did not assay for other serological markers of HBV infection in our study such as anti-HBs and anti-HBc which are indicators of previous exposure to HBV infection.

If these markers were assayed for, the actual co-infection rate would most probably be much higher than the present reported figures. Screening for HBsAg alone does not fully reflect the epidemiology of the disease as it could indicate a carrier state, viral replication or chronic hepatitis. Therefore, our study did not differentiate carriers of HBsAg from those with active infection.

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