

Human immunodeficiency virus (HIV) and hepatitis B virus (HBV) co-infection amongst patients in Biu, Borno state- Nigeria

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The soaring concern over co-infection rates of human immunodeficiency virus (HIV) and hepatitis B virus (HBV) amongst people in the country necessitated this survey in patients attending Abott Medical Centre, Biu in Borno State. Three hundred (300) patients were screened for both HIV and HBV using the rapid Chromatographic immunoassay for qualitative detection of HIV antibodies and HBV antigens in serum. Out of these 300 patients, 216 (72%) were negative to both HIV and HBV, 45 (15%) were HIV positive, 28 (9.3%) were HBV positive and 11(3.6%) were reactors to dual HIV and HBV infections. The co-infection rates showed association with age amongst positive reactors and in significance with gender. This study confirms occurrence of co-infections of HIV and HBV in the study area. Active surveillance through concurrent screening of both diseases during HIV testing and counseling as well as public awareness campaigns to educate the masses about the diseases is therefore recommended.

Keywords: Human Immunodeficiency Virus, Hepatitis B Virus, Co-infection, Biu, Nigeria.

INTRODUCTION

Co-infection of HIV and HBV is common due to shared routes of transmission (Alter, 2006) with over 350million HBV carriers and almost 40million HIV infected persons worldwide (UNAID, 2004; WHO, 2006). In areas of low endemicity, co-infection is usually acquired in adulthood through sexual and percutaneous routes with about 5-7% among HIV-infection person (Alter, 2006; Puoti et al., 2006). While in countries with high and moderate HBV endemicity, routes of transmission are perinatal or acquired in early childhood with infection rate of 10-20% (Diop-Ndiaye and Toure-Kane, 2008). The rate of progression and complication from viral hepatitis are accelerated in patients with underlying HIV infection (Sinicco et al., 1997). After acquiring HBV infection, HIV infected people are six-times more likely to develop chronic hepatitis B infection than HIV negative persons

(Gatanaga, et al., 1997). Reports reveal continuous increase of co-infection in many part of the world (Thio, 2009) with 53% prevalence rate in Kenya (Otedo, 2004), 41% in South Africa (Lodenyo et al., 2000) and South India (Saravanan et al., 2007), due to exposure of large population of persons to different sources of infection as the result of diverse lifestyles. This growing concern for the increase co-infections of HIV and HBV in recent years necessitates a proper assessment and quantification of disease burden to foster appropriate intervention strategies. In Nigeria, similar works have being conducted by some researchers (Baba et al., 1998; Sirisena et al., 2002; Akolo, 2004; Mustapha and Jibril, 2004; Nwokedi et al., 2006; and Olokoba et al., 2008). However, the availability of limited information in the study area motivated this investigation, which seeks to establish through a 4-month prospective survey to establish the occurrence of HIV and HBV co-infection amongst patients attending Abott Medical Centre, Biu; a major health centre in Biu Local Government Area (LGA) of Borno State, Nigeria.

Table 1. Distribution of HIV, HBV and co-infection in 300 patients at Abbot medical Centre

Types of Infections	Frequencies of Occurrence	Percentage frequency (%)
HIV	45	15
HBV	28	9.3
CO-INFECTION	11	3.6
NEGATIVE	216	72
TOTAL	300	100

Table 2: Distribution of HIV, HBV and co-infection in Patients according to sex

Type of Infection	Gender (%)		Total
	Male	Female	
HIV	32(72.7)	13(32.5)	45
HBV	6(13.6)	22(55)	28
CO-INFECTION	6(13.6)	5(12.5)	11
TOTAL	44(52.4)	40(47.6)	84

MATERIALS AND METHODS

Sample collection

Random venous blood specimens were collected after cleaning with an alcohol swabs from patients using a 5ml syringe and needle. The blood is transferred into centrifuge tubes and kept at room temperature for sera collection.

Sera

Specimens were immediately processed by separating serum from blood products using a centrifuge and only non-heamolysed blood samples were used for the screening process.

Virological Procedure

All procedure was performed in accordance to the guideline described in (Olokoba et al., 2008) and the Safety precautions as provided by (CDC, 1987; NCCLS, 1991; WHO, 1993). HIV and HBV screening were performed using the rapid chromatographic immunoassay for the qualitative detection of HIV antibodies (Inverness Medical, Japan) and HBV antigens (ACON Laboratories, USA) rapid test strips. About 3 drops of serum were dropped onto the specimen pad and held vertically such that the serum is allowed to move upward via capillary force and after 15minutes, results were read. Double lines were visible for positive samples (Control and Test line) while negative samples only single line appeared (Control line).

Data Analysis

All obtained results were recorded and analyzed using descriptive statistics and Chi-square.

RESULTS

Results of HIV and HBV screening of patients are shown in Table 1. Out of the 300 specimens collected, 216/300 (72%) were negative, 45/300 (15%) were HIV positive, 28/300 (9.3%) were HBV positive and 11/300 (3.6%) are co-infected with most reactors belonging to the age – group: 31-40 years. The prevalence of HIV, HBV, and co-infection showed that the highest infection occurred among males (52.4%). The detailed prevalence of infection compared with sex is shown in Table 2. The prevalence of HIV, HBV and co-infection among various age groups, showed that the highest infection occurred within the age bracket of 31-40 (66.6%) and co-infection rate of (63.6%) and was observed least within the age group of 41-50 (15.5%) and co-infection rate of (9.1%).

DISCUSSION

The present finding indicates an overall prevalence of co-infection of 3.6% (Table 1) and the highest co-infection rate of 63.6% within the age group of 31-40 (Table 3). This occurrence of HIV and HBV co-infection with regard to age was statistically significant ($P < 0.05$) and insignificant with gender as 6 (13.6%) and 5 (12.5%) were shown to be dual reactors HIV-HBV viral antigens. Reports of earlier works revealed, prevalence rates of

Table 3. Distribution of HIV- HBV co-infection in Patients among various age groups

Age-group	Type of Infections (%)			Total (%)
	HIV	HBV	Dual	
20-30	2	10	3(27.3)	15(17.9)
31-40	36	13	7(63.6)	56(66.6)
41-50	7	5	1(9.1)	13(15.5)
TOTAL (%)	45 53.6	28 33.3	11 13.1	84 100

15% in Maiduguri (Baba et al., 1998), 70% in Kano (Nwokedi et al., 2006), 30.8% and 28.7% respectively in Jos (Sirisena et al., 2002; Akolo, 2004), 26.5% in Gombe (Mustapha and Jibril, 2004) and 46.7% in Ilorin, North Eastern Nigeria (Olokoba et al., 2008). In comparison to previous works highlighted, this low occurrence may be associated with ignorance and or poor accessing attitude of infected persons for medical services for the fear of being recognized and stigmatized. Also, Biu is Local Government Area (LGA), in Borno state in the North eastern Nigeria characterized by a semi urban-rural scenario with less population when compared with locations of previous studies. Furthermore, the descriptive statistics showed that HIV-HBV co-infections were numerically higher in the male which could be associated with unsafe sexual behaviors of polygamous men within the active age group (31-40). Other factors associated with the observed dual occurrence may include socio-economic, cultural, occupational type and religious inclination of the people within this study area, as earlier reported as risk factors for the spread of HBV (Bello et al, 2011) and HIV (Bello and Olabode, 2011). In Conclusion, this study confirmed HIV and HBV co-infections occurrence in patients within Biu LGA. The need for implementation, monitoring and evaluation of a specially designed intervention strategy is strongly advocated. This could include concurrent HBV routine screening alongside HIV testing and counseling as well as public awareness and enlightenment campaigns to educate the masses about the diseases.

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