

Full Length Research Paper

Sero-prevalence and risk factors associated with hepatitis B surface antigen (HBsAG) amongst patients in BIU, Borno State, Nigeria

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A survey of hepatitis B virus (HBV) amongst patients attending Abott Medical Centre, Biu in Borno State was conducted to determine the prevalence and evaluate risk factors associated with hepatitis B spread following the growing concern over the increasing epidemics in the country. Four hundred and seventy two (472) patients were screened for HBV using the rapid chromatographic immunoassay for quantitative detection of HBV antibodies in serum. Out of these 472 patients, 136 (28.8%) were positive for HBsAg, of which 89 (65.4%) were men and 47 (34.6%) were females. The highest positive reactors were found in patients below the ages of 30 years (70.6%). Age and sex were statistically significant ($P<0.01$) by chi-square test. Risk factor evaluation using structured questionnaire and in-depth anonymous discussion revealed occupational type/profession, marital status, level of education and socio-cultural behaviors as contributing factors to the spread of HBV. In conclusion, this study provides preliminary information on the prevalence and associated risk factors of HBV in these carriers within Biu Local Government Area (LGA) which suggests the possibility of localized hepatitis pandemic. Hence, the need for promotion of health awareness campaigns, prophylactic vaccination, and most importantly the need to maintain active and continuous surveillance of this disease. Screening for HBV, counseling, testing and supportive treatment are therefore recommended for all patients visiting any health centre.

Key words: Sero-prevalence, hepatitis B surface antigen, chromatographic immunoassay, risk factors, Abott medical centre, Biu.

INTRODUCTION

Hepatitis B virus (HBV) a serious global problem which account for about two billion infected cases and 400 million chronic infections worldwide (Alter, 2006; UTAH, 2004). It is hyper endemic in Asia and sub-Saharan Africa (Gashau and Mohammed, 1991; Isselbacher and Wands, 1991) with about 50 million infection in Africa and 150,000 to 450,000 persons newly infected each year in

the United States of America (UTAH, 2004). It is thought to be the main etiological factor in over 75% chronic liver diseases (Isselbacher and Wands, 1991) and progression to hepatocellular carcinoma (HCC) (Ameeta and Thomas, 2009). HBV is the 10th leading cause of death worldwide accounting for 500,000 to 1.2 million deaths per year due to severe chronic hepatitis and HCC (Ganem and Prince, 2004). Nigeria is classified amongst the group of countries endemic for HBV infection. Currently about 18 million Nigerians are infected (Jombo et al., 2005; UTAH, 2004) and has reached hyper-endemic levels with the sero-prevalence of HBsAg estimated to range from 10 to

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40% (Fasola et al., 2008; Forbi et al., 2008). Many of these people may not be aware of the infection and hence, fail to seek appropriate medical attention therefore progressing to chronic liver disease, cirrhosis and hepato-cellular carcinoma. The advent of education and recent therapeutic measures has reduce the risk of developing complications of liver disease (Niederau et al., 1996), surgical interventions and enlightenment campaign programs for HIV/AIDS which also highlight ways in which HBV share similar routes of transmission with HIV has made remarkable achievement. Despite these interventions as well as the availability of a safe and effective vaccine since 1982 (Mast et al., 2004), and its inclusion into Nigeria's national immunization program in 1995, the vaccine became available to the country only in 2004 (Sadoh and Eregie, 2005; WHO, 2005). This late entry and the absence of a national HBV surveillance program, builds the burden of hepatitis B substantially. HBV is still associated with high mortality, morbidity, drug resistance cases and economic burden. Hence, there is need to maintain active and continuous surveillance on the occurrence and prevalence of this disease for effective strategy formulation and preventive measures. Although, studies have been carried up on HBV in other parts of the country, the availability of sparse reports in this area motivated this investigation. Therefore, this study seeks to establish the prevalence and risk factors associated HBV occurrence through a 6 month prospective survey (July to December, 2010) amongst patients attending Abott Medical Centre, Biu one of the major health facilities in Biu LGA of Borno State, Nigeria.

MATERIALS AND METHODS

Study area

The study was conducted in Biu metropolis which is located on the Biu plateau, hence, the name "Biu". It is located in the northeastern part of Nigeria, bounded on the west by the Gongola river valley, on the southeast by the Hawul river valley and on the north by the Lake Chad basin. It is located in the Sahel savanna and covers 5,100 sqkm. Principal ethnic group of Biu includes the Baburawa, Fulanis, Hausas and other non-indigenous groups.

Study design

A cross sectional study design was adopted where all patients visiting the center and recommended for HIV/AIDS routine testing were concurrently screened for HBV surface antigens on a daily basis over the study period of July to December 2010.

Sample collection

Venous blood specimens were collected from patients using a 5 ml syringe and needle after cleaning the collection site with an alcohol swab. Five milliliter (5 ml) of blood obtained by venopuncture was 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 at 1,500 revolutions per minute (rpm) for 10 minutes and only non-hemolysed blood samples were used for the screening process.

Virological procedure

HBV screening was performed using the rapid chromatographic immunoassay for the qualitative detection of HBV surface antigen (HBsAg) (ACON, Laboratory, USA) rapid test strips in accordance to the manufacturer's instructions. 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 15 min, results were read. Double lines were visible for positive samples (control and test line). Negative samples showed single line (control line).

Data analysis

The risk factors associated with HBV were analyzed using structured questionnaire and where necessary accompanied by in-depth anonymous discussion. All obtained results were recorded and analyzed using simple descriptive statistics. The analyzed data were further subjected to chi-square analysis.

RESULT

Results of HBV screening for the patients over the period under review were as shown in Table 1. Out of the 472 specimens screened, 136/472 was positive to HBsAg, representing an overall prevalence rate of 28.8%. The highest positive reactors were observed in August with an occurrence frequency of 39.0% and the least in October (2.2%). Table 2 showed the distribution of HBV carriers according to sex and age, with highest reactors in the males 89 (65.4%) and least amongst females 47 (34.6%) those within the age group 1 to 30 years tallied 96 reactors (70.6%) while the age group 31 to 50 recorded 40 reactors (29.4%). It was further observed that most HBV reactors were within the age bracket of 21 to 30, which was closely followed by the group below 20 years and least within 41 to 50 as illustrated in Figure 1. Figure 2 showed the distribution of HBV with regard to level of education, which indicated highest reactors amongst stark illiterate 48 (35.3%), secondary level 34 (25.0%) and least in tertiary level of education 14 (10.3%). Figure 3 showed the distribution of HBV in patient in relation to occupational type/profession as an index of socio-economic status. This revealed highest reactors amongst soldiers 41 (30.1%) and the least among teachers 2 (1.5%). Figure 4 showed the distribution of HBV with respect to marital status, this indicated highest reactors in the married group 69 (50.7%) and least amongst single patients 44 (32.4%). Further, in depth discussion with these patients revealed 17.2% (5/29) of the housewives (21.3%) with HBsAg, were further confirmed to be

Table 1. Monthly distribution of HBV carriers between July to December, 2010.

Months	Number tested	Number positive	Percentage frequency (%)
July	79	44	32.4
August	93	53	39.0
September	80	16	11.8
October	64	3	2.2
November	84	7	5.2
December	72	13	9.6
Total	472	136	100

*Prevalence rate =28.8%.

Table 2. Distribution of HBV amongst carriers (patients) according to sex and age.

Age-group	Sex		Total {N(%)}
	Males	Female	
1- 30	66	30	96 (70.6)
31-50	23	17	40 (29.4)
Total {N(%)}	89(65.4)	47(34.6)	136 (28.8)

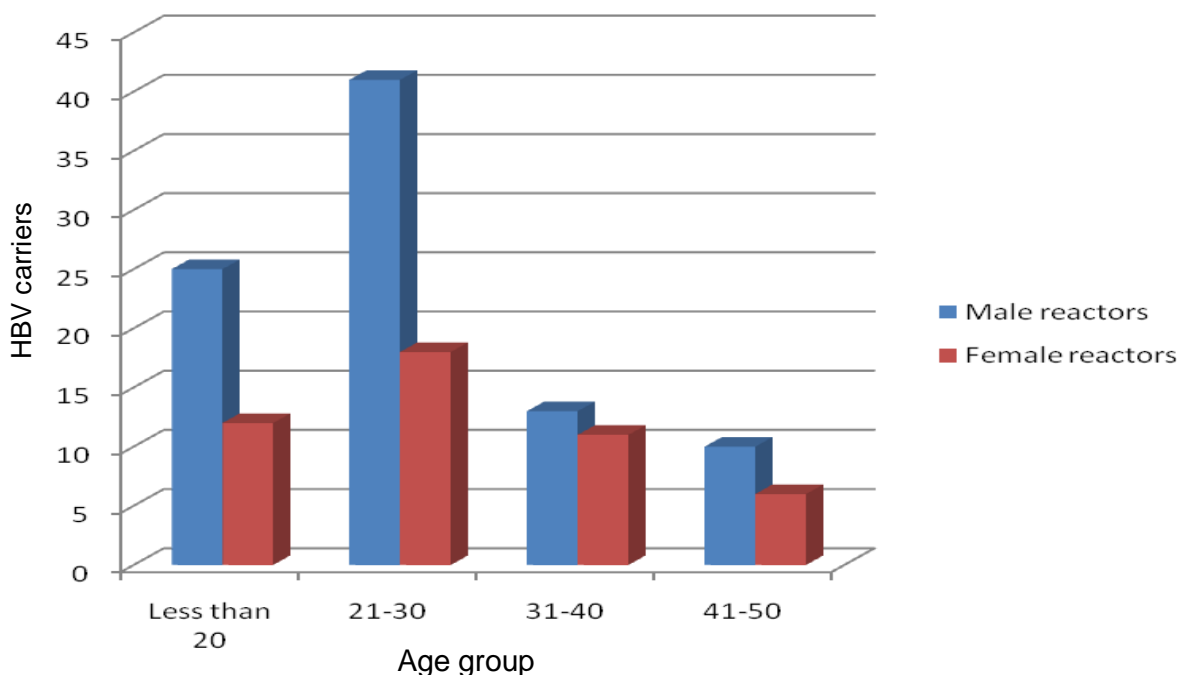


Figure 1. Distribution of HBV carriers by age and sex.

pregnant and 24 out of the 41 soldiers have been directly or indirectly associated with drugs. It also gathered that 45/69 (33.1%) married positive reactors were polygamist while some of these patients (59/136) (43.3%) confirmed recent and or previous social contact with commercial sex workers resident within the community.

DISCUSSION

An overall prevalence of 28.8% for HBV was recorded during the study period. This prevalence rate falls in the category of high endemicity as defined by Uneke (2005), which states high endemicity for HBV infection as HBsAg

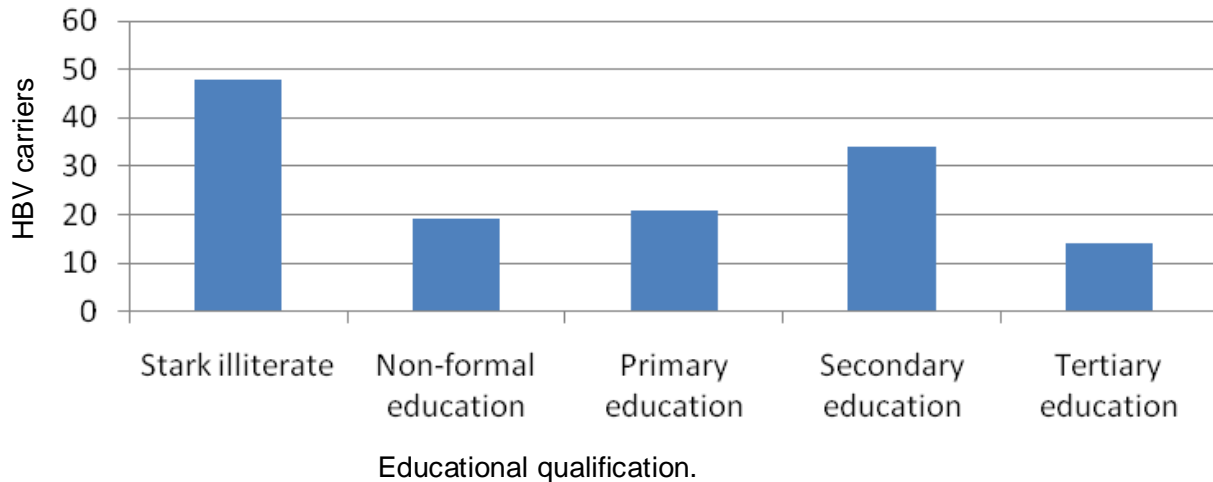


Figure 2. Distribution of HBV carriers by educational qualification.

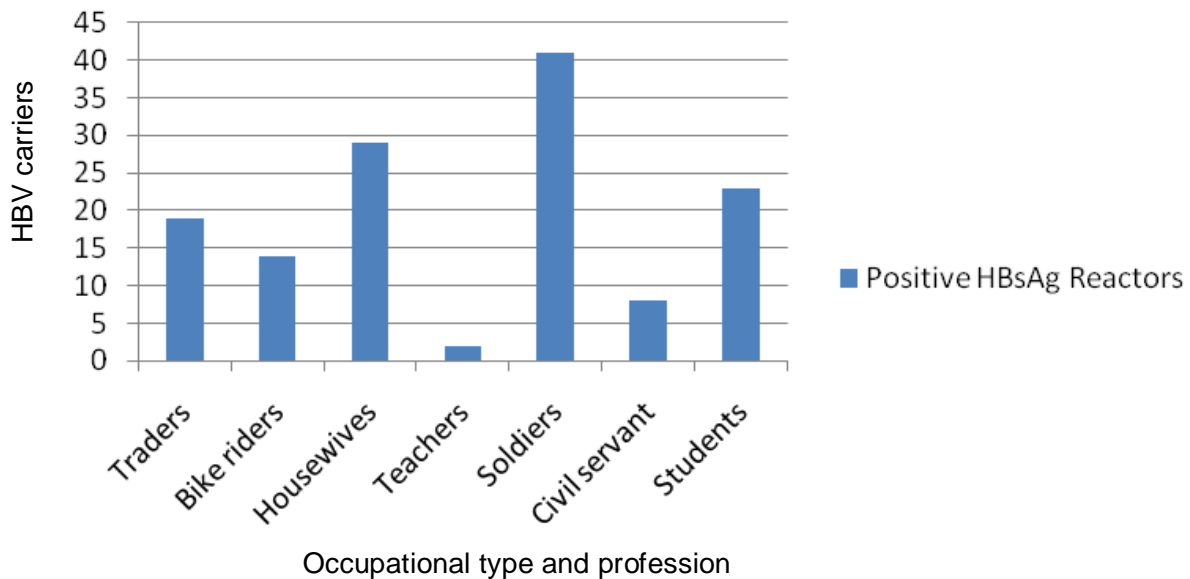


Figure 3. Distribution of HBV carriers by occupational type and profession.

values greater than 7% in an adult population.

The highest occurrence of 39.0% reactors was observed in August and least (2.2%) in October. This could be attributed to the peak of rainfall that prelude climate change favoring extrasensory desire for sexual activities, and or per harps an index of increased reporting frequency of patients to the hospital, although seasonal variation for HBV infection was not in the scope of the study. The occurrence ratio with regard to sex showed that men were more infected (65.4%) than women (34.6%) which was statistically significant ($P < 0.01$). This similar reports (Odusanyaa et al., 2005) accounts for significantly higher ($P < 0.02$) HBsAg prevalence in males. The age distribution ratio indicates

high occurrence in patients within the age group below 30 years. This conforms to similar findings (Mbaawuaga et al., 2000) which reported high frequency of HBV carriers among attributed to the peak of rainfall that prelude climate teenagers 10 to 19 and 30 to 39 age groups, suggesting sexually active male youths as potential carriers. Occupational type which was considered as an index of socio-economic status, shows that soldiers were the highest positive reactors (30.1%). Further in depth discussion with these patients indicates 24 out of the 41 soldiers have been directly or indirectly associated with drugs, this correlates reports which reveal high prevalence of viral hepatitis among United States Army using drugs especially marijuana stationed in Thailand and

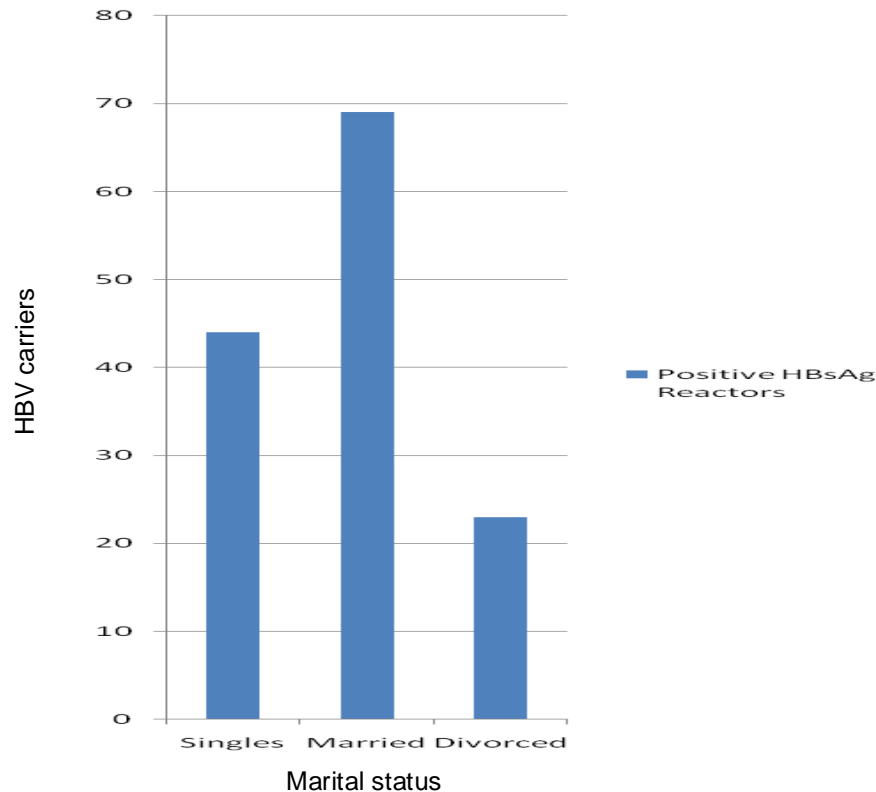


Figure 4. Distribution of HBV carriers by marital status.

Europe, (Scott et al., 1981). Positive reaction amongst housewives shows that 17.2% of the housewives (21.3%) with HBsAg were further confirmed to be pregnant with potential risk of infecting their foetus. This connotes earlier reports (Vranckx et al., 1999) which states that 10 - 20% of seropositive women for HBsAg transmit the virus to their neonates in addition to other previously documented neonatal vertical transmission in Makurdi, Benue State (Mbaawuaga et al., 2000) and Maiduguri, Borno State, Nigeria (Harry et al., 2004) with reported HBsAg seropositivity of 11% and 11.6% respectively. Married patients showed the highest HBV reactors 69/136 (50.7%) and the least 23 (16.9%) in the divorce group. Further investigation reveals, out of the 69 married positive patients, 45 (33.1%) were polygamist. This indicates the liberty in the social and cultural principles allowing multiple sexual partners which could be associated with the observed high prevalence as earlier highlighted as factor contributing to the spread of HBV Prier and Cowan (1987). Unsafe sexual behaviors and social contacts by some of these patients (59/136) (43.3%) with commercial sex workers resident within the community was also identified as a risk factor to the acquisition of hepatitis B as earlier reported (Scott et al., 1981). The educational background of these patients indicates high HBV reactors amongst stalk illiterate (35.3%) and the least amongst tertiary education holders

(10.3%) as well as teachers (1.5%), respectively. This implied correlation between HBV occurrences and level of education is contrary to earlier findings (Prier and Cowan, 1987) which state no association between the prevalence of HBV and education. In conclusion, this study provides preliminary information on the prevalence and associated risk factors of HBV in these carriers within Biu LGA. There is need for health promotion awareness campaign to educate the masses on the disease, prophylactic immunization, HBV screening, counseling, testing and supportive or palliative treatment at all health care levels, and conducting further studies to identify and evaluate social, cultural and economic factors associated with HBV spread with the bid to implement a specially designed socio-cultural intervention strategy.

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