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## SEROPREVALENCE OF HBsAg AMONG PATIENTS WITH FEBRILE ILLNESSES IN MURTALA MUHAMMAD SPECIALIST HOSPITAL, KANO, NIGERIA

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### ABSTRACT

*The study was carried out between the months of July and December 2013 to determine the prevalence of hepatitis B surface antigen among patients presenting with febrile illnesses attending Murtala Muhammad Specialist Hospital, Kano. Two hundred (200) blood samples were obtained from the consented patients with age ranged from 15-64 years, that were processed according to standard operating procedures (SOPs) and screened for the presence of HBsAg using a third generation enzyme linked immunosorbent assay method. A total of 22 (11%) patients were positive for HBsAg. Higher rate of infection was observed among males 72.2% (n=16) than their female counterparts 27.3% (n=6). Infection rate was found to be higher in age group 25-34 years, 45.4 % (n=10) than 15-24 and 35-44 years each with 27.3% (n=6), and none was found to be positive among 45-54 and 55-64 years age groups. Also more infection was observed among the married population 54.5 % (n=12) than single 40.9 % (n=9) and widow 4.5% (n=1). However, high sero-positivity is also occupationally dependent. More infections were seen among business occupational groups 50 % (n=11) than students 31.8 % (n=7) while 18.2 % (n=4) was seen among civil servants. The major route of transmission among the study group is sexual transmission in those with multiple sexual partners and history of blood transfusions. Those with history of vaccination against hepatitis B had no positive result (n=0). The study revealed a considerable high infection among males, married business occupation class and students these where however not statistically significantly different ( $p < 0.005$ ), and also pointed out potency and importance of vaccination for all vaccine preventable diseases.*

**Key Words:** Seroprevalence, Hepatitis B, Febrile Illness, Kano

### INTRODUCTION

Hepatitis B infection (HBI) is one of the major public health problems globally and is the 10th leading cause of death (WHO, 2013). Worldwide, more than two billion of the populations have evidence of past or recent HBV infection and there are more than 350 million chronic carriers of this infection (Samuel *et al.*, 2009). Individual infected with the virus can remain as carriers and asymptomatic for life with increase risk of hepatocellular carcinoma, liver cirrhosis and death from liver failure (Okonkwo *et al.*, 2010). Routes of transmission are blood and blood products, intravenous drug abuse, unsafe injection, usage of sharps and unprotected sexual activities. Other routes of transmission are mother to child, needle stick injury among health workers, barbers, tattooing and scarification marks (Mazie *et al.*, 2002; Paulyn *et al.*, 2010; Okonkwo *et al.*, 2010). The burden pose on health of individual made it necessary to carry out routing screening before blood transfusion in health facilities and more importantly to reduce its continuous spread. Hepatitis B screening is done for every pregnant woman registered for antenatal services in various health facilities. In most parts of the world adults contracts the infection through sexual contact and perinatal transmission accounts for its continuous endemicity in most endemic areas (Centre for Diseases Control, 2008).

World health organization reported in 1998 that most infections occur in adolescents and young adults with associated risk factors such as unprotected sexual intercourse, injection drug abuse, blood transfusion and body piercing as in barbing, tattooing, scarifications etc (Alao *et al.*, 2009; Paulyn *et al.*, 2010). Prevalence of hepatitis B infection is high in most developing countries in sub-Saharan Africa, Southeast Asia, South America (Sharma *et al.*, 2005) and mostly detected in blood donors, people living with HIV/AIDS (PLWHA), pregnant women, students and other occupationally related groups. Prevalence of 6.5%, 9.2% and 6.1% were found in Kinshasa, Democratic Republic of Congo and Ethiopia respectively (Baye and Yahannes 2007).

HBV infection occurs frequently and is highly endemic in Nigeria (Abiodun and Omoike, 1990; Fakunle *et al.*, 1981) and, the disease has an estimated 12% of population as carriers (Okonkwo *et al.*, 2010; Ugwuja and Ugwu, 2010). Several studies were conducted in Nigeria with associated risk factors in different population, regionally and established varied prevalence.

The aim of this study was to determine the seroprevalence of HBsAg among patients with febrile illnesses in Murtala Muhammad Specialist Hospital, Kano, Nigeria.

**MATERIALS AND METHODS**

**Study Population**

The study was carried out among patients who presented to outpatient department of Murtala Muhammad Specialist Hospital with febrile illnesses such as malaria. Age group recruited for the study were between the age of 15 – 64 years who are free, from their medical records and history, of any known disease or condition such as liver diseases, cancers, hypertension, diabetes mellitus, sickle cell disease, patient on chemotherapy and pregnancy if female. Two hundred (200) patients who consented were recruited through an interviewer administered open ended questionnaire which contains socio-demographic characteristics and risk factors associated with hepatitis B viral infection. The sample size was estimated based on the local prevalence of hepatitis B viral infection.

**Collection of Blood Sample**

Three (3) mls of blood was collected from each patient with sterile vacutainer needle directly into a universal sterile bottle. Samples were centrifuged at 3000 rpm for 5minutes and the sera obtained were

used for screening of HBsAg according to standard procedures (Cheesbrough 2005). For the detection of HBsAg, chromatographic immunoassay based Micropoint test strip made in USA was used. The tests and result interpretation were done according to laboratory standard and test kits manufacturer’s specifications.

**Ethical Approval**

Ethical approval was obtained from the Ethics and Research Committee of Hospital Management Board, Kano.

**Statistical Analysis**

This was done with SPSS version 20 by calculating simple percentages, association was determined by cross tabulations and statistical significance was set at  $p < 0.05$ .

**RESULTS**

A total of 200 blood samples were obtained from patients that presented with febrile illnesses within the age range of 15-64 years. The overall prevalence rate of HBV infection obtained among the patients was 11% as shown in Table1.

**Table 1: HbsAg Positivity in Patients with Febrile Illnesses at Murtala Muhammad Specialist Hospital, Kano**

HBV Positivity	Number of Sample	Percentage (%)
Reactive	22	11
Non- Reactive	178	89
<b>Total</b>	<b>200</b>	<b>100</b>

Table 2 shows some socio-demographic characteristics of the patients with HBV infection. Male patients were seen to be more infected than the female patients with 72.7% and 27.3% respectively. Age specific prevalence rate was seen among 25-34 years age groups to be 45.5% of the positive population then followed by 27.3% each for age groups 15-24 and 35-44 years. No infection recorded among age groups 45-54 and 55-64 years. Married

population were seen to be 54.5% of those infected followed by those that are single among the study population at 40.9%. Among the occupational groups, those engaged in business as occupation have highest rate of prevalence at 50% followed by students with 31.8% while low prevalence was seen among the civil servants.

**Table 2: Socio-Demographic Characteristics of the Patients and HBV Positivity in Murtala Muhammad Specialist Hospital, Kano**

Characteristics	Number of Samples N= 200, (%)	HBsAg Positive N=22, (%)
<b>Age group</b>		
15-24	68 (34.0)	6(27.3)
25-34	74 (37.0)	10(45.4)
35-44	37 (18.5)	6 (27.3)
45-54	12(6.0)	0(0)
55-64	09 (4.5)	0(0)
<b>Sex</b>		
Male	90 (45)	16 (72.7)
Female	110 (55)	6 (27.3)
<b>Marital status</b>		
Single	86(43.0)	9(40.9)
Married	105(52.5)	12(54.5)
Widow	8(4.0)	1(4.5)
Divorced	1(0.5)	0(0)
<b>Occupation</b>		
Business	75(37.5)	11(50.0)
Students	72(36.0)	7(31.8)
Civil Servants	53(26.5)	4(18.2)

For assessment of some risk factors associated with hepatitis B viral infection as shown in Table 3, only 7.5% of the recruited subjects have had hepatitis B vaccination at full dose and none is positive among them, others have never had even a single dose of the vaccine. On considering blood transfusion as a risk factor, 8.5% of the patients have history of blood transfusion and only 18.2% of them are infected. 10.5% of the patients have history of more than one sexual partner and among them 68.2% are HBsAg

positive while lower prevalence 31.8% was observed among those without the history of multiple sexual partners. This strongly suggested that sexual promiscuity exposes one to the dangers of contracting the disease. When tribal and scarification marks were considered as risk factors, only 10% of the study population have history of scarification or tribal marks and represent only 4.5% of the infected population.

**Table 3: Some Selected Risk Factors Associated with Hepatitis B Virus Infection Obtained from Murtala Muhammad Specialist Hospital, Kano**

Risk Factors	Number Examined N=200, (%)	HB Virus Positive N=22, (%)
<b>History of HBV vaccination</b>		
Yes	15(7.5)	0(0)
No	185(92.5)	22(100.0)
<b>History of blood transfusion</b>		
Yes	17(8.5)	4 (18.2)
No	183(91.5)	18(81.8)
<b>Multiple sexual partners</b>		
Yes	21(10.5)	15 (68.2)
No	179(89.5)	7 (31.8)
<b>Tribal marks/scarification</b>		
Yes	20 (10.0)	1(4.5)
No	180 (90.0)	21(95.5)

**DISCUSSION**

In this study, a total of 200 samples of blood were obtained from patients who presented with fever as a symptom to the General Outpatient Department (GOPD) of Murtala Muhammad Specialist Hospital in Kano City between the months of July to December 2013. The overall prevalence of HBsAg was found to be 11% which differs from the results obtained from other studies within the same state and from other geopolitical zones of Nigeria. This figure still confirms that Nigeria is an endemic state for hepatitis B virus infection. Prevalence rates obtained in the last one decade showed a fluctuating trend, 14.6% in 2004, and 10.1% in 2005 and in 2006 it was 10.7% (Nwokedi *et al.*, 2010). Recent report on the prevalence of hepatitis B infection on adolescent in Kano puts the rate at 12.5% (Yunusa *et al.*, 2014). The figure is also lower than 12.3%, (Hamza *et al.*, 2013) and 18.2% (Luka *et al.*, 2008) obtained among HIV infected population in Aminu Kano Teaching Hospital and among pregnant women in Zaria, respectively. It is also lower than 47.2% and 20% reported from Benue State among blood donors and Borno State among primary school pupils respectively. 17.1% (Nneka 2007) was also reported from Nassarawa State among sex workers which also higher than the present figure.

Prevalence rate obtained in present study is comparable to the values 11% (Sule *et al.*, 2010) reported from studies in Anyingba, Kogi State, 11.5% (David *et al.*, 2012) from Ekiti State and 10.6% (Esumeh *et al.*, 2003) from South-South region.

Several studies also reported values less than this. (Dawaki and Kawo, 2006) reported 7.3% prevalence among pregnant women in Kano, 6.8% (Ndako *et al.*, 2011) among secondary school students in north central Nigeria. 4.2% (Mukhtar *et al.*, 2005) in Zaria, 4.1 % (Ugwuaja and Ugwu, 2010; Okonko *et al.*, 2010). Age specific prevalence rate was found to be 45.5% which is higher among 25-34 years age group follows by 27.3% each for 15-24 and 35-44 years age groups. These findings agree with that reported by (Gambo *et al.*, 2012; Okonko *et al.*, 2010) indicating the high rate of hepatitis B infection among these age groups. They constitute the sexually active population among the study group and they are at high risk of engaging in several ways through which one can contract the infection. The study figured out significant difference ( $p>0.005$ ) in hepatitis B infection among the two sex groups with male patients having 72.7% while females recorded 27.3% prevalence rate. This finding is in contrast to reports by (Mbotto and Edet , 2012; Okonko *et al.*, 2010) in studies from South west Nigeria but in agreement with 12.1% and 32% reported from Kano, North west and North east by (Nwokedi, *et al.*, 2010; Gambo *et al.*, 2012). This can probably be explained by unequal exposure to risk factors of contracting the infection. Male population in this part of the country are more engaged in one form of risk behaviour or the other while the female population are always under close monitoring by parents. In this area the ratio of men to women that are engaged in business occupation, civil service, schools and other outdoor

activities is significant going by their tradition, culture This study also presents prevalence of hepatitis B infection that varies according to socioeconomic status of the patients (Okonko *et al.*, 2010; Alikor and Erhabor, 2007). Population of the study group engaged in one form of business trading or the other have high prevalence of the infection which is 50% and 31.8% among students while civil servants had the least prevalence of the infection. This is in agreement with the earlier studies that occupation is associated with the infection (Baye and Yahannes, 2007; Okonko *et al.*, 2010). Along with this, studies in Ethiopia revealed that mechanics and drivers had 28% prevalence rate, students 20% and civil servants had 15% prevalence rates of hepatitis B infection (Baye and Yahannes, 2007).

In Nigeria 4.1% was reported among students by (Okonko *et al.*, 2010) and 12.5% among female adolescents students (Yunusa *et al.*, 2014). The low prevalence rates among the civil servants may be related to high level of awareness on the preventive measures against the infection while high prevalence among those engaged in several business activities may be due low level of awareness and can engaged in various ways that could lead them to contract the infection especially sexual route as suggested by this study and by Dawaki and Kawo (2006) within same geographical areas. This study also revealed high prevalence rate among married population 54.5% while 10.9% was seen among the unmarried class because of horizontal transmission. This finding is in contrast to what was obtained in Ethiopia where 21.6% was obtained among married population while those that are singles recorded 75.7% (Baye and Yahannes 2007). It is also in contrast with the studies done in Abeokuta, south west Nigeria, where

and religion.

students recorded higher prevalence rate of 5.5% and married population recorded none (Okonkwo *et al.*, 2010).

This study reported sexual transmission as the major route of contracting the infection with 71.5% prevalence rate among those that have history of more than one sexual partner. 17.6% of those with positive history of blood transfusion as a result of poor screening and occult HBV infection in the past had the disease. This is consistent with the findings from other studies that unprotected sexual intercourse or sexual promiscuity and unscreened blood transfusion are major route of transmitting the infection (Dawaki and Kawo, 2006; Okonkwo *et al.*, 2010; Mbotto and Edet, 2012). Some other studies recorded high prevalence of hepatitis B infection among those with history of scarification or tribal marks. In this study 4.5% prevalence rate was recorded among those with history of scarification or tribal marks which is in contrast to 8.0% recorded by (Okonkwo *et al.*, 2010). Hepatitis B virus vaccination proved to be protective in this study as none of the 7.5% of the study population with history of vaccination is hepatitis B positive. This emphasizes continuous encouragement by individual, groups, Non-governmental organizations and governments to be more dedicated and committed at ensuring proper awareness and availability of the vaccine to the community. This finding is in agreement with assertion that the HBV vaccine is effective and protective (Lee *et al.*, 2006). Although an effective vaccine is now available for HBV, not everyone will have an access to the vaccine; therefore the public health education is still the best means of combating this disease.

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