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**SEROPREVALENCE OF HEPATITIS B AMONG HOSPITAL PATIENTS IN  
MAKURDI METROPOLIS, BENUE STATE, NIGERIA**

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**ABSTRACT**

**Objective:** The seroprevalence of hepatitis B Virus (HBV) was investigated between July and October 2011 to determine the prevalence of Hepatitis B virus infection in relation to demographic factors such as sex, age, literacy level, occupation, blood group, marital status among hospitals' patients in Makurdi metropolis, Benue State, Nigeria. **Materials and Methods:** Hepatitis B surface antigen was assayed using hepatitis B surface antigen serum/plasma strip test kit (Grand Medical Diagnostic, U.S.A). **Results:** Out of the 372 patients that participated in the study, 145(39.0%) were positive for HBsAg. Females were found to be more infected 41.1% (86/209) than males 36.2%(59/163) with no significant difference ( $\chi^2 = 0.94$ ,  $p = 0.331$ ). The age group > 50 years had the highest prevalence, 58.6% (17/29), while the lowest prevalence was observed in the 10-19 years old (30.8%). No significant difference was observed in the seroprevalence of HBsAg among the different age groups ( $\chi^2 = 8.62$ ,  $p=0.125$ ). With regards to the educational status and occupation of the patients, seroprevalence of HBsAg was significantly higher in patients that had no formal education, 84.6% ( $\chi^2 = 32.04$ ,  $p=0.000$ ) and those whose occupation is farming, 75.0% ( $\chi^2 = 46.10$ ,  $p=0.000$ ). Nostatistically significant difference was observed in the prevalence of HBsAg between the different blood groups of the patients ( $\chi^2 = 4.43$ ,  $p = 0.350$ ). With

regards to packed cell volume (PCV) a statistically significant difference was observed in HBsAg prevalence and PCV of the patients ( $\chi^2 = 9.31$ ,  $p = 0.002$ ). **Conclusion and Recommendations:** HBV infection is endemic in Makurdi and efforts should be made to step up health education campaign and interventional mechanisms which should include immunization of the populace and subsidized screening.

**Keywords:** HBV, patients, seroprevalence, HBsAg, Makurdi, Benue State.

## INTRODUCTION

Hepatitis is an inflammation of the liver which could be caused by certain virus (viral hepatitis), drug or alcohol. It constitutes an important public health problem worldwide. It is one of the major infectious diseases to which a large population is exposed [1].

Hepatitis B is caused by the hepatitis B virus (HBV) a double stranded DNA virus of the family (Hepadnaviridae) the virion is spherical in shape and may attain a size of 42nm [2]. HBV infection is a serious global health problem affecting up to 2 billion people worldwide [3].

Africa has the second largest number of chronic HBV carrier rate after Asia, with over 50 million people being lifetime carriers. It has been estimated that over 12 million people will die due to hepatitis B induced liver disease, representing a 25% risk among carriers [4]. The sub-Saharan region is highly endemic with HBsAg carrier rates of 9-20%, whereas 56-98% of the adult population shows evidence of past exposure to HBV infection [5].

Currently about 18 million Nigerians are infected [6]. This infection constitutes a serious public health problem, its prevalence among patients is scarcely documented and as such, there may be possibilities of misdiagnosis which may further expose physicians and other health workers to great risk of being infected during handling of such patients. Thus, this study was undertaken to determine the prevalence of Hepatitis B virus infection in relation to demographic factors such as sex, age, literacy level, occupation, blood group, marital status among hospitals' patients in Makurdi metropolis, Benue State, Nigeria.

## MATERIALS AND METHODS

### Study Area

The research was carried out in Makurdi metropolis of Benue State, Nigeria located at longitude 6<sup>o</sup>28'E and latitude 7<sup>o</sup>14'N of the Guinea savanna zone in central Nigeria.

### Blood Sample Collection and Patients' Enrollment

Prior to the commencement of the study permission was obtained from hospitals' management and individual consent was

obtained from all the participants. Blood samples were collected and screened for HBsAg from 372 patients (163 males and 209 females). Demographic and other factors such as age, sex, marital status, history of blood transfusion, blood group were obtained using structured questionnaire.

### Serological Assay

Blood samples were assayed using the HBsAg serum/plasma strip method. About 5 ml of blood sample was collected by venipuncture from each subject in an EDTA tube. The blood samples were left to clot after which sera were separated from the clotted by centrifugation. Antibodies to HBsAg was determined using rapid kit with double sandwich antibody procedure. The test was carried out according to the manufacturers' instructions.

### Statistical Analysis

Data collated were double entered in Microsoft Excel and SPSS for windows version 18.0 for analysis. Chi-square test was used to compare prevalence between variables and  $p < 0.05$  was considered significant.

## RESULTS

**Table 1** shows the overall seroprevalence of HBsAg in relation to demographic factors among hospitals' patients in Makurdi, Benue State, Nigeria. Out of the three hundred and seventy two (372)

patients that participated in the study, 145(38.9%) were seropositive for hepatitis B surface antigen (HBsAg). Females had higher prevalence, 86(41.1%) than male, 59(36.2%) though no statistically significant result was observed ( $\chi^2 = 0.94, p = 0.331$ ).

The seroprevalence of HBsAg in relation to age groups among hospital patients showed that the age group >50 years recorded the highest prevalence rate with 16 (61.5%), while the lowest prevalence was observed in the 10-19 years with 12(30.8%). No significant difference was observed in the prevalence of HBsAg between the age groups ( $\chi^2 = 8.62, p = 0.125$ ). With regards to educational status, patients with no formal education had the highest prevalence rate with 11(84.6%), while the least prevalence rate was observed in those that had tertiary education, 49 (29.2%). A statistically significant difference was observed in the prevalence of HBsAg and educational status of the patients ( $\chi^2 = 32.04, p = 0.000$ ). With regards to occupation of the patients, the highest prevalence was observed among farmers, 21(75.0%), while the least was observed among students, 44(24.9%). A statistically significant difference in prevalence of HBsAg was observed among occupation of patients ( $\chi^2 = 46.10, p = 0.000$ ). The seroprevalence of HBsAg in patients with respect to their marital status

shows a high prevalence among singles, 23(82.1%) while the least prevalence was observed among the married, 56(31.8%). A statistically significant difference was observed in the prevalence of HBsAg between singles and married participants ( $\chi^2 = 29.18, p = 0.000$ ). **Table 2** shows the seroprevalence of HBsAg in relation to blood groups and PCV among hospitals' patients in Makurdi. Patients having blood group B recorded the highest prevalence rate, 40(46.5%) and the least prevalence was recorded among those having blood

group A, 25(30.9%). Nosignificant difference was observed in the prevalence of HBsAg between the different blood groups of the patients ( $\chi^2 = 4.43, p = 0.350$ ). With regards to the PCV, patients with PCV <30 had a prevalence rate of 21(63.6%), while those with PCV >30 had a prevalence rate of 123(36.5%). Astatistically significant difference was observed in the prevalence of HBsAg between the two PCV ( $\chi^2 = 9.31, p = 0.002$ ).

**Table 1: Seroprevalence of HBsAg in relation to socio-demographic factors among hospitals' patients in Makurdi, Benue State, Nigeria**

Factors	No screened	No positive	(%)	$\chi^2$ -value	<i>p</i> -value
<b>Sex</b>					
▪ Male	163	59	(36.2%)	<b>0.94</b>	<b>0.331</b>
▪ Female	207	86	(41.1%)		
▪ <b>Total</b>	<b>372</b>	<b>145</b>	<b>(38.9)</b>		
<b>Age</b>					
▪ 10-19	39	12	(30.8)	<b>32.04</b>	<b>0.000</b>
▪ 20-29	169	59	(34.9)		
▪ 30-39	90	37	(41.1)		
▪ 40-49	45	20	(44.4)		
▪ $\geq 50$	29	17	(58.6)		
<b>Educational status</b>					
▪ No formal education	13	11	(84.6)	<b>46.10</b>	<b>0.000</b>
▪ Primary	38	26	(68.4)		
▪ Secondary	153	59	(38.6)		
▪ Tertiary	168	49	(29.2)		
<b>Occupation</b>					
▪ Civil service	76	27	(35.1)		
▪ Farming	28	21	(75.0)		
▪ Trading	75	45	(60.0)		
▪ Housewife	15	7	(46.7)		
▪ Student	177	44	(24.9)		
<b>Marital status</b>					
▪ Married	176	56	(31.8)		
▪ Single	28	23	(82.1)		
▪ Widow/widower	25	14	(56.0)		
▪ Divorced	143	52	(36.4)		

**Table 2: Seroprevalence of HBsAg in relation to blood groups and packed cell volume (PCV) of hospitals' patients in makurdi, Benue State, Nigeria**

Parameters	No screened	No positive	(%)	$\chi$ -value	p-value
Blood groups				<b>4.43</b>	<b>0.350</b>
▪ A	81	25	(30.9)		
▪ B	86	40	(46.5)		
▪ AB	85	34	(40.0)		
▪ O	120	46	(38.3)		
PCV				<b>9.31</b>	<b>0.002</b>
▪ < 30	33	21	(63.6)		
▪ > 30	339	124	(36.5)		

## DISCUSSION

High endemicity from HBV infection has been defined as HBsAg greater than 8% [7, 8]. Seropositivity of 38.9% among hospitals' patients in Makurdi shows that the area is highly endemic for HBV infection. This finding is higher to that of [9] who found 11.0% among pregnant women only in Makurdi. Seroprevalence of HBsAg observed in this study is also higher than 4.7% reported by [10] among apparently healthy pregnant women in Akure, Southwest Nigeria. In this study, our result was higher than earlier reports from communities and hospital based studies in some parts of Nigeria which showed high prevalences ranging from 7.4%-26.0% [11]. Compared to other African countries, seroprevalence of HBV in this study was higher than 8.2% reported by [12] in eastern Sudan, 15.5% reported by [13] among students in Bangui capital of the Central African Republic, 5.4% reported by [14] in Shashemene General Hospital, South Ethiopia.

Sex related prevalence of HBsAg showed that seropositivity of HBsAg was slightly higher in females than males but with no significant difference, this may be explained by multiple sexual partnerships and promiscuity which could be habits occurring in both sexes. This finding is at variance with reports of an earlier study conducted by [15] on blood donors who found a higher infection rate in males than in females. This study which surveyed a more generalized section of the population could therefore be more reflective of infection rates among the gender.

The highest rate in singles and widows/widowers could be that they indulged in sexual activities with multiple partners. This finding corroborates results of [16] who found 11.1% among pregnant widows in Anambra State. High prevalence recorded among those who have no formal education (illiterates) could be as a result of lack of awareness and inability to read and understand preventive and curative measures [17].

## REFERENCES

- [1] Hou J, Liu Z and Gu F, Epidemiology and prevention of hepatitis B virus Infection, Intl. J. Med. Sc, 2(1), 2005, 50-57.
- [2] Jawetz, Melnick, Adelberg's. Medical microbiology, 23<sup>rd</sup> Edition, University Press, Asia: McGraw-Hill, 2004, 446-487.
- [3] Davey S, State of the world's vaccines and immunisation, WHO, Geneva, 1996, 76-82.
- [4] Kiire CF, The epidemiology and prophylaxis of hepatitis B in sub-Saharan Africa: a view from tropical and subtropical Africa, *Gut*, 38: 1996, S5-12.
- [5] Alter M, Epidemiology of hepatitis B in Europe and worldwide, *J. Hepatol*, 39, 2003, S64-S69.
- [6] Jombo GTA, Egah DZ and Banwat EB, Hepatitis B Virus infection in a rural settlement of Northern, Nigeria. *Nig. J. Med*, 14 (4), 2005, 425-428.
- [7] World Health Organization [WHO]. Hepatitis B: World Health organization, fact sheet 204, 2000. <http://www.who.int/mediacentre/factsheets/fs204/en/>
- [8] Uneke CJ, Ogbu O, Anyanma GI, Njoku MO and Idoko JH, Prevalence of hepatitis B surface antigen among blood donors and human immunodeficiency virus infected patients in Jos, Nigeria, *Mem. Inst. Osw. Cruz*, 100 (1), 2005, 13-16.
- [9] Mbaawuaga EM, Enebeaku MNO, Okopi JA, Damen JG, Hepatitis B virus (HBV) infection among pregnant women in Makurdi Nigeria, *Afr. J. Biomed. Res*, 2008, 155-159.
- [10] Ojo OO and Anibijuwon II, Determination of antibodies to hepatitis B virus in pregnant women in Akure, Ondo State, Nigeria, *Contl. J. Microbiol.*, 3, 2009, 6-10.
- [11] Ekpo M, Sasegbon H and Oyewole F, HIV and HBV serostatus of non-intravenous drug users in Lagos, Nigeria. *Nigerian Med. J.*, 29, 1995, 35-36.
- [12] Abdallah TM, Mohamed MH and Ali AA, Seroprevalence and epidemiological factors of hepatitis B virus (HBV) infection in Eastern Sudan, *Intl J. Med. Med. Sc.*, 3(7), 2011, 239-241.
- [13] Komas NP, Bai-Sepou S, Manirakiza A, Léal J, Béré A, Le Faou A, The prevalence of hepatitis B virus markers in a cohort of students in Bangui, Central African Republic, *BMC Infect. Dis*, 10,

- 2010, 226. <http://www.biomedcentral.com/1471-2334/10/226>.
- [14] Asfaw N, Zufan S and Girmay M, Prevalence of hepatitis B surface antigen (HBsAg) among visitors of Shashemene General Hospital voluntary counselling and testing center, BMC Res. Notes, 4, 2011, 35. <http://www.biomedcentral.com/1756-0500/4/35>.
- [15] Aernan PT, Sar TT and Torkula SH, Prevalence of Plasmodia and hepatitis B virus co-infection in blood donors at Bishop Murray Medical Centre, Makurdi, Benue State, Nigeria, As. Pac. J. Trop. Med., 2011, 412-420.
- [16] Ezezbudo CN, Agbonlahor DE, Nwosu GO, Igwe CU, Agba MI, Okpala, H.O. and Ikaraoha CI, The seroprevalence of hepatitis B antigen and human immunodeficiency virus among pregnant women in Anambra State, Nigeria, Shiraz-E Med. J., 5(2), 2004, 115-120.
- [17] Kerkar N, Hepatitis B in children: complexities in management. *ediatr. Transplant*, 9(5), 2005, 685-691.