



## OCCUPATIONAL AND AGE RELATED RISK FACTOR OF HEPATITIS B PREVALENCE AMONG STAFF MEMBERS OF NIGER STATE COLLEGE OF EDUCATION MINNA.

A.I. Jibrin<sup>1</sup>, I.C.J. Omalu<sup>2</sup>, I.K. Olayemi<sup>2</sup>, B. Yusuf<sup>1</sup>, A.C. Ukubuiwe<sup>2</sup>, B.E. Nuhu<sup>1</sup>, and K. Oyibo-Usman<sup>2</sup>

<sup>1</sup>Department of Integrated Science, Niger State College of Education, Minna, Nigeria.

<sup>2</sup>Department of Biological Sciences, Federal University of Technology, Minna, Nigeria.

### Abstract

*Hepatitis B poses a major threat to public health worldwide, Nigeria inclusive. Empirical research has been carried out to assess the occupational and age related risk factors of Hepatitis B prevalence among staff members of Niger State College of Education Minna. The design of the study was experimental; the staff members of Niger State College of Education constituted the study population. Blood samples were taken from 97 staff constituting of 44 academic staff and 53 non academic staff 58 of whom were males and 39 were females. The subjects were screened for Hepatitis B virus using the in vitro diagnostic kit. Chi square and percentages were used to analyze the data. The infection was significantly influenced by age groups, to this end the younger age group 22 – 26 years with 1(14.29%) and the older age group 54 – 59 years with 2(16.66%) were the only groups infected. Both academic and non academic staff were infected with prevalence of 1(2.27%) and 2(3.77%) respectively. Interestingly, all the infected subjects were the males. It is hoped that the findings of this study will help in putting the epidemiology of Hepatitis B in a clearer perspective, thus strengthening existing structures for controlling the disease.*

**Keywords:** Hepatitis, Infection, Epidemiology, Public health

### 1.0. Introduction

Viral Hepatitis is a systematic disease caused by Virus A-E that mostly invades the liver (Brooks *et al.*, 2007). Hepatitis B is an inflammation of the liver, characterized by the presence of an inflammatory cell in the tissues of the organ. The Pathogen is a double-stranded DNA virus of Family *Hepadnaviridae* (Brooks *et al.*, 2007). Hepatitis Virus is found in the blood and other fluids from where it is transmitted from person to person. Identified routes of transmission of the virus include the vertical transmission (through childbirth), early life horizontal transmission (through bites, lesions and poor sanitary habits) and adult horizontal transmission (through sexual contact, intravenous drug abuse) (Cluster *et al.*, 2004).

Hepatitis Virus accounts for 400 million chronic infections worldwide (Alter, 2006). More than 2 billion people are infected, with 350 million of them being asymptomatic carriers of the Virus (Coopstead, 2010). Since a large number of the carries do not realize their infection status, the disease is usually referred to as 'silent killer' (Samuel *et al.*, 2004). The infection kills more than 1 million



carriers annually with mortality generally associated with complications of the Cirrhosis, Hepatocellular carcinoma and rarely fulminant liver failure during acute infection (Coopstead, 2010). Hepatitis prevalence rates of 1.6% has been reported in Saudi Arabia, 5.6% in Khartoum, 2.1% in Northern Turkey, 1.5% in Libya and 3.7% in Ethiopia (Pennap *et al.*, 2001). Nigeria is classified among the group of countries epidemics for Hepatitis B infection with current infected population of 18 million, resulting in about 1 million death annually (Pennap *et al.*, 2001). The prevalence rate differ from place to place in Nigeria. A prevalence rate of 11.1% was reported among pregnant women in Markudi (Mbaawuaja *et al.*, 2008), 11.6% from Maiduguri (Harry *et al.*, 1994), while a prevalence rate of 8.2% was reported in Northern Nigeria (Olokoba, 2011). Since this disease poses a major threat to public health and information on its prevalence in North – Central in general and Minna in particular, is scanty, this study was carried out to assess the level of infection at the Niger State College of Education, Minna, Nigeria.

## 2.0. Description of the Study

The study was carried out at Niger State College of Education which is the only State owned College of Education, situated in Minna, the State capital. Minna is located within longitude 6°33' and latitude 9°31'N covering a land area of 88km<sup>2</sup>, temperature, relative humidity and rainfall of 20°-30°C, 61.00% and 1334.00mm respectively. The climate presents two distinct seasons: a rainy season (April - October) and dry season (November - March). The ethnic groups in Minna are dominated by Gbagy, Nupe, Hausa/Fulani. A sizeable number of the residents of the city are civil servants especially in Educational establishments ranging from primary to tertiary institutions. The State College of Education where the samples were collected is located within the metropolis and employs staff from diverse ethnic and socio-cultural backgrounds.

### 2.1. Population Size and Sample Collection

The population from which the samples were collected for the study was the entire staff members of Niger State College of Education (NSCE) Minna. From this population a total of 97 staff made of 44 academic and 53 non-academic staff were sampled for blood specimens. Blood samples were collected from the subjects using sterile syringe and needles after the techniques of Omalu *et al.* (2012). Collected blood samples were transferred to EDTA bottles and preserved in a freezer below 0.00°C, until needed for further analysis. Oral questionnaire was adopted in obtaining information regarding employment cadre, age, and sex of the subjects.

## 3.0. Material and Methods

### 3.1. Ethics Clearance

All work was performed according to guidelines for experimentation in clinical research outlined by the Federal Ministry of Health in Nigeria. This exercise was followed by detailed explanation of the research to the subjects in their respective languages of understanding, after they willingly gave their informed consent.



### 3.2. Serological Examination of Blood Samples

The blood samples were analyzed for Hepatitis B surface antigen (HBsAG) using invitro diagnostic biotech (USA) as described by Omalu *et al.* (2012).

### 3.3. Data Analysis

Collected data were processed as percentage proportions and analyzed using SPSS version 10.1 for windows. Descriptive statistics were computed for all relevant data. Chi square were used to compare proportions within and among groups for statistical significance.

### 4.0. Results

Table 1 shows the sero-prevalence of Hepatitis B surface antigen among staff of Niger State College of Education with respect to employment cadre. Both academic and non academic staff were infected with Hepatitis B, resulting in all aggregation prevalence rate of 3.09% among the subjects tested. However, higher Hepatitis infection rate of 3.77% was recorded among non academic staff than the academic staff, who were infected at the rate of 2.27%. The relationship between staff age and Hepatitis B infection among the subjects is represented in Table 2. Hepatitis B infection was only recorded among two age groups investigated, namely: age groups 22 – 26 years and 54 – 59 years. While, Hepatitis B infection rate was 14.29% among staff aged 22 – 26 years as much as 16.66% at those within 54 – 59 years were infected with the virus. Sex-wise distribution of Hepatitis B infection among staff members of staff Niger State College of Education is highlighted in Table 3. All infected members of staff were of Male sex. On the whole, 5.17% of the males sampled harbored Hepatitis B Virus in their blood.

**Table 1: Sero-prevelence of Hepatitis B surface antigen (HBsAG) among staff members of Niger State College of Education Minna, in relation to employment cadre**

Employment cadre	No examined	No +ve	% +ve
Non Academics	53	02	3.77
Academics	44	01	2.27
Aggregate	97	03	3.09



**Table 2: Age distribution of Hepatitis B surface antigen (HBsAG) infection among staff of Niger State College of Education Minna**

Age group	No examined	No +ve	% +ve
22 – 26	07	01	14.29 <sup>a</sup> ☒
27 – 31	10	0	0.00 <sup>b</sup>
32 – 36	19	0	0.00 <sup>b</sup>
37 – 41	29	0	0.00 <sup>b</sup>
42 – 47	13	0	0.00 <sup>b</sup>
48 – 53	06	0	0.00 <sup>b</sup>
54 – 59	12	02	16.66 <sup>a</sup>
60 – 65	01	0	0.00 <sup>b</sup>
Aggregate	93	03	3.09

☒ Values followed by same superscripts alphabet in the column are not significantly different at  $p > 0.05$ .

**Table 3: Hepatitis B infection rate between male and female staff members of Niger State College of Education, Minna**

Gender	No examined	No +ve	% +ve
Male	58	03	5.17 <sup>a</sup> ☒
Female	39	0	0.00 <sup>b</sup>
Aggregate	97	03	3.09

☒ Values followed by different superscript alphabets are significantly different at  $p < 0.05$ .

## 5.0. Discussion

The result of this study has revealed Hepatitis B infection among the staff members of Niger State College of Education Minna. The finding is consistent with those of Omalu *et al.* (2012) who found similar infection of the virus among pregnant women in study area. The finding also confirms the earlier report of Pennap *et al.* (2001) who classified Nigeria amongst Hepatitis – endemic countries of the World. The overall Hepatitis infection rate of 3.09% among the subjects is consistent with those report of Pennap *et al.* (2001) who reported infection rate of 3.7% and 2.1% in Ethiopia and Northern Turkey respectively. However, the infection rate obtained in this study differed consistently from the lower rate of 1.6% and 1.5% reported for Saudi Arabia and Libya respectively; as well as the higher rate of 5.6% in Khartoum (Pennap *et al.*, 2001). The wide variations in prevalence rates of Hepatitis from one locality to another may be due to differential pathogen intensity in the human population



(Mbawuaja *et al.*, 2008), as well as, poor sanitary and behavioral habit of the people (Cluster *et al.*, 2004).

Hepatitis infection among the staff members cuts across both the non academic and academic employment cadre, though higher among the former than the latter cadre. This finding probably suggests that job type may not influence peoples level of awareness and hence, infection with Hepatitis B. The infection rate of Hepatitis among the subjects was significantly influenced by age. To this end, the younger age group of 22 – 26 years as well as the older subjects who were 54 – 59 years old were the only group infected with the Virus. This observation may be due to the immature immune system of the younger group (ages 22 – 26 years) and the waned immunity of the old aged subjects (ages 54 – 59 years). The result equally indicated sex bias with respect to Hepatitis B infection among the subjects as the males were the only ones infected. This may be due to the differential resistance immunity against the virus by the male and the female sexes; also it may be due to the fact that one sex is better informed about the risk of infection or avoids life styles that predispose one to Hepatitis B infection.

## 6.0.Conclusion

The findings of this study revealed Hepatitis B infection among staff members of Niger State College of Education Minna. The infections were significantly influenced by sex and age of the subject. This is an indication of existing risk factors that predisposes people to Hepatitis B in Minna. This finding therefore requires urgent intervention of Governmental and non-governmental organizations with respect to public enlightenment about Hepatitis B, as well as mass vaccination of the populace against the disease. It is hoped that the findings of this study will help in putting the epidemiology of Hepatitis B in a clearer perceptive, thus strengthening existing structures for controlling the disease.

## Acknowledgement

The authors gratefully acknowledge the encouragement from the management of Niger State College of Education, Minna, and the assistance of the technologists and nurses of the College clinic and also sincerely appreciate the cooperation from all members of the College community.

## References

- Alter, M.J. 2006. Epidemiology of Viral Hepatitis and HIV Co-Infections. *Hepatology*. 44:56-59.
- Barker, L.F.T. Courval, J. Mysuwanherd, W., Rimwngtragon, K., Wirth, D.F. 1996. Transmission of serum Hepatitis. *Journal of the American Medical Association*, 276 (10): 841-844.
- Brooks, G.F., Carol, K.C., Butel, J.S., Moises, S.A. 2007. *Medical microbiology*, 24th Edition, International Edition, McGraw Hill Publishers, New York, U.S.A.
- Chang, M. 2008. Hepatitis B virus infection. *Seminars in fatal and neonatal medicine* (2) :160 -167.



- Cluster, S.J., Huzlet, T., Ibeje, V.D., Kowdley, K. 2004. Global epidemiology of Hepatitis B virus. *Journal of Clinical Gastroenterology*, 38: 158-168.
- Coopstead, L.E. 2010. *Pathophysiology*. Missouri: Saunders. pp.886-887. ISBN 978-1-4160-5543-3.
- Harry, T.O., Bajani, M.O., Mosse, A.E. 1994. Hepatitis B virus infection among blood donors and Pregnant woman in Maiduguri, Nigeria. *African Medical Journal*, 71: 56.
- Hodges, G.R., Harry, T., Anderson, A.C. 1998. "Acceptance of Hepatitis B Vaccine among High Risk Health Care Workers- *American Journal of Infection Control*, 11:202-211.
- Mbaawuaga, E.M., Ebenebeahu, M.N., Okopi, J.A., Damen, J.G. 2008. Hepatitis B Virus (HBV) among Pregnant Women in Makurdi, Nigeria. *African Journal of Biochemical Research*, 11:155-9.
- Omolu I.C.J, Jibrin A.I, Olayemi I.K, Hasssan S.C, Mabmena A., Adeniran L.A. 2012. Seroprevalence of malaria and Hepatitis B (HBsAG) with associated risk factors among pregnant women attending antenatal clinic in General Hospital Minna, North Central Nigeria. *Annual Review and Research in Biology, Science Domain International*, 2(4): 83 – 88.
- Pennap, N. J., Barret, D. H., Bond, W. W., Bequest, K. R., Farew, M.S. Bender, T.R. 2011. Hepatitis B surface antigen in saliva, impetiginous lesions, and the environment in two Arabian villages. *Applied Environmental Microbiology*, 32: 572574.574.
- Samuel, F.K., Ahmad, M. Damen, J.G. 2004. Seroprevalence and correlates of HIV, Syphilis, and Hepatitis B in Nigeria. *Journal of Tropical Medicine*, 6:15-21.
- Uyar, E.T., Mbaawuaga, E.M., Ebenebaku, M.N.O. 2011. Hepatitis B Virus (HBV) infection among Pregnant women in Northern Turkey. *Infectious Disease*, 8:119.