

# Occurrence of Hepatitis B and C among Patients Attending Specialist Hospital Gombe

<sup>1</sup>Wilson Hussaina Bodeno, <sup>2</sup>Lynn Maori, <sup>2</sup>Maikudi Haruna, <sup>3</sup>Samira David, <sup>4</sup>Emmanuel Peter and <sup>5</sup>Nuhu Mohammed,  
<sup>1</sup>Microbiology department, Gombe State University, Nigeria

<sup>2</sup>Laboratory Department, State Specialist Hospital Gombe, Nigeria

<sup>3</sup>Department of Microbiology, University of Jos, Plateau State.

<sup>4</sup>School of Health TechnologyKaltungo, Gombe State, Nigeria

<sup>5</sup>Snakebite Treatment and Research Hospital Kaltungo, Gombe State

Corresponding Author: Lynn Maori

**Abstract:** Risk of infection by hepatitis B (HBV) and C (HCV) viruses remains a challenge, to patients. It is often a major public health concern in low incomes countries. Hepatitis B and C virus infection is a major public health problem worldwide, while infection is high in the developing world particularly Asia and sub-Saharan Africa. This study is therefore aimed at estimating occurrence of Hepatitis B and C virus infection and its associated risk factors among patient attending Specialist Hospital Gombe. Samples from patients were obtained screened in the laboratory and were stored at room temperature by thawing and strips containing coated antigen to HBsAg kits removed from the foil. Cassettes were labeled according to samples. Using a separate disposable pipette, 2 drops of sample (plasma) was added into each test strip and allowed to run across the absorbent pad. Results were read after 15 minutes. Two controls were used in the test, where two red bands indicate positive; one band designates a negative test and no band at all means an invalid result. The occurrence of hepatitis B and C infection in 164 was estimated on plasma collected from the patients attending Specialist Hospital Gombe, using HBsAg and HCV test strips (ACON). The occurrence of HBV among patients was 37 out of 164 (22.5%), and also occurrence of HCV among patients was 11 out of 164 (6.7%). In both estimations' males were the ones that have the highest positive cases in HBV (12.8%) and (4.8%) in HCV. These findings were based on screening using rapid test kits, therefore there is need for further investigations using high techniques like DNA hybridization and PCR to confirm the findings.

**Keywords:** Infection, Hepatitis B, Hepatitis C, Occurrence, Plasma

## I. INTRODUCTION

Hepatitis (inflammation of liver cells) has been associated with the consumption of alcohol and certain drugs as well as been linked with the presence of infectious microbes. However, a group of unrelated and hepatotropic viruses (hepatitis A, B, C, D, and E) belonging to the family Hepatoviridae have been reported to be the leading cause of viral hepatitis which is estimated to be responsible for about million deaths in the year 2013. (Stanaway *et al.*,2013), Bulk of the morbidity and mortality associated with viral hepatitis are caused by hepatitis B and C viruses. (stanaway *et al.*,2013). Infections with hepatitis B and C virus are a major global health problem affecting 240 million people who suffer from chronic hepatitis B virus infections and about 150 million who suffer from hepatitis C virus (HCV) infections. In most cases, these viruses cause chronic infections whose natural course leads to liver cirrhosis, liver failure, and/or hepatocellular carcinoma in affected patients. In Nigeria, several prevalence figures have been reported for hepatitis B viral infection among different

study group or population. For the general populace, 10%–15%, among surgeons 25.7% (Belo *et al.*,2000), voluntary blood donors 2.9%, infants 16.3%, and 12.3% for HIV patients. (Hamza *et al.*, 2005). Reports for hepatitis C infections in Nigeria gave the following prevalence rate. About 2.1% for the general population. (karoney *et al.*, 2013), 12.3% for adult blood donors. (Halim *et al.*, 2000), 5% for sickle cell anemia patients. (lesi *et al.*, 2003), and 11% for doctors and dentists. (Ejiofor *et al.*, 2010).

## AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to determine the occurrence of viral hepatitis B and C and the risk Factors for infection among patient attending specialist Hospital Gombe State.

## SPECIFIC OBJECTIVES

1. To determine the occurrence of viral hepatitis B and C among patient attaining specialist Gombe.
2. To determine the risk factors associated with Hepatitis B and C among the study population.

## STATEMENT OF THE PROBLEM

The World Health Organization (2000); reported that liver inflammation (hepatitis) kills over 1.4 million people worldwide annually. Hepatitis viruses can cause permanent liver inflammation and leads to hepatocellular carcinoma (HCC), one of the ten most common cancers globally. Viral hepatitis is one of the major public health problems throughout the world affecting several hundreds of millions of people. Viral hepatitis is a cause of morbidity and mortality in the human population, both acute and chronic sequel infection (WHO, 2000).

## JUSTIFICATION

Hepatitis B and C Virus infection is a pandemic and chronic that may lead to chronic liver diseases which are often lethal, this research was done to assess the status of Hepatitis B and C Virus, moreover Hepatitis B and C Virus is widely distributed worldwide. In Nigeria the rate at which hepatitis B and C Virus along with other diseases as co-infection, such as human immunodeficiency virus (HIV), pulmonary tuberculosis (PTB) are fully studied but given less attention, thus when this work is successfully carried out, the findings would assist to address and improve diagnosis in order to help in the prevention and reduction of the spread.

## SCOPE OF THE STUDY

This study determined the seroprevalence rate of hepatitis B and C among patients attending specialist Hospital Gombe. Other factors such as sex, age, marital status, occupational

status and educational status of the participants were also assessed.

**STUDY SITE**

The research was carried out at specialist Hospital within Gombe metropolis. Gombe State has a latitude of 10.283333° N and longitude of 11.166667° E in north eastern part of Nigeria to the population of 2,857,042. Gombe State share boundaries with Yobe to the North, Adamawa and Taraba to the South, Borno to the East and Bauchi to the west. (Julius, 2009).

**STUDY POPULATION**

A total of one hundred and sixty-four (164) Blood samples were collected from different patients attending Specialist Hospital Gombe.

**SAMPLE COLLECTION**

5ml of blood samples were aseptically collected from different patients attending Specialist Hospital Gombe, Gombe State, Nigeria.

**PRINCIPLE OF THE TEST**

This is a qualitative lateral flow chromatographic immunoassay. When an adequate volume of the test specimen is dispensed onto the sample pad of the test device, the specimen migrates by capillary action across the strip. The Antibody or Antigen if present in the specimen binds with its corresponding conjugated Antigen or Antibody on the test device (strip) thereby forming a reddish coloration in the presence of a chromogen.

**DATA COLLECTION PROCESS**

Data was collected using structured questionnaire based on the set criteria. Consent forms were duly signed before collecting the blood samples.

**STATISTICAL ANALYSIS**

The data generated was analyzed for statistical significance in the association of hepatitis B and C infection, demographical parameters as well as possible risk factors using Pearson Chi-Square with the aid of Statistical Package for Social Sciences (SPSS).

**ASSAY PROCEDURE**

Samples were brought to the laboratory and stored at room temperature by thawing and strips containing coated antigen to HBsAg kits removed from the foil. Cassettes were labeled according to samples. Using a separate disposable pipette, 2 drops of samples (plasma) was added in to each test strip and allowed to run across the absorbent pad. Results were read after 15 minutes. Two controls were used in the test, where two red bands indicate positive; one band designates a negative test and no band at all means an invalid result. (Monica, 2006).

**II. RESULT**

Table 1: % of occurrence of hepatitis B and C in patients attending Specialist Hospital Gombe.

	No. of positive	No. of negatives	No. screened	Percentage infected
HBV	37	127	164	22.5%
HCV	11	153	164	6.7%

The study investigated the occurrence of HBV and HCV among patients attending Specialist Hospital Gombe. The result obtained from the research were presented in the table 1 and 2.

Table 2: Age, Gender, Marital Status, Educational Status, Settlement, and Occupational Status based occurrence of hepatitis B and C

VARIABLES	NONE	HBS	HCV	TOTAL	P VALUE
<b>AGE GROUP</b>					
11-20	25(15.2%)	4(2.4%)	1(0.6%)	30	0.010
21-30	48(29.2%)	14(8.5%)	3(1.8%)	65	
31-40	24(14.6%)	15(9.1%)	3(1.8%)	42	
41-50	15(9.1%)	4(2.4%)	2(1.2%)	21	
51-60	2(1.2%)	0(0.0%)	1(0.6%)	3	
61-70	0(0.0%)	0(0.0%)	1(0.6%)	1	
70 above	2(1.2%)	0(0.0%)	0(0.0%)	2	
Total	116(76.7%)	37(22.4%)	11(6.6%)	164(100%)	
<b>GENDER</b>					
Male	65(39.6%)	21(12.8%)	8(4.8%)	94	0.563
Female	51(31.0%)	16(9.7%)	3(1.8%)	70	
Total	116(96.1%)	37(22.6%)	11(6.7%)		
<b>MARITAL STATUS</b>					
Single	59(35.9%)	17(10.4%)	3(1.8%)	79	0.004
Married	57(34.7%)	20(12.2%)	7(4.3%)	84	
Divorce	0(0.0%)	0(0.0%)	1(0.6%)	1	
Total	116(70.7%)	37(22.6%)	11(6.7%)	164(100%)	
<b>EDUCATIONAL STATUS</b>					
None	7(4.3%)	3(1.8%)	3(1.8%)	13	0.416
Primary	19(11.6%)	5(3.0%)	2(1.2%)	26	
Secondary	50(30.5%)	18(10.9%)	3(1.8%)	71	
Bachelor	39(23.8%)	10(6.0%)	3(1.8%)	52	
Above bachelor	1(0.6%)	1(0.6%)	0(0.0%)	2	
Total	116(70.7%)	37(22.6%)	11(6.7%)	164(100%)	
<b>SETTLEMENT</b>					
Rural	43(27.3%)	11(6.7%)	3(1.8%)	57	0.010
Urban	58(35.4%)	19(11.6%)	8(4.9%)	85	
Semi urban	15(9.1%)	7(4.3%)	0(0.0%)	22	
Total	116(70.7%)	37(22.6%)	11(6.7%)	164(100%)	
<b>OCCUPATIONAL STATUS</b>					
Manual Laborer	21(12.8%)	4(2.4%)	1(0.6%)	26	0.233
Skilled Laborer	8(4.9%)	7(4.3%)	3(1.8%)	18	
Manual business person	19(11.6%)	7(4.3%)	2(1.2%)	28	
Skilled business person	28(17.1%)	11(6.7%)	1(0.6%)	40	
Manual professional	6(3.7%)	2(1.2%)	1(0.6%)	9	
Skilled professional	15(9.1%)	3(1.8%)	3(1.8%)	21	
None	19(11.6%)	3(1.8%)	0(0.0%)	22	
Total	116(70.7%)	37(22.6%)	11(6.7%)	164(100%)	

## DISCUSSION

A total of 164 patient were screened during the study and among them the vast majority were male with 21(12.8%) while females are having 3(1.8%). It was observed that majority of the patient belongs to the age group of 31 to 40 years. (Table 2). Out of 164 of the sample studied, 37(22.5%) of them were found to be positive for HBsAg, and 11(6.7%) were found to be positive for HCV. (Table 1). In relation to marital status HBsAg shows high occurrence rate in married 20(12.2%) were HCV also shows high occurrence rate in married 7(4.3%). (Table 2). According to educational status, HBsAg showed that patients who are in secondary level has the highest number of positive cases 18(10.9%). And HCV also showed high number of positive cases in secondary level 3(1.8%). (Table 2). In relation to settlement, it was discovered that the occurrence of HBsAg is higher in patient who live in urban 19 (11.6%) and also HCV is high in patient who lives in urban 8(4.9%). (Table 2). On the other hand, the analysis of HBsAg and HCV According to educational status indicated that, the high occurrence of HBsAg was among skilled businessperson 11(6.7%). (Table 2).

The occurrence of 22.5% for HBsAg recorded in the study is lower than the figure reported by Elkanah *et al.* who recorded an occurrence of 26.37% for blood donors in Jalingo. (Elkanah *et al.*, 2010). This may be as a result of the difference in population studied, variation in methodology and sensitivity of diagnostic kits and gains made along the four-prong strategy developed by the World Health Organization which has ensured the registration of hepatitis-related cancer cases, creating national guidelines for prevention of infection in health-care workers, adopting universal vaccination, public awareness creation and screening all donated blood. (Musa *et al.*, 2015). Age group 31-40 years had the highest age based HBsAg prevalence of (9.1%). This finding is in agreement with (Malewe *et al.*, 2017), but in contrast to the report of Tula and Iyoha. (Tula *et al.*, 2015). The highest prevalence of HBsAg recorded for the subjects within 31-40 age group may be attributed due to sexual active nature of this group, illicit drug uses, body piercing, etc., which are risk factors associated with HBV transmission and are prevalent among this age group. This study report gave a statistically significant ( $P=0.010$ ) which is nation support by (Khan *et al.*, 2011). Sex-based HBsAg and HCV occurrence is high in males (12.8%) and (1.8%) but lack significant association ( $P = 0.563$ ). This finding agrees with Adoga, Tula and Iyoha. (Adoga *et al.*, 2010). but disagrees with Bwogi and Sule. (Bwogiet *et al.*, 2009). This may be due to multiple sexual partnership and polygamy, men having sex with men, and the care-free nature of men that allows for the sharing of sharps such as nail cutters and barbing clippers may be responsible for the sex-based prevalence recorded. Injectable drug usage is also more prevalent in males than in female. This may be a contributing factor. Educational based HBsAg in this study revealed that secondary level patient has the highest number of positive cases in HBV (10.9%) which is not in agreement with the work of (Eke *et al.*, 2011) this may be as a result of difference in population studied and settlement of the study. This report gave a statistically significant ( $P=0.416$ ) which is not significant. In relation to settlement this study revealed that patient from urban area has the highest percentage of HBV and HCV. In this study HBV has the highest positive case with (11.6%) and HCV has (4.9%) may be as a result of settlement area of the study is carried out This report gave a statistically significant ( $P=0.010$ ) which is significant. More ever our study revealed those patients that are married were more infected with both

HCV and HBV than single and divorce. This may be due to exposure to HBV risk factors such asexual intercourse, receiving unscreened blood or blood product and other intimate behavior that bring about the contact with body fluid of infected person (Vazquez *et al.*, 2013) This report gave a statistically significant ( $P=0.004$ ) which is significant. Occupationally the higher prevalence of HBV infection was found among skilled business persons, this may be due to the exposure of business person to multiple sex partners this agreed with the findings of (Zhang *et al.*, 2011) This report gave a statistically significant of ( $P=0.233$ ) which is not significant.

## CONCLUSION

This study revealed an overall occurrence of HBV to be 22.5% and HCV to be 6.7% among patients attending specialist hospitals Gombe. It's also shows that the highest occurrence of HBV and HCV infections was observed in Males than Females among patients. The finding was based on screening using rapid test strip kits; therefore, there is need for further investigation using other techniques like DNA hybridization and PCR to confirm the findings.

## RECOMMENDATIONS

- Government should design HBV and HCV awareness programme to help educate the poor masses.
- Government should fund HBV and HCV research so that HBV and HCV occurrence of different locations should be known, and treatment should be given to such populace immediately.
- Health workers should counsel blood donors on the risks of infecting others if not treated.
- All blood and blood products should be screened with sensitive techniques like ELISA based, before transfusion.
- Individuals should know their HBV and HCV status, if positive but asymptomatic, should seek Medical attention from time to time.

## References

- [1] Adoga, M.P., Gyar, S.O., Pechulono, S., & Bashayi, O.O., Emiaseyen, S.E., Zungure, T. (2010). *Hepatitis B virus Infection in apparently health urban Nigerians: Data from pre-vaccination tests. J Infect Dis* 397-400.
- [2] Amin, J., Law, M.G., & Bartlett, M. (2006). Causes of death after diagnosis of hepatitis B or hepatitis C infection: a large community-based linkage study. 368:938-945.
- [3] Bello AC, (2000). *Prevalence of Hepatitis B Virus Markers in Surgeons In Lagos, Nigeria East African Med. J.*, 77 (5):283-285
- [4] Bwogi, J., Braka, F., Makumbi, I., Mishra, V., Bakamutumaho, B., & Nanyunja, M. (2009) Hepatitis B infection is highly endemic in Uganda: Findings from a national serosurvey. *Afr Health Sci* 9(9):8-108.
- [5] Ejiofor, O.S., Emechede, G.O., Ijure, W.C., Ifeadike, C.O., & Ubajaka, C.H. (2010). *Hepatitis C virus infection in Nigerians. Niger Med J* 51(1):73-6.
- [6] Eke AC, Eke UA, Okafor CI, Ezebiah IU and Ogbuagu C (2011). Prevalence correlates and patterns of hepatitis B surface antigen in a low resource setting. *Virology* 2011; 8:12
- [7] Elkanah, O.S., Okoye, A.H., & Debby-Sambo, O.E. (2010). *Prevalence of hepatitis B surface antigen*

- among blood donors in Jalingo, Taraba state, Nigeria. *Niger J Parasitol* 2010; 34:138-42.
- [8] EMA. (2016). Reviews direct-acting antivirals for hepatitis C. 2016. Available at [http://www.ema.europa.eu/ema/index.jsp?curl=pages/human/referrals/Direct-acting\\_antivirals\\_indicated\\_for\\_treatment\\_of\\_hepatitis\\_C](http://www.ema.europa.eu/ema/index.jsp?curl=pages/human/referrals/Direct-acting_antivirals_indicated_for_treatment_of_hepatitis_C)
- [9] Halim, N.K.& Ajayi O.I.(2000). *Risk factors and seroprevalence of hepatitis C antibodies in blood donors in Nigeria. East Afr Med J.* 77(4):10-12.
- [10] Hamza, M., Samaila, A.A., Yakasai, AM., Musa, B., Musa, M.B., & Abdulkazaq, G.H. (2013). *Prevalence of hepatitis B and C virus infection among HIV infections in a tertiary hospital in North – Western Nigeria. Niger J Basic Clin Sci* 10(7):6-81
- [11] Julius Toba (2009). Pomp, as Gombe Monarch marks anniversary. *Nigerian Compass*
- [12] Karoney MJ and Siika AM. (2013). Hepatitis C virus infection in Africa: a review. *Pan Afri Med J.* 2013; 14:44
- [13] Khan, F., Shams, S., Qureshi, I.D., Israr, M., Khan, H., & Sarwar, M.T. (2011). *Hepatitis B virus infection among different sex and age groups in Pakistani Punjab. Virol J* 2(1):18-225.
- Lesi, O.A., & Kehinde, M.O. (2003). *Hepatitis C virus infection in patients with sickle cell anaemia at the Lagos university hospital. Niger Postgrad Med J* 10(7):9-8
- [14] Lesi OA, Kehinde MO, Oguh DN and Amira CO (2007). Hepatitis B and C infection in Nigerian patients with HIV/AIDS. *National Postgraduate Med J.* 2007; 14:129-33.
- [15] Musa, B.M., Bussell, S., Borodo, M.M., Samaila, A.A., & Femi, O.L. (2015). *Prevalence of hepatitis B virus infection in Nigeria, a systematic review and meta-analysis. Niger J Clin Pract* 18(1):63-72.
- [16] Stanaway, J. D., Flaxman, A.D., Naghavi, M., Fitzmaurice, C., Vos T, & Abubakar, I.(2013).The Global Burden of Viral Hepatitis from 1990 to 2013: Findings from the Global Burden of Disease Study, 83:1-8.
- [17] Tula, M.Y., & Iyoha, O. A. (2015). *Cross sectional study on the sero-prevalence of hepatitis B surface antigen (HBsAg) among apparently health student of a tertiary institution in North – Eastern Nigeria. Int J Trop Dis Health* 7(1):2-8.
- [18] Vazquez-Mantes JL, Covenio-Juarez MD, Montana-Estrada LF Attan M and Gomez-Dantez H. (2003). Seroprevalence of hepatitis B in pregnant women in Mexico, *salud publica mex.* 2003; 45:165-170.
- [19] World Health Organization, WHO, 2000, World Health Report, Geneva.
- [20] Zhang, Z.H., Wu, C.C., Chen, X.W., Li, X., Li, J., & Lu, M.J. (2011). *Genetic variation of hepatitis B virus and its significance for pathogenesis. World Journal of Gastroenterology.* 2(2):126-144.