VOL. 05 NO. 3,
AUGUST, 2024
E-ISSN 3026-8702
P-ISSN 3026-8745

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Clinical and Metabolism Studies (JCMS)

Prevalence of Hepatitis B Virus among Patients Attending Univrsity Health Clinic, Nassarawa State University, Keffi

***Aliyu, A.A., Abubakar, B. S. and Hussaini, F.A.**
Department of Zoology Science Nasarawa State University, Keffi.
Corresponding Author: *binmalikone@nsuk.edu.ng*

Abstract

Hepatitis B virus (HBV) is a viral infections that affects liver. The infection can be severe (chronic) that can lead to lifelong infection or death. This study aimed to determine the prevalence of Hepatitis B infection among patients attending unversity health clinic, Nassarawa state university, Keffi. Total of 120 blood samples were collected by trained Medical Laboratory Technologist in the university clinic through cubital vein bleeding after which, each sample was screened using Rapid Chromatographic Immunoassay strip as in accordance to manufacturer's instruction. Data obtained from questionnaire and the results of the laboratory analysis was analyzed. Out of the 120 samples examined, the overall prevalence of the infection 15(12.50%) was recorded. Basad on age group, highest prevalence with HBV fall between 21- 40 years 8(16.00%), followed by 1-20 years 4(10.00%) while the least was in 41 years and above 3(14.2%) however, in compring mean of the age groups, there is no statistical significant difference (P>0.05). On marital based, separated had the highest prevalence of HBV 5(20.83%) compared to married and single individuals 6(9.67%) and 4(11.67%) although, there is no statistical significant difference. Result as well reveal that the infection based on occupation, business men were having the hihest prevalence 5(14.700%) followed by students 7(14.00%) while least was recorded from civil servants 3(8.33%) however, there is no statistical significant difference between the three categories (p>0.05). Comparing the prevalence of the infection between

alcohol consumers and none alcohol consumers, result show that consumers had higher prevalence 7(18.91%) than none consumers 8(9.63%) and there is statistical significant difference between the mean ($p<0.05$). This findings emphasize the need for comprehensive public health measures to address the burden of hepatitis B in the communities around the university environment and treatment strategies should be put in place.

Keywords: Prevalence, Hepatitis B Virus, Patients, University Health Clinic.

Introduction

Viruses are microscopic organisms that can infect hosts, (humans, plants and other animals). They are small piece of genetic material Deoxyribonucleic Acid (DNA) or Ribonucleic Acid (RNA) enveloped inside of a protective shell called capsid (Abeles, 2014). RNA and DNA are two types of nucleic acids that play crucial roles in genetic information storage and protein synthesis in living organisms. DNA is a double-stranded molecule found in the nucleus of cells and contain the genetic instructions necessary for the development, functioning, and reproduction of all known organisms While RNA is a single-stranded molecule that involved in various cellular processes, including gene expression and protein synthesis (Albert, 2010). Viruses cannot replicate without the host, most common type of viruses includes Influenza viruses, human herpesviruses, human papillomaviruses, enteroviruses, flaviviruses, Human Immunodeficiency Virus , "Hepatitis viruses" etc. (Abeles, 2014). Virus usually get to the host through various routes through Air, Sexual intercourse, Body contact, fluids etc. (Louten, 2016). Hepatitis B virus is a member of the Hepadnaviridae family, the virus particle called (Dane particle virion), consists of an outer lipid envelope and an icosahedral nucleocapsid core composed of protein. The nucleocapsid encloses the viral DNA and a DNA polymerase that has reverse transcriptase activity similar to retroviruses (WHO, 2014). Eight HBV genotypes have been identified so far (A–H), which are also genetically related to various monkey viruses (CDC, 2007).

Hepatitis B virus infection is one of the major public health problems globally. According to World Health Organisation (WHO, 2021) an estimates of about 350 million people worldwide are living with hepatitis B and for most, testing and treatment remain beyond reach. The prevalence of HBV infection varies

geographically, with an estimated 2 billion people worldwide having evidence of past or present infection, and 257 million individuals being chronic carriers (Abdulkareem and Mohammed, 2023). In Nigeria about 90 millions are living with either hepatitis B or C accounting for 26% of the global total (Ajuwon, 2021). Hepatitis B viral infections can lead to chronic liver disease such as liver cirrhosis, hepatocellular carcinoma and may lead to serious complications if left untreated. The problem lies in the high prevalence of these infections worldwide and the potential long-term health consequences they can have (WHO, 2024). Many people with hepatitis virus infection are asymptomatic and do not know if infected, there may be symptoms during the acute phase of infection, and may also have symptoms with chronic infection. Typical symptoms of infection are Fever, loss of appetite, nausea and vomiting, abdominal pain, weakness and fatigue and joint pain. May also have symptoms of liver disease, including jaundice (yellowing of skin and the whites of eyes, dark-colored urine, Light or clay-colored poop and some case lead to swelling with fluid in belly, arms and legs, Center for Disease Control and Prevention (CDC, 2023). Therefore understanding the epidemiology and transmission patterns of hepatitis B viruses can help in the development of effective prevention and control strategies especially in the north central zone of Nigeria (Nasarawa state inclusively).

Materials and Method

About 3ml of blood sample was collected from the veins using a sterile needle and syringe into a plain tube and labelled with an identification number individuals. The collected samples were allowed to settle for about 5-10 minutes. Subsequently, the samples was centrifuged at 2000rpm for 5 minutes, sera of each sample was separated into pre-labelled plain containers and store at -10^0C before analysis.

Laboratory Investigation

A specific Hepatitis B (Healgen one step strips, Zhejiang Orient Gene Biotech Ltd, China) test kits were used in accordance to the manufacturer's instructions (Chen, 2021).

Test Procedure

Test strips were equilibrated to room temperature thereafter using sterilized Pasteur pipette, two drops of the serum was transferred to the absorbent pad on the test strip. The fluid was allowed to migrate for about 10 minutes for appearance of the test lines.

The result was then observed immediately and recorded for each sample collected separately (Majam *et al.,* 2021).

Data Analysis

The data obtained from questionnaire and the results obtained from laboratory analysis was analysed using Smith's Statistical Package (SPS). Descriptive statistics and pecentage nalysis was presented on tables. One-way analysis of variance and student t-test were employed to determine the significant differeces between the socio-demographic data and the HBV among patience. P-value of ≤ 0.05 was considered statistically significant at 95% confidence interval

Ethical Clearance

Approval to conduct the study was obtained from the Nasarawa State ministry of healthwhich was taken to director, Nasarawa State University health clinic to obtained permission to use their outpatients. All participants consented and their right were protected, they were adequtely informed of the process, purpose and objectives of the study. Participants' confidentiality and anonymity were ensured by handling all information carefully during and after the data collection.

Result

The present study presented result of prevalence of HBV infection among patients attending University health clinic Nasarawa State University, Keffi. Out of 120 samples examined for HBV, 15(12.50%) as the overall prevalence was recorded with the highest prevalence in age group between 21 – 40 years 8(16%) and least were recorded in both age group of 1 – 20 and 41 and above years 4(10%) and 3(10%) respectively with no statistical significant difference between the age groups ($p>0.05$) as it presented in table 1. In Table 2, the Evaluation based on marital status, result show that single and separated individuals recoded high prevalence of infection 4(11.76%) and 5(20.83%) respectively while least infection is in married individuals 6(9.67%) although, there is no statistical significant difference of infection between the mean of the three categories (married, separated an single) as ($P>0.05$). The prevalence of infection in relation to occupation, students and business men happen to have high prevalence of infection 7(14.00%) and 5(14.70%) respectively while civil servant reveal to have least infection 3(8.33%) however, there no statistical significant difference in infection between the mean of the three occupations ($P>0.05$) as it presented in Table 3.

Table 4 presented the prevalence of HBV infection in relation to residential status (Rural and Urban) where Urban residents show high prevalence 9(13.84%) compared to Rural with 6(10.91%) however, statistically there is no significant difference in prevalence between rural and urban residents (P>0.05).

Table 5 evaluated if there is association of HBV infection in alcohol consumption and the result showed that individuals who consumed alcohol have high prevalence compared to those who do not consume alcohol and statistically there is significant association in alcohol consumption with HBV infection (P<0.05)

Table 1: Prevalence of HBV in Realation to Age Group

Age Group	No. Examined	No. Positive	Prevalence (%)
1-20	40	4	10.00
21-40	50	8	16.00
41 and above	30	3	10.00
Total	**120**	**15**	**12.50**

P>0.05 (0.441)

Table 2: Prevalence of HBV in Realation to Marital Status

Marital Status	No. Examined	No. Positive	Prevalence (%)
Single	34	4	11.76
Married	62	6	9.67
Separated	24	5	20.83
Total	**120**	**15**	**12.50**

p>0.05 (0.376)

Table 3: Prevalence of HBV in Relation to Occupation

Occupation	No. Examined	No. Positive	Prevalence (%)
Students	50	7	14.00
Business	34	5	14.70
Civil servant	36	3	8.33
Total	**120**	**15**	**12.50**

P>0.05 (0.668)

Table 4: Prevalence of HBV Associated with Residential Status

Socio-Demographic (Residential)	No. Examined	No. Positive	Prevalence (%)
Rural	55	6	10.91
Urban	65	9	13.84
Total	**120**	**15**	**12.50**

P>0.05 (0.691)

Table 5: Risk Factors of Alcohol Associated to HBV Infection

Risk factors (Alcohol Consumption)	No. Examined	No. Positive	Prevalence
Yes	37	7	18.91
No	83	8	9.63
Total	**120**	**15**	**12.50**

P-value = 0.00462

Discussion

Infection with HBV is worldwide significant problem in public health with about 5% (300 millions), of world population has chronic infection of HBV, which is a major concerned. This current study reveal the overall prevalence of HBV infection of 12.50% which is relatively high. The finding is comparable to those pooled national prevalence of 12.1% - 13.6% in the general population and 11.5% among children reported by different meta-analytic studies in Nigeria Ajuwa *et al.,* 2019, Olayonka *et al.,* 2016 and Musa *et al.,* 2015. Intra country differences also exist with high prevalence values among students in the Northern Nigeria [9% in Jos (Peters *et al.,* 017); 11.4% in Maiduguri (Ajayi *et al.,* 2021); 12.5% in Zaria (Musa *et al.,* 2014) and 18.4% in Kaduna (Shevin, 2020)]. On the other hand, relatively low prevalence values were noted in Southern Nigeria [(1.2% in Calabar (Halim and Ajayi, 2020); 2.9% in Ibadan (Olayinka, *et al.,* 2016) and 6.5% in Ebonyi Ejiofor *et al.,* 2020)].

The high prevalence of infection within age group of 21 – 40 could be as a result of youth age that usually characterised with active sexual urge, exposure to social interactions, peer pessure etc. the key route of hepertitise virus transmisson from an infected individual to others is by fluid exchange that comprises mouth fluid (kissing, oral sex), genital fluid (sexual intercourse) etc. (Chen, 2021). According to Shapard *et al.,* (2016) the age group of 20 -33 show that the youth which are sexually active should be target for HBV infection since since sexual activity is one of the major risk factor associated with the infection.

The high prevalence recorded in business men and students might be as a result frequent interaction with multiple individuals, poor sanitation, lack of awareness about the risk associated to HBV infection etc. according to Oluwaseyi *et al.,* (2023) majority of people in Nigeria are at risk due to not taken precautionary measures such as good sanitation, reluctancy of people to know their HBV status in oder to be vaccinated and nonecare atitude coming in contact with people in markets or working places.

Conclusion

The study investigate the prevalence and determine some risk factors of hepatitis B virus among patients attending university health clinic. Poor knowledge of hepatitis B was observed with high prevalence among the participants especially yourth (with age group between 21-40 years) and business men of which majority were either not go to

school or had low level of helth education awareness. The study concluded that the prevalence of hepatitis B infection is high and participant with age group of 21-40 years were the predictors of HBVamong the study population.

It is believed that the study has provided relevant information to the university management on HBV and how it can be prevented and effectively managed if diagnosed. The finding emphasize the need for targeted interventions and increased awareness regarding Hepatitis B and C transmission and prevention in the university community. It is therefore recommended that immunization and health awareness programs that mitigate the transmissibility and clinical consequences of the viral pathogen in infected patients in communities should be advocated.

References

Abeles, S.R. and Pride, D.T. (2014). Molecular bases and role of viruses in the human microbiome. I Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7172398.

Assoumou, S.A., Paniagua, S.M., Linas, B.P., Wang, J., Samet, J.H. and Hall, J. (2020). Rapid versus laboratory-based testing for HIV and hepatitis C at a drug detoxification treatment center. *Journal of infectious diseases, **222(***53):76-83.

Alshabi, A., Fatima, N., Marwan, A., Oraibi, K.G. and Qubaisi, E.A. (2021). Epidemiology screening and genotyping analysis for Hepatitis B virus in Southwestern region of Saudi Arabia. *Journal Infection of Public Health **14***(2):187-192.

Aroldi, A., Lampertico, P., Montagnino, G., Passerini, P., Villa, M., Campise, M.R. and Lunghi, G. (2005). Natural history of hepatitis B and C in renal allograft recipients. *Transplantation,* **79:**1132-1136.

Ajuwon, B.I., Yujuico, I., Roper, K., Richardson, A., Sheel, M. and Ludbury, B.A. (2021). Hepatitis B virus infection in Nigeria. I retrieved from http://doi.org/10.1186/s12879.

Ajayi, B.B., Latbone, S., Igwegbe, I.U., Kida, I.M. and Goni, B.W. (2021). Serological detection of hepatitis B and D virus co-infection among patients attending a tertiary health facility at Maiduguri, Nigeria. *The Egyptian Journal of internal medicine* **33:**5.

Bigna, J.J., Amaugou, M.A., Asangbeh, S.I., Kenne, A.M., Noumegni, S.R.N, Ngo, M.E. *et all*. (2017). Seroprevalence of Hepatitis B virus infection in Cameroon. *A systematic review and meta-analysis Biomedical journal,* **7**(6):15-29.

Chen, B., Ma, Z., Xu, B., Chang, H., He, X. and Pei, L. (2021). Evaluation of seven rapid diagnostic tests for detection of hepatitis B and C virus antibodies in China. *journal of viral hepatitis*. **28**:657-63.

Centers for Disease Control. (2022). Hepatitis B preventions. I retrieved from
https://www.cdc.gov/hepatitis/hbv/index.htm.

Chuang, W.L., Dai, C.Y., Chang, W.Y., Lee, L.P., Lin, Z.Y., Chen, S.C. and Hsich, M.Y. (2015). Viral interaction and responses in chronic hepatitis C and B co-infected patients with interferon-alpha plus ribavirin combination therapy. **10**:125-133.

Center for Disease Control and Prevention (2021). Progressing hepatitis B prevention through universal infant vaccination China. *Morbidity and mortality weekly report*.**56**(18): 441-445. Chen, C.J., Wang, L.Y. and Yu, M.W. (2021). Epidemiology of hepatitis B virus infection in the Asia-Pacific region. *Journal of gastrointestinal and Hepatology,* **15**(2): 3-6.

European Centre for Disease Prevention and Control. (2018). Hepatitis B and C epidemiology in selected population groups in the EU/EEA.

Ejiofor, O.S., Emechebe, G.O., Igwe, W.C., Ifeadike, C.O. and Ubajaka, C.F. (2020). Hepatitis C virus infection in Nigerians. *Nigeria Medical Journal,* **14**(51):173-6.

Geta, M., Yizengaw, E., Getaneh, Z. and Getahun, T. (2021). Seroprevalence of hepatitis B virus infection among patients attending Addis Alem primary Hospital, Bahir Dar, Northwest Ethiopia. International journal of General medicinal, **14**:405-411.

Halim, N.K. and Ajayi, O. I. (2020). Risk Factors and sero- prevalence of Hepatitis C Antibody in Blood donors in Nigeria. *East Africa Medical Journal,* **77**(11):410-2.

Julie, S. (2023). Virus. I Retrieved from https://www.genome.gov/virus.

Kim, B.H. and Kim, W.R. (2018). Epidemiology of Hepatitis B Virus Infection in the United States. *Clinical liver disease*, **12**(1):1-4

Liaw, Y.F., Hen, Y.C., Sheen, I.S., Chien, R.N., Yeh, C.T. and Chu, C.M. (2014). Impact of acute hepatitis C virus and hepatitis B superinfection in patients with chronic hepatitis B virus infection. *Gastroenterology,* **126**:1024-1029.

Louten, J. (2016). Virus Structure and Classification. I Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7150055.

Lingani, M., Akuta, T., Ouoba, S., Sanou, A.M., Sogiyama, A. and Tarnagda, Z., *et al.,* (2018) High Prevalence of Hepatitis B infections in Burkina Faso. *BioMed central public health,* **18**(1):551

Malekzadeh, R., Khatibian, M. and Rezvan, H. (2018). Viral hepatitis in the world and Iran. *Journal of iran medical council,* **15**:183-200.

Oesterreicher, C., Hammer, J., Koch, U., Pfeffel, F., Sunder, P.G., Petermann, D. and Muller, C. (2015). Hepatitis B and Hepatitis C genome in peripheral blood mononuclear cells in patients undergoing chronic hemodialysis. *Kidney international*, **48**:1967-1971.

Oluwaseyitan, A.A., Olabiyi, H.O., Emmanuel, B., Joseph, N.I., Michael, A., Tolulope, O.B., Osaze, E., *et al.* (2020). HIV-hepatitis co-infection in a rural community in Northern Nigeria. *Pan African Medical Journal,* **36**:352.

Oluwaseyi, A.A., Folusho, A.A. and Oghenerobor, B.A. (2023).Knowledge, Risk level and Prevalence of Hepatitis B and C among Comercial Mini-busaDrivers in Ado-Ekiti, Ekiti Sate, Nigeria. *Enfermeria Global,* 71:390-406.

Omatola, C.A., Onoja, B.A. and Agama, J. (2020). Detection of Hepatitis B Surface Antigen among Febrile Patients in Ankpa, Kogi State Nigeria. *Journal of Tropical medicine,* **6**(11):20-28.

Ojule, A.C., Akani, C.I. and Opurum, H.C. (2021). Sero-prevalence of hepatitis C antibodies in pregnant women in Port Harcourt, Nigeria. *Port Harcourt Medical Journal,* **3**(17):00-01.

Oti, V.B., Tella, E.E., Atttah, A.A., Almustapha, F.Y. and Danjuma, E.D. (2021). Hepatitis B Virus Infection Prevalence among Patients in a Local Community Hospital in Nasarawa State, Nigeria. *Epidemiology international journal 2021,* **5**(4):00203.

Peters, Y.J., Ramyil, S., Freeman, D.D,. Isa, A.H. and Anzaku, A.S. (2017). Hepatitis B and C viral infections among clinical medical in Jos, North Central Nigeria. *Bingham Journal of Medicine* **1**(1):19-22.

World Health Organization. (2023). WHO Global Health Sector Strategy for the Elimination of Viral Hepatitis. 2016-2020NASCP and Nigeria Viral Hepatitis Strategic Plan: 2016-2020.

Shepard, C.W., Simard, E.P., Finelli, L., Fiore, A.E. an Bell, B.P. (2016). Hepatitis B Virus Infection; Epidemiology and Vaccination. *Journal of Health Research,* **2**(4):76-87.

Shevin, Z., Jatau, S.D., Mamman, A., Kandawa, A.J. and Bigwan I.E. (2020). Detection of Hepatitis c virus amongst pregnant women in Kaduna state. I retrieved from http://www.nigeriamedj.com/text.asp?2010/51/4/173/73290.

Tawiah, P.A., Yawson, A.A., Effah, E.S., Wiredu, K.A. and Oppong, K. (2021). Prevalence and risk factors of hepatitis B virus infection among medical laboratory science students in a Ghanaian tertiary institution. *Journal of Health Research,* **7**(2): 123-145.

World Health Organization. (2021). Global progress report on HIV, viral hepatitis and sexually transmitted infections I. retrieved from https://www.who.int/publications/i/item/97894.

World Health Organization (2022). Fact sheets of hepatitis B updated. I retrieved from https://www.who.int.

Ajuwon BI., Yujuico I, Roper K, RichardsonA, Sheel M, Lidbury BA. Hepatitis B virus infection in Nigeria: a systematic review and meta-analysis of data published between 2010 and 2019. BMC Infect

Olayinka, A.T., Oyemakinde, A., Balogun, M.S., Ajudua, A., Nguku, B., Aderinola, M., *et al.*, (2016). Seroprevalence of Hepatitis B Infection in Nigeria: A National Survey. American Journal of Tropical Medicine and Hygiene. 2016;95(4):902-907.

Musa BM, Bussell S, Borodo MM, Samaila AA, Femi OL. Prevalence of hepatitis B virus infection in Nigeria, 2000-2013: A systematic review and metaanalysis. Niger J Clin Pract 2015;18:163-72