

Detection of Hepatitis B and C Virus Infection among Students of Private Tertiary Institution in Southwestern Nigeria

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Background: Hepatitis is defined as the inflammation of the liver. It may be caused by autoimmune diseases or exposure to certain chemical agents such as drugs, herbs, dietary supplements and industrial toxins, or microbial agents such as parasites, bacteria, and viruses; majorly the hepatitis viruses. The hepatitis B virus-HBV (Family *Hepadnaviridae*) and hepatitis C virus-HCV (Family *Flaviviridae*) in particular, can cause acute and chronic hepatitis and are the leading causes for hepatic cirrhosis and cancer, thus creating a important burden to healthcare organizations due to the high morbidity/mortality and costs of management. HBV is 10 times more infectious than the HCV with many carriers not realizing they are infected with the virus, thus referred to as a “silent killer”. HBV can effectively be prevented by vaccination, here, a safe and effective HBV vaccine has been available since the 1980s and can prevent acute and chronic infection with an estimated 95% success. Whereas, there is no vaccine against HCV infection and a person with HCV can infect others from one to several weeks before symptoms begin to show up. These two hepatitis viruses (HBV and HCV) account for a substantial proportion of liver diseases worldwide and Nigeria belongs to the group of countries highly endemic for viral hepatitis. In Nigeria, HBV infection is hyperendemic and may be the highest in sub-saharan Africa. In Nigeria, 18.7% of liver cancer patients carry markers of HCV and it is said that the results of seroprevalence studies of HCV in Nigeria vary depending on the study population and also the geographical setting having higher rates along the eastern borders and some in Northern regions. Patients with dual HBV/HCV infection have a higher risk of progression to cirrhosis and decompensated liver disease and have an increased risk of hepatocellular cancer (HCC). Co-infected patients represent a diverse group with various patterns of viral replication and great variations of immune profiles. Because the two hepatotropic viruses share same modes of transmission (sexual intercourse, injections, needle stick, blood transfusion etc), co-infection with the two viruses is not uncommon, especially in areas with a high occurrence of HBV infection and among people at high hazard for parenteral infect. Patients with dual HBV and HCV infection have additional severe liver illness, and are at an augmented risk for evolution to hepatocellular carcinoma. Despite the level of public health awareness been created, many are yet to know their Hepatitis B and C virus infection status. Early detection of Hepatitis B and C virus infection can prevent liver diseases, including liver cancer. Howbeit, the percentage occurrence of Hepatitis B and C virus infection among undergraduate students of Babcock University is not known. Besides, there is a need to identify factors that predispose young adults in this setting to Hepatitis B and C virus infection. Scarcity of information in this regard, therefore, necessitates this study.

Aim: To determine the prevalence rate of hepatitis B and C virus infection and associated risk factors among undergraduate students of Babcock University.

Methodology: This descriptive cross-sectional study was carried between the months of April and June, 2017 after ethical approval (with registration number: BUHREC215/17) was obtained from the Babcock University Health Research Ethics Committee (BUHREC). Blood samples of 200 consenting participants, 96 males and 104 females (16-35 years) were randomly collected and screened using rapid diagnostic test kits. HBV markers were determined using a HBV 5 in 1 Panel cassette supplied by Innovita Biological Technology Co., Ltd., China; while antibody to HCV was detected using anti-HCV test strip supplied by Blue Cross Bio-Medical Co., Ltd., China. The demographic and clinical information of the participants were collected using structured questionnaires. The results were statistically analyzed using the Statistical Package for the Social Sciences software – Version 18.0 (SPSS-18.0). P values<0.05 was considered significant.

Results:

The outcome of this study shows that out of the 200 participants screened, 3 (1.5%) were positive for *Hepatitis B surface antigen* (HBsAg), 10 (5.0%) were positive for *Antibody to Hepatitis B surface antigen* (HBsAb), 3 (1.5%) were positive for *Antibody to Hepatitis B core antigen* (HBcAb), 2 (1.0%) were positive for *Antibody to Hepatitis B envelope antigen* (HBeAb) and none (0%) was positive for *Hepatitis B envelope antigen* (HBeAg) (Figure 1). 2 (2.1%) of the 96 males screened were positive for HBsAg, while only one (1%) out of the 104 females screened was positive for HBsAg. There was no significant difference ($P>0.05$) between the number of male and female students positive for HBsAg. On the basis of age scattering, data show that 3 (2.7%) out of the 110 students aged 16-20 years old were positive for HBsAg, while students in the other age groups were negative for HBsAg. Risk issues related with infection include: tattooing, history of blood transfusion and shared sharp objects. Fascinatingly, there was no record of mono-HCV infection, as well as co-HBV and HCV infection in this study.

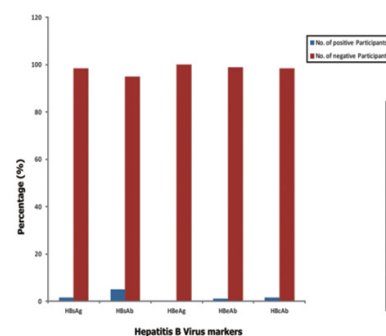


Figure 1: Histogram showing the Hepatitis B Virus Profile of the study participants

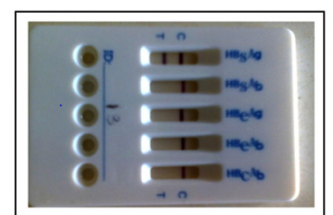


Figure 2: Hepatitis B Virus 5 in 1 Cassette showing a test positive for HBsAg, HBeAb and HBcAb

Conclusion: The outcome of this study showed that there was no record of HCV, as well as HBV/HCV co-infection among undergraduate students of Babcock University, however a low prevalence rate of HBV mono-infection (1.5%) exists. Following the outcome of this screening, we recommend the following: (1) Public health awareness with regard to HBV and HCV infection should be intensified and sustained by relevant stake holders, (2) HBV vaccination should be ensured and carried among students of higher institutions, (3) detection of HBV/HCV-DNA and determination of Viral Load should be attempted by future Researchers, (4) Where grants/funding is available, sensitive methods such as polymerase chain reaction (PCR), Enzyme Immuno Assay (ELISA) and Recombinant immunoblot assay (RIBA) should be used to screen and confirm the HBV and HCV status of the study population, (5) The serum liver enzymes such as alanine aminotransferase (ALT), aspartate aminotransferase (AST) and albumin levels should be determined for the positive individuals in order to determine hepatic involvement and the severity of damage to the liver, and lastly, (7) Positive individuals should visit the hospital for appropriate treatment.

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