

SJMLS - 8(1) - 005**Prevalence of Hepatitis B, C and D Infections in Preoperative Patients at a Tertiary Hospital in Southern Nigeria**

Joseph E. Udosen¹, Euphoria C. Akwiwu² *, Dennis A. Abunimye², Utibe-Abasi Felix², David U. Akpotuzor², Josephine O. Akpotuzor²

Department of Surgery, University of Calabar, Calabar, Nigeria¹, Department of Haematology and Blood Transfusion Science, University of Calabar, Calabar, Nigeria²

Author for Correspondence *: ecakwiwu@gmail.com / +234-803-677-7296 / ORCID Number: 0000-0001-6097-557X. <https://dx.doi.org/10.4314/sokjmls.v8i1.5>.

Abstract

Patients going for surgical operations are required to be screened for hepatitis B virus (HBV) and hepatitis C virus (HCV) infections among other transmissible infections. This is necessary for better assessment of the patient's condition alongside the need for extra precautions during surgery. Hepatitis D virus (HDV) infection is not commonly reported but occurs in association with that of hepatitis B virus. The epidemiology of this co-infection is worth investigating, as it constitutes a more aggressive form of hepatitis. Following due ethical considerations, this cross-sectional descriptive study enrolled 180 pre-operative patients for viral hepatitis screening. Immunochromatographic methods were used for detection of HBV and HCV infections, while detection of HDV was based on enzyme-linked immunosorbent assay method. Data processing was carried out using SPSS version 22.0. Results are presented as numbers and frequencies as percentage. The prevalence of HBV, HCV and HDV as recorded among pre-operative patients was 7.8%, 1.7% and 1.1% respectively. Hepatitis B virus alone accounted for 68.8% of all hepatitis cases, while its co-infection with HDV and HCV were observed to be 12.5% and 6.2% respectively. Single infection of HCV was seen to be 12.5% of all infected cases. Hepatitis B virus was observed to be the most prevalent viral hepatitis agent within the studied population, while hepatitis D virus was detected at a rate of 1.1%

Keywords: Hepatitis, virus, prevalence, nosocomial infection

Introduction

Hepatitis infections caused by viral agents are among the recognized transmissible infections of medical importance (WHO, 2020). Owing to their associated morbidity and mortality risks, efforts towards their prevention are strategically being deployed as seen in blood product screening, encouragement towards safe sexual practices as well as antenatal care for prevention of mother-to-child transmission (WHO, 2019; Alfred *et al.*, 2021; Akwiwu *et al.*, 2021). Moreso, patients going for surgical operations are required to be screened for hepatitis B and C among other transmissible infections. This is necessary for better assessment of the patient's condition alongside the need for extra precautions during surgery. The latter has a wider scope of consideration in terms of safety for involved health workers/caregivers and prevention of nosocomial spread. These preventive interventions are particularly of great importance considering that treatment options are quite limited with regards to viral hepatitis infections (WHO, 2022).

Most commonly reported of viral hepatitis agents in order of prevalence are hepatitis B virus and hepatitis C virus. The other variants such as hepatitis D virus and hepatitis E virus appear to be rare. While transmission of the latter is mediated by hygiene, HDV shares similar transmission patterns as HBV and HCV. In addition, it has been observed that hepatitis D virus infection occurs in association with that of hepatitis B virus (Mentha *et al.*, 2019; Niro *et al.*, 2021; WHO, 2022). This co-infection status is worth investigating in terms of the epidemiology since it constitutes a more

aggressive form of hepatitis as it relates to disease progression towards cirrhosis and liver decompensation (Rizzetto and Alavian, 2013; Ahn and Gish, 2014).

It is unfortunate that in our setting, known for poor funding of the health sector together with poor health-seeking behaviour from the populace, it is difficult to ascertain the presence of the so-called rare types from routine laboratory screening records of patients. There is no provision for the routine screening of HDV infection at present. This study, therefore, considered the screening of HBV, HCV and HDV infections in pre-operative patients at a tertiary hospital in Southern Nigeria with a view to observing the prevalence of these infections and the possible presence of HDV infection.

Materials and Methods

This cross-sectional descriptive study enrolled consenting pre-operative patients for viral hepatitis screening at University of Calabar Teaching Hospital, Calabar. Ethical approval was obtained from the Institution's Ethical Health Research Committee. Informed consent was obtained from each study participant.

The subjects were each screened for the presence of antibodies to HBV and HCV using immunochromatographic methods (Clinotech Diagnostics, Richmond, Canada). Detection of HDV was based on enzyme-linked immunosorbent assay method (BioAssay™, United States). Data processing was carried out using SPSS version 22.0. Results are presented as numbers and frequencies as percentage.

Results

This study on pre-operative hepatitis screening observed 19 infections in 16 participants out of a total of 180 enrolments. The prevalence of HBV, HCV and HDV as recorded among preoperative patients was 7.8%, 1.7% and 1.1% respectively. These figures summed up to a general prevalence of 10.6% for viral hepatitis among the study participants as shown in Table 1. Distribution of single and co-infections are shown in table 2. Hepatitis B virus alone accounted for 68.8% of all hepatitis cases, while its co-infection with HDV and HCV were observed to be 12.5% and 6.2% respectively. Single infection of HCV was seen to be 12.5% of all infected cases.

Table 1. Prevalence of HBV, HCV and HDV among preoperative patients

Hepatitis Agent	Number of Participants n = 180	Percent % = 100
HBV	14	7.8
HCV	3	1.7
HDV	2	1.1
Total	19	10.6

Table 2. Co-infection and single infection distribution of HBV, HCV and HDV

Hepatitis Agent	Number of Infected Persons n = 16	Percent % = 100
HBV	11	68.8
HBV & HDV	2	12.5
HBV & HCV	1	6.2
HCV	2	12.5

Discussion and Conclusion

This study was undertaken among patients scheduled for surgery at University of Calabar Teaching Hospital to observe the prevalence of hepatitis infections caused by HBV, HCV and HDV. Frequency of occurrence for these viral hepatitis infections were observed to be 7.8%, 1.7% and 1.1% respectively. The respective results for HBV and HCV were comparable to the Nigerian national figures of 8.1% and 1.1% (WHO, 2020). Although prevalence of these infections may thus be considered stable, their apparent persistence demands sustained attention.

The understanding that hepatitis D virus is dependent on the presence of hepatitis B for its pathogenesis has been helpful in devising a preventive strategy against its transmission. Hepatitis B vaccination holds the potential for controlling the spread of both hepatitis B and D. This approach would have been effective but for the prevailing inadequate healthcare coverage present in Nigeria (Akpotuzor *et al.*, 2013; Essendi *et al.* 2015; Ugochi *et al.*, 2018; Akwiwu and Akpotuzor, 2018; Ndem *et al.*, 2021). Hepatitis B virus infection remains the most reported viral hepatitis in Nigeria, yet, there exists little report on the prevalence of hepatitis D virus infection. This study observed 1.1% prevalence of hepatitis D virus infection in general, while its co-infection with HBV constituted 12.5% of all hepatitis infections recorded. The observation of the present study highlights the importance for its integration in routine screening among those reactive for HBV testing. It will aid the profiling of HBV infection in terms of prognosis and approach to management.

Apart from the direct impact on infected individuals, the finding that HDV infection is present in our setting calls for extra care in deploying precautionary safety measures against spread. The risks and burden of contracting HDV are of concern considering the already existing constraints in the field of surgery including; inadequacy of healthcare professionals, facilities and equipment in addition to the invasive nature of most surgical procedures (WHO, 2022; Udosen *et al.*, 2023). There is need to protect the healthcare force and control possible nosocomial transmissions. This study concludes that Hepatitis B virus remains the most prevalent

viral hepatitis agent within the studied population, while hepatitis D virus was detected at a rate of 1.1%

Conflict of interest

All Authors declare no conflict of interest.

References

- Ahn, J., Gish R.G. (2014). Hepatitis D Virus: A Call to Screening. *Gastroenterology and Hepatology (NY)*; **10(10)**:647-686.
- Akpotuzor, J.O., Akpan, P.A., Akwiwu, E.C. (2013). Perception level of voluntary counseling/testing and knowledge/awareness of HIV/AIDS among adult population in Ugep Town of Cross River State of Nigeria. *Journal of AIDS and Clinical Research*; **4**: 234.
- Akwiwu, E.C., Akpotuzor, J.O. (2018). Determinants of voluntary uptake of HIV counseling and testing among infected persons in Calabar, Nigeria. *Contemporary Journal of Interdisciplinary Studies*; **7(4)**: 48-54.
- Akwiwu, E.C., Alfred, U.O., Akpotuzor, J.O., Onukak, E.E. (2021). Antenatal Care Coverage and the Prevalence of Syphilis, Viral Hepatitis and Human Immuno-Deficiency Virus Infections Among Pregnant Women in Uyo, Nigeria. *Journal of Medical Laboratory Science* **31(3)**: 11-19.
- Alfred, U.O., Akwiwu, E.C., Ugochi, V.E. & Akpotuzor, J.O. (2021). Prevalence of Viral Hepatitis among Pregnant Women Attending Traditional Birth Homes in Southern Nigeria. *Sokoto Journal of Medical Laboratory Science* ; **6(3)**: 11 – 15.
- Essendi, H., Johnson, F.A., Madise, N., Mathews, Z., Falkingham, J., Bahaj, A.S. *et al.* (2015) Infrastructural challenges to better health in maternity facilities in rural Kenya: community and health worker perceptions. *Reproductive Health*; **12**: 103.
- Mentha, N., Clément, S., Negro, F., Alfaiate, D. (2019). A review on hepatitis D: From virology to new therapies. *Journal of Advanced Research*; **29(17)**:3-15.
- Ndem, B.N., Akwiwu, E.C., Akpan, P.A., Akpotuzor, J.O., Bassey, I.E., Isong, I.K., Onukak, E.E. (2021). Timely accessing of antenatal care and prevalence of vitamin B12 and folate deficiencies among pregnant

- women in a Nigerian population. *New Zealand Journal of Medical Laboratory Science*; **75**: 12-15.
- Niro, G.A., Ferro, A., Cicerchia, F., Brascugli, I., Durazzo, M. (2021). Hepatitis delta virus: From infection to new therapeutic strategies. *World Journal of Gastroenterology*; **27(24)**:3530-3542.
- Rizzetto, M., Alavian, S.M. (2013). Hepatitis delta: the rediscovery. *Clinical Liver Diseases*; **17(3)**:475-87.
- Udosen, J.E., Akwiwu, E.C., Akpotuzor, D.U., Akpotuzor, J.O., Abunimye, D.A. (2023). Gender-Based Preponderance of Commonly Observed Surgical Cases Presenting at a Referral Health Facility in Southern Nigeria. *Saudi Journal of Biomedical Research*; **8(1)**: 5-8.
- Ugochi, V.E., Akwiwu, E.C., Akpotuzor, J.O. (2018). Factors associated with HIV Transmission and Infection among Persons Aged 0-17 years in Calabar Metropolis of Nigeria. *Journal of Medical and Dental Science Research*; **5(5)**: 27-30.
- World Health Organization (2019). Hepatitis. <http://www.who.int>.
- World Health Organization (2020). World Hepatitis Day – In Nigeria, an estimated 20 million people are chronically infected. <http://www.afro.who.int/news>.
- World Health Organization (2022). Hepatitis D. <http://www.who.int>.

Citation: Joseph E. Udosen, Euphoria C. Akwiwu, Dennis A. Abunimye, Utibe-Abasi Felix, David U. Akpotuzor, Josephine O. Akpotuzor. Prevalence of Hepatitis B, C and D Infections in Preoperative Patients at a Tertiary Hospital in Southern Nigeria. *Sokoto Journal of Medical Laboratory Science*; **8(1)**: 40-43. <https://dx.doi.org/10.4314/sokjmls.v8i1.5>.

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.