Seroprevalence of Hepatitis B and Hepatitis C among Men Visiting a Selected Health Facility in Ado-Ekiti, Ekiti State

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ABSTRACT

As a viral infection targeting the liver, hepatitis poses significant risks, including the potential progression to cirrhosis, hepatic failure, and hepatocellular carcinoma. Hepatitis B (HBV) and Hepatitis C (HCV) persist as critical public health concerns, predominantly in developing regions characterized by insufficient screening programs, vaccination coverage, and disease awareness. This study determines the prevalence of Hepatitis B and Hepatitis C among men attending Oke Iyimi Health Facility, Ado-Ekiti, Ekiti State, Nigeria, and it identifies the rate of co-infection within the study population. A cross-sectional study design was employed. Venous blood samples (n = 138) were collected from male participants. Plasma samples were analyzed using Promed® rapid diagnostic test kits for the detection of Hepatitis B surface antigen (HBsAg) and Hepatitis C virus antibody (anti-HCV). Data were analyzed using Microsoft Excel and SPSS version 26. Results showed that 12 participants (8.7%) tested positive for HBV, while 1 participant (0.7%) tested positive for HCV. The only HCV positive patient was also HBV-positive, indicating one case of HBV/HCV co-infection. The highest HBV positivity occurred among participants aged 31–40 years (15.4%), followed by 21–30 years (13.5%) and 51–60 years (6.3%). The HCV infection (0.7%) was observed in the 21–30 years age group. Based on these findings, it is recommended that routine screening for viral hepatitis be intensified at the community and primary healthcare levels. Public health education, vaccination programs, and awareness campaigns should also be strengthened to promote early detection, prevention, and control of Hepatitis B and C infections among men.

Keywords: Hepatitis B, Hepatitis C, Men, Ado Ekiti

INTRODUCTION

The word “Hepatitis’ means an inflammation of the liver. It occurs as a result of a number of factors and pathogen infection, especially from hepatitis viruses. Hepatitis B and C virus (HBV and HCV) infections are major global health concerns among the five hepatitis viruses (A–E). For instance, worldwide, the estimated number of individuals with chronic HBV and HCV infections was around 296 million and 58 million, respectively. Furthermore, it is reported that HBV and HCV cause 820,000 and 290,000 deaths, respectively, with cirrhosis and hepatocellular carcinoma accounting for the majority of these deaths (WHO, 2022a; WHO, 2022b). There are variances in the prevalence of hepatitis B and C infections worldwide. The Western Pacific and African regions have the highest prevalence of hepatitis B infections, while HCV infections are more prevalent in the Eastern Mediterranean and Europe (WHO, 2022a; WHO, 2022b). HBV and HCV are vertically transmitted from the mother to the fetus during childbirth or intrauterine transmission (Tesfaye *et al*., 2024). On the other hand, horizontal transmission of the virus happens when unscreened blood or blood products are transfused, through sexual contact with an infected partner, or from the reuse of contaminated needles, syringes, or sharp objects in a medical setting, the community, or among drug users (Hebo *et al*.,

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2019). Globally, 325 million people are living with hepatitis B virus (HBV) or hepatitis C virus (HCV) infections (WHO, 2020a). In 2015, HBV caused an estimated 887,000 deaths mainly from complications such as cirrhosis and hepatocellular carcinoma while 257 million people were living with the chronic infectious disease (WHO, 2020b). Also, globally, about 71 million people are living with chronic hepatitis C infection causing about 400,000 deaths in 2016 (WHO, 2020c). The World Health Organization (WHO) classifies the prevalence of HBV infection as high (>8.0%), intermediate (2%–8%), and low (<2%) (Odukoya *et al*., 2022). In Nigeria, 19 million people are estimated to be living with HBV infection with an average prevalence rate reported to range from 11% to 13% (Spearman *et al*., 2017; Akindigh *et al*., 2019). Also, for HCV infection in Nigeria, about 3.2 million people are estimated to live with the infection with a prevalence rate of 2.1% (Omolade and Adeyemi, 2018). Hepatitis is a major public health challenge in Nigeria and is highly infectious, as individuals who are infected may often be unaware of their status and therefore unable to take preventive measures to reduce transmission. A key global health sector strategy for eliminating hepatitis is providing targeted information to guide focused action. Therefore, an effective Nigerian response to the hepatitis B and C (HBV and HCV) pandemic requires data on the current burden and epidemiology of the viral hepatitis (Odukoya *et al*., 2022).

HBV infection is a life-threatening infection, and 20%–30% of adults with the chronic infection will develop cirrhosis and liver cancer (WHO, 2020b). Notwithstanding, there is an available and safe effective hepatitis B vaccine that confers 98%–100% protection (WHO, 2020b). In addition, chronic HCV infection increases the risk of cirrhosis by 15%–20% within 20 years and is a major cause of liver cancer (WHO, 2020c). However, more than 95% of those infected achieve full recovery with antiviral therapy (WHO, 2020c). Lack of access to testing, vaccination, treatment, and sociocultural factors serve as barriers in developing countries and play a major role in increasing the burden of HBV and HCV infections (WHO, 2020c; Omolade and Adeyemi, 2018). HBV and HCV infections carry significant social and economic consequences, including stigmatization that often results in the marginalization of affected individuals. Such marginalization can lead to profound psychological and emotional distress, while also diminishing employability, limiting economic prospects, and hindering the formation of intimate relationships and broader social interactions.

It also poses financial burden on the individual and their family because of the regular monitoring that is required for its management (Wallace *et al*., 2017). Despite their strong potential for spreading, HBV and HCV infections are manageable and largely preventable. However, for interventions to be effective and scarce resources efficiently utilized, there must be scientific evidence guiding implementation of such interventions (Odukoya *et al*., 2022). Much of the available information on HBV and HCV infection prevalence were based on estimates from hospital-based surveys or surveys conducted amongst specific high-risk sub-population groups (Omolade and Adeyemi, 2018). Population-based data on HBV and HCV prevalence in Nigeria are limited, and where available, HBV/HCV positivity tends to be higher in males than in females (Okonkwo *et al*., 2017).

Men in particular face a heightened susceptibility to HBV and HCV due to their behavioral and occupational exposures. Studies in Nigeria have shown that men are more likely to engage in high-risk practices such as sharing sharp objects in barbershops, traditional scarification, having multiple sexual partners, and underutilizing health services compared to women (Odukoya *et al*., 2022). These practices increase their susceptibility to viral hepatitis, yet most epidemiological studies in Nigeria have focused on women, especially pregnant women, leaving a knowledge gap regarding men.

Thus, the study sought to determine the seroprevalence of HBV and HCV among male participants visiting Oke-Iyinmi health center, Ado-Ekiti in order to contribute gender-specific data toward national hepatitis elimination strategies. Further study could compare male and female prevalence to provide broader gender perspective.

METHODS AND MATERIALS

Study Area

The study was carried out in a selected Health facilities in Ekiti State, Nigeria. Ekiti state is situated entirely within the tropics. It is located between longitude $40^0$51’ and 50^0 451’ east of the Greenwich meridian and

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latitude 70^0 151' and 80^0 51' north of the equator. It lies south of kwara and Kogi State, east of Osun State and bounded by ondo State in the East and in the South, with a total land Area of 5887.890sq km. Ekiti State has 16 Local government Councils. Ekiti state has three senatorial districts and the research will be carried out at Ekiti Central (Ado, Ekiti West,and Ijero), Ekiti North (Ido/osi, Moba and Oye) and Ekiti South (Ekiti East, Ekiti South West, Emure, Ikere and Ise/orun). The 2006 population census by the National population commission put the population of Ekiti State at 2,384,212 people. The state has two major seasons rainy and dry with its highest downpour around April to October and dry season through November to march. The inhabitants mostly engage in Agriculture which provides income and employment for more than 75% of the population of Ekiti State.

Ethical Considerations

Ethical approval for the collection of blood samples and administration of structured questionnaire was obtained from Ekiti State, Ministry of Health and Human Services, Ado-Ekiti. Similarly, advocacy visits was paid to the Officers in Charge (OICs) of the health centres where the research was conducted.

Sample Size Determination

Sample size was determined using of Raosoft sample size calculator (Raosoft, 2004) at 5% margin of error and 95% confidence level (WHO, 2009). The total sample size generated for this study was 384, despite the calculated sample size, a total of 182 men who visited the clinic from January 2024 to September, 2025 were enrolled for the survey.

Inclusion and Exclusion Criteria

Men who had a history of HBV vaccination were excluded from the study. All men, irrespective of their ages, attending clinic, who consented to be part of the study and signed a verbal informed consent, were included in the study. Exclusion criteria was given to men with a history of co-infection prior to the study.

Sample Collection and Hepatitis B, and C Screening

Hepatitis B, C diagnosis was carried out among men to have an insight of the current infections prevalence in the district. Aseptic collection of 5 ml venous blood samples was performed on each men through vein puncture, using 70% ethanol for disinfection, into properly labeled sample bottles. The sera were separated and kept at room temperature in labeled containers for approximately 2 hours before being centrifuged at 3000 rpm for 10 minutes. The serum was then transferred into new cryovials, each appropriately labeled, and stored at −20°C until the assay was conducted. For the testing, immunoassay (ELISA) kits (Curaty Rapid Diagnostic Test HBsAg, and Curaty Rapid Diagnostic Test HCV) were employed; the kits were dipped into the serum with the arrow side facing downward for 2-3 seconds, after which the strips were placed on an absorbent test bench, ensuring each strip was positioned next to its corresponding labeled sample tube for identification purposes. When two colored bands are visible on the Control and Test Band, it indicates a positive result for HcsAg, and HBsAg. Conversely, if only a single color band is present on the Control and there is no line on the Test Band, it signifies a negative result for HcsAg, and HBsAg.

Data Analysis

Data were recorded on Microsoft excel sheet and then analyzed by using Statistical Package for Social Sciences (SPSS) version 26 database software program. Categorical variables were measured as percentages while continuous variables were expressed as mean ± standard deviation. Frequencies were used to summarize descriptive statistics; Test for significance was done using Pearson's Chi-Square at P=0.05.

RESULTS

Distribution of Hepatitis B, Hepatitis C among Participants

Out of the 138 participants tested**,** 12 individuals were positive for Hepatitis B virus (HBV)**,** giving a

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prevalence of approximately 8.7%**,** while only 1 participant tested positive for Hepatitis C virus (HCV)**,** corresponding to a prevalence of about 0.7%**.**

Age-Group Distribution of Participants with Hepatitis B and C

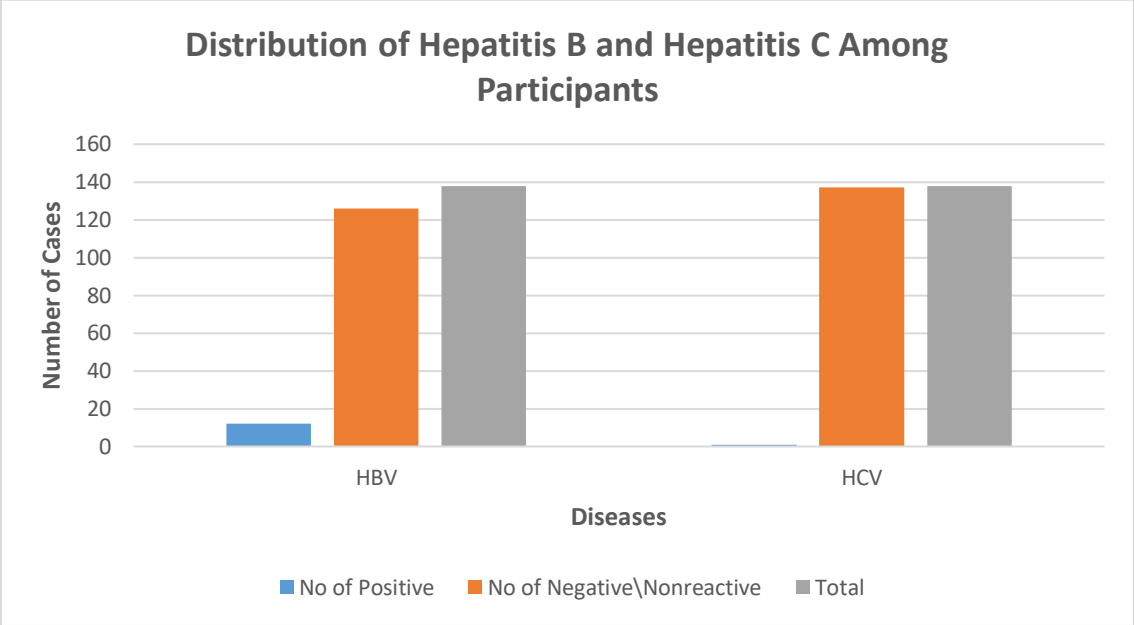

Fig 1: Distribution of Hepatitis B and C among participants

Figure 2 illustrates the age-specific distribution of hepatitis B and C infections among the study participants. The highest representation was observed in the 21–30-year age group (37 participants), among whom five tested positive for HBV and one for HCV. This was followed by the 31–40-year age group, which comprised 39 participants and recorded the highest number of HBV-positive cases (six), with no HCV infections detected. Among participants aged 51–60 years (n = 16), only one individual tested positive for HBV. No cases of HBV or HCV were identified in the remaining age groups (11–20, 41–50, 61–70, 71–80, and 81–90 years). Notably, the sole participant in the 81–90-year age group tested negative for both infections.

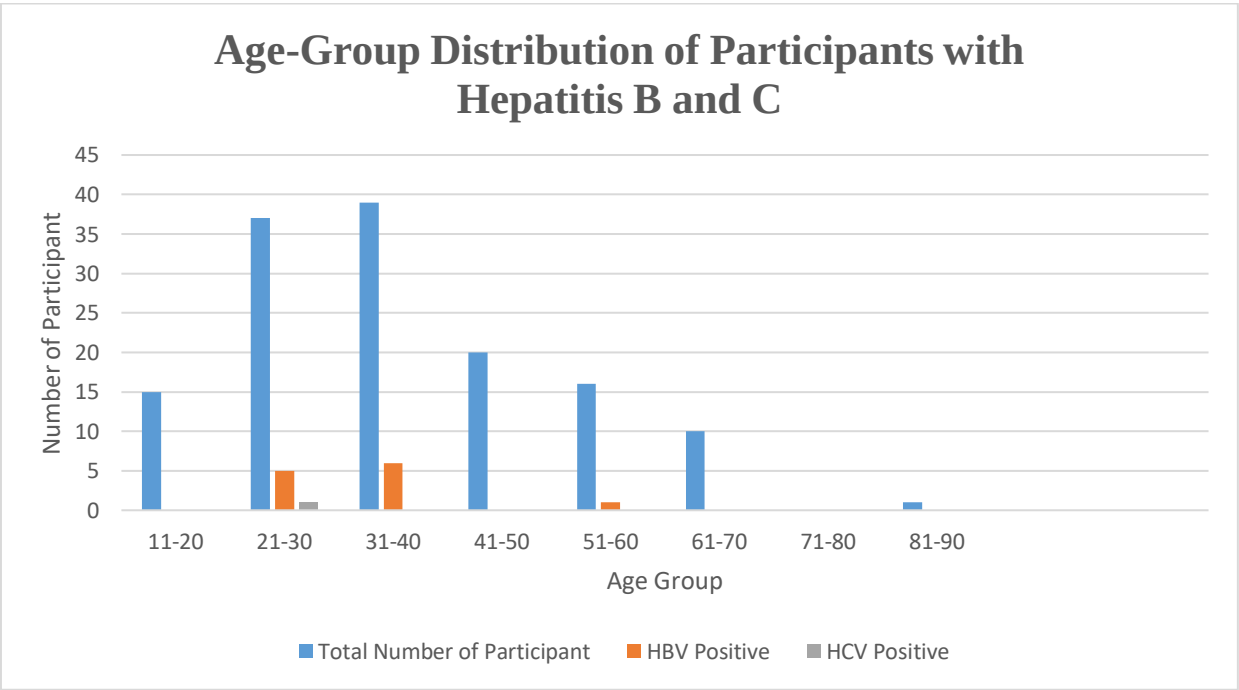

Figure 2: Age-Group Distribution of Participants with Hepatitis B and C

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Distribution of Hepatitis B and Hepatitis C Co-Infections among Participants

The result of the distribution of hepatitis B and C co-infections is presented in Figure 3. One participant tested positive for both HBV and HCV (HBV+/HCV+).

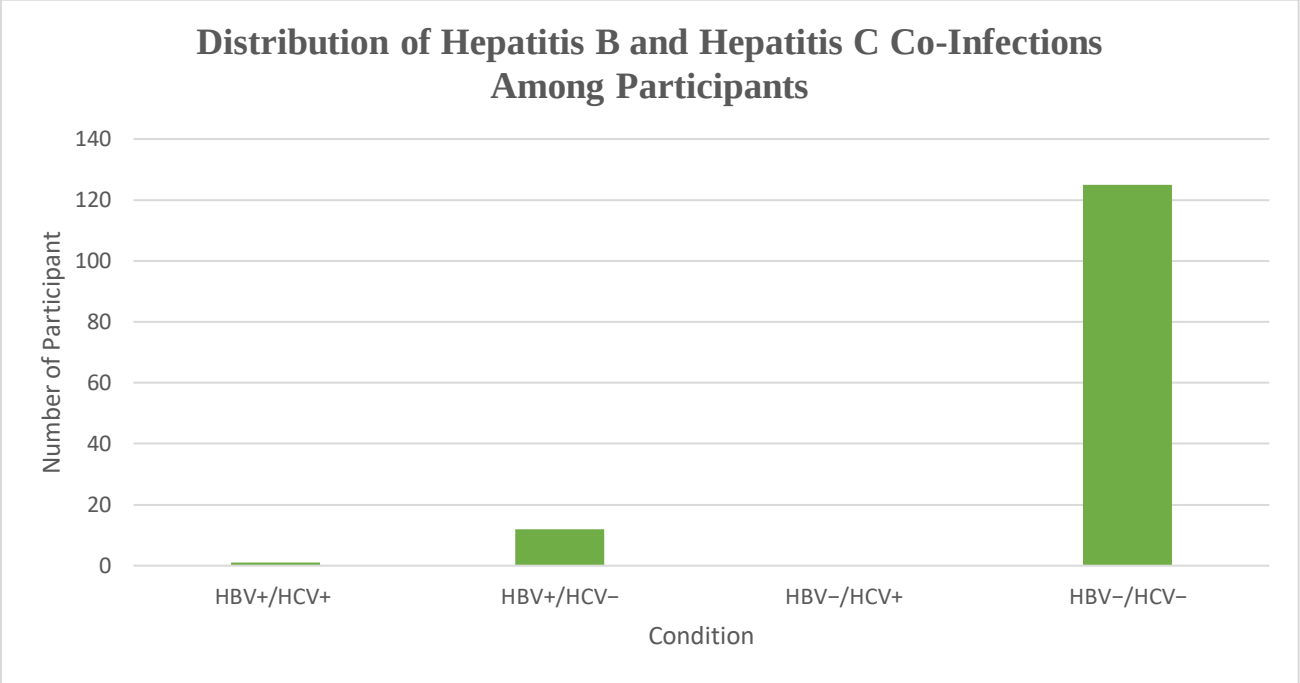

Figure 3: Distribution of Hepatitis B and Hepatitis C Co-Infections among Participants

DISCUSSION

Viral hepatitis remains a major public health challenge in Nigeria and across West Africa, with hepatitis B virus and hepatitis C virus contributing substantially to chronic liver disease, cirrhosis, and hepatocellular carcinoma. Adult men are a key population for targeted screening and prevention given shared blood borne and sexual transmission routes and frequent contact with barbing, medical injections, and other potential exposures (Easterbrook, 2016). This investigation surveyed men attending health facilities at Oke-Iyinmi using rapid diagnostic test kits to estimate the burden of hepatitis B and hepatitis C. Rapid tests provided timely, point-of-care screening appropriate for routine services, although antibody assays may misclassify infection compared with enzyme immunoassay or nucleic acid testing, particularly for anti-HCV, so confirmatory pathways remain essential when interpreting point estimates (Easterbrook, 2016).

Out of 138 participants screened, 12 (9.4%) tested positive for HBV, while only one (0.7%) was positive for HCV. The HBV prevalence observed in this study agrees with the findings of Olayinka *et al.* (2016), who reported a national prevalence of 11% among adults in Nigeria. It is also consistent with Musa *et al.* (2015) and Ajuwon *et al.* (2021), who documented HBV prevalence rates ranging between 9% and 14% in different regions of the country. This study supports the findings of Kassim et al. (2014), who found that 6.7% of blood donors at FMC Ido-Ekiti had HBV. According to Famoni et al. (2024), the prevalence of HBV and HCV among blood donors in Ado-Ekiti was 4.8% and 1.2%, respectively. The prevalence of HBV and HCV among teenage boys in Ikere-Ekiti has been estimated to be 3.75% and 0.25%, respectively, according to Ajayi et al., 2022. This suggests that HBV infection in Oke-Iyinmi is within the national endemic range and confirms that the virus remains a persistent public health concern in Nigeria. The low prevalence of HCV infection recorded in this study is similar with the report of Odukoya *et al.* (2022), who found HCV seroprevalence below 1% among residents of Lagos State. This observation also aligns with the meta-analysis by Musa *et al.* (2015), which showed that HCV infection is relatively rare in the Nigerian general population. The low detection of HCV in this study may be attributed to improved blood transfusion screening, increased awareness, and better infection control practices in health facilities.

Age-specific analysis showed that HBV infection was more common among men aged 31–40 years, followed by those aged 21–30 years, while older age groups had very few or no positive cases. This finding is consistent with Ojerinde *et al*. (2023), who reported higher HBV prevalence among young and middle-aged adults in Ekiti State. Similarly, Ajuwon *et al*. (2021) observed that HBV infection peaks within the sexually and economically active age group. These findings suggest that adults within this age range are more likely to engage in behaviours that increase the risk of exposure, such as unprotected sexual contact, sharing of sharp objects, or occupational exposures.

Only one case of HBV and HCV co-infection was recorded, while twelve participants had HBV mono-infection. The low rate of co-infection observed in this study is consistent with the findings of Lawal *et al*. (2020), who reported a low prevalence of HBV/HCV dual infection among patients in Lagos. Similarly, Ajuwon *et al*. (2021) noted that HBV/HCV co-infection is uncommon in the general Nigerian population but may be more frequent in high-risk groups. This implies that while dual infection is rare in community samples, it remains clinically significant due to its potential to accelerate liver complications.

Comparison with regional studies revealed some variation in HBV prevalence across Nigeria. For instance, Odukoya *et al*. (2022) reported lower HBV rates in Lagos compared with our findings in Oke-Iyinmi. This difference may be attributed to higher vaccination coverage, better health education, and stronger infection control measures in urban areas. Conversely, rural or semi-urban communities like Oke-Iyinmi may have lower awareness and access to vaccination by men, which could explain the slightly higher HBV rate observed. Despite these differences, our result is aligned with the national pattern of moderate-to-high endemicity reported across Nigeria (Musa *et al*., 2015). The sample size used in this study was relatively small and limited to men visiting selected health facilities, which may not represent the general male population in Oke-Iyinmi. Additionally, the use of rapid test strips, though effective for field screening, does not distinguish between active and past infections.

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