# The Hepatitis B Virus and Chronic Liver Disease in Nigeria: A Brief Review of Literature

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## ABSTRACT

About 300 million people worldwide are estimated to be infected with Hepatitis B virus. Nigeria is one of the countries with the highest incidence, with a prevalence of 10-15%. Across the country, the male to female predilection varies and children are not spared. Medical personnel, especially surgeons and dentists are at the greatest risk of infection, while other health workers, commercial sex workers, and drivers have also been found to be at significant risk of getting infected.

In Nigeria, there is a strong relationship between HBV infection and various forms of Chronic liver disease [CLD], including chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. HCV is not strongly implicated in the pathogenesis of CLD in Nigeria but coexistent HBV and HDV infection tends to aggravate the course of HBV-associated liver disease. HBV infection worsens the prognosis in HIV positive patients.

The ideal diagnostic tests- HBV DNA and liver biopsyare widely unavailable in the country and expensive for the average patient where available.

HBV-induced liver disease affects people mainly in the prime of their life, and its prevention is therefore important. Prevention of infection will include primary methods such as education; enforcing rules on adequate screening of all blood donors; and vaccinating the entire population against HBV. Secondary prevention methods will include counseling patients about their infection and their need to take precautions to prevent spread of infection; and enforcing standard safety precautions in laboratories and hospitals. For those with established liver disease, the aim will be to provide skilled clinical care and social support to limit physical and social damage from the disease.

HBV infection and its sequelae represent a real public health issue in Nigeria today, and should be adequately dealt with by health personnel, the government and all individuals.

### INTRODUCTION

In Nigeria, along with some other African countries, HBV genotype E has been found to be the most common but with low genetic diversity.<sup>1</sup>

Hepatitis B virus infection is acquired through transfusion of blood and blood products, mother-tochild (vertical) transmission, needle-stick accidents among health care workers, sexual intercourse, scarification marks and indiscriminate injections by quacks usually with contaminated needles, dialysis and intravenous drug abuse.

### OCCURRENCE

Sub-Saharan Africa suffers from an excessively high endemicity of hepatitis B virus.<sup>2</sup> 300 million people world-wide are estimated to be infected with the virus, with the highest incidence being in parts of Africa, the Middle and the Far East. In Nigeria, the seroprevalence of HBsAg in the general population averages 10-15%<sup>3~4</sup>, although certain parts of the country have higher prevalence. In Maiduguri for instance, a serological survey of 287 blood donors (all males) and 224 pregnant women found that 22.0% of the blood donors and 11.6% of the pregnant women were positive of HBsAg.<sup>5</sup>

There appears to be no sexual predilection for HBV infection in Nigeria, as studies from various centers show: Sirisena N.D et al<sup>6</sup> in Jos found that the carriage rate in females- 13.0%- was significantly higher than in males -8.2%; Abiodun et al in University of Benin Teaching Hospital found a higher prevalence in males<sup>7</sup>; in UCH, Odaibo et al demonstrated a higher infection rate among male patients compared with females<sup>8</sup>; and in Aminu Kano Teaching hospital, more HJV positive males than HIV positive females were found to have HBV infection.<sup>9</sup>.

Children are not spared from this virus, as Alikor and Erhabor in University of Port Harcourt demonstrated a 12.4% prevalence of HBsAg among children tested. Prevalence rate was relatively higher among males (13.7%) compared to females (10.7%).<sup>10</sup>

There appears to be no regard for background in the distribution of the virus, as shown by a study done in Jos to investigate the seroprevalence of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infection among

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258 clergymen-in-training who represented a donor population that fulfilled the criteria for safe blood transfusion. In all, 15.1% of the men were positive for HBsAg, 4.3% were positive for anti-HCV and 2.7% were HIV-positive. This means that adequate screening of blood from all donors must be done, as no one is 'safe' from HBV infection.

Factors responsible for the high endemicity of HBV include low socioeconomic status leading to overcrowding and poor sanitation; socio-cultural practices such as scarification and tribal/tattoo marks often made with unsterilized instruments.<sup>11</sup>

# THE ROLE OF OCCUPATION IN HBV INFECTION IN NIGERIA

Health workers, especially surgeons and dentists appear to be the group of people at the greatest risk of acquiring HBV infection during their course of work, as evidenced by studies done in University of Port Harcourt College of Health Sciences<sup>12</sup>, and University College Hospital, Ibadan<sup>13</sup>. Similarly, a study conducted in 3 major hospitals in Lagos state by Belo AC, using one hundred and sixty seven surgeons (study group) and 193 administrative staff (controls) showed that the prevalence of hepatitis B surface antigen (HBsAg) in the surgeons was found to be 25.7% as compared to 15% in the control group.14 Nigerian medical students have also been found to be at risk of infection-313 Medical students of the Lagos State University College of Medicine, Ikeja, Nigeria were tested and 72% were found to be susceptible to the infection and required vaccination.15

In another cross-sectional study of all clinical dental students in the four Nigerian dental schools on number and type of exposure to HBV, management of the exposures, personal protection against cross infection, and the reporting of such exposures, one hundred and fifty-three students responded (response rate of 84.5 percent). Only 37.9 percent of these were fully vaccinated against HBV. 58.8 percent of the students have had at least one occupational exposure. There was no significantly associated difference between sex, age, location of school, and exposure. Most of the exposures (44.4 percent) occurred in association with manual tooth cleaning. There was inadequate protection of the eyes. None of the exposures were formally reported.<sup>16</sup>

In another study in University of Port Harcourt on prevalence of HIV and HBV co-infection, commercial sex workers had the highest prevalence among the occupational groups(13.3%) followed by applicants(10.7%) and drivers(10.0%) while the lowest occupational prevalence occurred among farmers<sup>17</sup>.

A study done by the Department of Restorative Dentistry, College of Medicine, University of Lagos<sup>18</sup> to assess knowledge and practice of cross-infection control among Nigerian Dental Technologists shows the general perception of Nigerian Health workers and the Nigerian population at large to this subject. 43% only responded to administered questionnaires, while 61.9% erroneously believed that HIV posed a greater occupational risk to them than HBV. Infection control practices were also inadequate in them, while only 24.4% had received HBV vaccination and 38.4% were not aware of the need to be vaccinated.

This poses a great risk of getting infected to such medical personnel and the patients they should be treating. It was concluded that the knowledge and practice of infection control was poor and below acceptable standards. This is further confirmed by studies in various teaching hospitals in Nigeria.

## **HBV AND LIVER DISEASE IN NIGERIA**

HBV is hepatotrophic. It causes liver disease including acute hepatitis, fulminant hepatitis, chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. The outcome of infection depends on several factors, including the virulence of the virus, the immunocompetence and age of the patient as well as some genetic factors<sup>19</sup>

In most cases of CLD seen in Nigeria, ranging from chronic hepatitis through liver cirrhosis to hepatocellular carcinoma, HBV infection has been a very strong implicating factor. Hepatitis B virus (HBV) is strongly associated with an aggressive type of chronic active liver disease (CALD) and hepatocellular carcinoma, which tend to present in the relatively young, in sub-Saharan Africa.<sup>20</sup> A clinicopathological study done in Lagos by Lesi O.A et al<sup>21</sup> showed that of the 74 patients with CLD studied, Hepatitis B and C infections were identified in 58% and 12% of the patients respectively. Also, Olubuyide et al<sup>22</sup> in their study in Ibadan concluded that there is a high rate of HBV infection, and a low rate of HCV infection, among Nigerian patients with HCC. However, HBV and HCV are independent risk factors for the development of HCC, with HBV having an effect more rapidly. Baba et al<sup>23</sup> after their own study in Maiduguri concluded that HBV and therefore CLD are endemic in their environment, and suggested that health education to prohibit traditional practices that could predispose individuals to HBV infections be emphasized.

It's strongly believed that prevention of HBV transmission and infection in Nigeria will reduce the incidence of CLD in Nigeria.

## THE ROLE OF HCV AND HDV IN HBV-ASSOCIATED LIVER DISEASE IN NIGERIA.

HBV does not only have a higher prevalence in our environment<sup>24</sup>, but it is also more important than hepatitis C virus as an aetiological factor in the pathogenesis of liver disease, including HCC, in Nigeria. This is unlike places such as Japan, Europe and the United States where 50%-75% of patients with HCC have evidence of HCV infection.<sup>25</sup> A study of 100 cases of HCC in North-Eastern Nigeria<sup>26</sup> showed that 67% of the HCC patients were positive for HBsAg which is consistent with the findings of other studies in Nigeria. On other hand, only 13% of the patients were positive for HCV antibody which indicates that HCV is not as important as HBV in the aetiology of HCC in this environment. Also, in studying hepatitis B and C antiginaemia in patients with acute icteric hepatitis (AIH) in Ibadan, it was shown that while both HBV and HCV infections are common in Nigeria, AIH may be more associated with HBV than HCV in the country<sup>27</sup>.

It is known that co-existent infection with HDV tends to aggravate the course of HBV-associated liver disease. Ojo et al<sup>28</sup> in O.A.U.T.H.C disease did a study to determine the sero-prevalence of hepatitis D virus (HDV) among thirty one consecutive southwestern Nigerians with HBsAg-positive, HCV antibody-negative chronic liver disease. Alongside, they tested for HBsAg and the HDV antigen in fifty randomly selected sera each from blood donors and university freshmen undergoing pre-admission medical tests and who had no clinical evidence of liver disease. Their study showed a low HDV prevalence in their community, and while calling for more work to be done on HDV epidemiology in HBsAgassociated CALD, they suggested that the virus might play only a minor role in the pathogenesis of HBsAgassociated chronic liver disease among patients.

In the same hospital, a study of a cohort of 50 new patients suggested that while the HBV is the major aetiological agent of CLD in Nigeria, the HDV is not an important aggravating factor save in a small number of patients.<sup>29</sup>

# THE INTERACTIONS BETWEEN HBV AND HIV INFECTIONS IN NIGERIANS

Concomitant infection with HIV and HBV could either be a co-infection due to shared parenteral and sexual routes of transmission, or a super-infection of one on the other. It is postulated that in this African population where HBV infection is highly endemic and childhood infection almost universal, HIV infection may be a superinfection of HBV infections contracted in childhood<sup>30</sup>. It EDITORIAL ARTICLES

A study done by Iwalokun et al<sup>32</sup> confirmed HBsAg antigenemia as an important finding in patients with HIV-1 infections in Nigeria and it was concluded that hepatitis B infection deteriorates liver functions and its investigation in HIV-1 infected patients may be of clinical and therapeutic importance prior to antiretroviral therapy administration.

lower counts in those with triple infection.<sup>31</sup>

Although the hepatic pathophysiology and therapeutic implications in antiretroviral regimens are poorly understood, HIV infected patients with HBV co-infection have been found to respond less to HAART. There seems to be an increased morbidity and mortality in HBV/HIV patients on HAART therapy and additional concern and care must be taken in order to minimize the complications associated with the increasing use of HAART in them.<sup>33</sup>

### HBV AND SICKLE CELL DISEASE IN NIGERIA.

It is commonly believed that sickle cell disease patients who require frequent blood transfusions are at a significantly higher risk of getting HBV infection more than the rest of the populace. However, there are varying reports from studies across Nigeria. Some indicate there's an increased risk of infection and all sickle cell disease patients should be vaccinated against HBV,<sup>34</sup> while others believe the risk of HBV infection for sickle-cell patients is not clearly increased by blood transfusion.<sup>35</sup>

### THE CHALLENGES ASSOCIATED WITH THE DIAGNOSIS OF HBV INFECTION IN NIGERIA

Investigations done to detect liver disease in Nigeria include liver function tests; hematological investigations, including full blood count and ESR; and specific tests for viral markers of HBV and HCV are also done. Ideally, the first hepatitis B viral marker looked for is HBsAg. and its presence indicates acute or chronic infection. A full viral profile is then done. IgM anti- HBc indicates active disease. IgG anti- HBc indicates past exposure to hepatitis B. HBeAg, HBV DNA and DNA polymerase appear in the serum soon after HBsAg and indicate active viral replication and high infectivity. In Nigeria, however, not all these tests can be carried out, due to inadequate testing facilities and financial constraints of patients. The commonest investigation done is HBsAg, whose presence does not differentiate between an ongoing and a chronic infection. The HBV DNA and DNA

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polymerase which are highly specific for active viral replication and infectivity are not usually tested for in our hospitals, and like other such specialized tests, may only be available in some private clinics at prices the average patient cannot afford.

The hallmark of diagnosis of CLD is a liver biopsy. This investigation is however not done in a lot of Nigerian centers. This is because there are not enough histopathologists in the country and not many of the available ones are able to correctly interpret the biopsy results of patients.<sup>36</sup>

## THE CURRENT ISSUES IN THE MANAGEMENT OF HBV-ASSOCIATED LIVER DISEASE IN NIGERIA

In symptomatic patients presenting acutely, relief of symptoms is important, while low fat, low protein and high calorie diet are advised and patients are advised to stop alcohol intake. For those who already show signs of chronic infection along with laboratory evidence of presence of HBsAg, HBeAg and HBV DNA in their serum, abnormal serum aminotransferases, and biopsy-confirmed hepatitis, drugs like interferon, lamivudine and adefovir dipivoxil have been shown to be therapeutic, especially when used in combination.

Ola et al in UCH<sup>37</sup> evaluated the efficacy and safety of recombinant inter (rIFN) in 26 adult Nigerian patients with chronic hepatitis B infection. They demonstrated that rIFN is effective in the management of chronic hepatitis B infection even in Nigerians. However, the frequency of occurrence of adverse events was 53.8% and the laboratory safety parameters were not significantly affected by therapy.

# CONTROLLING HBV INFECTION IN NIGERIA: THE WAY FORWARD

Studies clearly show that this virus is a common cause of morbidity and mortality in the Nigerian society, affecting people mainly in the prime of their life. Prevention of its transmission is of therefore of paramount importance. Prevention of infection will include primary prevention methods such as educating the people on the virus, particularly its modes of transmission and the disease process it initiates; advocating lifestyle changes; enforcing rules on adequate screening of all blood donors; and vaccinating the entire population against HBV. HBV has been part of the National Programme on Immunisation (NPI) since 2003 but a significant proportion of the population is either not aware of this, or is not enlightened enough to seek immunization. Secondary prevention methods including counseling patients about their infection and their need to take extra precautions so as not to spread the infection; enforcing standard safety precautions in laboratories and hospitals to avoid accidental needle punctures and contact with infected body fluids are also important. Also, it's advisable to give combined prophylaxis- vaccination and immunoglobulin- to staff with accidental needle-stick injury; all newborn babies of HBsAg positive mothers; and regular sexual partners of HBsAg positive people who have themselves been tested negative.

For those with established liver disease, the aim will be to provide skilled clinical care and social support to limit physical and social damage from the disease.

### CONCLUSION

HBV infection and its sequelae represent a real public health issue in Nigeria today. The task of reducing the menace this virus represents in a nation already grappling with malaria, high maternal mortality, poverty and socio-political problems is for all individuals, not just the government or medical personnel.

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