ISSN: 2832-7748

Research Article

Advances in Sexual & Reproductive Health Research

Influence of Environmental Condition, Residential Nature and Socio-Cultural Values of the Community on the Prevalence of Hepatitis-B Infection in Kaduna State-Nigeria

Sagir Musa Hassan and Yahya Saleh Ibrahim*

Department of Public Health. Faculty of Allied Health Sciences. Maryam Abacha American University, Maradi-Niger Republic & Centre for Energy and Environmental Strategy Research Kaduna State University, Kaduna-Nigeria.

***Corresponding Author**
Yahya Saleh Ibrahim, Department of Public Health. Faculty of Allied Health Sciences. Maryam Abacha American University, Maradi-Niger Republic & Centre for Energy and Environmental Strategy Research Kaduna State University, Kaduna-Nigeria.

Submitted: 17 Mar 2023; **Accepted**: 20 Apr 2023; **Published**: 27 Apr 2023

Citations: Hassan, S. M., Ibrahim, Y. S. (2023). Influence of Environmental Condition, Residential Nature and Socio-Cultural Values of the Community on the Prevalence of Hepatitis-B Infection in Kaduna State-Nigeria. *Adv Sex Reprod Health Res, 2*(1), 184-189.

Abstract

Hepatitis is a liver inflammation which causes a variety of health challenges and can be highly fatal. Basically, there are five (5) main strains of the hepatitis virus namely types A, B, C, D and E. Although all the types cause liver related disease, however they essentially differ in a way, such as mode of transmission, geographical distribution, severity of the illness, and methods of prevention, Types B and C in particular lead to chronic disease in hundreds of millions of people and, together, are the most common cause of liver cirrhosis, cancer and viral hepatitis infection. It should however be noted that some hepatitis types are preventable by vaccination. This therefore, made this study relevant with increase in the global occurrences hepatitis among women, children and adults in most developed and developing societies. The study uses purposive sampling techniques with 316 sample size, an inferential statistics was applied using SPSS package version 23, to analyse the responses from the questionnaires receipt from the field. The results of this study suggested that there is significant negative impact of Environmental Health Condition (ECH), and Social and Cultural Nature (SOCN) on the prevalence of hepatitis infection in Nigeria. The study has also established that Residential Nature (RESN), of women within reproductive age in Kaduna state have positively and significantly influence the prevalence of hepatitis B virus (HBV) infection within the period of the study. Also, the study has suggested that Social and Cultural Nature (SOCN) of the community have significantly influence the prevalence of hepatitis infection among women of child bearing age in Kaduna state (in the study area). The results of the study shows that environmental conditions, residential nature as well as social and culture nature or values of the communities significantly influence the prevalence of hepatitis B virus (HBV) infection in Kaduna state. It is recommended policy direction towards eradication or elimination of the prevalence of hepatitis in the identified communities should targets improve environmental condition, promotion of positive socio-cultural behaviours that reduce the risks factors associated with hepatitis infection prevalence and houses and residential estates should respond to the conditions that warrants the prevalence of hepatitis such as changing our drainage system and improve on our sanitary facilities and location.

Introduction

According to World Health Organization (WHO) report on World Hepatitis Day (WHD) (2020) that globally 325 million people are living with hepatitis B and C, 900,000 people died annually as a result of hepatitis B infection, only 10% of the people living with hepatitis B and 19% living with hepatitis C know their hepatitis status while only 42% of children have access to the birth related hepatitis B vaccine dose. This result is alarming considering the fact that the global number of people living with the infection in 2015 was 257 million (WHO, 2016). The infection has adverse consequences on underdeveloped and developing countries due to their characterized poor environmental health condition [1]. In other words, viral hepatitis prevalence differs throughout the world with highest reported cases in tropical regions [2].

Hepatitis is a liver inflammation which causes a variety of health challenges and can be highly fatal. Basically, there are five (5) main strains of the hepatitis virus namely types A, B, C, D and E. Although all the types cause liver related disease, however they essentially differ in way such as mode of transmission, geographical distribution, severity of the illness, and methods of prevention, [3]. Types B and C in particular lead to chronic disease in hundreds

of millions of people and, together, are the most common cause of liver cirrhosis, cancer and viral hepatitis infection. It should however be noted that some hepatitis types are preventable by vaccination.

A study conducted by WHO (2016) estimated that 4.5 million avoidable deaths could be averted in the developing countries by 2030 through vaccination, diagnostic tests, medications and awareness campaigns. The global hepatitis strategy by WHO as endorsed by all the WHO Member States intends to reduce fresh hepatitis infections up to 90% and deaths up to 65% between 2016 and 2030. Hepatitis virus causes both acute and chronic infection with momentous complications and sequelae [4]. Hepatitis prevalence differs all over the world, however tropical regions have the highest cases [5]. It is forecasted that 5 to 15% of adults are infected chronically with hepatitis B virus in sub-Saharan Africa There is also 15 to 25% risk of premature dying in adulthood from the virus through related cirrhosis and hepatocellular carcinoma, whereas a negligible fraction of those with acute infections may also give way to fulminant liver failure. In areas especially of high endemicity hepatitis B virus is mainly contracted from birth and early childhood.

The perinatal transmission to a baby from an infected mother is widespread. It should also be noted that approximately 90% of those infected through perinatal transmission, 30% of those contracted in early childhood, and 6% of those contracted at five (5) years of age develop chronic infection.

In Nigeria the prevalence of hepatitis B virus is not known despite the fact that the country is considered to be among the highly endemic countries in Africa. The chronic viral hepatitis data are not regularly gathered by the Integrated Disease Surveillance and Response system, which only cantered on acute viral hepatitis cases; thus, hepatitis infection remains largely underreported. Viral hepatitis B is a common, severe disease caused by a virus called hepatitis B virus (HBV), a partially double-stranded DNA virus of the Hepadnaviridae family. There are basically four (4) major serotypes and nine minor subtypes that have been serologically recognized at the hepatitis B surface antigen (HBsAg) level. The total succession of DNA from HBV isolates worldwide has led to the enumeration of eight (8) genotypes (from A to H) and a number of sub genotypes, showing different ethno/geographic distributions. HBV genotypes have also been associated with various clinical outcomes and responses to interferon therapy.

The symptoms of hepatitis B virus disease spectrum differs from subclinical hepatitis to anicteric, hyper acute, acute and subacute hepatitis at the early or the primo-infection stage and from an asymptomatic carrier stage to chronic hepatic cirrhosis and hepatocellular carcinoma during the chronic phase. The incubation period is 1 to 6 months in the acute phase. The anicteric hepatitis is a major form of expression for this disease, where most of the patients are asymptomatic. Anicteric hepatitis patients have a larger propensity to develop chronic hepatitis. It is associated with a prodromal phase, during which a serum sickness-like syndrome can occur.

Nigeria is a tropical country which has been empirically recognized as highly endemic for hepatitis B virus infection and 75% of its population is possibly to have been exposed in their lives to the virus at one time or the other. In Nigeria there are presently about 18 million infected with hepatitis virus.

Hepatitis B virus infection continues to be one of the global endemic health problems [6]. It is one of the most dangerous infectious diseases which are causing noteworthy mortality. It results in liver inflammation and then advances from acute to chronic hepatitis infection. In the year 2015, WHO estimated that 257 million people were living with chronic hepatitis B virus infection and 68% of that figure were living in the Western Pacific and African regions [7]. The estimation further suggests that the African continent has the second largest number of people infected chronically with hepatitis B virus with 6.1% of the adult population infected.

This research focuses on the predisposing factors influencing hepatitis B prevalence, in Kaduna State Nigeria. The prevalence dimensions discussed here in the study are environmental health condition, residential nature and social and cultural nature.

Research Questions

The following research questions will guide the study:

1. To what extent does residential nature impact on hepatitis B infection in Kaduna State?
2. To what extent does environmental health condition influence hepatitis B infection in Kaduna State?
3. To what extent does social and cultural nature influence hepatitis B infection in Kaduna State?

Objectives of the Study

The aim of the study is to examine the predisposing factors influencing the prevalence, prevention of hepatitis B virus among women of reproductive age in Kaduna state. The specific objectives of the study are:

i. To determine the impact of environmental health condition on hepatitis B infection in Kaduna State;
ii. To examine the influence of residential nature on hepatitis B infection in Kaduna State;
iii. To investigate the influence of social and cultural nature on hepatitis B infection in Kaduna State.

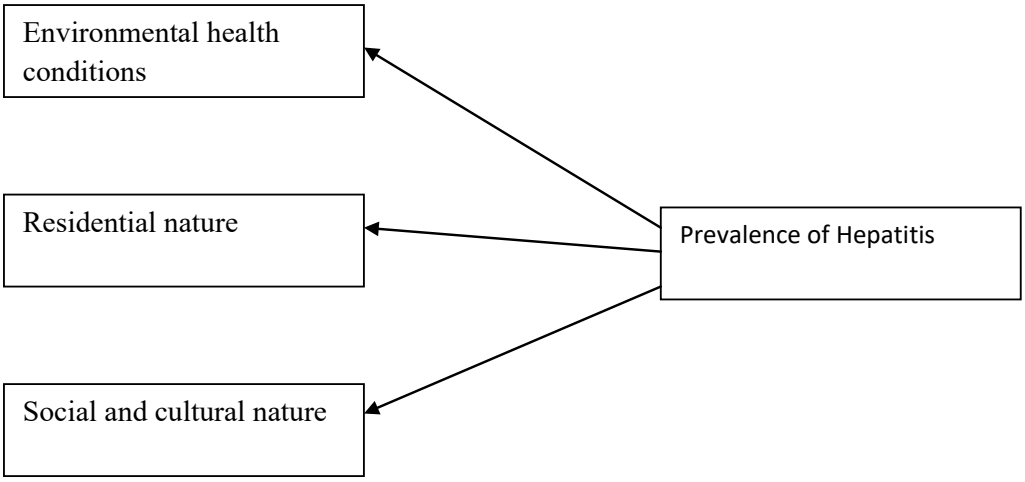
Hypothesis of the Study

The study formulates the following hypotheses in null form and in line with the stated objectives:

i. $H_0$1: Environmental health conditions have no significant influence on hepatitis B infection in Kaduna State;
ii. $H_0$2: Residential nature has no significant impact on hepatitis B infection in Kaduna State;
iii. $H_0$3: Social and cultural nature has no significant influence on hepatitis B infection in Kaduna State;

Conceptual Model of the Study

The conceptual model develop below is representing both the objective of the study and the hypotheses of the research.
H0 H02 H03



Virology

Hepatitis B virus belongs to the orthohepadnavirus taxonomic classification. It is one of the two genera of the 'Hepadnaviridae' (hepatotropic DNA viruses) family. The genus transmits a disease to mammals, for instance hepatitis B virus, the Woolly monkey hepatitis virus and woodchuck hepatitis virus, belong to these category. While the Avi Hepadnavirus infect birds, for instance wild herons' hepatitis virus and duck hepatitis virus. It should however be noted that the human hepatitis B virus is the prototype member of the hepadnaviridae family and the viruses behave in a similar manner to retroviridae [8].

Viral Structure

Basically, hepatitis B virus exists in three (3) different forms
- It is a small structure, spherical in nature and it is 20 nm in diameter.
- Its filamentous form is 22 nm in diameter of variable length and widths.
- Its spherical 42-nm virions, consisting of an electron-dense isometric core (nucleocapsid), 27 nm in diameter called the Dane particle.

Hepatitis B Virus Genome

The hepatitis B virus genome has a guanine and cytosine (guanine + cytosine) content of 48%. Its sequence has termini with cohesive endings that equal the distinctively located 5'-ends of the two (2) strands overlapping by 240 nucleotides approximately and maintain the circular configuration of the genome. The double stranded genome has a nick at a unique site on the full-length negative strand. This is opposite the position242 nucleotides, downstream from the 5' end, of the positive strand.

Epidemiology

The World Health Organization (WHO) estimates that globally hepatitis B virus chronicity/carrier rate at four (4) billion are chronically infected with a similar number at risk of hepatitis B virus or liver related disease. Similarly, the organization estimates that globally, there are two (2) billion people with serologic evidence of past or present hepatitis B virus infection [9]. One-third of all cirrhosis and half of all cases of hepatocellular carcinoma can be approximately attributed to the infection of chronic hepatitis B virus and that it is probably accountable for 500,000 to 700,000 deaths annually. Again, Sub-Saharan Africa accounted for about 60 million people living with chronic hepatitis B virus and that more than half of these numbers are infants and children.

Stages of Hepatitis B Virus Infection

Significant development has been made in the understanding of the three basic hepatitis B virus infection natural stages in hosts. These are the acute infection, chronic asymptomatic and chronic symptomatic stages [10]. It should however be noted that not all the viruses that infected patients pass through all the above three stages [11]. Liver related complications, such as hepatocellular carcinomas and cirrhosis risk amplifies as the patient passes from acute to chronic stage of the infection. In reality, most hepatitis B virus infections stop at the acute stage while few pass on to the chronic stage [12].

Acute Hepatitis B Viral Infection

Acute viral infection is the initial stage of the infection which every infected patient passes through, even though some patients do not go beyond this stage. The early phases of acute stage of the infection are distinguished serologically by hepatitis HBsAg, HBsAg presence, high serum hepatitis B virus DNA, minimal or insignificant inflammation on liver biopsy and normal level of serum aminotransferase level [13].

Research Design

The data used in the study is cross-sectional in nature, thus survey research design will be adopted to describe the basic features of the data. This is because the study collects data for the purpose of describing and interpreting existing conditions, prevailing practices, beliefs, attitudes, on-going process, impacts that are felt or trends that are developing. In other words, it measures the hepatitis

B virus prevalence amongst women of reproductive or childbearing age. In addition, the design employed helps in describing the relevant aspects of the phenomena under consideration and provides detailed information about each relevant variable.

Population of the Study

The target population of the study is the total number of women who are pregnant and visiting the antenatal clinic for their routine laboratory screening and examination in the largest general hospital in each of the three (3) senatorial zones. These hospitals are Hajiya Gambo Sawaba Memorial Hospital Zaria, Yusuf Dantsoho Memorial Hospital Kaduna and Sir Patrick Ibrahim Yakowa Memorial Hospital Kafanchan representing zone one, two and three respectively

Sample of the Study and Sampling Technique

Considering the fact that the target population is large, this research adopted Krejci and Morgan (1970) sample size determination for a finite but large population. Thus, the present study employed a sample size of 316. The 316-sample size was purposely selected from the target population. This number was generated based on the previous prevalence of hepatitis B virus reported among women child of bearing age attending antenatal care units of the hospitals under consideration.

Method of Data Collection

The data will be collected using a comprehensive and structured questionnaire which was self-administered to the child bearing age women attending antenatal care units of the hospitals under review. Attitude was measured using a five-scale Likert measuring scale.

Techniques of Data Analysis

In order to examine the influence of the impact of hepatitis B virus prevalence among the women of reproductive age or women of child bearing age attending antenatal care units at the general hospitals being studied, the study applied parametric technique using multiple regression analysis. This is because the analysis is simply a way of mathematically sorting out which of those variables certainly have an impact and it also helps to determine how well the independent variables predict the value of the dependent variables. The data analysed using SPSS version 23. It was also used to test the research hypotheses at 5% level of significance (95% confidence level). The rationale for the choice of multiple regression technique is that it shows clearly the actual effect of the independent variable on the dependent variable.

Results Presentation and Discussion

$H_0$1: Environmental Health Condition (EHC) among women of reproductive age in Kaduna state has negative but significant influence on hepatitis B virus (HBV) infection. This is proved by the regression result which revealed negative coefficient value (-0.125) and significant p-value (0.000). Environmental Health Condition (EHC) has no significant influence on the Hepatitis B virus among women of reproductive age in Kaduna state. Environmental Health Condition (EHC) is the first hypothesis of the study. The result reveals that it is negatively but significantly impactful to Hepatitis B virus among women of reproductive age in Kaduna state. The finding therefore provides evidence that Environmental Health Condition (EHC) will have a significant but negative impact on the Hepatitis B virus among women of reproductive age in Kaduna state. In view of the reported result for Environmental Health Condition (EHC) having significant impact on the Hepatitis B virus among women of reproductive age in Kaduna state, the result provides enough evidence of rejecting the first Hypothesis of the study. Thus, Hypothesis One, (H01) is therefore rejected.

$H_0$2: Residential Nature (RESN) among women of reproductive age in Kaduna state has significant and positive influence on hepatitis B virus (HBV) infection. This is proved by the regression result also revealed positive coefficient value (0.276) and significant p-value (0.000). Residential Nature (RESN) has no significant influence on the Hepatitis B virus among women of reproductive age in Kaduna state. The second hypothesis of this study is Residential Nature (RESN). The result found Residential Nature (RESN) to be significantly and positively associated with Hepatitis B virus among women of reproductive age in Kaduna state. Thus, in view of the reported result in respect of the Residential Nature (RESN) having significant impact on the Hepatitis B virus among women of reproductive age in Kaduna state, it provides evidence for to reject the second hypothesis of the study. Thus, Hypothesis Second ($H_0$2) is rejected.

$H_0$3: Social and Cultural Nature (SOCN) among women of reproductive age in Kaduna state during the period of the study has significant but negative impact on hepatitis B virus (HBV) infection. This is confirmed by the regression result which revealed negative coefficient value (-0.527) and significant p-value (0.000). Social and Cultural Nature (SOCN) has no significant influence on the Hepatitis B virus among women of reproductive age in Kaduna state. The third hypothesis of this study is Social and Cultural Nature (SOCN). The result found Social and Cultural Nature (SOCN) to be significantly associated with Hepatitis B virus among women of reproductive age in Kaduna state. However, the result shows negative coefficient. Consequently, in view of the reported result in respect of the Social and Cultural Nature (SOCN) having significant but negative impact on the Hepatitis B virus among women of reproductive age in Kaduna state, it provides evidence for to reject the third hypothesis of the study. Thus, Hypothesis three ($H_0$3) is rejected.

Conclusions and Recommendations

Conclusions

The study suggested that Environmental Health Condition (ECH), Social and Cultural Nature (SOCN) contribute to prevalence of Hepatitis infection in the stuy . The study has also established that Residential Nature (RESN), of women within reproductive age in Kaduna state have positively and significantly impacts hepatitis B virus (HBV) infection within the period of the study. Also, the study has suggested that Social and Cultural Nature (SOCN) of the community have significantly influence the prevalence of hepatitis

infection among women of child bearing age in Kaduna. The results of the study shows that environmental conditions, residential nature as well as social and culture nature or values of the communities significantly influence the prevalence of hepatitis B virus (HBV) infection in Kaduna state [14-19].

Recommendation

In line with the findings of the study and the conclusion, the recommendations are suggested as follows:

1) With documented evidence from the study that, there is significant but negative influence of Environmental Health Condition (EHC) on hepatitis B virus (HBV) infection among women of reproductive age in Kaduna state. Thus, in policy formulation, government at all levels should count Environmental Health Condition (EHC) among factors impacting hepatitis B virus (HBV) in significant terms.

2) The study again suggests that Residential Nature (RESN) impacting on hepatitis B virus (HBV) infection among women of reproductive age in Kaduna state both positively and significantly. Therefore, policy makers on health-related matters especially on hepatitis B virus should consider Residential Nature (RESN) as an important factor when formulating and implementing policies. International organizations like World Health Organization (WHO) and relevant organizations should as well recognize that Residential Nature (RESN) plays significant roles on hepatitis B virus (HBV) infection among women of reproductive age in Kaduna state.

3) (iii) Furthermore, the study documents that Social and Cultural Nature (SOCN) impacts hepatitis B virus (HBV) infection among women of reproductive age in Kaduna state significantly but negatively. Policy makers and implementers on hepatitis B virus should consider Social and Cultural Nature (SOCN) plays significant role on hepatitis B virus (HBV) infection among women of reproductive age in Kaduna state, though the significant influence is negative.

References

1. Falla, A. (2018). Towards the elimination of chronic viral hepatitis in Europe: prevalence, risk groups and screening strategies.
2. Olayinka, A. T., Oyemakinde, A., Balogun, M. S., Ajudua, A., Nguku, P., Aderinola, M., ... & Nasidi, A. (2016). Seroprevalence of hepatitis B infection in Nigeria: A national survey. The American journal of tropical medicine and hygiene, 95(4), 902.
3. Adeyemi, A. S., Afolabi, A. F., & Adeomi, A. A. (2014). Hepatitis B Virus (HBV) infection in pregnancy: knowledge and practice of care providers in Nigeria. Open Journal of Obstetrics and Gynecology, 2014.
4. Otegbayo, J. A., Taiwo, B. O., Akingbola, T. S., Odaibo, G. N., Adedapo, K. S., Penugonda, S., ... & Kanki, P. (2008). Prevalence of hepatitis B and C seropositivity in a Nigerian cohort of HIV-infected patients. Annals of hepatology, 7(2), 152-156.
5. Koyaweda, G. W., Ongus, J. R., Machuka, E., Juma, J., Macharia, R., Komas, N. P., & Pelle, R. (2020). Detection of circulating hepatitis B virus immune escape and polymerase mutants among HBV-positive patients attending Institut Pasteur de Bangui, Central African Republic. International Journal of Infectious Diseases, 90, 138-144.
6. World Health Organization. (2017). End hepatitis by 2030: prevention, care and treatment of viral hepatitis in the African Region: framework for action, 2016-2020. In End hepatitis by 2030: prevention, care and treatment of viral hepatitis in the African Region: framework for action, 2016-2020.
7. Raimondo, G., Allain, J. P., Brunetto, M. R., Buendia, M. A., Chen, D. S., Colombo, M., ... & Zoulim, F. (2008). Statements from the Taormina expert meeting on occult hepatitis B virus infection. Journal of hepatology, 49(4), 652-657.
8. Datta, S., Chatterjee, S., Veer, V., & Chakravarty, R. (2012). Molecular biology of the hepatitis B virus for clinicians. Journal of clinical and experimental hepatology, 2(4), 353-365.
9. Amidu, N., Alhassan, A., Obirikorang, C., Feglo, P., Majeed, S. F., Timmy-Donkoh, E., & Afful, D. (2012). Sero-prevalence of hepatitis B surface (HBsAg) antigen in three densely populated communities in Kumasi, Ghana. Journal of Medical and Biomedical Sciences, 1(2).
10. Sodipo, O. Y., & Ebenso, B. (2017). An appraisal of the prevention of mother-to-child transmission of hepatitis B virus health system in Nigeria. Journal of Public Health and Epidemiology, 9(12), 309-317.
11. Venkatesh, S. (2019). Technical guidelines for diagnosis & management of Hepatitis B, Government of India, Ministry of Health and Family Welfare, Nirman Bhwan, New Delhi
12. Sodipo, O. Y., & Ebenso, B. (2017). An appraisal of the prevention of mother-to-child transmission of hepatitis B virus health system in Nigeria. Journal of Public Health and Epidemiology, 9(12), 309-317.
13. Tetteh, V. (2016). Hepatitis B and C infection in pregnant women attending antenatal clinic at the Catholic Hospital, Battor in the Volta Region, Ghana. A thesis submitted to the Department of Clinical Microbiology, Kwame Nkrumah University of Science and Technology, Kumasi in partial fulfillment of the requirements for the degree of Masters of Science (Clinical Microbiology) School of Medical Sciences, College of Health Sciences
14. Falla, A., Veldhuijzen, I., & Richardus, J. H. (2014). The public health challenge of chronic viral hepatitis: an urgent need for screening. Eurohealth, 20(4), 7-10.
15. World Health Organization. (2018). World health statistics 2018: monitoring health for the SDGs, sustainable development goals. World Health Organization.
16. Venkatesh, S. (2018). National guidelines for diagnosis and management of viral hepatitis, Ministry of Health and Family Welfare, New Delhi, India. National Health Mission
17. NWAJIOBI-PRINCEWILL, P. I. (2016). PREVALENCE OF OCCULT HEPATITIS B VIRUS INFECTION AMONG PATIENTS AT THE NATIONAL HOSPITAL, ABUJA. Faculty of Pathology.
18. Block, T. M., Guo, H., & Guo, J. T. (2007). Molecular virolo-

gy of hepatitis B virus for clinicians. Clinics in liver disease, 11(4), 685-706.
19. Motayo, B. O., Usen, U., Folarin, B. O., Okerentugba, P. O., Innocent-Adiele, H. C., & Okonko, I. O. (2013). Prevalence and seasonal variations of HIV 1 and 2 infection among children in Abeokuta, South West Nigeria. Journal of Microbiology Research, 3(3), 107-110.