

ORIGINAL ARTICLE

SEROPREVALENCE OF HEPATITIS B AND C - REPORT OF A PUBLIC HEALTH OUTREACH IN SOUTH-WEST NIGERIA BY THE ENLIGHTENMENT INITIATIVE ON VIRAL HEPATITIS

Oguntoye Oluwatosin O.^{1,2,3*}, Ariyo Olumuyiwa E.^{1,2}, Abdulkareem Lukman^{1,4}, Osasona Oluwadamilola G.^{1,5,6}, Ifeora Ijeoma M.^{1,7,8}, Eromon Philomena E.^{1,9}, Chukwurah Ifeanyi¹⁰, Oguntoye Oluwafunmilayo A.^{2,3} and Nkereuwem Precious E.³

¹Enlightenment Initiative on Viral Hepatitis, Ede, 232101 Osun State, Nigeria.

²Department of Medicine, Federal Teaching Hospital Ido-Ekiti, 371101 Ekiti State, Nigeria.

³Department of Medicine, Afe Babalola University Ado-Ekiti, 360001 Ekiti State, Nigeria.

⁴Department of Internal Medicine, University of Abuja Teaching Hospital Gwagwalada, 902101 Abuja, FCT, Nigeria.

⁵Department of Medical Laboratory Sciences, Faculty of Basic Sciences, Redeemers University Ede, 232101 Osun State, Nigeria.

⁶Department of Medical Services, Hospitals Management Board, Ado-Ekiti, 360281 Ekiti State, Nigeria.

⁷Center for Translation and Implementation Research, College of Medicine, University of Nigeria, 410001 Enugu State, Nigeria.

⁸Department of Medical Laboratory Sciences, Faculty of Health Sciences and Technology, University of Nigeria Enugu Campus, 410001 Enugu State, Nigeria.

⁹African Centre of Excellence for Genomics of Infectious Diseases, Redeemers University Ede, 232101 Osun State, Nigeria.

¹⁰Marketing Department, Fidson Healthcare Plc., Obanikoro, 100232 Lagos State, Nigeria.

*Corresponding author: Oguntoye Oluwatosin O.

Email: oguntoyeoo@abuad.edu.ng

ABSTRACT

Hepatitis B virus infection is the commonest cause of chronic liver disease in Nigeria with its attendant complications. Majority of Nigerians do not know their status, therefore there is a need to routinely screen the populace to detect those who are infected. The objective of this study is to determine the prevalence of Hepatitis B and C among the participants of a public health outreach. This was an observational cross-sectional study conducted by the Enlightenment Initiative on Viral Hepatitis during the 2022 World Hepatitis Day. Consenting patients attending the General Out-Patient Clinic of the hospital were counselled and screened for HBsAg and Anti-HCV using Rapid Test Kits. Consenting members of staff of the hospital were also counselled and screened. A total number of 171 patients participated in the free screening exercise; 53 males (31%) and 118 females (69%) with a mean(\pm SD) age of 37.27 \pm 13.65. Seventy-five members of staff of the hospital also participated in the free screening exercise; 29 males (38.7%) and 46 females (61.3%) with a mean(\pm SD) age of 43.36 \pm 6.48. All the 171 patients were screened for HBsAg and 7(4.1%) were found to be reactive. Similarly, all the 75 members of staff were screened for HBsAg and 1 (1.3%) was found to be reactive. Furthermore, 50 of the patients were screened for anti-HCV and 3(6.0%) of them were found to be reactive. Hepatitis B and C viruses are very much prevalent in our environment. The importance of routine screening for these viruses in our population cannot be overemphasized.

Keywords: Hepatitis B, Hepatitis C, Liver Disease, Prevalence, Population, Nigeria.

INTRODUCTION

Hepatitis B and C viruses are primary hepatotropic viruses that causes both acute and chronic viral hepatitis¹. They are common causes of chronic liver disease in Sub-Saharan Africa and South-East Asia and they are associated with the development of liver failure and liver cancer^{2,3}.

The World Health Organization (WHO) classified regions of the world based on prevalence rates of Hepatitis B virus (HBV) infection into areas with high, intermediate, or low endemicity: >8% for high, 2-7% for intermediate, and <2% for low endemic areas for HBV infection⁴. The prevalence rate of Hepatitis B virus in sub-saharan Africa and south-east Asia is over 8%⁴. Nigeria is a high endemic

nation for Hepatitis B virus infection with an average national prevalence of 8.1% (range 7.3 - 24%)⁵⁻⁷. The estimated population of Nigeria is over 200 million based on the 2006 national population census, thus over 17 million Nigerians are chronically infected with Hepatitis B virus⁵.

Hepatitis C virus (HCV) infection is highly prevalent in Africa (especially Egypt), Central and East Asia including Japan and China⁸. In Nigeria, according to the 2018 HIV/AIDS Indicator and Impact Survey (NAIIS) carried out among adolescents and adults, the national HCV sero-prevalence rate is approximately 1.1% (range 0.5 - 4%)^{5,9}. Thus, it is estimated that over 2.2 million Nigerians have chronic HCV infection⁵. Both HBV and HCV are contracted from contact with blood, blood products

and body fluids of an infected individual through sharing of sharps, unprotected multiple sexual intercourse, injections from intravenous drug abusers, unsafe blood transfusion, horizontal (person to person) and vertical (mother to child) transmissions^{10,11}.

In Nigeria, majority of the individuals with chronic HBV and HCV infections are not aware of the infection because they are usually asymptomatic and by the time they are presenting to the hospital with symptoms, liver cirrhosis, liver failure or liver cancer would have probably developed^{10,11}.

Hence, there is a need to sensitize the Nigerian populace about these viruses and to screen them routinely at every given opportunity in order to ascertain their status. This would enable early detection of the infection, close monitoring for disease progression and commencement of therapy once indicated.

The Enlightenment Initiative on Viral Hepatitis (EIVH) is a non-governmental organization (NGO) registered with the Corporate Affairs Commission of Nigeria (Registration Number:179743) founded for the purpose of creating public awareness about viral hepatitis among Nigerians¹². We are a group of scientists comprising of Gastroenterologists, Hepatologists, Infectious Diseases experts and Virologists with members across the different geo-political zones of Nigeria.

The objective of the NGO is to reduce the burden of viral hepatitis and its complications among Nigerians. We intend to achieve this by organizing public health outreaches, centered on creating awareness about viral hepatitis, on a quarterly basis in the different geo-political zones of Nigeria which will coincide with global public health campaign days declared by the World Health Organization. We provide counselling and free screening for Hepatitis B and C viruses to participants during our public health outreaches in order for them to know their status and to take the necessary action. Those who are negative are encouraged to get vaccinated for Hepatitis B and those who are positive are referred to a specialist (Gastroenterologist) for further evaluation and care. There is no available vaccine for Hepatitis C. We usually endeavor to communicate the outcome of our public health campaign activities to relevant authorities to ensure that data is available to help inform appropriate public health policies. The report of one of such screening exercises conducted by the Enlightenment Initiative on Viral Hepatitis is hereby presented.

Research Question: What is the prevalence of Hepatitis B and C infection among attendees of Federal Teaching Hospital Ido-Ekiti, Ekiti State.

Study Objective: To determine the prevalence of Hepatitis B and C infection among patients attending the General Out-Patient Clinic of the Federal Teaching Hospital Ido-Ekiti, Ekiti State.

METHODS

Study Design

This was an observational cross-sectional study.

Study Location

The study was conducted at the General Out-Patient Clinic of the Federal Teaching Hospital Ido-Ekiti (Ado Annex), Ekiti State in South-Western Nigeria by the Enlightenment Initiative on Viral Hepatitis during our public health outreach to commemorate the 2022 World Hepatitis Day.

Selection of Study Subjects

Selection of the study subjects was by simple random sampling. Consenting patients attending the General Out-Patient Clinic of the hospital were counselled and recruited into the study. Consenting members of staff of the hospital were also counselled and recruited into the study.

Sample Collection and Analysis

Fingerstick whole blood sample obtained from the study subjects was used to screen for HBsAg and Anti-HCV using Rapid Test Kits (Manufactured by PROMED®, China).

Data Analysis

The data obtained was analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0. Descriptive statistics used included frequency tables, charts, means and standard deviations. Chi Square (X^2) test was used to compare categorical variables while the Student T test was used to compare continuous variables between the two groups (patients and staff). A p-value <0.05 was taken as statistically significant.

RESULTS

A total number of 171 patients participated in the free screening exercise; 53 males (31%) and 118 females (69%) with a male to female ratio of 0.45 to 1 and a mean (\pm SD) age of 37.27 \pm 13.65 (Table 1). Seventy-five members of staff of the hospital also participated in the free screening exercise; 29 males (38.7%) and 46 females (61.3%) with a male to female ratio of 0.63 to 1 and a mean (\pm SD) age of 43.36 \pm 6.48. The mean (\pm SD) age of the members of staff was significantly higher than that of the patients ($p = 0.001$). All the 171 patients were screened for HBsAg and 7 (4.1%) were found to be reactive (Figure 1). Similarly, all the 75 members of staff were screened for HBsAg and 1 (1.3%) was found to be reactive. The difference in the prevalence of HBsAg between the two groups was not statistically significant ($p = 0.261$).

Furthermore, 50 of the patients were screened for anti-HCV and 3 (6.0%) of them were found to be reactive (Figure 2). None of the staff members was screened for anti-HCV. Majority (54.5%) of the participants who tested positive to the screening

tests were young individuals less than 45 years of age and majority were also females (54.5%) (Table 2).

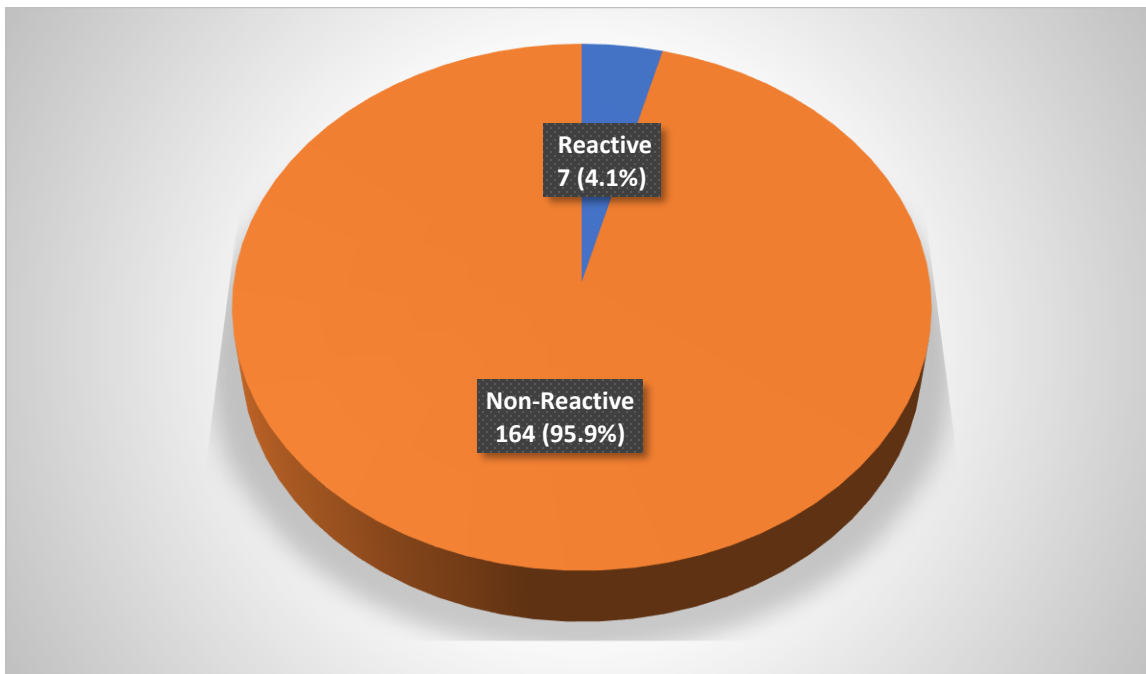


Figure 1: Seroprevalence of HBsAg among the Patients

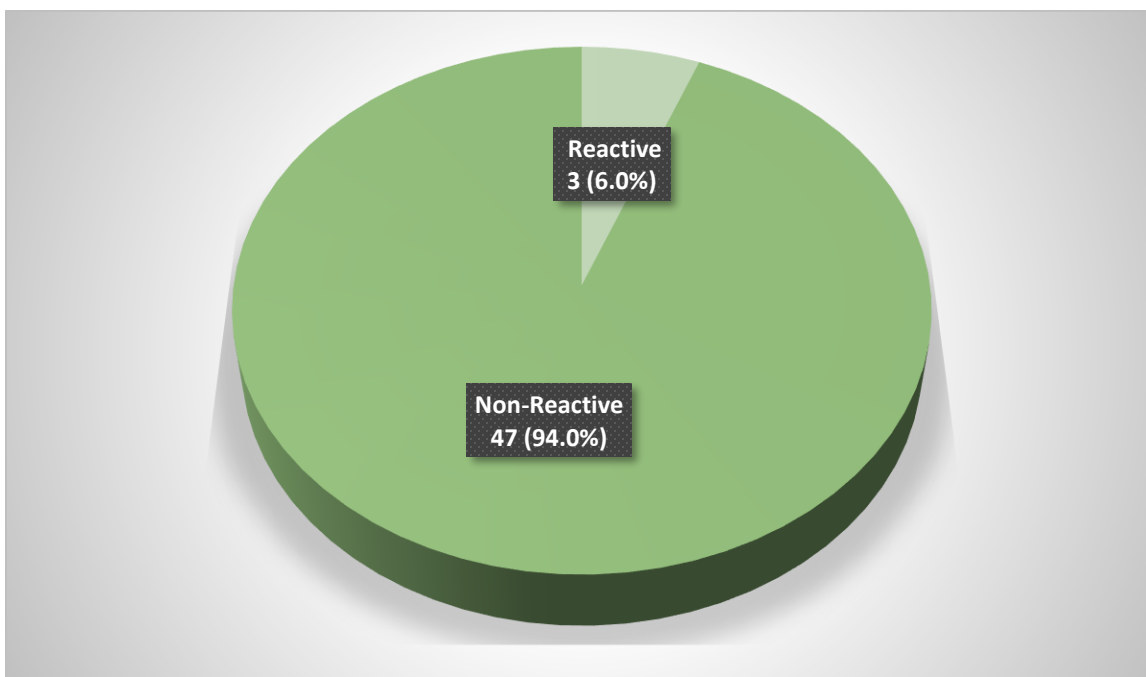


Figure 2: Seroprevalence of Anti-HCV among the Patients.

Table 1: characteristics of the study participants

Variables	Patients171			Staff75			Total246
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)	
Gender	53 (31.0)	118 (69.0)	171 (100)	29 (38.7)	46 (61.3)	75 (100)	0.240 #
Age (years)							
Range	9-72	11-85	9-85	35-57	25-54	25-57	
Mean ± sd	38.52±15.27	36.70±12.89	37.27±13.65	44.14±5.78	42.87±6.91	43.36±6.48	0.001 ##
Age group							0.001 #
<15	4	3	7 (4.1)	0	0	0 (0)	
15-24	6	13	19 (11.1)	0	0	0 (0)	
25-34	10	37	47 (27.5)	0	6	6 (8.0)	
35-44	15	39	54 (31.6)	16	21	37 (49.3)	
45-54	10	17	27 (15.8)	12	19	31 (41.3)	
55-64	5	4	9 (5.3)	1	0	1 (1.3)	
65-74	3	2	5 (2.9)	0	0	0 (0)	
75-84	0	2	2 (1.1)	0	0	0 (0)	
≥85	0	1	1 (0.6)	0	0	0 (0)	
Anti-hcv status							
Reactive	1 (2.0)	2 (4.0)	3 (6.0)	--	--	--	
Non-reactive	19 (38.0)	28 (56.0)	47 (94.0)	--	--	--	
Total tested	20 (40.0)	30 (60.0)	50 (100)	--	--	--	
Not tested	33	88	121	--	--	--	
Total	53	118	171	--	--	--	
Hbsag status							0.261 #
Reactive	3 (1.8)	4 (2.3)	7 (4.1)	1 (1.3)	0 (0)	1 (1.3)	
Non-reactive	50 (29.2)	114 (66.7)	164 (95.9)	28 (37.3)	46 (61.4)	74 (98.7)	
Total	53 (31.0)	118 (69.0)	171 (100)	29 (38.6)	46 (61.4)	75 (100)	

KEY: # signifies that Chi Square (X²) test was used while ## signifies that Student T test was used.

Table 2: gender and age distribution of subjects with reactive results

Total tested	Patients		Staff	
	Hbsag 171	anti-hcv 50	Hbsag 75	anti-hcv 0
Gender				
Male	3	1	1	--
Female	4	2	0	--
Age group				
< 45	3	3	0	--
45-64	4	0	1	--
≥ 65	0	0	0	--
Total	7	3	1	--

DISCUSSION

This study was conducted to determine the seroprevalence of Hepatitis B and C among patients and members of staff of the health institution. The mean age of the members of staff was significantly higher than that of the patients in this study. This could be due to the fact that the General Out-Patient Clinic (Ado Annex) attends to all categories of patients of different age groups from where they are subsequently referred to respective specialist clinics. There was no age restriction on the patients that were screened during the outreach (some of them were in the paediatric age group). The members of staff on the other hand were mostly graduates with tertiary education who have spent varying number of years in the civil service, therefore on the average they were older. Furthermore, more females participated in the screening exercise than males in both study groups. This can be attributed to the good health seeking behaviour of females in our population¹³. Thompson *et al* also reported a greater percentage of women visiting health care facilities for health concerns¹⁴.

In this study, the prevalence of Hepatitis B infection is higher among the patient group (4.1%) than the staff group (1.3%) although not statistically significant ($p = 0.261$). This could be due to the fact that the staff members who participated in the study were mostly non-clinical staff who are at a lesser risk of exposure to blood and body fluids of patients compared to the clinical staff who are known to be at a higher risk.^[15] Overall, these prevalence values are less than the average national prevalence of 8.1% (range is 7.3% to 24%) in Nigeria⁵⁻⁷. Nevertheless, efforts must be continued to combat any further spread of the virus among the populace.

The prevalence of anti-HCV among the patient group was 6% which is higher than the average national prevalence of 1.1% (range is 0.5% to 4%) in Nigeria^{5,9}. Unfortunately, not all the patients were screened and none of the staff members was screened for anti-HCV due to shortage of Test Kits which would have provided a complete serological status of both study groups and appropriate comparison would therefore have been made. Nevertheless, this relatively high prevalence of 6% obtained among those patients who were tested is a finding of concern. All the participants who tested positive following the screening exercise were appropriately counselled and referred to a specialist (Gastroenterologist) for further review and management. Individuals who tested negative to the screening tests were counselled to get vaccinated for Hepatitis B and to complete the vaccination series. All participants were counselled about the risk factors for the acquisition of the

viruses and how to avoid them and be protected against them.

Majority of the individuals who tested positive to the screening tests were young individuals (less than 45 years old). This is in keeping with other similar studies in which a high prevalence, particularly of Hepatitis B, had been reported in the younger population^{6,7}. In Nigeria, the commonest means of transmission of Hepatitis B virus is by horizontal transmission in early childhood from one child to the other¹⁰. Mother to Child transmission (vertical transmission) is another important means of transmission of the virus in Nigeria⁹. About 70-90% of vertical infections will result in a chronic infection while 20-50% of early childhood infections (horizontal transmission) will progress to the chronic stage^{2,3}. In contrast, when transmission occurs in adolescents or adults, only 1-5% will progress to the chronic infection unless the individual is immunocompromised^{2,3}. In early childhood and among young individuals the immune system is not yet well developed and acquisition of the virus at this time usually leads to chronicity. All of these may explain the high prevalence of HBV infection among the younger population in this study.

According to the World Health Organization about 1.5 million new infections of HBV occurs each year globally with about 820,000 deaths annually, largely from fulminant hepatitis, decompensated liver cirrhosis and hepatocellular carcinoma³. Liver cirrhosis is the ultimate consequence (end stage) of progressive liver fibrosis from untreated chronic HBV and HCV infections¹. It is associated with high morbidity and high mortality from liver failure and development of hepatocellular carcinoma^{1,3}. Progression to this end stage is variable but slow, developing over 20-40 years in patients with chronic liver injury who have not been treated^{1,3}.

It is of importance to note that hepatocellular carcinoma is the third most common cause of cancer mortality and sixth most common cancer worldwide with the incidence rising globally¹⁶. The incidence of hepatocellular carcinoma in Nigeria is moderately high (11-20/100,000)¹⁷. Chronic HBV infection is the main aetiological agent of hepatocellular carcinoma in Nigeria and the national mean sero-prevalence rate for HBV infection among Nigerian patients with hepatocellular carcinoma is 59.6%¹⁸.

In resource-poor countries like Nigeria where there is currently no facility for liver transplantation Gastroenterologists / Hepatologists are usually at the receiving end of managing numerous patients presenting with the complications of chronic HBV and HCV infections; particularly decompensated liver cirrhosis and hepatocellular carcinoma with fatal outcomes^{19,20}. This trend has to be stopped.

Thus, the World Health Organization has set a target towards eliminating viral hepatitis by the year 2030 as one of the Sustainable Development Goals²¹.

This study has shown that HBV and HCV infections are prevalent in our population and efforts must be enhanced to identify more people who are infected and refer them appropriately so that appropriate interventions can be instituted early before the development of irreversible liver damage.

Limitations

The Hepatitis B vaccination status of the participants was not explored. Not all the patients who participated in the screening exercise were screened for Hepatitis C and none of the members of staff was screened for Hepatitis C due to shortage of Test Kits. Low level of participation in the screening exercise particularly among the members of staff group.

Recommendations

Government should ensure widespread availability of facilities for free routine screening for HBV and HCV among Nigerians. Those who test negative should get fully vaccinated for Hepatitis B and those who test positive should receive optimal specialist care evaluation and treatment.

Efforts should be stepped-up to make the Hepatitis B vaccine available for free for all age groups across the country. This would ensure an improved national vaccination coverage with majority of the populace fully vaccinated and protected.

Ensure all newborns receive the Birth dose of HBV vaccine (HepB-BD) and also complete the standard immunization schedule according to the National Programme on Immunization.

Continuous training of healthcare personnel about the practice of Standard Precautions while performing their duties.

All stakeholders including the government at all levels (Federal, State and Local) through the various relevant ministries, departments and agencies; non-governmental agencies, donor agencies, international partners and the World Health Organization need to step-up efforts towards combating the spread of these infections.

Efforts should be stepped-up towards ensuring implementation of the already established strategies of the Federal Ministry of Health of Nigeria and the World Health Organization towards eliminating viral hepatitis by 2030 as one of the Sustainable Development Goals.

Government and International Organizations on Viral Hepatitis should support the efforts of NGOs such as the Enlightenment Initiative on Viral Hepatitis in providing public health education on

viral hepatitis; population screening and vaccination; and in conducting scholarly research.

Implementation of these Infection Prevention and Control (IPC) measures would help to reduce the burden of Hepatitis B and C virus infections and its sequelae among the general population of Nigeria.

CONCLUSION

Hepatitis B and C viruses are very much prevalent in our environment and majority of the populace do not even know their status. The importance of routine screening for these viruses in our population cannot be overemphasized so that infected individuals can be identified early and offered the necessary medical intervention.

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