

Seroprevalence and Knowledge of Hepatitis B among Healthcare Workers in Saki, Southwest, Nigeria

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Abstract

Background: Hepatitis B is caused by hepatitis B virus (HBV); an enveloped DNA virus which causes chronic liver diseases. Healthcare workers (HCWs) are at risk of certain viral hepatitis infection due to their occupational exposure to infected body fluids as well as injuries from sharp objects.

Materials and Method: This cross-sectional study was carried out among nurses and medical laboratory personnel in State Hospital and Baptist Medical Centre, Saki, Oke-Ogun Area, Oyo State, Southwest, Nigeria. Participants who consented to the study completed a structured self-administered questionnaire for data collection on their knowledge of HBV infection. Venous blood was collected aseptically and the sample was used for hepatitis B surface antigen (HBsAg) screening using rapid test kit. Data analysis was done using SPSS version 25 for Windows.

Results: A total of 140 HCWs aged 20-59 years participated in the study, comprising of 21(15%) males and 119 (85%) females. Most participants were nurses (52.14%) with the 20–24 years age group most represented (48.57%) and the 55-59 years age group least represented (0.71%). The seropositivity of HBsAg was 5%; with more females (3.57%) than males and more nurses (2.86%) than medical laboratory personnel. The positivity was found in individuals younger than 50 years of age. There was no statistically significant association between HBV positivity, age, sex and HCW category. Majority of the HCWs were aware of the infection (92.86%) and its modes of transmission (72.86%). Participants also had a good knowledge of the infection though some have had needle stick injury (12.14%) and a relatively high proportion have also been fully vaccinated (73.57%).

Conclusion: With proper health education, accurate diagnosis, proper treatment of infected individuals, good knowledge of disease transmission and prevention as well as good vaccination coverage, HBV infection amongst HCWs can be prevented and its prevalence reduced.

Keywords: Healthcare workers, Hepatitis B, prevalence, knowledge, Saki, Oke-Ogun.

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I. Introduction

Viral hepatitis affects millions of people worldwide annually, causing disability and death¹. It is caused by five known hepatitis viruses designated A, B, C, D and E². These viruses infect the liver causing acute and chronic infection with significant complications and sequelae³.

Hepatitis B is caused by hepatitis B virus (HBV) which is an enveloped DNA virus of the hepadnavirus family with a core antigen surrounded by a shell containing hepatitis B surface antigen (HBsAg)^{4,5}. Hepatitis B virus can cause chronic and often fatal liver diseases, such as liver cirrhosis and hepatocellular carcinoma^{6,7,8}. The main modes of transmission of this virus include transfusion of blood and blood products, contact with infected body fluids (urine, semen, sweat, saliva, and tears), use of contaminated needles, from mother to child and via sexual contact⁹.

Serologic markers in HBV infection include: HBsAg, anti-HBc, anti-HBs, HBeAg, antiHBe and HBV DNA. Among these markers, HBsAg is the first marker detectable in blood. It appears in the 4th to 10th week of the incubation period declining to undetectable levels in 3-6 months.

The virus has been shown to have a worldwide distribution, occurring among persons of all ages, genders, races and regions of the world¹¹. Hepatitis B virus infects about 2 billion people worldwide because it is endemic; 350million of infected persons are chronically ill and become carriers of the virus, 10 to 30million new infections are recorded annually and about 1million die yearly with majority in sub-Saharan Africa^{6,12}. A

systematic review and meta-analysis of cross-sectional studies on hepatitis B between 2000 and 2013 revealed that about 13% of Nigerians are infected¹³.

Healthcare workers (HCWs) are at increased risk of certain viral hepatitis infection due to their occupational exposure to infected body fluids such as blood and saliva¹⁴. Injuries from sharp objects are also one of the most frequently reported occupational accidents by healthcare workers¹⁵. Studies in the United States have revealed that the risk of acquiring HBV following needle stick injury from HBV positive individual is 27 to 37%¹⁶. Several authors have reported the prevalence of HBV among healthcare workers; 10.6% and 4.98% in Cameroon^{17,18} as well as 2.5% in Ethiopia¹⁹ while in Southwest Nigeria, the prevalence ranged from 1.5 to 7%^{7,10,12,20,21}.

Hepatitis B is a vaccine preventable disease, though a sizeable proportion of HCWs never get vaccinated²². Hepatitis B vaccination is recommended for exposed HCWs as part of the universal precautions policy for protection of HCWs and those who are HBV negative after screening should take hepatitis B vaccination, while those who are HBV positive should be treated²³.

As long as prevention remains a recommended safeguard to limit disease spread, the knowledge of the HCW is highly important in the prevention and spread of infection. With proper information, the dangers of HBV can be prevented to a large extent. Therefore, this study is aimed at determining the prevalence of HBsAg among healthcare workers and assessing the knowledge of these workers about hepatitis B.

II. Materials And Method

Study design: This cross-sectional study was carried out among nurses and medical laboratory personnel in two major hospitals in Saki, a semi urban and the largest town in Oke-Ogun area of Oyo State, Southwest, Nigeria. The medical laboratory personnel comprise of medical laboratory assistant (MLA), technicians (MLT) and scientists (MLS). The two hospitals were State Hospital (a government hospital) and Baptist Medical Centre, Saki (a mission hospital); both provide primary and secondary healthcare services to people of Oke-Ogun area of Oyo State and neighbouring Kwara State.

Sample size: With 95% confidence interval, 5% degree of accuracy and 7% prevalence of HBV from a previous study¹⁹, Cochran sample size formula²⁴ was used to determine sample size.

Sample Collection and Analysis: Participants who consented to the study completed a structured self-administered questionnaire which was used to collect data on socio-demographic characteristics, knowledge of transmission of HBV infection and uptake of hepatitis B vaccination. Two millilitres (2ml) of venous blood was collected aseptically by venipuncture into an Ethylene Diamine Tetra-acetic Acid (EDTA) tube, which was centrifuged and plasma was used for HBsAg screening using rapid test kit. The qualitative immunochromatographic method was used to detect the presence of HBsAg in blood. Test result was interpreted according to manufacturer's instruction.

Data analysis: This was done using SPSS version 25 for Windows. Percentage was used to express descriptive data. The relationship between the socio-demographic characteristics and HBV positivity was calculated using Chi-square test.

Ethical Issues: Ethical approval was obtained from Baptist Medical Centre, Saki ethics review committee and informed consent was obtained from each participant.

III. Result

A total of 140 HCWs aged 20-59 years participated in the study, comprising of 21(15%) male and 119 (85%) female. Most participants were nurses (52.14%) with the 20-24 years age group most represented (48.57%) and the 55-59 years age group least represented (0.71%).

Table 1: Socio-demographic characteristics of the studied population

Variables	Frequency (n) (N=140)	Percentage	
Age groups (years)	20-24	68	48.57
	25-29	11	7.86
	30-34	13	9.29
	35-39	23	16.43
	40-44	12	8.57
	45-49	10	7.14
	50-54	2	1.43
55-59	1	0.71	
Sex	Male	21	15
	Female	119	85
Marital status	Single	81	57.86
	Married	59	42.14
HCW category	Nurses	73	52.14

	MLS	5	3.57
	MLT	61	43.57
	MLA	1	0.71

The seropositivity of HBsAg was 5%; with more females (3.57%) than males and more nurses (2.86%) than medical laboratory personnel. The positivity was found in individuals younger than 50 years of age with the 35-39 and 45-49 age groups having the same level of seropositivity (1.43%) but no HBV infection in the 40-44 years age group.

Figure 1: Pie chart showing the prevalence of HBsAg

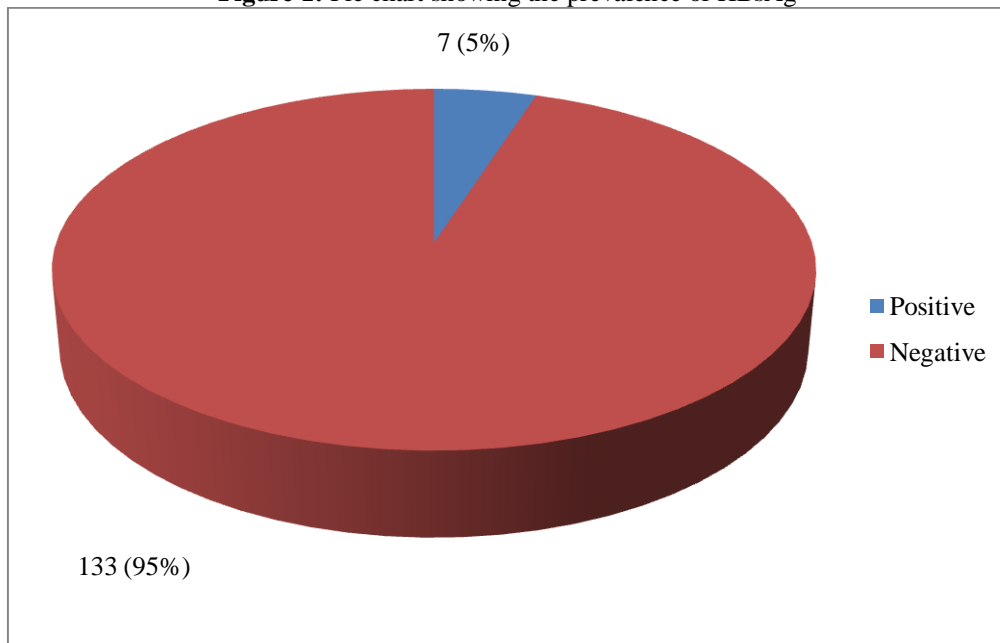


Table 2: Distribution of respondents by socio-demographic characteristics according to HBV status

Socio-demographic characteristics		HBV Positivity Frequency (%)		Statistic and p-value	
Age-group (years)	Positive n (%)	Negative n (%)	Total	χ^2	p-value
20-24	1 (0.71)	67 (47.86)	68 (48.57)	0.286	0.999
25-29	1 (0.71)	10 (7.14)	11 (7.86)		
30-34	1 (0.71)	12 (8.57)	13 (9.29)		
35-39	2 (1.43)	21 (15.00)	23 (16.43)		
40-44	0 (0.00)	12 (8.57)	12 (8.57)		
45-49	2 (1.43)	8 (5.71)	10 (7.14)		
50-54	0 (0.00)	2 (1.43)	2 (1.43)		
55-59	0 (0.00)	1 (0.71)	1 (0.71)		
Total	7 (5.00)	133 (95.00)	140 (100)		
Sex					
Male	2 (1.43)	19 (13.57)	21 (15)	0.302	0.583
Female	5 (3.57)	114 (81.43)	119 (85)		
Total	7 (5.00)	133 (95.00)	140 (100)		
HCW category					
Nurses	4 (2.86)	69 (49.29)	73 (52.14)	0.950	0.813
MLS	0 (0.00)	5 (3.57)	5 (3.57)		
MLT	3 (2.14)	58 (41.43)	61 (43.57)		
MLA	0 (0.00)	1 (0.71)	1 (0.71)		
Total	7 (5.00)	133 (95.00)	140 (100)		

Majority of the HCWs were aware of the infection (92.86%) and its modes of transmission (72.86%). Participants also had a good knowledge of the infection though some have had needle stick injury (12.14%) and a relatively high proportion have also been fully vaccinated (73.57%).

Table 3: Correct response to knowledge on Hepatitis B infection

Variable	Frequency	Percentage
Ever heard of HBV infection	130	92.86
HBV is caused by a virus	121	86.43
Ever done HBV test	109	77.86
Aware of modes of transmission	102	72.86
Ever had needle stick injury	17	12.14
Possible infection without symptoms	97	69.29
Vaccination prevent HBV infection	111	79.29
Fully vaccinated	59	42.14

IV. Discussion

The prevalence and knowledge of hepatitis B infection among HCWs has been reported in various parts of Nigeria but none has been reported for the Oke-Ogun area of the country which necessitated this study. The seroprevalence of HBV in this study was 5% which is similar to values reported among HCWs in Southwest, Cameroon¹⁸ and Southwest, Nigeria^{7,20,21} but higher than that obtained from similar studies in Southeast, Nigeria^{10,25}. The prevalence obtained in this study is also reduced compared to that reported by a national survey in 2016²⁶. The findings of this study is lower than that observed among HCWs in Uganda²⁷, Saudi Arabia²⁸ and Tanzania²⁹, half that reported in North West Region of Cameroon¹⁷, doubled that reported in Ethiopia¹⁹ but higher than in Poland³⁰, Libya³¹ and Rwanda³².

Out of 140 HCWs screened, 7(5%) were positive for HBsAg; 4(2.86%) nurses and 3(2.14%) medical laboratory technicians though this was not statistically significant ($p>0.05$). This is similar to a study carried out in Libya³¹ with the highest prevalence in nurses and nurse-aides and low prevalence in laboratory technicians but in contrast to another study conducted in a private tertiary health institution in Southwest, Nigeria where none of the laboratory technicians were positive²⁰. In this study, the HBV positivity was more among female (3.57%) which is in line with a previous study in Southeast, Nigeria¹⁰ but at variance with other Southwest Nigerian studies^{20,21} as well as a Cameroonian¹⁸ and an Ethiopian study¹⁹ with more male. This finding was not statistically significant. The outcome of this study showed that the seropositivity of HBsAg was found in those younger than 50 years, more of whom were 30-49 years of age as also reported by some Nigerian authors^{10,20,21}. There was no HBV infection in the 40-44 years age group though contrary to a finding in Southeast, Nigeria with no infection in the 30-39 years age group¹⁰. No statistically significant association was observed between HBV positivity and age.

Majority (92.86%) of the HCWs were aware of the infection while 111 (79.29%) knew that vaccination can prevent HBV infection. This is comparable to a study in Southwest, Nigeria where 89% had heard of HBV before the study and 87.6% of the participants identified that vaccination can prevent HBV infection⁷ as well as a study in Cameroon with 84.9% aware of the infection¹⁷. In this study, most participants had a good overall knowledge of HBV infection which is similar to findings in Ethiopia¹⁹ but contrary to findings in Cameroon¹⁸. From findings in this study, 102 (72.86%) were aware of the modes of transmission which is comparable to that obtained in a previous Southwest, Nigeria study with high level of knowledge about different modes of transmission¹² but higher than that obtained in a Cameroon study with 67.6% having good knowledge of the modes of transmission¹⁷.

Findings from this study revealed that 109 (77.86%) participants have been previously screened for HBV while 59 (42.14%) had been fully vaccinated. This is lower than the result obtained in Southwest Nigeria with 48.5% fully vaccinated¹² but higher than that obtained in Southeast, Nigeria with 25.31% previously screened and 6.67% fully vaccinated²⁵. Lower values of fully vaccinated HCWs have also been reported in Tanzania²⁹ and Libya³¹. The proportion of participants who have had needle stick injury in this study (12.14%) is lower than that reported by in previous studies^{18,19,27}.

The prevalence of HBV obtained in this study may be due to the high level of awareness, good knowledge of modes of transmission and vaccination of the HCWs though it is often assumed that because these individuals work in healthcare facilities, they should have adequate knowledge of certain diseases as this will enable them observe proper preventive measures.

A limitation of the study was that participants were drawn from a single town in the area and study findings may not be generalised to all HCWs in the area, especially if HBV rates differs in other towns in the area. Future studies can consider the determination of the level of protection conferred on each individual by the vaccine, other factors known to contribute to risk of infection and link the number of years of practice to positivity of infection.

V. Conclusion

With proper health education, accurate diagnosis, proper treatment of infected individuals, good knowledge of disease transmission and prevention as well as good vaccination coverage, HBV infection amongst HCWs can be prevented and its prevalence reduced.

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