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Knowledge of hepatitis B virus transmission, and seroprevalence of hepatitis B surface antigen among pregnant women attending Primary Healthcare Centers in Sokoto metropolis, Nigeria

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ABSTRACT

Background: Hepatitis B virus (HBV) infection is a major cause of morbidity and mortality across the world, and it is associated with high risk of maternal and fetal complications in pregnant women. **Aim**: This study aimed to determine the knowledge of HBV transmission, and seroprevalence of hepatitis B surface antigen (HBsAg) among pregnant women in Sokoto metropolis, Nigeria. **Materials and Methods:** A cross-sectional study was conducted among 209 pregnant women (selected by a two-stage sampling technique) attending the antenatal clinics of the Primary Healthcare Centers in Sokoto metropolis, Nigeria. Blood samples were collected and tested for hepatitis B surface antigen in addition to questionnaire administration. Data were analyzed using the IBM SPSS version 20 statistical computer software package. **Results**: Majority 182 (87.1%) of the 209 respondents were aged ≤ 34 years. Also, majority of participants had no formal education (58.9%), and were multigravida (76.1%). Only about a third and below knew the various modes of transmission of HBV infection. Whereas, only a few have had previous blood transfusions (6.7%) or surgeries (6.7%), more than a third of participants (39.2%) reported sharing needles and sharps. Sixteen (7.7%) of the 209 participants were reactive to hepatitis B surface antigen. **Conclusion**: This study showed low level of knowledge of HBV transmission and prevalent exposure to re-used needles and sharps among the participants, while a substantial proportion of them had HBsAg seropositivity. Mass education of the public on the risk factors of the disease, use of aseptic techniques, and proper screening of blood and blood products for HBV are crucial to its prevention and control.

Keywords: HBV transmission, HBsAg, knowledge, seroprevalence, pregnant women

INTRODUCTION

Hepatitis B virus (HBV) infection is a major cause of morbidity and mortality across the world, and it remains an important public health issue worldwide, especially in developing and under-developed countries.[1,2] It has been estimated that about one-third of the world population is infected with HBV, and with 600,000 HBV-related deaths annually, while about 350-400 million people develop lifelong chronic infection.[3,4]HBV infection is believed to be one of the most infectious diseases in the world, and accounts for about 7.3% of liver cancer deaths worldwide, with higher proportions in low and middle income countries; and HBV-related end-stage liver disease or hepatocellular carcinoma are responsible for over 1 million deaths per-year and currently represent 5-10% of cases of liver transplantation.[1-6]

Reports from previous studies showed wide variations in the prevalence of HBV infection in different regions of the world with the disease being endemic in sub-Saharan Africa, China, and some parts of Asia; and high rates of chronic infections were also found in the Amazon and southern parts of eastern and central Europe. [1,5,6] Evidence from literature showed wide variations in HBV seroprevalence across the sub-Saharan African countries including Sierra Leone (6.2%),[7] Mali (8.0%),[8] and Ghana (16.0%).[9] Nigeria is among the countries that are highly endemic for viral hepatitis in sub-Saharan Africa, with high HBV seroprevalence in studies conducted among pregnant women across the country including Makurdi (11.0%),[10] Maiduguri (11.6%),[11] and a rural community in North Central Nigeria (12.6%).[12]Of serious concern is

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the fact that despite the availability of safe and effective vaccine in preventing the transmission of HBV infection, Nigeria has remained a hyper endemic area for HBV infection with an estimated 12% of the population being chronic carriers, and with 2-15.8% of pregnant women being infected.[13-15]

HBV infection is generally transmitted through either vertical or horizontal modes, but vertical transmission constitutes the major mode of transmission in endemic areas where it accounts for 90.0% of cases and poses high risk of neonatal infection.[16,17] Transmission from mother to baby can occur during delivery as well as transplacentally via the hematogenous route. This probably occurs when the maternal blood contaminates the mucosal membrane of the new born baby, and it carries high risk of persistent infection with about 90% of children infected in the first year of life becoming chronic carriers in contrast to 10% of those infected thereafter; and with the chronicity increasing the risk of cirrhosis and hepatocellular carcinoma.[17,18] On the contrary, horizontal transmission which occurs through transfusion of infected unscreened blood and blood products, injection drug use, tattoos or acupuncture needles, and sexual intercourse (homosexual and heterosexual) accounts for only 10.0% of cases in endemic areas; and it is transmissible among children, families, and close contacts of infected persons.[17,19]

HBV infection during pregnancy is associated with high risk of maternal and fetal complications.[20] Although, chronic infection with HBV is often asymptomatic in pregnant women, it causes serious complications including coagulation defects, postpartum hemorrhage, anorexia, acute and chronic liver cirrhosis, and hepatocellular carcinoma; and maternal mortality has been shown to increase in pregnant women with liver cirrhosis.[20] Also, there is a 10-20% risk of a pregnant woman infected with HBV transmitting it to her fetus, thus resulting to serious fetal complications such as stillbirth, neonatal jaundice and neonatal death. Without intervention, the risk of perinatal HBV transmission is greatest for infants born to women who are HBeAg positive with infectivity rate of 70 to 90% at 6 months of age, and about 90% of these children remain chronically infected.[21] On the other hand, the risk of perinatal infection among infants born to HBeAg negative mothers ranges from 10-40% with 40-70% of these infected infants remaining chronically infected. Also, children born to HBsAg positive mothers who do not become infected during perinatal period remain at a high risk of infection during early childhood.[1,5,6] Several conditions and practices have been found to increase the risk of transmission of HBV infection in pregnant women. These constitute the risk factors for HBV transmission, and they include history of HBV infection in family members, family history of liver disease, increasing parity, polygamy and history of previous STIs, tattooing/scarification or tribal marks, and other procedures that involve sharing needles or sharps; also, previous blood transfusions, and previous surgical procedures including dilatation and curettage for miscarriage are significant risk factors for hepatitis B infection.[22-24] Knowledge of transmission of HBV infection and the factors associated with it is important in halting the spread of the disease, as it enables those at risk to take appropriate measures against the factors associated with the transmission of the disease. Despite the high HBV seroprevalence among pregnant women across sub-Saharan Africa, reports from previous studies conducted among pregnant women in the continent generally showed low level of awareness of HBV infection and poor knowledge of its transmission.[25-27] Although, a previous study had reported an HBV seroprevalence of 6.5% among pregnant women in Sokoto, Nigeria, information on their knowledge of the transmission of HBV infection and their current HBV sero-status is limited. This study was conducted to determine the knowledge of hepatitis B virus transmission, and seroprevalence of hepatitis B surface antigen among pregnant women attending Primary Healthcare Centers in Sokoto metropolis, Nigeria.

MATERIALS AND METHODS

Study Design, Population and Area

A cross-sectional study was conducted among pregnant women attending the antenatal care clinics of the Primary Healthcare Centers (PHCs) in Sokoto metropolis, Nigeria, from October to December 2017. All those who consented to participate were considered eligible for enrollment into the study, while those who work as health workers or were too ill to respond to the questions in the questionnaire were excluded.

Sample Size Estimation and Sampling Technique

The sample size was statistically estimated at 203 and the eligible participants were selected by a 2-stage sampling technique. At the first stage, 10 PHCs were selected from the PHCs in Sokoto metropolis, Nigeria, by simple random sampling using the ballot option. At the second stage, 21 eligible participants were selected from each of the selected PHCs by systematic sampling technique using the patients' attendance list in the respective facilities to constitute the sampling frame. A total of 209 pregnant women were enrolled into the study.

Data Collection and Analysis

A set of pretested semi-structured interviewer-administered questionnaire was used to obtain information on the participants' socio-demographic characteristics, knowledge of transmission of hepatitis B virus, and the risk factors for HBV infection. A data sheet was used to collect information on HBsAg sero-status; blood samples were obtained from the study participants by pricking them with lancets after obtaining informed consents and the samples were tested using validated Lab Acon rapid diagnostic kit for HBsAg (Hang Zhou Bios Test Biotech Co Ltd, Hang Zhou, China). The questionnaire was pretested on 15 pregnant women attending the antenatal care clinic of one of the PHCs that were not selected for the study; the questions were well understood and no modification was necessary. Data were analyzed using the IBM SPSS version 20 computer statistical software package. Quantitative variables were summarized using mean and standard deviation, while qualitative variables were summarized using frequencies and percentages.

Ethical Consideration

Ethical approval was obtained from the Health Research and Ethics Committee, Sokoto State Ministry of Health, Sokoto, Nigeria. Permission to conduct the study in the selected PHCs was obtained from the Sokoto State Ministry for Local Government Affairs, Sokoto, Nigeria and the administration of the respective Local Government Areas. Informed written consent was also obtained from the study participants before commencing data collection.

RESULTS

Socio-demographic characteristics of participants

All the 209 questionnaires administered were adequately completed and found suitable for analysis, giving a response rate of 100%. The ages of the participants ranged from 15 to 44 years, and majority 182 (87.1%) of the 209 respondents were aged ≤ 34 years. Most of the participants were married (95.2%), practiced Islam as religion (97.0%), and belong to Hausa ethnic group (90.4%). Majority of them had no formal education (58.9%), and were multigravida (76.1%) as shown in Table 1.

Participants' knowledge of transmission of HBV infection and its prevention with HBV vaccine

Whereas about half, 107 (51.2%) of the 209 participants were aware of HBV infection, only a few (8.1%) knew that it is caused by a virus, less than half (40.1%) knew that it is a communicable disease (40.7%), and less than a third (29.2%) knew that it affects the liver. Also, whereas, about half of participants (54.1%) knew that HBV infection is not transmissible through contaminated foods, only about a third and below knew its modes of transmission with the most commonly known ways of transmitting the disease being transfusion with contaminated blood (39.2%) and sharing needles and sharps (37.3%). Only about a third (31.6%) of the participants knew that HBV infection can be prevented with HBV vaccine, and that the vaccine is available in the hospital (Table 2).

Table 1: Socio-demographic characteristics of participants

Variables	Frequency (%) n = 209
Age group (years)	
15-24	84 (40.2)
25-34	98 (46.9)
35-44	27 (12.9)
Religion	
Islam	203 (97.1)
Christianity	6 (2.9)
Marital status	
Single	8 (3.8)
Married	199 (95.2)
Widowed	2 (1.0)
Tribe	
Hausa	189 (90.4)
Others	20 (9.6)
Education level	
None	6 (2.9)
Quranic only	117 (56.0)
Primary	15 (7.2)
Secondary	57 (27.3)
Tertiary	14 (6.7)
Parity	
Primigravida	50 (23.9)
Multigravida	159 (76.1)

Participants' HBV risk profile and seroprevalence of hepatitis B surface antigen

Whereas, only a few of the participants reported risk factors for HBV infection such as family history of liver disease (4.3%), and previous blood transfusions and surgeries (6.7%), more than a third of them (39.2%) reported sharing needles and sharps. Sixteen (7.7%) of the 209 participants were reactive to hepatitis B surface antigen (Table 3).

DISCUSSION

This study assessed the knowledge of hepatitis B virus transmission, and seroprevalence of hepatitis B surface antigen among pregnant women attending Primary Health Centers in Sokoto metropolis, Nigeria. The participants in this study were relatively young with most of them being aged ≤ 34 years; this is similar to the finding in a study in Akure, Nigeria,[28] that also reported a young population of participants with majority of them being aged 25-35 years.

Table 2: Participants' knowledge of transmission of HBV infection and its prevention with HBV vaccine

Variables	Frequency (%) n = 209
Awareness of HBV infection and its cause	
Ever heard of HBV	107 (51.2)
Knew that HBV infection is caused by a virus	17 (8.1)
Knew that HBV infection is a communicable disease	85 (40.7)
Knew that HBV infection affects the liver	61 (29.2)
Knowledge of transmission of HBV infection	
Knew that it is not transmitted by eating contaminated food	113 (54.1)
Knew that it is transmissible through tattoo or body piercing	49 (23.4)
Knew that it is transmissible by sharing needles and sharps	78 (37.3)
Knew that it is transmissible through transfusion with infected blood	82 (39.2)
Knew that it is transmissible through sexual contact	73 (34.9)
Knew that it can be transmitted from an infected mother to her baby	72 (34.4)
Knew that it is not transmitted through breast feeding	25 (12.0)
Knowledge of prevention of HBV infection with HBV vaccine	
Knew that HBV infection can be prevented with HBV vaccine	66 (31.6)
Knew that that HBV vaccine is available in the hospital	66 (31.6)

Table 3: HBV risk profile and hepatitis B surface antigen status of participants

Variables	Frequency (%) n = 209
HBV risk profile	
Gave family history of liver disease	9 (4.3)
Had previous blood transfusions	14 (6.7)
Had previous surgeries	14 (6.7)
Shared needles and sharps	82 (39.2)
Hepatitis B surface antigen status	
Reactive	16 (7.7)
Non-reactive	193 (92.3)

The fact that majority (58.9%) of the participants in this study did not have formal education could have contributed to their early marriage with majority of them being multiparous at their relatively young age. In addition, they were predominantly Muslims (being the main religion in northern Nigeria), and Islam forbids child bearing outside wedlock. In contrast to the finding in this study, majority of the participants in studies conducted in other places including Ghana,[9] and Rwanda[29] had at least primary education.

The low awareness of hepatitis B virus infection (51.2%) among the participants in this study and the generally low proportion of participants that knew the various ways of transmitting the infection, and it's prevention with HBV vaccine is disturbing considering the fact that Nigeria is highly endemic for the disease (with a prevalence of 10-20%)[30], and the high risk of transmitting the infection to their babies (i.e., vertical transmission) since they lack the knowledge of its transmission and prevention. Similarly low awareness of HBV infection and poor knowledge of its transmission were reported in studies conducted in several sub-Saharan African countries where the disease is also endemic including Ghana,[25] Cameroon,[26] and Kenya.[27] The rapid spread of hepatitis B virus infection in the developing countries is believed to be driven largely by the poor knowledge of the disease as a result of lack of community health education, illiteracy and poverty.[16]

Although, the prevalence of most of the risk factors for HBV infection was relatively low among the participants, it is worrisome that more than a third of them (39.2%) had shared needles and sharps, as this places them at risk of HBV infection and other blood borne viral infections particularly, HIV infection. The substantial proportion of participants that had shared needles and sharps in this study could be due to the fact that most of them did not know that it is one of the routes of transmission of HBV infection. This finding provides additional evidence in support of the belief that poor knowledge of the disease is one of the driving forces behind its spread in the developing countries,[16] and it suggests the need for mass public health education regarding the transmission and prevention of the disease in Sokoto, Nigeria, and in other places where the disease is endemic.[13] Also, the relatively high prevalence of sharing of needles and sharps among the participants in this study (39.2%) could have contributed to a substantial proportion of them (7.7%) having hepatitis B surface antigen seropositivity, as previous studies have established strong links between exposures involving sharing needles and sharps (including tribal and tattoo marks) and HBsAg seropositivity.[23,24] These findings underscore the need for collaboration between Sokoto State Ministry of Information, Home Affairs and Culture, and Sokoto State Ministry of Health in the prevention and control of the disease, through mass education of the public on its risk factors, use of aseptic techniques in the health facilities, and proper screening

of blood and blood products for HBV before administering them to pregnant women.

CONCLUSION

This study showed low level of knowledge of HBV transmission and prevalent exposure to re-used needles and sharps among the participants, while a substantial proportion of them had HBsAg seropositivity. Mass education of the public on the risk factors of the disease, use of aseptic techniques, and proper screening of blood and blood products for HBV are crucial to its prevention and control.

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Nil.

Conflict of interest

None declared.

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