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Incidence Of Hepatitis B Surface Antigen Among Pregnant Women Attending Antenatal In Selected Private Clinics In Port Harcourt Metropolis, Nigeria

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ABSTRACT
Despite the implication of perinatal transmission of Hepatitis B virus from mothers to their fetus during pregnancy, recommended routine antenatal screening of pregnant women has not been fully implemented in many Nigerian hospitals and clinics offering antenatal services. The study aimed to determine the incidence of hepatitis B surface antigen among pregnant women attending antenatal in selected private clinics in Port Harcourt metropolis. The study employed a cross-sectional design between March and April 2020. A purposive sampling technique was used. Medical risk factor exposure to HBsAg was gotten from patient's folders. Blood samples of participants were analyzed at a central laboratory. A commercial rapid diagnostic test strips was used; Micro point and labACON to detect HBsAg in serum/plasma. Data was analyzed using statistical tools such as frequency count, percentage and Chi-square. The result showed a low incidence (6%) of HBsAg among the respondents. A significant relationship existed between medical risk factor exposure and the incidence of HBsAg virus among the pregnant women attending antenatal in the selected private clinics in Port Harcourt Metropolis, in Nigeria at a df of 5 and a p-value of 0.05. It was recommended that, vaccinations for HBV should be completed by all women of reproductive age to build immunity against the virus.
Keywords:

INTRODUCTION

The threat of Hepatitis B virus to pregnancy cannot be overemphasized. According to the World Health Organization (2015), hepatitis B increases the incidence of hyperemesis gravidarum mostly within the first trimester; and in the second and third trimesters, there is an increased chance of hypertensive disorders and higher incidence of postpartum hemorrhage. Mac *et al* (2019) stated that, Hepatitis B virus (HBV) is a resistant virus that may exist and survive on surfaces for a long period of time. It can be contagious even in dry blood and more contagious in serum or plasma. The virus can be found in all geographical population. It occurs majorly in tropical regions and is responsible for the one million deaths occurring annually, worldwide.

Viral transmission is through exposed mucosa, broken skin, infected blood, saliva and fluids from organs of reproduction. It may also occur more in childhood; this is because it is implicated in perinatal transmission. The risk of getting infected with the virus is increased among intravenous drug addicts, promiscuous individuals, body piercing, and people in occupations where blood and blood products are used. Sharing of sharps and living in a crowded environment. The mode of transmission of the hepatitis B

virus (HBV) may be horizontally or vertically. Horizontal transmission results from close personal contacts. Vertical transmission is mainly perinatal either through the placenta or during vaginal or unsupervised caesarean sections (Abdi *et al*, 2015).

Global figures of the infection reveals about 350 million persons are chronically infected with more than 68,600 persons dead as a result irrespective of geographical locations (WHO, 2016). Complication of chronic hepatitis (hepatic carcinoma) resulted to the death of 887,220 from a population of 257million people as of 2015 (WHO, 2015). High figures (15-25%) of the general population are estimated to be a representation of persons chronically infected in the sub-Saharan regions of Africa (Olayinka *et al.*, 2016). In Nigeria, a high incidence of Hepatitis B virus infection has also been documented in a study by Emechebe *et al.,* in 2009 which reported incidence rates as high as 9-39% of the general population was infected with the hepatitis B virus.

There is an urgent need to examine its incidence especially in low resource settings in Nigeria to aid informed decision making and intervention to curtail it. Hepatitis B virus screening is one among the other screening done as routine during antenatal booking however; screening for hepatitis B infection is not adequately practiced in many low resource settings in Nigeria (Nongo *et al.*, 2016). Most recent study on prevalence of Hepatitis B surface antigen among pregnant women attending antenatal from two tertiary hospitals within Port Harcourt Metropolis was in 2005 and 2006 respectively. There is however paucity of study on the incidence of Hepatitis B virus infection among pregnant women attending antenatal clinic in private hospitals in Port Harcourt metropolis, Rivers state, Nigeria. Hepatitis B virus infection remains a serious global public health concern (WHO, 2019). It is this concern that prompted this research to determine the incidence of hepatitis B surface antigen among pregnant women attending antenatal in selected private clinics in Port Harcourt metropolis.

Research questions

The study provided answers to the following questions:

1. What is the incidence of Hepatitis B surface antigen virus among pregnant women in Port Harcourt Metropolis?
2. What are the medical risk factors that contribute to the incidence of hepatitis B surface antigen virus among pregnant women in Port Harcourt Metropolis?
3. What is the relationship between medical risk factor and incidence of hepatitis B surface antigen virus among pregnant women in Port Harcourt Metropolis?

Hypothesis

One null hypothesis was postulated to guide the study as shown below:

H_o: There is no significant relationship between risk factor exposure and the incidence of Hepatitis B surface antigen ($p<0.05$, at 95% CI).

METHODOLOGY

The methods and procedure adopted in the study are shown below:

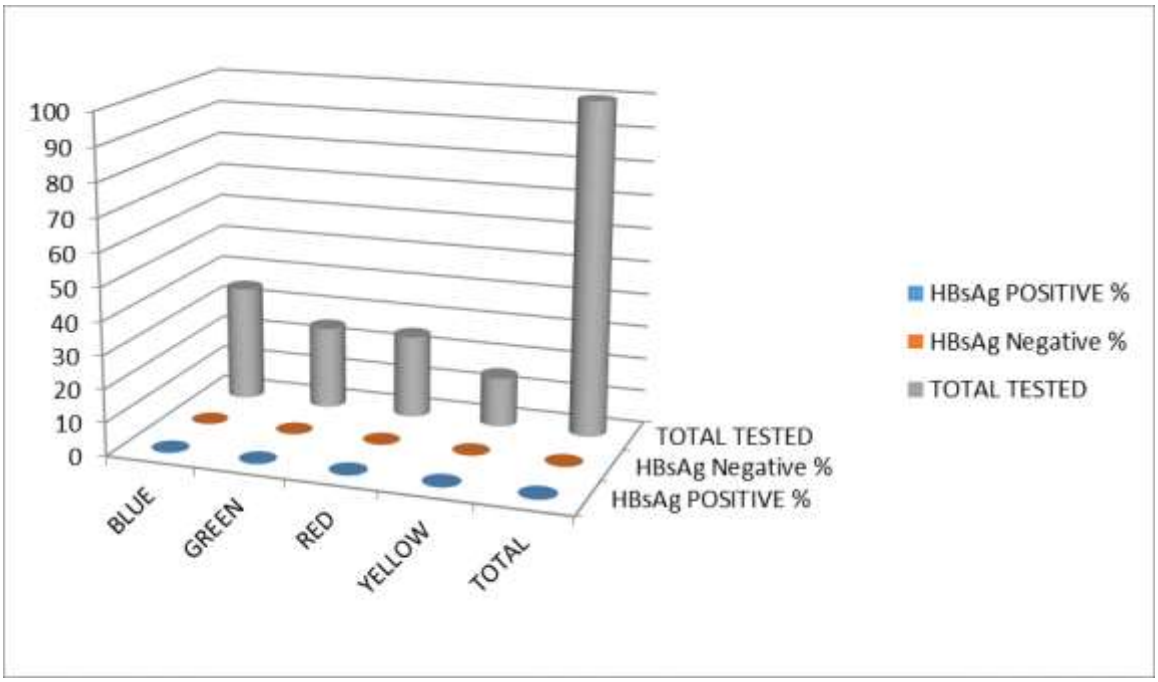
The study adopted a laboratory based cross-sectional research design with a population consisting of one hundred and twenty-five pregnant women who attended antenatal clinic in the selected private clinics in Port Harcourt metropolis from first of March to 30th of April, 2020. A sample size of 100 was used which was determined using the Fisher's formula. A non-probability sampling in which every single participant who meets the inclusion criteria from a heterogeneous population was enrolled until the desired number of participants was reached.

Data was collected through a clinical investigation. A total of 100 pregnant women from the 125 who presented for antenatal met the criteria to be included in category "C" which comprised women that knew their hepatitis B status to be negative. A verbal informed consent was sort from the patients by the laboratory scientist as part of routine laboratory investigation under the supervision of the researcher in the phlebotomy room of the different clinics utilized for the purpose of the study. Socio-demographic characteristics from respondents were retrieved from laboratory forms and labels on blood sample while medical risk factor exposure to HBsAg was gotten from patient's folders. Blood samples of participants were analyzed at a central laboratory. Blood samples were collected thereafter by the laboratory scientist

and standard precautions were maintained. Blood samples were put into EDTA bottles, sorted based on category under the supervision of the primary investigator and kept inside different blood sample collection box at a room temperature to maintain its potency. Commercial rapid diagnostic test strips (LabACON and Micro Point) to detect presence of hepatitis B surface Antigen in either serum or plasma was used. A permit to view patient's folder was granted as previously requested. Data on socio-demographic characteristics and risk factor exposures were retrieved from patient care folders in the various clinics under. The incidence of HBsAg among the pregnant women attending antenatal clinics were descriptively presented using frequency distribution tables, percentages and charts. Each entry in the table contains the frequency or count of the occurrences of values within a particular group or interval, and in this way, the table summarizes the distribution of values in the sample. The relationship between the HBsAg status and the risk factor was analyzed using Pearson chi-square.

RESULTS

The results of the study are presented below:



Bar chart 4.2: Representation of incidence of HBV across the selected private clinics. N=100

Table 1: Incidence of Hepatitis B surface antigen among participants, N=100

HBsAg status	**Clinics**				**Total (%)**
	Blue	Green	Red	Yellow	
Positive	3(3%)	1(1%)	2(2%)	0(0%)	6(6%)
Negative	32(32%)	24(24%)	23(23%)	15(15%)	94(94%)
Total	35	25	25	15	100

The table 1 above presents the incidence of the hepatitis B virus across the various clinics under study. The number of pregnant women who met the inclusion criteria for the study and whose blood samples were analyzed in line with the aims of the research were as follows; 35 pregnant women from Blue clinic, 25 from Green clinic,25 from Red clinic and 15 from yellow clinic. New cases of HBV were discovered in 3(3%) of the study participants from Blue clinic, 1(1%) from green clinic, 2(2%) from Red clinic while

Yellow clinic had no incidence of the Hepatitis B virus. The Cumulative incidence of the HBsAg in the four clinics under study was 6% of the entire population used for the study.

Table 2: Incidence of HBsAg across medical risk factor exposure, N=100

Risk Factors	Frequency	HBsAg Positive	HBsAg Negative
Previous history of contraceptive use	Yes 13	3(23.1%)	10(76.9%)
	No 87	3(3.4%)	84(96.6%)
Previous hospital admission	Yes 35	4(11.4%)	31(88.6%)
	No 65	2(3.1%)	63(96.9%)
Previous blood transfusion	Yes 16	3(18.8%)	13(81.25%)
	No 84	3(3.6%)	81(96.4%)
Partial vaccination	Yes 1	0	1(100%)
	No 99	6(6.1%)	93(93%)
Previous cesarean section	Yes 19	3(15.8%)	16(84.2%)
	No 81	3(3.7%)	78(96.3%)
Previous history of IV drug use	Yes 22	2(9.1%)	20(90.9%)
	No 78	4(5.1%)	74(94.9%)

Table 2 shows the medical risk factors that may have contributed to the incidence of HBV among the participants. Among the 100 participants recruited for the study, 13 had a previous history of contraceptive use. Three (23.1%) of them were positive to the HBsAg while 3(3.4%) of the other 87 who did not identify with a history of previous contraceptive use were also positive. Among those with or without previous history of hospital admission, four (11.4%) in 35 and 2(3.1%) in 65 had HBsAg positive results. Three (18.8%) in 16 of the pregnant participants who tested positive to the HBsAg had a history of previous blood transfusion. The other 3(3.6%) in 84, positive to the HBV virus had no history of previous blood transfusion. Only one participant had a history of partial vaccination and was negative to the HBV. Six (6.1%) among 99 with a history of partial vaccination were positive to the HBV. Three (15.8%) in 19 who had previous caesarean section were HBsAg positive. The other 3(3.7%) in 81 who had no similar history were also positive to the virus. Two (9.1%) of 22 participants exposed to previous intra venous drug use were sero positive to the HBsAg however, 4(5.1%) in 78 who were not exposed were also positive.

Table 4: Chi-square test showing relationship between medical risk factor and incidence of Hepatitis B surface antigen. N=100

	X^2cal	X^2tab	Df	P value	Inference	Decision
Chi-Square	67.96	11.07	5	0.05	$X^2cal>x^2tab$	H_1 accepted

From the table 4 above, the value of calculated chi square $x^2 = 67.96$, the degree of freedom (df) = 5, at a level of significance, p=0.05. Hence the critical chi square value $X^2tab= 11.07$. Since the calculated chi square value is greater than the critical chi square value, the null hypothesis which states that there is no significant relationship between the medical risk factors and incidence of Hepatitis B surface antigen at $p<0.05$ at 95% CI is rejected. While the alternate hypothesis which states that a significant relationship exists between the medical risk factor and incidence of Hepatitis B surface antigen at $p>0.05$ at 95% CI is accepted.

DISCUSSION OF FINDINGS

The findings of this study are discussed below:

The findings of the study showed that previous hospital admissions and previous history of intra venous drug use was also listed among the risk factor exposure contributory to the incidence of Hepatitis B virus among the pregnant participants. The higher the exposure to hospital environs the greater the risk of

contracting the virus. Blood transfusion was also implicated in the incidence of Hepatitis B virus among the pregnant participants. This may be attributed to the fact that although blood products are being screened for viral infections, there may still be loop holes or lapses in the provision of standard laboratory procedures for blood and blood product screening before recommendation for transfusion. Another medical risk factor that was implicated with incidence of the virus was partial vaccination. This may be due to the fact that those pregnant participants were mostly vulnerable to the HBV as a result of low immunity to the virus. A history of previous caesarean section was not exempted from the list of medical exposures that contributed to the increased incidence among certain groups. This may be attributed to the fact that the more the exposure to surgical hospital procedures the higher the risk of been infected with the hepatitis B virus.

The findings of this study is similar to the result from a cross-sectional study conducted on hepatitis B virus among pregnant women in Yirgalem Hospital, Ethiopia from October 2015 to August 2016 by Amsalu *et al.,* (2018) which showed that, exposure to the virus was from medical risk factors such as blood transfusion with unscreened blood, previous caesarean section in which improperly sterilized surgical equipment were used, infected needle prick injuries in the course of duty and unsafe abortion. Findings from this study can also be compared with the work of Bafa and Andamlak in (2020) which showed that, risk factors such as blood transfusion, surgical procedures (cs) and partial vaccination to the HBV were seen as predictors of HBV infection. This may be due to the fact that Blood (serum or plasma) is a common source for the infection as the virus can survive in dry blood on surfaces or serum or plasma for months.

The findings of this study is at variance with that of Bittaye *et al*, (2019) which revealed that no significant relationship existed between medical risk factors such as past history of blood transfusion, and past history of intravenous drug therapy and the incidence of hepatitis B whereas a significant relationship was seen to exist between medical risk factor exposure and the incidence of hepatitis B virus. These variations may be due to laid down policies and standards for the management of pregnant women in tertiary facilities which has been breached in private health facilities whose major intent is to make profit first rather than placing the safety of their patient as paramount. This in turn, has subjected their patient to undue medical risk. The incidence in this present study may have also been attributed to negligence on the part of the health care personnel's in carrying out standard medical practices in their respective departments within the private health facilities.

CONCLUSION

Based on the findings of the study, it was concluded that the incidence of hepatitis B surface antigen among pregnant women in Port Harcourt metropolis was low and the medical risk factors included previous hospital admission, previous blood transfusion, partial vaccination and previous cesarean section.

RECOMMENDATIONS

The following recommendations were made based on the findings of the study:

1. Vaccinations for HBV should be completed by all women of reproductive age to build immunity against the virus.
2. Pregnant women should only undergo surgical operations (caesarean section) if there is an obvious indication.
3. All equipment used invasively during delivery should be properly sterilized.
4. Surgical instruments used for Known Hepatitis B patients or newly diagnosed Hepatitis B patient should be set aside for only positive cases and never used on non-positive cases irrespective of the standard of sterilization.
5. All blood and blood products should be properly screened for Hepatitis B and other viral infection before transfusion.

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