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Socio-Demographic Factors Associated With The Incidence Of Hepatitis B Surface Antigen Among Expectant Mothers In Port Harcourt Metropolis, Rivers State, Nigeria

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ABSTRACT
Infection with Hepatitis B virus cuts across all groups of individual irrespective of the socio-demographic characteristics. The study examined the socio-demographic factors associated with the incidence of Hepatitis B surface antigen among expectant mothers in Port Harcourt Metropolis, Rivers State, Nigeria. The study employed a cross-sectional design between March and April 2020. A purposive sampling technique was used. Socio-demographic characteristics from respondents were retrieved from laboratory forms and labels on blood sample. 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. Demographic data was presented in frequencies and percentages, descriptive results were presented in tables and charts. Inferential statistics were done via hypothesis testing in Pearson Chi-square and results were also presented in tables. No significant association was found between age, parity and the incidence of HBsAg at a p-value of 0.05, df of 8 for age and 6 for parity. It was recommended that, health facilities should ensure prompt screening of expectant mothers for the viral infection at first antenatal booking and every six months' post-partum irrespective of gravid status, this will be of great importance in investigating the infection and promptly implementing evidenced based medical intervention.
Keywords: Hepatitis B, infection, expectant mothers, perinatal transmission

INTRODUCTION

Infection with Hepatitis B virus cuts across all groups of individual irrespective of the socio-demographic characteristics. Expectant mothers have been considered to be among low risk groups. However, statistical report by Musa *et al.,* (2015) revealed incidence rate as high as 11% in Nigeria. Its prevalence varies in different geographical locations but mostly highest in tropical regions (Mac *et al.*, 2019). This high rate recorded calls for more efforts to be made in order to prevent further increase. Records show that a major source of vertical transmission of the Hepatitis B virus is from an infected mother to her infant by intranatal/transplacental transmission in utero, perinatal transmission during delivery and postnatal transmission during care or through breast milk (Navabakhsh *et al.*, 2011). Fernandes (2014) noted that, vertical transmission of the virus from mother to child (MTCT) accounts for 35-40% incidence of HBV worldwide. Mother to child transmission of the virus has been implicated in pregnancy among women suffering from the hepatitis B virus infection and the virus is responsible for the annual deaths estimated as a million worldwide (Olayinka *et al*, 2016).

The severity of the hepatitis B virus is dependent on the age of acquisition and route of transfer or spread of the virus (Fernandes *et al*, 2014). In Nigeria most studies revealed low prevalence of hepatitis B in infancy and an increasing rate with age. Hepatitis B Virus transmission from mother to their children

accounts for 2.8% of the Nigerian population and is mostly through vertical transmission, although Horizontal transmission have also been linked to the spread of the virus (Jennifer *et al.*, 2015). The prevalence of HBsAg among pregnant women decreases with corresponding increase in social status. This may be as a result of educational exposure, awareness of the virus and its mode of transmission (Marc et al, 2017). Mustapha *et al.*, (2019) in Gombe found that promiscuity increased the chances of infection with HBsAg.

The outcome of an acute hepatitis in pregnancy may include premature labour with the resultant squeal of prematurity and studies have demonstrated high incidence of prematurity when compared to the general population (Nongo *et al.*, 2016). Viral hepatitis is a major public health challenge. In May 2016, a global health sector strategy on viral hepatitis was adopted by the world health assembly. It was intended to last from 2016-2020. A detailed role of the universal health coverage was stated with the intent of achieving sustainable development goals. The strategy was driven by a vision to completely eradicate the viral hepatitis by about 90% and also reduce mortality by 65% before 2030. This global strategy can be achieved jointly through the implementation plans laid down by the world health organization (WHO, 2016). Universal screening for hepatitis B is therefore of great importance in pregnancy because neonatal infection from HBV is minimized (Dionne-Odom *et al*, 2016).

Socio-demographic prevalence of HBsAg in similar studies carried out in the Gambia by Bittaye *et al*, 2019 revealed that there was no significant relationship between age and incidence of HBsAg however ages 21-37 (26,25 and 24) were mostly seen to be sero positive. However, a significant relationship existed between parity and the prevalence of HBsAg (p=0.001). This incidence may be due to the fact that exposure to the virus increased as the number of pregnancy and deliveries among the participants' increased. The Multiparous group had a higher risk of contracting the virus either from medical mismanagement in previous deliveries; through blood transfusion with improperly screened blood and exposure to caesarean section whose risk reduction is dependent on sterility of the instruments used. There is greater chance of been exposed to the virus as pregnancy and delivery increases. Thus, it becomes imperative to carry out a study of this sort to investigate the socio-demographic factors associated with the incidence of Hepatitis B surface antigen among expectant mothers in Port Harcourt Metropolis, Rivers State, Nigeria.

Research questions

The study provided answers to the following research questions:

1. What is the association between age and the incidence of HBsAg among the expectant mothers?
2. What is the association between parity and the incidence of HBsAg among the expectant mothers?

Hypotheses

The following hypotheses were stated to guide the study and were tested at 0.05 alpha level:

1. There is no significant association between age and the incidence of HBsAg among the expectant mothers.
2. There is no significant association between parity and the incidence of HBsAg among the expectant mothers.

METHODOLOGY

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 and Socio demographic characteristics were descriptively presented using frequency distribution tables, and percentages. The relationship between the HBsAg status and other variables were analyzed using Pearson chi-square.

RESULTS

The results of the study are presented below in Tables

Table 1: Socio demographic characteristics of participants (N=100)

Variables	Categories	Frequency	Percentages %
Age	21-25	18	18
	26-30	32	32
	31-35	37	37
	36-40	6	6
	41 and above	7	7
Occupation	Civil Servant	32	32
	Self- Employed	37	37
	Unemployed	31	31
Educational status	Tertiary	46	46
	Secondary	35	35
	Primary	15	15
	Informal	4	4
Residency	Urban	81	81
	Rural	19	18
Marital Status	Married	100	100
Parity	Para 1	62	62
	Para 2 and 3	22	22
	Para 4 and above	16	16

From Table 1 presented above, out of the 100 participant recruited for the study, 18(18%) were within ages 21-25. Thirty two 32(32%) were in the age range of 26-30, 37(37%) were in the age range of 31-35, 6(6%) within range 36-40 and the remaining 7 (7%) of the population under study were 41 years and above. Hence majority of the women were within ages 31-35. Thirty two (32%) were Civil servants, 37(37%) were self-employed, while 31(31%) were unemployed. About 46(46%) had a tertiary level of education, 35(35%) had secondary education, 15(15%) primary education while 4(4%) had other forms of informal education. Eighty one (81%) of the study participant resided in the highbrow areas of the Port Harcourt metropolis while 19(19%) resided in the low brow areas. All the participants recruited for the

study were married (100%) with 62(62%) who were para 1, 22(22%) Para 2 and 3 and 16(16%) who were para 4 or above.

Table 2: Incidence of HBsAg across different age group (N=100).

Age Group	Number tested	HBsAg Positive (%)	HBsAg Negative (%)
21-25	37	0(0%)	37(100%)
26-30	32	1(3%)	31(97%)
31-35	18	3(17%)	15(83%)
36-40	8	1(13%)	7(88%)
41 and above	5	1(20%)	4(80%)

From the table 2 above, the incidence of Hepatitis B surface antigen across the various age groups under study is displayed. Thirty-seven in the age range of 21-25 were all negative to the hepatitis B virus. This may be attributed to the fact that the majority within that age groups were newly married and recommendation for routine viral laboratory testing are now practiced by churches before a union between spouses is sealed. Hence participants in this age group were at lower risk of contracting the HBV from their spouse who were also tested for the virus as a routine before marriage. One (3%) in 32 and 3 (17%) in 18 of the participants within the age range of 26-30 and 31-35 were sero positive to the hepatitis B virus. Another 1(13%) in 8 and 1(20%) in 5 of the participants who tested positive were age ranged 36-40 and 41 and above.

Table 3: Incidence of HBsAg across the parity of the respondents (N=100).

Parity	Number tested	HBsAg Positive (%)	HBsAg Negative (%)
Para1	38	1(20%)	37(97%)
Para 2	33	1(3%)	32 (97%)
Para 3	19	3(17%)	16(84%)
Para 4 and above	10	1(13%)	9(9%)
Total	100	6(6%)	94(94%)

Table 3 shows the Hepatitis B surface antigen sero positive result across the parity of the participants. One (3%) in 33 of the expectant mothers with para 2 was positive to the HBsAg virus and the other 3(17%), para 3 and 1(13%), para 4 in 19 and 10 pregnant participants blood samples tested positive to the HBV.

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

	X^2cal	X^2tab	Df	P value	Inference	Decision
Chi-Square	8.26	15.51	8	0.05	X^2cal<x^2tab	H_0 accepted

From the table 4 above, the value of calculated chi square $x^2 = 8.26$, the degree of freedom (df) = 8, at a level of significance, p=0.05. The critical chi square value X^2tab= 15.51. Since the critical chi square value is greater than the calculated chi square value, the null hypothesis which states that there is no significant association between the socio demographic factor (age) and incidence of Hepatitis B surface antigen at p<0.05 at 95% CI is accepted.

Table 5: Chi-square test showing relationship between parity and incidence of Hepatitis B surface antigen (N=100)

	X^2cal	X^2tab	Df	P value	Inference	Decision
Chi-Square	4.5	12.59	6	0.05	X^2cal<x^2tab	H_0 accepted

From table 5 above, the value of calculated chi square $x^2 = 4.5$, the degree of freedom (df) = 6, at a level of significance, p=0.05. The critical chi square value X^2tab= 12.59. Since the critical chi square value is

greater than the calculated chi square value, the null hypothesis which states that there is no significant association between the parity and incidence of Hepatitis B surface antigen at $p<0.05$ at 95% CI is accepted.

DISCUSSION OF FINDINGS

The findings of this study revealed that young age, and multiparity contribute to the incidence of Hepatitis B virus among the pregnant participants. The incidence in the age group stated may be attributed to the fact that they are considered to be in their reproductive or sexually active age hence they were seen to be more at risk of contracting the HBV. The incidence in the advanced age group may be attributed to the fact that although approaching menopause, some married at a later age than those within ages 21-25. Hence were still classified among the reproductive age groups that may have been exposed to the virus from an infected or jaundiced spouse. Findings from this study can be compared with the work of Kolawole *et al.*, (2012). In Nigeria, Osogbo to be precise, the relationship of the variables under study was compared. The results showed no significant relationship between the socio demographic (age) with the incidence of HBV. From another study by Bittaye *et al.*, (2019) aimed at determining the socio - demographic prevalence of HBsAg among pregnant women attending antenatal clinic in EFSTH (Edward Francis Small Teaching Hospital) in the Gambia in 2015. The age range of 21 -37 (26, 25 and 24) were seen to be mostly sero-positive as compared with other age range. This may be due to lack of antenatal screening in the country. Thus the incidence of the HBV in the work of Bittaye *et al.*, 2019 can be supported by the fact that the vaccination programme introduced in 1990 had not been fully established. Hence pregnant women within the age range stated as above were probably born before the full implementation of the universal vaccination strategy into the Expanded Program on Immunization. This fact may be indirectly identified with this present study.

Having a history of multiparity was also considered one of the major risk factor predisposing the participants to the Hepatitis B virus. This incidence may be due to the fact that exposure to the virus increased as the number of pregnancy and deliveries among the participants' increased. The Multiparous group had a higher risk of contracting the virus either from medical mismanagement in previous deliveries; through blood transfusion with improperly screened blood and exposure to caesarean section whose risk reduction is dependent on sterility of the instruments used. There is greater chance of been exposed to the virus as pregnancy and delivery increases. The result agrees with findings 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). From the total of 475 pregnant women enrolled for the study, reproductive variables such parity, trimester and gravidity were not significantly associated with the prevalence of HBV infection. The reviewed literature and this present study accepted the null hypothesis after data analysis. This may be attributed to the fact that HBV could occur in any of the participants irrespective of the parity and trimester. The incidence of the virus in the parity reported may be as a result of increase in the number of pregnancy and delivery in the sexually active participants. An increase in the number of pregnancy and delivery results to greater risk of exposure (sexually or surgically) to the HBV virus.

CONCLUSION

Based on the findings of the study, it was concluded that the socio-demographic factors associated with the incidence of Hepatitis B virus among expectant mothers in Port Harcourt Metropolis were age and parity.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. The health facilities should ensure prompt screening of expectant mothers for the viral infection at first antenatal booking and every six months' post-partum irrespective of gravid status, this will be of great importance in investigating the infection and promptly implementing evidenced based medical intervention.

2. Premarital screening of women of reproductive age for viral infections including Hepatitis B should be encouraged, extramarital affairs discouraged and unhealthy behaviour such as sharing of toothbrush with spouse or other family members be avoided.
3. Unvaccinated groups among the pregnant women registered for antenatal should be the target population for intervention if a rapid decrease or total elimination of the hepatitis B virus would be achieved according to the WHO vision 2030 agenda which is to completely eradicate the virus.

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