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TEACHING HOSPITAL, OSOGBO: A 5-YEAR STUDY**

PREVALENCE OF HEPATITIS B AMONG PREGNANT WOMEN AT LAUTECH TEACHING HOSPITAL, OSOGBO: A 5-YEAR STUDY

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ABSTRACT

INTRODUCTION

Hepatitis B virus is most commonly transmitted from mother to child during birth and delivery. The prevalence of hepatitis B in pregnant women worldwide is 0.25-2.5%. This study was designed to determine the prevalence of Hepatitis B among pregnant women at LAUTECH Teaching Hospital, Osogbo with a view to producing a data base for effective treatment and control plan of the disease.

METHODS

It was a retrospective study over a 5-year period (2015-2019) that determined the prevalence of Hepatitis B in pregnancy and fetomaternal outcomes. Data on socio-demographic characteristics of patients were retrieved from the case files. Data analysis was done with SPSS version 23 using appropriate statistical tools.

RESULTS

110 cases were identified among 4300 pregnant women. The prevalence of Hepatitis B was 2.56%. The prevalence increased over the 5-year period. There was association between the prevalence of Hepatitis B infection, age, marital status, location, and parity. There was also association between hepatitis and the birth weight of babies as well as their APGAR

(Appearance, Pulse rate, Grimace, Activity, Respiration) scores.

CONCLUSION

The prevalence of Hepatitis B infection among pregnant women is slightly higher than the global prevalence with an increasing rate over the five-year period. Feto-maternal outcomes were associated with chronic hepatitis B infection. The importance of prevention of the infection needs to be further emphasized.

Keywords: Hepatitis B; Pregnancy; fetomaternal outcomes

INTRODUCTION

Hepatitis B virus (HBV) infection occurs worldwide and constitutes a major public health problem.¹ It is endemic in some regions especially Asia and Africa.² Hepatitis B virus infection is a potentially life threatening liver infection. It is a major global public health problem and is known to cause chronic hepatitis with high risk of mortality resulting from hepatic cirrhosis and cancer. Infection in pregnancy may be life-threatening to the mothers and fetuses.^{2,3}

The World Health Organisation (WHO) estimates that in 2015, 257 million people were living with chronic hepatitis B infection

(defined as hepatitis B surface antigen positive) with an estimated 887,000 deaths, mostly from cirrhosis and hepatocellular carcinoma.³ The virus is most commonly transmitted from mother to child during birth and delivery, as well as through contact with blood or other body fluids.³

As of 2016, 27 million people (10.5% of all people estimated to be living with hepatitis B) were aware of their infection, while 4.5 million (16.7%) of the people diagnosed were on treatment.⁴ The prevalence of hepatitis B in pregnant women worldwide is 0.25-2.5% while in Nigeria, regional studies have shown prevalence ranging between 4.7% and 15.8%.^{2,3}

Hepatitis B affects 325 million people worldwide causing 1.4 million deaths a year. It is the second major killer infectious disease after tuberculosis, and 9 times more people are infected with hepatitis than HIV. Hepatitis is preventable and treatable, however, over 80% of people living with hepatitis lack prevention, testing and treatment services.⁴ Infection in adulthood leads to chronic hepatitis in less than 5% of cases, whereas infection in infancy and early childhood leads to chronic hepatitis in about 95% of cases. Transmission of the virus may occur from mother to child during childbirth and through the reuse of needles and syringes either in health-care settings or among persons who inject drugs.^{3,4}

The likelihood that infection becomes chronic depends on the age at which a person becomes infected. Children less than 6 years of age who become infected with the hepatitis B virus are the most likely to develop chronic infections. In infants and children, 80–90% of infants infected during the first year of life develop chronic infections and 30–50% of children infected before the age of 6 years develop chronic infections.^{4,5}

The prevalence of HBV among pregnant women in developed countries and some

developing countries is known. Although studies have been carried out on HBV in other parts of the country, information is scarce on the prevalence of HBV among pregnant women in Osun State. Also data on the prevalence of HBsAg positivity in pregnant women and fetal outcome in southwest Nigeria are limited. As a result, guidelines and adequate information on the prevention and control strategies are lacking. This study evaluates the prevalence of Hepatitis B among pregnant women at a university teaching hospital in Nigeria with a view to providing information on it and producing a data base for effective treatment and control plans.

METHODS

This study was carried out at the Ladoke Akintola University of Technology Teaching Hospital (LTH) now UNIOSUN Teaching Hospital, Osogbo, Osun State, Nigeria. The study population was pregnant women who attended antenatal clinic, tested positive to hepatitis B surface antigen and delivered in LTH. All the women had screening for HBsAg as part of the routine booking investigations.

It was a retrospective study from January 1, 2015, to December 31, 2019. Medical records were examined and sociodemographic data, presence of Hepatitis B and associated complications in the mothers and babies, fetal outcomes such as the birth weight, APGAR score, admission to SCBU, were obtained.

Data were fed into SPSS version 23. Categorical variables were summarized using numbers and percentages while the mean and standard deviation were for continuous variables. Chi-square test was used for categorical variables where appropriate. *P*-value was set at 0.05. Ethical approval was obtained from the departmental research and ethics committee on the 8th June, 2020 with approval number LTH/EC/2020/06/460.

RESULTS

During the study period, a total number of 4,300 mothers delivered out of which 110 of them tested positive to HBsAg test (Table 1). Thus, the prevalence of HBsAg during the period was 2.56%. Over the five-year period, there was increase in the number of pregnant women with hepatitis B infection (Figure 1).

Table 1: Prevalence of Hepatitis B (2015-2019)

Years	Number of Hepatitis-B positive Mothers	Number of deliveries	Prevalence
2015	11	610	1.8
2016	17	744	2.3
2017	23	954	2.4
2018	26	963	2.7
2019	33	1029	3.2
Total	110	4300	2.56

Majority of the pregnant women were within 30-39years of age, were civil servants, married, Christian, had tertiary level of education, live within Osogbo metropolis and multiparous. There was a statistical significance between prevalence and age, marital status, location and parity with p-value 0.017, 0.027, 0.043 and 0.010 respectively (Table 2).

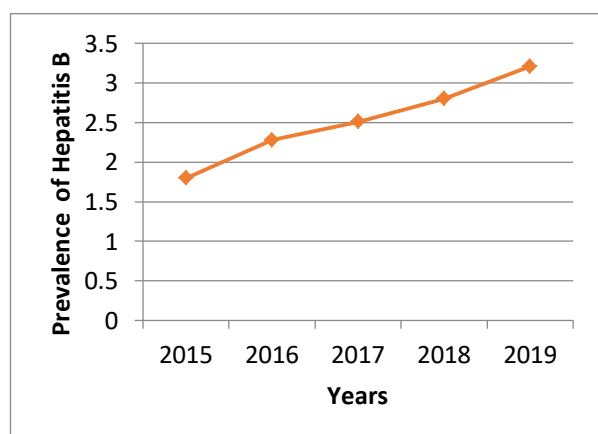


Figure 1: Five-year prevalence of Hepatitis B positivity among pregnant women

Table 2: Prevalence of Hepatitis B in various socio-demographic groups

	Positive	Negative	X ²	P-value
Age Group				
20-29	45(3.5)	1240(96.5)	13.411	0.017
30-39	62(2.8)	2140(97.2)		
40-49	3(0.4)	810(99.6)		
Occupation				
C/S	55(2.5)	2130(97.5)	3.009	0.151
Housewife	32(3.1)	1006(96.9)		
Trader	11(1.8)	754(98.2)		
Student	9(2.9)	300(97.1)		
Marital Status				
Single	5(3.8)	125(96.2)	6.177	0.027
Married	105(2.5)	4065(97.5)		
Religion				
Christian	68(1.3)	2473(98.7)	4.042	0.061
Islam	42(2.4)	1717(97.6)		
Education				
Primary	6(2.3)	252(97.7)	4.117	0.091
Secondary	37(3.1)	1173(96.9)		
Tertiary	67(2.4)	2765(97.6)		
Location				
Osogbo	80(2.1)	3729(97.9)	8.376	0.043
Outside Osogbo	20(4.8)	401(95.2)		
Outside Osun State	10(14.3)	60(85.7)		
Parity				
Primiparous	45(2.8)	1550(97.2)	11.499	0.010
Multiparous	65(2.4)	2640(97.6)		

Table 3 showed that only 10(9.1%) were aware of their HBV status. Out of the 110 HB positive women, only 5(4.5%) had HBV profile test done which shows a low uptake of further investigations following a positive screening test. Four (4) of the results showed no abnormality while one showed abnormal results. Only 2(1.8%) of the women were previously vaccinated against HBV.

As shown in Table 4, the birth weight of the babies revealed that 16(14.5%) were low birth weight (<2.5kg), 70(63.6%) were appropriate for gestation (2.5 -3.5kg), 20(18.2%) were large for gestation and 4(3.6%) were macrosomic (>4kg). The

Appearance, Pulse rate, Grimace, Activity, Respiration (APGAR) score of the babies at one minute of life showed that 92(83.6%) had a good score while 18(16.4%) had a poor score of 3.

Twenty five (22.7%) of the babies had complications such as asphyxia (11.8%), LBW (5.5%), neonatal jaundice (3.6%) and prematurity (1.8%). Twenty five (22.7%) of the babies had SCBU admission on account of being HIV-exposed, asphyxia, neonatal jaundice and prematurity. Out of all infants delivered to HBsAg positive mothers, only 15(13.6%) had HBV test done and all were negative.

Table 3: Screening for Hepatitis-B Virus and Profile Test of the Participants

Variable	Frequency	Percentage
Awareness of HbsAg* Status		
Yes	10	9.1
No	100	90.9
Screening for HbsAg*		
Yes	110	100.0
No	0	0.0
Hepatitis B Profiling		
Yes	5	4.5
No	105	95.5
Results(from profiling)		
Normal	4	80.0
Abnormal	1	20.0
Previous hepatitis vaccination		
Yes	2	1.8
No	108	98.2

*HBsAg: Hepatitis B surface antigen

Table 4: Fetal Outcome

Variable	Frequency	Percentage (%)
Birth weight (Kg)		
LBW† (<2.5)	16	14.5
AGA†† (2.5 -3.5)	70	63.6
LGA*(3.6-4.0)	20	18.2
MACROSOMIA (>4.0)	4	3.6
APGAR** SCORE		
Good	92	83.6
Poor	18	16.4
Complication		
None	85	77.3
Asphyxia	13	11.8
Low birth weight	6	5.5
Neonatal Jaundice	4	3.6
Prematurity	2	1.8
Admission to SCBU***		
Yes	25	22.7
No	85	77.3
Reason for Admission(n=25)		
Asphyxia	13	52.0
Low birth weight	6	24.0
Prematurity	2	8.0
Neonatal Jaundice	4	16.0
HBV test done		
Yes	15	13.6
No	95	86.4
Result of the baby HBV‡		
Negative	15	100.0
Positive	0	0.0

†LBW: Low birth weight, ††AGA: Appropriate for gestational age, * LGA: Large for gestational age, ** APGAR: Appearance, Pulse rate, Grimace, Activity, Respiration, * * * SCBU: Special Care Baby Unit, ‡HBV: Hepatitis B Virus

There was association between birth weight and level of complications in babies of HBsAg positive pregnant women at p-value <0.0001 as shown in Table 5.

Table 5: Relationship between Fetal Outcome in HbsAg[†] Positive Mother and Complications in Babies

	Complications					Df	X ² value	P value
	None	NNJ ^{***}	Premature	Asphyxia	LBW			
Birth Weight								
LBW††	6(7.1)	0(0.0)	2(0.0)	4(30.8)	6(100.0)	12	46.549	<0.0001
AGA†††	59(69.4)	2(50.0)	2(100.0)	7(53.8)	0(0.0)			
LGA [*]	16(18.8)	2(50.0)	0(0.0)	2(15.4)	0(0.0)			
Macrosomia	4(4.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)			
APGAR^{**} SCORE								
Good	71(83.5)	4(100.0)	2(100.0)	9(69.2)	6(100.0)	4	4.320	0.364
Poor	14(16.5)	0(0.0)	0(0.0)	4(30.8)	0(0.0)			

[†]HbsAg: Hepatitis B surface antigen, ^{††}LBW: Low birth weight, ^{†††}AGA: Appropriate for gestational age, ^{*}LGA: Large for gestational age, ^{**}APGAR: Appearance, Pulse rate, Grimace, Activity, Respiration, ^{***}NNJ: Neonatal Jaundice

DISCUSSION

The findings from this study show the prevalence of Hepatitis B to be 2.56%. This is a little above the worldwide prevalence of 0.25-2.5%.⁴ In Nigeria, regional studies have shown prevalence ranging between 4.7% and 15.8% while in other parts of West African sub-region, sero-prevalence of 8%–16.2% has been reported.³ The prevalence rate indicates a pattern that follows a low prevalence from the southern parts of the country rising to its peak of 15.8% in the northern parts.^{6,7} It also supports the fact that the incidence of hepatitis B in pregnancy differs between countries, within countries and also from one region to the other.^{8,9}

The prevalence of hepatitis-B among participants over the five year period under review showed an increasing rate from 2015 to 2019 (1.8% to 3.2%). This is in agreement with the study done by Salemi, *et. al* (2017) in which there was an increasing national trend in the prevalence of hepatitis among pregnant women, particularly among high-risk groups.¹⁰ This underscores the need for coordinated approaches involving culturally-appropriate health education/risk-reduction

programs, and increased vaccination and screening efforts championed by health providers.

The sociodemographic and obstetric factors considered in this study included, among others, age and parity of the patients. The 30–39 year age group had the highest HBV sero-prevalence rate of 56.4%, followed by 20-29 years with zero-prevalence of 40.9% and 40-49years, 2.7%. This shows that hepatitis B prevalence is highest among women of reproductive age, the sexually active age and those more at higher risk of having a sexual contact with an infected person. This is similar to studies done by Chinenye and Benjamin.^{1,9} Olokoba also found the highest prevalence among women of reproductive age groups who are described as most sexually active and fertile.¹¹

Majority of the participants were civil servants from Osogbo town, which is a reflection of the study location, Osogbo, State of Osun, in which the working class are predominantly civil servants.¹² More than half of the women had tertiary level of education (60.9%) and were multiparous

(59.1%) and married (95.5%). This could be a reflection of the fact that one's level of education and marital status influence the choice of level of health care facility used for antenatal care and as such women with higher level of education attend tertiary health facilities where necessary routine investigations are done and appropriate management given.

In this study, all pregnant women were tested for HBsAg and this was in agreement with what was obtained in the study of Sunita in which all the pregnant women were screened according to World Health Organization recommendation.³ This is also in keeping with the routine booking investigations done for all pregnant women in a tertiary health facility according to American College of Obstetrician and Gynaecologists guideline.^{3,13} Majority of the cases had no profiling of HBV done following positive screening test. Also, most of the women (91.8%) were not referred to a gastroenterologist for further care. This result deviated from the American College of Obstetrician and Gynaecologists guideline which says that all pregnant women screened positive for HBsAg must be referred to a gastroenterologist for further investigations (including profiling) in order to assess the disease level and determine the need for subsequent treatment.¹³

Among those who had profiling done, only one (20%) had abnormal results. This is higher than expected according to the report by World Health Organization in which fewer than 5% of otherwise stable adult individuals had abnormal results and develop chronic infections.² This signifies increase in the infectivity in this region and all efforts must be put in place to curb the spread of hepatitis B.

Most (100, 90%) of the hepatitis B positive pregnant women, were not aware of their status until they had routine screening done in pregnancy. This might be due to ignorance and inadequate health education and promotion prevalent more in developing countries like Nigeria. This is in agreement with a study done by Freij and Sever that

over 80% of people living with hepatitis are not aware of their status and lack prevention, testing and treatment services despite the fact that hepatitis B affects 325 million people worldwide and causes 1.4 million deaths a year as well as being the second major killer infectious disease after tuberculosis, and infecting 9 times more people than HIV.¹⁴

Furthermore, most (98.2%) of the women have not had previous vaccination. This is in agreement with studies done by Olokoba and Onwuakor in which 91.2% and 94.6% have not had previous vaccination respectively.^{11,15} This further explains the need for more awareness on the public health importance of this infection in terms of risk factors, symptoms, mode of transmission, prevention, testing and available treatment services.

The consequences of chronic HBV infection on the outcome of pregnancy with regard to fetal outcome have not been clearly defined. Majority of the babies did not have any complication but when present it included birth asphyxia, prematurity, low birth weight, neonatal jaundice and HIV exposure, which were also found in babies whose mothers were not HBsAg positive. However, there was association between the complications and the birth weight of babies of HBsAg positive women.

The prevalence of hepatitis B infection among pregnant women is of public health importance especially because of the effects on their babies in which perinatal transmission after birth could result in approximately 90% chronic carriage, with long-term complications of chronic hepatitis, cirrhosis and hepatocellular carcinoma. Therefore, all efforts should be geared at ensuring that those with positive test results should have hepatitis B profiling done to determine their infectivity and how to manage it appropriately. Also, all pregnant women with positive test should be referred to a gastroenterologist for further management to prevent the long term sequelae of hepatitis B infection. Furthermore, awareness should be made on

the importance of hepatitis B infection prevention in general and during pregnancy among people in the community through health education and health promotion. Further research is needed in other geopolitical zones of the country to revalidate the findings of this study.

CONCLUSION

The prevalence of Hepatitis B infection among pregnant women is slightly higher than the global prevalence with an increasing rate over the five-year period. Feto-maternal outcomes were associated with chronic hepatitis B infection. The importance of prevention of the infection needs to be further emphasized.

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Conflicts of interest

There are no conflicts of interest.

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