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THE OUTCOME OF PREGNANCY AMONGST HEPATITIS B VIRUS POSITIVE WOMEN IN A TERTIARY INSTITUTION IN NIGERIA

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ABSTRACT

Background: Hepatitis B Virus (HBV) infection occurs worldwide, and is particularly endemic in sub-Saharan Africa. Viral hepatitis due to Hepatitis B infection has the same frequency in the pregnant and non - pregnant populations. The aim of the study is to determine the outcome of pregnancy in the presence of HBV infection among pregnant women attending the Ante-Natal Care clinic and to find out the risk factors for acquiring HBV infection. **Objectives:** The aim of this study is to determine the prevalence and outcome of pregnancy in the presence of Hepatitis B Virus infection among pregnant women attending Ante-Natal Care clinic of the Usmanu Danfodiyo University Teaching Hospital, Sokoto. To find out the risk factors for acquiring the infection. **Design:** It was a prospective study carried out from November 2012 to August 2013. **Setting:** Ante-Natal Care (ANC) clinic of the Department of Obstetrics and Gynaecology Usmanu Danfodiyo University Teaching Hospita, Sokoto. Nigeria. **Subjects:** Pregnant women attending antenatal care clinic. **Intervention:** Hepatitis B immunoglobulin were administered to neonates of seropositive mothers **Outcome Measures:** Hepatitis B serology, mode of delivery, gestational age at delivery, APGAR scores and birth weight. **Result:** The sero-prevalence of Hepatitis B virus infection among the women was 7.7%. The seropositive mothers were found to have a twofold risk of developing urinary tract infection (RR- 1.99. CI -0.53,7.44), though not statistically significant-P-value- 0.32). However, there was no adverse maternal or fetal outcome and no identifiable risk factors among respondents. **Conclusion:** Hepatitis B virus infection is endemic in our region, routine antenatal screening of pregnant women and early active/passive immunisation of exposed neonates to reduce this rate in the unborn child is necessary.

KEYWORDS: Pregnancy, Hepatitis B Virus Infection, Pregnancy Outcome.

INTRODUCTION

Hepatitis B virus (HBV) is a DNA virus causing hepatitis in humans. It accounts for about 400 million chronic infections worldwide and is hyper-endemic in sub-Saharan Africa and Asia.[1] Viral hepatitis due to Hepatitis B has the same frequency in the pregnant and non-pregnant populations and in each of the three trimesters of pregnancy. The occurrence of acute Hepatitis B is 2 per 1000 pregnant women.[2],[3] It is a serious public health problem worldwide and thought to be the main aetiological factor in over 75% of chronic liver diseases.[4]

Hepatitis B Virus infection (HBV) is a significant cause of morbidity and mortality and associated with complications of pregnancy, more so in under developed and developing countries like Nigeria. The overall prevalence of HBV infection in the developed world is about 0.5% to 5%[5], while in Asia and Sub-Saharan Africa, it is about 10-15%.[6] In China, Taiwan, India, and Saudi Arabia, the prevalence rates were 7.8%, 15.5%, 0.9% and 2.49% respectively[7], [8], [9], [10], while that in Congo and Senegal were 6.5% and 13.8% respectively.[11], [12]

In Nigeria, the prevalence rate among pregnant women in Akure, South west, was 4.6%.[13] In the South -South, Port Harcourt had 4.3%[14], while Enugu, South East, it was 4.6%.[15]

In Maiduguri, North-Eastern Nigeria, the rate was 11.6%[16] and in the north-west, Zaria had 13.3%.[17]

The risk factors for acquiring HBV infection include; high parity, multiple sexual partners, unprotected sexual contact and previous positive history of sexually transmitted diseases. Others risk factors include; tattoos, scarification marks, positive history of jaundice or contact with a jaundiced patient, exposure to infected blood or body fluids, intravenous drug abuse and sharing

of contaminated needles.[5], [18] Others at risk include; Sickle cell disease and dialysis patient.[19], [20]

Neonates are particularly infected via vertical transmission from mother to child.[6] Without intervention, the risk of perinatal HBV transmission is greatest for infants born to women who are HBeAg-positive, with infectivity rate of 80% to 90% at 6 months of age. About 90% of these children will remain chronically infected.[2], [6] The risk of transmission among those born to HBeAg-negative mothers ranges from 10% to 40%, with 40%−70% of these infected infants remaining chronically infected.[8] Children born to HBsAg-positive mothers who do not become infected during the perinatal period remain at a high risk of infection during early childhood.[8]

HBV-related end-stage liver disease or hepatocellular carcinoma (HCC) is responsible for over a million deaths yearly and currently represent 5−10% of cases of liver transplantation. HCC is one of the most common cancers worldwide and HBV is responsible for at least 75% of this cancer.

Maternal complications associated with viral hepatitis are preterm labour, obstetric haemorrhage, fulminant hepatitis, renal failure, disseminated intravascular coagulopathy (DIC) and hepatic encephalopathy while foetal complications are intrauterine foetal death, prematurity and risk of vertical transmission. Death occurs in about 15%-45%.[6], [10]

HBV infection does not appear to be a cause of birth defects, but there appears to be a higher incidence of low birth weight among infants born to mothers with acute infection during pregnancy. In one small study, acute maternal hepatitis (type B or non B) had no effect on the incidence of congenital malformations, stillbirths, abortions, or intrauterine growth restriction. However, acute hepatitis did increase the incidence of prematurity.[11]

The diagnosis of HBV infection in pregnancy is significant due to the morbidity and mortality of the pregnant women in acute condition, its effect on pregnancy, and the risk of vertical transmission from mother-to-child. The affected new born most often remains a chronic carrier with the attendant consequences of chronic liver disease. The intervention to stop vertical transmission can only be applied when the status of the pregnant woman is known. Mother-to-child transmission can be avoided by Passive immunisation of the new born at birth. Infection in infancy or early childhood may lead to a high rate of persistent infection of about 25-90%, while the rates are lower when infection occurs during adulthood in about 5-10% of cases. In most endemic areas, infection occurs mainly during early childhood. Mother-to-infant transmission accounts for approximately 50% of the chronic infection cases.[7], [8], [9], [10]

MATERIALS AND METHOD

Study Population and Sample Collection

This was a prospective study conducted between November 2012 to August 2013 at the Usmanu Danfodiyo University Teaching Hospital, Sokoto. It involved I83 pregnant women who came for the first antenatal care visit were recruited by a simple random sampling technique of balloting (rolled and pick paper) procedure after a written informed consent was obtained. An interviewer administered questionnaires were filled for all the participants and relevant information was obtained.

The participants were made to sit; a pair of disposable gloves, spirit swab, sample container, 10 millilitre syringes and needles and tourniquet were provided. Both hands of the researcher and the lab technician were washed and gloved and then tourniquet were applied at a level above the cubital fossa and about 5 millilitres of venous blood was withdrawn from the cubital vein into an ethylene diamidetetra acetic acid (EDTA) bottle. The sample was stored at -20^0 Celsius until used. It was then centrifuged to separate the plasmas from the red cells at frequency of 10,000 revolutions per minute over 5minutes. The serum thus collected was analysed for HBsAg using the third generation Enzyme Linked Immuno Sorbent Assay method (AGON biopharm test kit, China). Those who tested negative were further screened using the seromarkers for possible HBcAb which is the first antibody to be detected early in the disease and throughout life time. The seropositive patients were further investigated for other Hepatitis B Virus markers which include; HBeAg, anti HBeAg, anti HBcAg and anti HBsAg in addition to Liver function test. They were referred to physicians thereafter. They were also followed up throughout pregnancy and delivery. The babies were then referred to the neonatologist.

RESULTS

One hundred and eighty-three pregnant women were recruited for the study and their blood samples were analysed for the presence of Hepatitis B antigens and antibodies. Nineteen (10.4%) tested positive for Hepatitis B antigens and core antibody, while 164 (89.6%) of all mothers tested negative. Of the positive samples, 14(73.68%) were Hepatitis B surface antigen (HBSAg) positive and 5(26.32%) were Hepatitis B core antibody (HBCAb) positive. Thus, the prevalence rate for Hepatitis B virus infection among the respondents was 7.7%. The ages of the respondents ranged between 18 to 42 years with a mean age of 26.59 ± 5.19. (Figure ii).

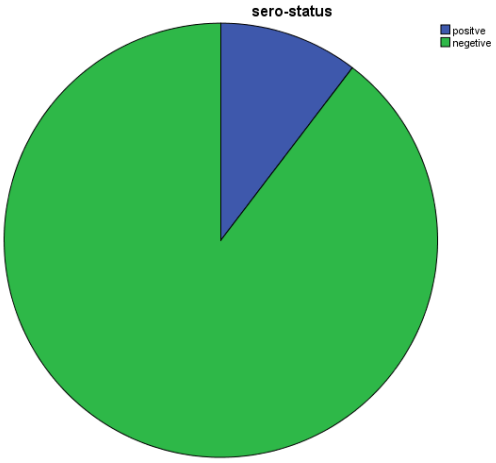

Figure i- Sero-status of respondents

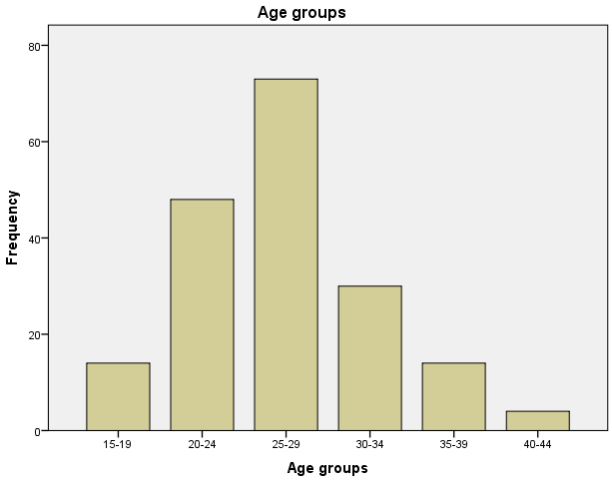

Figure ii- Age distribution of respondents

The prevalence of the disease was highest (35.7%) among the 35-39 years age group and lowest (6.25%) among the 20-24 years age group. It is noteworthy that no woman in the age range of 30-34 and 40-44 years were seropositive. The mean age of the seropositive women was 27.58 years, while that of the seronegative was 26.48 years. This was not statistically significant; p-value >0.05. (Table i).

Table i: Mean ages of seropositive and seronegative patients.

Age(years)	Sero-positive (%)	Sero-negative (%)	Total
15-19	2(10.5)	12(7.3)	14
20-24	3(15.8)	45(27.4)	48
25-29	9(47.4)	64(39.0)	73
30-34	0(0)	30(18.3)	30
35-39	5(26.3)	9(5.5)	14
40-44 Mean	0(0) 27.58±5.70	4(2.5) 26.48±5.13	4
Total	19(100)	164(100)	183

Majority, (96.2%) of the respondents were literate. Of the sero-positive respondents, the highest frequency (14.3%) of the disease was among those whose highest educational qualification was primary school. The bulk of the respondents (72.1%) were not gainfully employed, however, sero-positive status was not related to occupational status of the respondents. The Hausa/Fulani ethnic group composed 63.9% of respondents, however the highest sero-positive rate of 18.75% was among the Yoruba ethnic group. Most (77.1%) of the respondents were Muslims.

Table ii: Socio-demographic characteristics of the respondents.

Socio-demographic characteristics	Sero- positive (%)	Sero- negative (%)	
Education			
None	0 (0)	7(4.3)	7 (4.3)
Quranic only	2(10.5)	20(12.2)	22 (12.0)
Primary	2(10.5)	12(7.3)	14 (7.6)
Secondary	7(36.9)	49(29.9)	56 (30.6)
Tertiary	8(42.1)	76(46.3)	84 (51.5)
Total	19 (100)	164 (100)	183 (100)
Occupation			
Civil servant	3(15.8)	24 (14.6)	27(14.7)
Health worker	0 (0)	14 (8.5)	14(7.7)
Self employed	1(5.3)	9 (5.5)	10(5.5)
Unemployed	15 (78.9)	117(71.3)	132(72.1)
Total	19 (100)	164 (100)	183 (100)
Tribe			
Hausa/Fulani	15(78.9)	102(62.2)	117(63.9)
Igbo	0 (0)	25(15.2)	25(13.7)
Yoruba	3(15.8)	13(7.9)	16(8.7)
Others	1(5.3)	24(14.7)	25(13.7)
Total	19 (100)	164 (100)	183 (100)
Religion	16 (84.2)	125 (76.2)	141(77.1)
Islam	3 (15.8)	39 (23.8)	42 (22.9)
Christianity	19 (100)	164 (100)	183 (100)

Seventeen (89.5%) among the seropositive group were formally educated while 2 (10.5%) had no formal education. Also, 15 (78.9%) were unemployed while 4 (21.1) were not and 17 (89.5%) of their spouses were gainfully employed while 2 (10.5%) were not. However, educational status, employment status of both the patient and her spouse were not found to influence the risk of acquiring HBV.

Table iii: a (Risk factors for acquiring HBV infection).

Risk factors	Sero-positive	Sero-negative	Total (%)	RR	CI	P- Value
Educational status No formal education Formally educated	2(9.5) 17(10.5)	19(90.5) 145(89.5)	21(100) 162(100)	0.908	0.225, 3.654	0.98
Occupation(patient) Employed Unemployed	4(7.8) 15(11.4)	47(92.2) 117(88.6)	51(100) 132(100)	0.690	0.240, 1.981	0.48
Occupation(spouse) Employed Unemployed	17(9.7) 2(25.0)	158(90.3) 6(75.0)	175(100) 8(100)	0.389	0.108 1.401	0.16

Seven (36.8%) among the sero-positive group had a history of multiple sexual partners while the other 12 (63.2%) did not. Only 1(5.3%) of them had a history of sharing sharp instruments while the rest 18 (94.7%) did not. Also, 2 (10.6%) had a positive history of blood transfusion and 7 (36.8%) had previous history of surgery; however the history of sharing of sharps statistically significant at being protective against contracting hepatitis B viral infection at p value 0.04. Majority, 78.9% of the seropositive patients were multigravidae but this was also not significant.

Table iii b: (Risk factors for acquiring HBV infection).

Risk factors	Sero-positive	Sero-negative	Total (%)	RR	CI	p-Value
Sexual partners						
Single	12(8.8)	125(91.2)	137(100)	0.576	0.241,1.374	0.21
Multiple	7(15.2)	39(84.8)	46(100)			
Sharing of sharps						
Yes	1(2.2)	45(97.8)	46(100)	0.165	0.023, 1.205	0.04
No	18(13.1)	119(86.9)	137(100)			
Blood transfusion						
Yes	2(14.3)	12(85.7)	14(100)	1.420	0.365, 5.533	0.62
No	17(10.1)	152(89.9)	169(100)			

The gestational age at booking ranged between 10 to 39 weeks with a mean of 23.14 ± 6.02 weeks. Co-morbidities noted among the seropositive respondents include hypertensive disorders of pregnancy, urinary tract infection, vulvo-vaginitis and malaria. There was a near two fold risk of acquiring urinary tract infection among the seropositive respondents.

One (5.3%) among the seropositive respondents developed acute viral hepatitis. There was no maternal mortality among the respondents. (Table iv).

Table iv: Maternal Co-Morbidities

Co-morbidity	Sero-positive	Sero-Negative	RR	CI	P-Value
Malaria	1(0.5%)	21(11.73%)	0.391	0.55-2.79	0.32
Vulvo-vaginal candidiasis	1(0.56%)	8(4.47%)	1.04	0.16,6.93	0.97
Urinary tract infection	2(1.12%)	8(4.47%)	1.99	0.53,7.44	0.32
Hypertensive disorders of pregnancy	2(12.5%)	14(%)	1.20	0.304,4.72	0.80

There were four abortions among the respondents but that occurred among the seronegative group. Only 1 (5.3%) among the seropositive group had a home delivery and there was one still born baby too. There were 3 (11.1%) preterm births among the seropositive group but this was not statistically significant.

Of the respondents studied, 91.26% (167/183) had vaginal deliveries among which 7.78% (13/167) were seropositive while, 92.22% (154/167) were seronegative. Whereas, 8.74% (16/183) had caesarean section on account of obstetric indications. Among them, 6.25% (1/16) was seropositive and 93.75% (15/16) were seronegative.

Among 125/183 (68.31%) respondents, 90.40% (113/125) babies had APGAR scores of 7 to 10. Of them, 10.62% (12/113) mothers were seropositive and 89.38% (101/113) were seronegative while 9.60% (12/125) had 0 to 6. Among which 33.33% (4/12) were abortions, 41.67%(5/12) stillbirths and 25%(3/12) were asphyxiated. Among the seropositive women, 20% (1/5) had still birth and 33.33%(1/3) had an asphyxiated baby.

The mean birth weight was the same (3.1 ± 0.38 and 3.1 ± 0.63) among the seropositive and seronegative groups respectively.

Table v: Pregnancy Outcome.

Gestational age at delivery	Seropositive	Seronegative	Statistics
Preterm birth Term birth	3 (11.1%) 16 (10.5%)	24 (88.9%) 136 (88.5%)	RR= 1.056 CI= 0.330, 3.378 p-0.928

DISCUSSION

The seroprevalence rate of Hepatitis B virus among the antenatal women was 7.7%. High endemicity to Hepatitis B viral infection is defined as seroprevalence above 7% of adult population in a given location.[1] Therefore, with the above prevalence rate, our environment is highly endemic. This prevalence is similar to reports of studies from Akure.[13], Maiduguri[16] and Zaria.[17] It is however, higher than reports from Port-harcourt[14], and Enugu.[15] This difference in seroprevalence could be as a result of the type of screening performed, whether institutional or community based study, type of test performed either by detection of surface antigen alone, or in addition; core antibody or viral DNA,-and the sample size. This study was institutional based with a relatively small sample size.

The highest prevalence was noted among respondents' between the age group 35-39years. Though this was not though not statistically significant, it was similar to findings of other workers.[13]

All those who tested positive for Hepatitis B viral markers were literate and the seroprevalence was slightly higher among those with formal education. Thus, not statistically significant, it may be due to the fact that the study was hospital based, in an urban community and positive health seeking behaviour among formally educated individuals tends to be better than in those not formally educated. This is similar to the findings in Ilorin[24] and Akure.[13] However, studies in Minna[22] and Awka[20] found higher rates among non-formally educated women.

Among the tribes studied the Yoruba ethnic group had the highest seropositivity rate of 18.75% in a Hausa dominated community.

There was no difference in seropositivity status across various occupations. However, none among the health workers was seropositive.

Among the risk factors studied, there was no identifiable risk factor to contracting the virus. This conforms to a study by CDC[1] but not with studies in Enugu[14] and Port Harcourt[15] where multiple sexual partners, parity and blood transfusion/surgeries were the identified risk factors respectively. Surprisingly, sharing of sharps appeared to be protective and can be explained by the probability of the respondents huddling information of sharing sharps.

The multigravidae had a higher prevalence of 11.6% among the respondents while that of primigravidae was 7.4%. This denotes an increase with increasing parity which is contrary to what was reported in India.[10]

There was about two-fold risk of developing urinary tract infection among the seropositive respondents. This finding is peculiar to this study as other worker reported increased risks of antepartum haemorrhage, preterm labour and gestational diabetes mellitus.

CONCLUSION

Hepatitis B viral infection is hyper endemic in our environment, however, there was neither identifiable risk factor nor adverse outcome among the respondents. There is need for increased awareness of the population on the disease, mode of transmission and preventive measures. Also, routine screening for Hepatitis B viral markers in pregnancy should be incorporated into our ante-natal care protocol. Availability of Hepatitis B vaccine for seronegative mothers and immunoglobulin for exposed mothers and babies should be ensured to combat the menace of the silent killer.

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