

Serological Screening of Hepatitis B Virus Among Pregnant Women Receiving Antenatal Care At Medical Center Mararaba, Nasarawa State.

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ABSTRACT: Hepatitis B virus is a major public health problem worldwide and is more prevalent in developing countries which Nigeria is one. It is commonly transmitted during pregnancy, as it has been shown to pose substantial risk to pregnant women and the developing fetus which result in chronic carrier state and high mortality rate. The aim of this study is to determine the prevalence of hepatitis B virus (HBV) among pregnant women receiving antenatal care at Medical Centre Mararaba, Nasarawa State. A Randomized cross sectional study was utilized for this study. Three hundred and thirteen pregnant women were screened for hepatitis B virus. A questionnaire was designed to obtain relevant socio demographic information from the participating pregnant women. 5ml of blood samples was collected through vein puncture method into a microtitre tube containing Ethylene Diamine Tetraacetic Acid (EDTA). Blood Samples were investigated for hepatitis B virus using immunochromatographic method. 20 (6.4%) of the pregnant women screened were positive for HBV. The highest prevalence rate in relation to age was found among pregnant women between the ages of 25-34 years with 4.15% seropositivity. Pregnant women in their second trimester had the highest prevalence of 5.11%, there was a significance difference between HBV and trimester at ($P>0.05$). There was a significant association between HBV and occupation at ($P>0.05$) were housewives and business women had the highest prevalence with 3.2% and 2.9%, the lowest prevalence rate 0.32% was recorded among civil servants. There was a statistically insignificant relationship between tribal marks as a risk factor and sharp objects ($P<0.05$) and HBV infection. There was a statistically significant association ($P>0.05$), between HBV infection and blood transfusion. This study confirms the prevalence of the infection in the population studied. Routine screening of pregnant women should continue in order to identify and treat the infection, thereby eradicating the risk of vertical transmission.

Key words: Antenatal Care, Hepatitis B Virus, Pregnancy, Prevalence

INTRODUCTION

Hepatitis is a medical condition that is characterized by the inflammation of the liver, which results from the exposure to certain chemicals or autoimmune diseases. However, the infection is often caused by one of several viruses. The most common causes of hepatitis are five unrelated hepatotropic viruses (hepatitis A, B, C, D and E) which reside in the blood and other body fluid [1].

Transmission of HBV results from exposure to infectious blood or body fluids like (sweat, saliva, semen, vagina fluid). Currently, there are four major recognized mode of transmission which include mother to child transmission at birth (perinatal), contact with an infected person (horizontal), sexual contact and blood transfusion [2].

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Diagnosis of HBV infection is usually through serological and virological markers. Globally, over 2 billion people are infected with the virus and over 350 million have chronic

infection [3]. Infection with this virus does not only lead to acute illnesses, but chronic illnesses like liver cirrhosis and hepatocellular carcinoma which accounts for more than 1 million deaths globally [4]. The prevalence of hepatitis B virus infection is relatively high in Africa, having the second highest number of chronically HBV-infected individuals [5].

Nigeria is classified among the group of countries endemic for HBV infection with a current infected population of 20 million. The World Health Organization in 2002 recommended the screening of all pregnant women against HBV and universal immunization of all infants against HBV infection. Despite the implementation of these recommendations, the high prevalence of HBV infection among pregnant women may be an indicator of hepatitis B virus prevalence rate in the general population. In 2015, a prevalence rate of 12 to 20% was recorded among pregnant women in Nigeria, with the highest prevalence in Kano state [6]. Therefore the aim of this study was to determine the seroprevalence of HBV infection among pregnant women and its relationship with some risk factors.

MATERIALS AND METHODS

Study design: The study was a cross sectional prevalence study involving all pregnant women receiving antenatal care at the hospital. A well designed questionnaire was used to obtain demographic information from the women.

2.2 Study participants: Pregnant women receiving antenatal care at the hospital were recruited for the study. Non- pregnant women were excluded from the study. The purpose and procedure of the study was explained to the pregnant women by the matron and laboratory scientist and those who gave their consent were recruited for the study.

Procedures: Blood samples were collected from three hundred and thirteen pregnant women between the months of February to April 2016. Blood sample was obtained by vein puncture, the arm of the individual was tied with a tourniquet and the position of the veins disinfected using cotton wool soaked in methylated spirit. Using a disposable sterile needle, 5ml blood sample was collected from each patient. Each blood sample was transferred into a labeled plastic microtitre tube containing Ethylene DiamineTetraacetic Acid (EDTA) which is an anticoagulant and stored at temperature of -15 to -20 degrees Celsius until ready to use. The immunochromatographic screening test of HBV infection was performed in accordance with the criteria of Chessbrough [7].

RESULTS

A total of 313 pregnant women receiving antenatal care at the hospital were tested for Hepatitis B infection. Of these, 20 pregnant women tested positive to HBV with sero-prevalence rate of 6.4% in the study population as shown in Table 1. Table 2 shows the sero-prevalence rate for HBV in association with various age groups in the study population, the highest prevalence (4.15%) was recorded among pregnant women within the ages of 25-34 years; the lowest prevalence (0.63%) was recorded among pregnant women between ages 35-44 years. There was a statistically significant association ($P>0.05$) between age and HBV infection.

Table 3 shows the prevalence rate of HBV in relation to trimester in the study population. The highest prevalence 5.11% was recorded among pregnant women in the second trimester. The lowest prevalence was recorded among pregnant women in the first trimester, with a prevalence rate of 0.32%. There was a significant relationship ($P>0.05$) between trimester and HBV infection. Table 4 shows the prevalence rate of HBV in relation to occupation in the study population. The highest prevalence was recorded among pregnant women who are housewives and business women and the lowest prevalence rate was among pregnant

women who are civil servants with prevalence rates of 3.2%, 2.9% and 0.32% respectively. There was a statistically significant association ($P>0.05$) between occupation and HBV infection.

Table 5 shows the prevalence rate of HBV in relationship with sharp objects. The highest prevalence rate 3.8% was recorded among pregnant women that do not share sharp objects and the lowest prevalence rate 2.6% was recorded among pregnant women that share sharp objects. There was a statistically significant association ($P<0.05$) between those who share sharp objects and HBV infection. Table 6 shows the prevalence rate of HBV in association with tribal mark. The highest prevalence rate (3.5%) was recorded among pregnant women without tribal marks and the lowest prevalence rate (2.9%) was recorded among pregnant women with tribal marks. There was an insignificant relationship ($P<0.05$) between tribal mark and HBV infection. Table 7 shows the prevalence rate of HBV in relation to blood transfusion. The highest prevalence rate of 5.8% was recorded among pregnant women that were positive to HBV infection with no history of blood transfusion and the lowest prevalence rate 0.64% was recorded among pregnant women that were positive to HBV infection with history of blood transfusion. There was a significant statistical relationship ($P>0.05$) between blood transfusion and HBV infection.

TABLE 1: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN MEDICAL CENTRE MARARABA

RESULT	NUMBER SCREENED	PREVALENCE (%)
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POSITIVE	20	6.4	
NEGATIVE	293	93.6	
TOTAL	313		100.0

TABLE 2: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN ACCORDANCE WITH AGE

AGE GROUP	NUMBER SCREENED	NUMBER		PREVALENCE (%)
		POSITIVE	NEGATIVE	
15 - 24	71	5	66	1.59
25 - 34	204	13	191	4.15
35 - 44	38	2	36	0.63
TOTAL	313	20	293	6.40

TABLE 3: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN RELATION TO TRIMESTER

TRIMESTER	NUMBER SCREENED	NUMBER POSITIVE	NUMBER NEGATIVE	PREVALENCE(%)
1 ST TRIMESTER	49	1	48	0.32
2 ND TRIMESTER	200	16	184	5.11
3 RD TRIMESTER	64	3	61	0.96
TOTAL	293	20	293	6.40

TABLE 4: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN RELATION TO OCCUPATION

OCCUPATION	NUMBER SCREENED	NUMBER POSITIVE	NUMBER NEGATIVE	PREVALENCE (%)
APPLICANTS	4	0	4	0.00
BUSINESS WOMEN	145	9	136	2.90
CIVIL SERVANTS	17	1	16	0.32
HOUSE WIVES	107	10	97	3.20
STUDENTS	9	0	9	0.00
TEACHERS	31	0	31	0.00
TOTAL	313	0	293	6.40

TABLE 5: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN RELATIONSHIP WITH SHARP OBJECTS

SHARP OBJECTS	NUMBER SCREENED	NUMBER POSITIVE	NUMBER NEGATIVE	PREVALENCE (%)
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YES	90	8	82	2.60
NO	223	12	211	3.80
TOTAL	313	20	293	6.40

TABLE 6: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN ASSOCIATION WITH TRIBAL MARKS

TRIBAL MARKS	NUMBER SCREENED	NUMBER POSITIVE	NUMBER NEGATIVE	PREVALENCE (%)
YES	87 9 78	2.90		
NO	226 11	215	3.50	
TOTAL	313	20	293	6.40

TABLE 7: PREVALENCE OF HBV AMONG PREGNANT WOMEN IN RELATION TO BLOOD TRANSFUSION

BLOOD TRANSFUSION	NUMBER SCREENED	NUMBER POSITIVE	NUMBER NEGATIVE	PREVALENCE (%)
YES	25	2	23	0.64
NO	288	18	270	5.80
TOTAL	313	20	293	6.40

DISCUSSION

The result of our study demonstrates a 6.4% prevalence rate of HBV among pregnant women receiving antenatal care at Medical Center Mararaba. This also indicates a moderate endemicity of HBV among pregnant women receiving antenatal care at the hospital. According to WHO criteria [8], it defines low prevalence to be less than 2%, moderate prevalence as 2-8% and high prevalence to be greater than 8% [9]. The prevalence rate recorded in this study is similar to the findings of [10],[11],[12] who recorded prevalence rates of 7.3%, 6.7% and 6.06% amongst pregnant women receiving antenatal care. The prevalence rate recorded in this study is however higher than the reports of [13],[14],[15] who recorded prevalence rates of 4.0%, 5.6% and 4.3% respectively. The prevalence rate 6.4% reported from this study is lower than 8.2%, 16.3% and 7.9% recorded by [16],[17],[18]. The differences in prevalence rates may be due to diverse geographical variation, sexual behavior and differences in cultural practices [19].

The highest prevalence (4.15%) of HBV infection in this study was found among pregnant women between the age group of 25 to 34 years of age. These could be explained by

the relationship between hepatitis infection and high risk of sexual practices which is noted to be highest amongst this age group as reported by [20]. Similar results were obtained by [16], [21], in Maiduguri and Zaria. The lowest prevalence (0.63%) was found among pregnant women between the age group of 35 to 44 years of age, this could probably be due to decrease in sexual practices. This result is similar to the findings of [22], [23] who found the lowest prevalence in their study to be among 35-40 years age group.

The prevalence rate in respect to trimester was highest in the second trimester (5.11%) and the lowest in the first trimester (0.32%), significantly more women in the latter half of pregnancy were positive for the HBV. This may be due to reduction in the immune system of the mother, which makes her prone to infection. This is similar to the separate studies carried out in Maiduguri and Katsina by [24], [25] where the overall positive cases were recorded in the second trimester with prevalence rates of 9.2% and 21% respectively. Also, other authors have shown that the level of infectivity of the mother in transmitting the virus to the fetus increases substantially in the second and third trimester, thus, the risk of transmission of HBV to neonates increases [26], [27].

Housewives and business women had the highest prevalence rates of 3.9% and 2.9% while civil servants had the lowest prevalence rate with 0.32% in this study, this is similar to the report of [28] who reported significant prevalence rates of 4.6% among housewives compared to other occupations in Iran. Laret *al.* and Wurieet *al.* [29] and [30] also reported similar findings in relation to occupation in their study with prevalence rates of 8.8% and 3.4% in Jos and Kenya respectively. The high prevalence from this study could be due to high risk of exposure to the disease through body contacts with people, exposure to body fluids such as sweats when carrying out their daily activities. The women. This finding contradicts the findings of [33],[34], who reported that sharing of sharp objects is gradually being eroded in the society.

A prevalence rate of 2.9% was recorded in relation to HBV infection and tribal marks, there was a significant association with HBV infection. This may be due to repeated use of old and unsterilized sharp instruments [35]. This report is however similar to the findings of [36] where tribal marks was reported as a significant risk factor among pregnant women in Ethiopia.

Only two of the participants with previous history of blood transfusion were positive to HBV infection. This is similar to the study of [22]. This low significant rate could be due to the national regulation policy of universal screening of blood and blood products as adapted by most health sectors [37].

CONCLUSION

The results obtained from this study revealed the prevalence rate of HBV to be 6.4% which implies that hepatitis B infection among pregnant women receiving antenatal care at the hospital is on the average. Therefore, more strategies such as aggressive sensitization on risk factors and routine screening for HBV in pregnancy is strongly advocated to reduce morbidity and treatment of HBV infection in pregnancy to reduce mother-to-child transmission.

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absence of prevalence amongst students, applicants and teachers in this study may be due to the fact that they might have received HBV vaccine.

Table 5 shows that the sharing of sharp objects in relation to HBV infection which had significant association in this study, with a prevalence rate of 2.6%. This may be that the infection in this class of women possibly resulted from wounds obtained from exchange or re-use of sharp objects. This is however similar to the reports of [31],[32] who recorded prevalence rates of 26.6% and 5.5% among pregnant

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