

Burden of HBV Infection among Pregnant Women in a Low Income City of Ibadan, Nigeria

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Abstract: Mother to child HBV transmission has been a prominent cause of ailment among children which progresses to chronic hepatitis, cirrhosis of the liver and hepatocellular carcinoma. About a million die annually as a result of these complications. This study focused on the evaluation of HBsAg prevalence among pregnant women in a secondary health institution in Ibadan, Oyo State. Seven hundred and ninety nine(799) pregnant women who attended antenatal between March and December, 2017 were recruited into this cross sectional study. Blood samples were aseptically withdrawn from each of the women after informed consent was obtained. Samples were centrifuged, sera separated and kept at -20°C. Analysis was thereafter carried out following the manufacturers' guideline using conventional method. Out of the 799 pregnant women tested in total, 54 (6.8%) were HBsAg positive. The age groups with the highest prevalence rate were 35 - 39 (31.5%) and 30 - 34 years (24.1%). The least educated had the lowest prevalence of 14.8%(p>0.05).Free hospital screening and vaccination of all pregnant women together with their babies should be included in the antenatal and postnatal programmes of hospitals to prevent mother to child transmission. Other serological markers like anti-HBs, anti-HBe and anti-HBc are advocated for to be also included in the antenatal programme nationwide for pregnant women and those negative should be vaccinated to confer protection against HBV infection.

Key words: HbsAG • Infection • Antenatal • Pregnant Women • Secondary Health Institution

INTRODUCTION

Hepatitis B virus (HBV), a cause of liver damage, ranks as the world's tenth cause of death with an annual 500, 000 to 1.2 million mortality cases due to chronic hepatitis, liver cirrhosis and hepatocellular carcinoma [1]. Areas with high HBV incidence often have high transcongenital transmission from an infected mother, either before or after birth, with more than 60% chances that the baby will acquire HBV infection [2]. Perinatal infections can be particularly high, getting as high as 90% [3]. When there is no immune prophylaxis, about 10-20% of HBsAg positive pregnant women would infect their children with the virus [4].

Some maternal complications like hemorrhage (intraventricular, intrapartum and postpartum), premature labor etc are often seen in pregnancy with viral hepatitis [5].

Transcongenital transmission is high causing hepatitis infection of the fetus and the neonates with its attendant serious effects which is capable of causing mental and physical impairment later in the future [6] and it has also been noted as the commonest cause of jaundice in pregnancy [7]. Vertically transmitting this disease is possible if the mother was infected during late pregnancy with acute hepatitis, in her first postpartum or if the mother happens to be a persistent carrier of hepatitis B surface antigen (HBsAg) [8].

With the observation of an infection in the first trimester, there is close to 10% neonatal vertical transmission but reaches as high as 80%-90% in the third trimester in those with acute infection of hepatitis B virus [9]. About 10-20% of children whose mothers are positive to HBsAg will be HBV infected while 90% of those whose mothers are positive to both HBsAg and HBeAg will be infected [10, 11].

The risk of transmission of hepatitis B can be reduced to <10% among children whose mothers are HBsAg or HBeAg positive [12, 13] when there is prompt administration of immunization with HBIG (hepatitis B immunoglobulin G) and vaccine at birth. Many hospitals in Nigeria however are yet to be practicing this.

Varying rates of HBsAg prevalence among different groups have been reported from several studies from different states in Nigeria [14, 15, 16, 17]. The purpose of this work was to ascertain the rate of HBsAg prevalence among the antenatal attending pregnant women in Ibadan, Oyo state, Nigeria.

MATERIALS AND METHODS

Study Area: This research work was performed at St Mary's Catholic General Hospital, Eleta, Ibadan among antenatal attending pregnant women. Ibadan city is 3°5'E and 7°23'N where environmental sanitation is low, potable water is lacking, housing is inadequate and waste management is poor particularly in the indigenous areas with high density and low income population.

Study Population: The study was performed among 799 antenatal attending pregnant women in St Mary's Catholic General Hospital, Eleta, Ibadan between March and December, 2017.

Inclusion and Exclusion Criteria: 799 pregnant women who gave informed consent were recruited in this study while those who declined consent were excluded.

Sample Collection and Analysis: From each subject, 5 ml venous blood was withdrawn aseptically by venipuncture. Samples were centrifuged, sera separated and kept at -20°C. Samples were assayed using a qualitative Micropoint Rapid Diagnostic (Italy) test kits, an immunochromatographic strip sandwiched with monoclonal antibody to detect HBsAg. Manufacturer's instructions were adhered to strictly.

Ethical permission was obtained from Oyo State Research Ethics Committee.

Data Analysis: Descriptive statistical analysis was employed to present the obtained data. Chi square test was used to determine significant relationship between groups. The statistical significance level was set at $p < 0.05$ (when confidence interval was 95%).

RESULTS

799 pregnant women were studied in this work. 54 (6.8%) of them tested positive to HBsAg while 745 of them were negative. (Table 1). Table 2 showed that the ages of all the subjects were between 15 - 54 years. The predominant age groups in this study were 25 - 29 years and 30 - 34 years with 26.9% and 33.3% respectively. However, the age groups with the highest prevalence rate of HBsAg are 35 - 39 years (31.5%) followed by 30 - 34 years (24.1%) while those with the least HBsAg prevalence were > 40 years.

The study further demonstrated that majority of the pregnant women tested had at least a secondary education 425 (53.2%), 173 (21.7%) had primary education and 201 (25.2%) had tertiary education (Table 3).

DISCUSSION

Early detection of diseases is good as it facilitates quick diagnosis and immediate appropriate treatment especially among asymptomatic individuals. Hepatitis B surface antigen prevalence rate of 6.8% among pregnant women in this secondary health institution in Ibadan is similar to previous study in Osogbo with 7.1% HBsAg prevalence rate [18]. HBV infection is said to be endemic when the prevalence rate is higher than 7% in an adult population [19]. The result of this work reveals intermediate prevalence of HBsAg infection among pregnant women in Ibadan. The prevalence of 6.8% in this work is different from earlier report from another part of the same city recording 11.5% [20]. This may be as a result of more awareness and prophylactic measures (vaccination) among pregnant women in the capital city while they were single or before they became pregnant given rise to relatively lower prevalence rate among the same category of people. The findings of this research is lower than HBsAg prevalence rate of 7.6% in Nnewi [22], Awka 9.3% [23], Makurdi 11% [24], Maiduguri 15.8% [25] and Jos 63.3% [26] all among pregnant women in Nigeria. The prevalence rate demonstrated in this work is higher than the 2.2% prevalence rate in Benin city [27], Port-Harcourt 4.3% [28], Ilorin 5.7% [29], Lagos 4.4% [30], Enugu 4.6% [31] and 5.0% in Ibadan [32], all in Nigeria.

Table 1: HBsAg prevalence rate among investigated pregnant women

Total tested	HBsAg Negative	HBsAg Positive	Prevalence rate (%)
799	745	54	6.8

Table 2: Distribution of HBsAg among investigated pregnant women according to age groups

Age groups	Number (n) N=799	Percent (%)	HBsAg positive (%) N=54
15-19	11	1.4	1 (1.9)
20-24	99	12.4	12 (22.2)
25-29	215	26.9	11 (20.4)
30-34	266	33.3	13 (24.1)
35-39	167	20.9	17 (31.5)
40-44	32	4.0	0 (0)
45-49	3	0.4	0 (0)
50-54	6	0.8	0 (0)

Table 3: Other socio-demographic features of the investigated pregnant women

	Number (n) N=799	Percent (%)	HBsAg positive (%) N=54
Ethnicity			
Yoruba	737	92.2	52 (96.3)
Igbo	57	7.1	2 (3.7)
Hausa	5	0.6	0 (0)
Religion			
Christianity	301	37.7	21 (38.9)
Islam	498	62.3	33 (61.1)
Educational status			
Primary	173	21.7	8 (14.8)
Secondary	425	53.2	32 (59.3)
Tertiary	201	25.2	14 (25.9)

All these reports confirm the high HBV infection in the country and emphasizes the importance of screening pregnant women for the virus and necessary measures taken to prevent mother to child transmission.

HbsAg prevalence rate found in this study is lower than 8.0% recorded in another West African country [33] and far less than 16.0% found in a neighboring country [34]. An Asian country, Taiwan was reported to have 15.5% which is far greater than found in this study. However, the 6.8% seroprevalence rate is far more than the 2% found in the developed countries like the United States of America and Western Europe [35]. The clear gap between the third world countries and the developed nations in the prevalence rate of HBV infection may not be unconnected with the widespread prophylactic measure (vaccination) put in place in developed countries for both children and the adult alike.

The age groups with the highest prevalence rate for HbsAg in this work are 30-34 years (24.1%) and 35-39 years (31.5%). This is similar to what Habiba *et al.* [36] found in their study, where most of those confirmed positive to HBsAg were between 30-35 years. Sexual activity has been found to be the highest at this age range in the society thus giving credence to the fact that sexual

activity plays a prominent role in the transmission of hepatitis B virus. Aganga *et al.* [37] also had similar report that in hepatitis B endemic areas, the most affected with the highest HBsAg prevalence and specific antibody were found among those between 25-29 and 30-34 years. This is however different from the work by Vazquez-Martinez *et al.* [38] who noted that, in Mexico, 26 years was the average age of women infected with the Hepatitis B virus.

This study found the level of education to be another important factor. The study found the lowest prevalence (14.8%) amongst the least educated and those with secondary education had the highest prevalence of 59.3%. This is similar to the report of Opaleye *et al.* [18] in Osogbo that the greater prevalence rate in their study was among the more educated pregnant women. The effect of education and mass sensitization on the carrier rates of this infection is low. This is contrary to what was reported by Ezegebudo *et al.* [39].

CONCLUSIONS

Information on HBsAg infection prevalence amongst pregnant women in Ibadan has been further provided.

We strongly advocate for widespread vaccination, mass awareness and general surveillance to bring the spread of this virus to a stop. To prevent mother to child transmission, hospitals should include free screening and vaccination of all pregnant women and their babies in the antenatal and postnatal programmes. Other serological markers like anti-HBs, anti-HBe and anti-HBc are also strongly advocated for to be included in the antenatal programme nationwide for pregnant women and those negative to be vaccinated to confer protection against HBV infection.

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