

Seroprevalence of Hepatitis B Surface Antigen among Pregnant Women Attending Ante-Natal Clinics in Sokoto Metropolis

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Abstract:

Aim: The aim of this study is to screen and assess the prevalence of Hepatitis B Virus (HBV) infection among the pregnant women attending ANC in Sokoto Metropolis.

Method: 5ml of blood was collected from each of 384 participants recruited and these serum samples were tested for hepatitis B virus infection using HBsAg Rapid Test Strip manufactured and described by ABON Biopharm Co., Ltd (Hangzhou).

Result: Prevalence rate of 6.51% was obtained for hepatitis B virus infection in pregnant women. The highest HBsAg prevalence rate recorded was 9.17% for pregnant women aged 21–25 while the lowest recorded was 2.43% for those aged 16-20.

Conclusion: This study confirmed a high seroprevalence of Hepatitis B virus infection amongst pregnant women which is in line with the findings of earlier studies that HBV infection is endemic in Nigeria.

I. Introduction

Hepatitis is a medical condition defined by the inflammation of the liver; which has many aetiological agents such as viruses, bacteria, fungi, parasites, drugs, and chemicals. while, viral aetiology is the commonest (19).

Hepatitis B has become an issue of global health importance, and it is rapidly spreading in developing countries including Nigeria, due to lack of community health education, illiteracy and poverty. It still remains a public health problem(5). Hepatitis B virus continues to cause serious health problem in developing countries. Neonatal infection with HBV which is often acquired during delivery carries a high risk resulting in persistent infection (12). Those who have the infection may develop chronic hepatitis eventually leading to cirrhosis and hepatocellular carcinoma. After 20 years of chronic hepatitis infection, an estimate of 5% of patients will develop cirrhosis if they are infected at an age younger than 40 years, and an estimate of 20% if infected at an age greater than 40 years(8). Majority of patients are asymptomatic and help in the spread of the disease in the community and health care workers (5). Hepatitis B is 50 to 100 times more infectious than HIV and 10 times more than hepatitis C virus (4,21).

Several studies were conducted on the prevalence of Hepatitis B in different regions. In a study conducted by the World Health Organization (WHO), about 2 billion people worldwide have been infected with the virus and about 350 million live with chronic infection. An estimated 600 000 persons die each year due to the acute or chronic consequences of hepatitis B(21).

HBV infection is endemic in Asia and Sub-Saharan Africa including Nigeria (2). Vertical transmission of HBV infection is thought to be a major mode of transmission in endemic areas (2). The virus is also transmitted through contact with the blood or other body fluids (semen, vaginal secretion or saliva) of an infected person - not through casual contact, perinatal (from mother to baby at birth) is also common particularly in Asia and Africa(7.,20). Hepatitis B infection could be acute or chronic. It is acute when it lasts less than six months and chronic when it persists longer (14).This infection present with malaise, anorexia, abdominal pain and jaundice but some time there are no symptoms till the development of cirrhosis, portal hypertension, oesophagealvarices, ascitis, encephalopathy or liver malignancy(1). There is vaccine available for hepatitis B which is now incorporated in immunization schedule all over the world and it is expected that its incidence will decrease(6 ,10).

The prevalence of hepatitis B varies in different regions, it is endemic in China and part of Asia, High rates of chronic infections are also found in the Amazon and the southern parts of eastern and central Europe, In the Middle East and Indian sub-continent, an estimated 2% to 5% of the general population is chronically infected. Less than 1% of the population in Western Europe and North American is chronically infected (21). Nigeria belongs to the group of countries highly endemic for viral hepatitis (15).

Hepatitis B virus can be transmitted from carrier mothers to their babies during perinatal period. Transmission, probably, occur when maternal blood contaminates the mucous membrane of the new born baby

during birth. Infection may also result from haematogenous transplacental transmission, breast feeding and close postnatal contact between infant and the infected parent (3). Perinatal infection and infection during the first year of life have important consequences because 90% of these infants become chronic carriers as compared to 10% of those infected after the age of six (6). Such chronicity increases the risk of cirrhosis and hepatocellular carcinoma (3).

II. Materials And Methods

Study Area

The study was carried out in the Faculty of Medical Laboratory Science in collaboration with ANCs in Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto Specialist Hospital and Maryam Abacha Women and Children Hospital all in Sokoto Metropolis, Sokoto State.

Study Population

The study population comprised of 384 pregnant women attending ANC in Sokoto Metropolis, Sokoto State.

Ethical Consideration

Ethical clearance for the study was sought and obtained from ethical committee of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Specialist Hospital Sokoto and Maryam Abacha Women and Children Hospital Sokoto (MAWCH). Patients consent were also obtained. All data and information generated in the study shall remain confidential except only for the purpose of this research.

Laboratory Methods

PRINCIPLE - HBsAg Rapid Test

The HBsAg one step Hepatitis B Surface Antigen Rapid Test Strip (Serum/Plasma) is a qualitative solid phase, lateral flow sandwich immunoassay for the detection of HBsAg in Serum/Plasma. The membrane is pre-coated with anti-HBsAg antibodies on the test line region of the strip. During testing, the Serum/Plasma reacts with anti-HBsAg antibodies conjugated particle. The mixture migrates upward on the membrane chromatographically by capillary action to react with the anti-HBsAg antibodies on the membrane and generate a colored line. The presence of this colored line in the test region indicates a positive result; while it's absent indicate a negative result. To serve as a procedural control, a colored line will always appear in the control line region indicating that proper volume of the specimen has been added and membrane wicking has occurred.

Procedure

About 5ml of blood was collected by venipuncture and it was dropped in a plain sample container. The blood was allowed to retract and it was centrifuged at 1500 rpm for 15 minutes, serum was collected and kept at -20°C until needed.

Serological Test

Rapid Test Strip to detect Hepatitis B surface antigen (HBsAg)

HBsAg Rapid Test Strip manufactured and described by *ABON Biopharm Co., Ltd* (Hangzhou) was used for the detection of HBsAg in the serum with strict adherence to the manufacturer's instructions.

Steps:

- i. The test was performed at room temperature (18°C to 30°C)
- ii. Strip was removed from the foil pouch and then it was placed on a level surface.
- iii. The strip was immersed into the specimen, with the arrow pointing towards the specimen. The strip was taken out after 10 seconds and it was laid flat on a clean dry, non-absorbed surface.
- iv. The result was read after 15 minutes.

RESULT

- ❖ Positive result: the test was positive when both control (C) and test (T) lines on the test strip are coloured.
- ❖ Negative result: Absence of the colour in the test (T) line indicates negative result.

RESULT

Of the 384 pregnant women recruited for the study only 25 (6.51%) were tested to be positive. The rates of infection were then compared with other variables (age, occupation, level of education, ethnic group, religion, trimester of pregnancy and transfusion).

Table 1: The table below shows the frequency and percentage of infectivity in relation to age.

Age	Number examined	Number infected	(%)
16 – 20	82	2	(2.43)
21 – 25	109	10	(9.17)
26 – 30	78	7	(8.97)
31 – 35	44	3	(6.81)
36 – 40	58	2	(3.44)
41 – 45	13	1	(7.69)
Total	384	25	

Table 2: The table below shows the frequency and percentage of infectivity in relation to occupation.

Occupation	Number examined	Number infected	(%)
Civil Servant	124	6	(4.84)
House wife	202	13	(6.44)
Artisan	29	3	(10.34)
Students	29	3	(10.34)
Total	384	25	

Table 3: The table below shows the frequency and percentage of infectivity in relation to level of education.

Level of education	Number examined	Number infected	(%)
Non-educated	41	8	(19.51)
Primary	143	5	(3.50)
Secondary	141	2	(1.42)
Tertiary	59	10	(16.94)
Total	384	25	

Table 4: The table below shows the frequency and percentage of infectivity in relation to Ethnic group.

Ethnic group	Number examined	Number infected	(%)
Hausa/Fulani	254	12	(4.72)
Yoruba	42	3	(7.14)
Igbo	33	6	(18.18)
Other	55	4	(7.27)
Total	384	25	

Table 5: The table below shows the frequency and percentage of infectivity in relation to Religion.

Religion	Number examined	Number infected	(%)
Islam	286	7	(2.44)
Christianity	85	14	(16.47)
Others	13	4	(30.77)
Total	384	25	

Table 7: The table below shows the frequency and percentage of infectivity in relation to trimester of pregnancy.

Trimester of pregnancy	Number examined	Number infected	(%)
First trimester	167	13	(7.78)
Second trimester	121	7	(5.78)
Third trimester	96	5	(5.49)
Total	384	25	

Table 8: The table below shows the frequency and percentage of infectivity in relation to blood transfusion.

Blood transfusion	Number examined	Number infected	(%)
Yes	16	6	(37.50)
No	368	19	(5.16)
Total	384	25	

III. Discussion

Screening asymptomatic people is an important instrument in disease detection, prompt diagnosis and intervention, particularly at an early stage of the disease. This may improve the health outcome as well as better understanding of the transmission pattern of the disease (2). In Asia and sub-Saharan Africa, HBV infection is endemic and thought to be the main etiological factor in over 75% of the chronic liver disease (1). Viral hepatitis infection remains a public health problem in developing countries. The research work carried out on seroprevalence of HBsAg among pregnant women attending Antenatal clinics in Sokoto Metropolis revealed high prevalence. Out of the 384 pregnant women recruited for the study only 25 (6.51%) were tested to be positive. This rate is higher than the prevalence rate of 4.3% earlier reported in Port harcourt, 5.5% in Bayelsa (2), 6.06% in Lagos (17), 2.19 % in Benin City (16) but lower than 6.67% in Awka and 16.5% in Osogbo (15) all in southern Nigeria. The result is also higher than the prevalence rates of 3.8% in Abuja (2), 5.7% in Ilorin

(1) but lower than 6.57% in Minna (13), 8.3% in Zaria (11) and 11.6% reported among pregnant women in Maiduguri (9) all in central and Northern Nigeria. It is observed that while the prevalence rate of HBsAg appears to be generally high in Nigeria, the higher rate is reported in northern Nigerian compared to the southern part of the country. This could be as a result of poor awareness of this infection in the part where there is high prevalence.

The poor standard of living in Nigeria which is more highly pronounced in the northern part of the country coupled with the misconception about the safety of immunization may also be factors responsible for the generally high prevalence of the disease.

The result of this study is higher than the 1.5% reported in Libya and similar studies in other parts of the world indicated 2.1% in North Turkey, 3.1% in Saudi Arabia, 3.7% in Ethiopia and 5.6% in Khartoum (15) the global prevalence of chronic HBV infection varies in the order, highest in Africa, Asia and the Western Pacific (>8%) to intermediate (2-7%) in Southern and Eastern Europe and lowest (< 2%) in Western Europe, North America and Australia (16).

On the basis of age, the distribution of HBV infection among women attending antenatal clinic in Sokoto Metropolis indicates that the age group 21-25 has the highest rate of infection of 9.17% followed in descending order by 26 – 30 (8.97%), 41 – 45 (7.69%), 31 – 35 (6.81%), 36-40 (3.44%) and 16-20 (2.43%). The high rate of infection observed among the 21 – 25 and 26-30 age groups may be attributable to the high rate of sexual activity, multiple sex partners, tattooing that is usually characteristic of the age group. Many other variables such as occupation, level of education, ethnic group, religion, trimester of pregnancy and blood transfusion were evaluated with highest percentages among students and artisan, non-educated women, Igbo, other religions, first trimester and those that had blood transfusion respectively.

IV. Conclusion

This study determined a high seroprevalence of Hepatitis B virus infection amongst pregnant women in Sokoto Metropolis. It has, therefore, confirmed a high seroprevalence of Hepatitis B infections amongst pregnant women in North-western Nigeria and also confirmed the findings of earlier studies that HBV infection is endemic in Nigeria.

Recommendations

- It is recommended that all pregnant women should be routinely screened for Hepatitis B virus infection as part of antenatal care services, particularly during the first visit.
- Campaign about awareness of the disease and public immunization of women should be encouraged before any accidental contact with infectious agent.
- Those pregnant women tested to be positive should be treated based on fetal-maternal status.
- Pregnant women and masses in general should be educated on means of contacting the infection.
- It also recommended that more of these researches should be carried out

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