Original Research Article

SEROPREVALENCE OF HEPATITIS B VIRUS AMONG PREGNANT WOMEN ATTENDING ANTE-NATAL CLINIC AT GENERAL HOSPITAL ARGUNGU, KEBBI STATE NIGERIA

ABSTRACT:

Hepatitis B virus infection is caused by Hepatitis B virus, and the virus can be transmitted from infected mother to her new born child during pregnancy. This research work was aimed at determining the prevalence of Hepatitis B virus among pregnant women attending ante-natal clinic (ANC) in General Hospital Argungu. 300 serum samples were assayed using Hepatitis B surface antigen (HBsAg) Rapid Test Strip manufactured by Lab ACON Hangzhou Biotest Biotech Co., Ltd. 38 (12.7%) of the participants have antibodies to HBV. From the research the highest prevalence of HBsAg was found among the age group 20 – 29 years and lowest among the age group of 30 – 39 years. 2nd trimester (4 – 6 months) had the highest prevalence rate of 11.3%, followed by 3rd trimester (7 – 9 months) with 1.3%, while the 1st trimester (1 – 3 months) had zero prevalence (0%). Those that shared sharp objects had the prevalence of 4.6%. Those that had blood transfusion had prevalence of 1.0% while those that are unvaccinated had the highest prevalence of 12.3%. The family type or status i.e. monogamy or polygamy, from the three hundred subjects screened, two hundred and thirty nine family type of the subjects were monogamous and sixty one were polygamous which represent 11.2% and 18.0% respectively. It was observed that fifty had primary education, two hundred and thirty six had secondary education, twenty had tertiary education and ninety four had informal education. Those that had secondary education had the highest prevalence of 7.0% while those with primary education have the least prevalence with 1.0%. This study shows that there are tendencies of vertical transmission from these infected mothers to their new born babies. It is therefore recommended that more studies with advance technology such as PCR should be encouraged and more research should be conducted on a large population in other states of the country so as to establish the endemicity of HBV.

Keywords: sero prevalence, HBV, Pregnant Women, General Hospital.

INTRODUCTION

Hepatitis B virus (HBV) is a DNA virus belonging to the family Hepadna-viridae with Hepatitis B Surface Antigen (HBsAg) being a complex antigen found on its surface [1, 2]. The recognition of hepatitis B virus was first made by Blumberg. When testing the serum of an Australian Aborigine, which he described as Australian antigen and is later termed hepatitis B surface antigen [3]. Hepatitis B virus has been recognized as one of the public challenges worldwide with approximately two billion people infected, an estimated 1 – 2 million annual deaths due to infection and about 400 million persons being chronic carriers [4].

In human, hepatitis B virus is among the most important cause of acute inflammation and necrosis of the liver and it is an etiological agent of hepato-cellular carcinoma. HBV attack the liver and cause livelong infection, cirrhosis of the liver, liver cancer, liver failure and death [5]. Hepatitis B virus is transmitted parentarally and most common by transfusion of HBV infected blood or blood products, intravenous drug abuse, from mother to child, needle stick injury, ear piercing, tattooing and other tribal ceremonies, barbers razors etc. infection may also be spread by formites, sharing of toothbrush, abrasion and sexual contact (hetero or homosexual) with infected persons [6]. Neonates born of chronically infected mothers are 20% at risk of the infection progressing to chronic phase [7].

Since detection of HBsAg in serum is an indicative of either acute or chronic phase of HBV infection, this investigation was carried out to detect the prevalence of HBsAg in the Sera of Pregnant women attending General Hospital Argungu with a view of establishing the seroprevalence of HBV infection among pregnant women attending the hospital.

MATERIALS AND METHOD

Study Area

The research was designed in order to study the prevalence rate of Hepatitis B surface antigen infection among pregnant women in Argungu metropolis. General Hospital Argungu was used for the purpose of this study.

Ethical Clearance:

Ethical clearance for the study were obtained from ethical committee of General Hospital Argungu. Informed consent was obtained from the Patients.

Study Population

The study population comprised of three hundred pregnant women attending ANC in Argungu metropolis, kebbi state.

Sample Collection

Five milliliter of blood samples was collected by vein puncture from the anti-cutibal foci after swabbing with 70% alcohol from each subject aseptically. The blood was allowed to clot; the serum was centrifuged at 2500 rpm for 20 minutes. It was then separated into sterile sample bottle and labeled with their antenatal number, and was sued for HBV assay.

Laboratory Methods

The ACON rapid test kit was used to test the samples for HBV antibodies. This is a rapid chromatographic immunoassay for the qualitative detection of antibodies to HBV in serum or plasma. The specificity and sensitivity of ACON kits is 98.2% - 100% and 97.2% - 99.8% respectively [8]

Principle of the Test

The ACON HBsAg Rapid Test Strip (serum/plasma) is a qualitative, solid phase, two-site sandwich immunoassay for the detection of HBsAg in whole blood, serum or plasma. The membrane is pre-coated with anti-HBsAgantibodies on the test line region of the strip. During testing, the whole blood, serum or plasma specimen reacts with anti-HBsAg antibodies conjugated particles. The mixture migrates upward on the membrane chromatographically by capillary action to react with anti-HBsAg antibodies on the membrane and generate a coloured line. The presence of this coloured line in the test region indicates a positive result, while its absence indicates 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 specimen has been added and membrane wicking has occurred.

Procedure

The test strip and the test samples were allowed to equilibrate to room temperature prior to testing. The test strip was removed from the sealed foil pouch. The tape from the test card was peeled off, and the test strip was stocked in the middle of the test card with arrows pointing down on the test card. By holding the dropper vertically, 3 drops of serum (approximately 75µl) was transferred onto the “specimen pad” of the test strip, and the timer was started. The result was read after 15 minutes.

Interpretation of Test Results

- POSITIVE: Two distinct coloured lines appear. One line should be in the control region (C) and another line should be in the test region (T).
- NEGATIVE: One coloured line appears in the control region no apparent coloured line appears in the test region (T).
- INVALID: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test strip. If the problem persists, discontinue using the test kid immediately.

RESULTS

A total of three hundred (300) serum samples were collected from pregnant women attending ante-natal clinic, General Hospital Argungu. Out of the three hundred serum samples screened for HBsAg, thirty eight 38 (12.7%) women were positive for Hepatitis B surface antigen and 262 (87.44%) were negative for Hepatitis B surface antigen. (Table).

Table 2 shows the age distribution of HBsAg. The age group below 20 years has the highest prevalence of 15.0% followed by 20 - 29 years age group with 12.4% while the 30 – 39 years age group has the least prevalence of 10.0%, followed by 40 – 49 years age group with zero prevalence.

Table 3. Shows the Prevalence of HBsAg in relation to trimester of subjects. 2nd trimester (4 – 6 months) had the highest prevalence rate of 13.9%, followed by 3rd trimester (7 – 9 months) with 8.2%, while the 1st trimester (1 – 3 months) had zero prevalence (0%).

Table 4. Show the prevalence of HBsAg in relation to risk factors. Those that shared sharp objects had the prevalence of 17.5%. Those that had blood transfusion had prevalence of 18.7% while those that are unvaccinated had prevalence of 15.8%. The family type or status i.e. monogamy or polygamy, from the three hundred subjects screened, two hundred and thirty nine family type of the subjects were monogamous and sixty one were polygamous which represent 11.2% and 18.0% respectively.

Table 5. Shows prevalence of HBsAg in relation to educational status of subjects. From the table, it was observed that fifty had primary education, two hundred and thirty six had secondary education, twenty had tertiary education and ninety four had informal education. Those that had tertiary education had the highest prevalence of 30.0% while those with primary education have the least prevalence with 6.0%.

TABLE 1: Overall Result of HBsAg Prevalence

Total number	No. of positive (%)	No. of negative (%)
300	38 (12.66)	262 (87.4)

HBsAg = Hepatitis B surface antigen, No. = number, % = percent.

TABLE 2: Age Distribution of HBsAg Among the Patients

Age (years)	No. screened	No. positive	(%)
Below 20	80	12	15.0
20 – 29	177	22	12.5
30 – 39	40	4	10.0
40 – 49	3	0	0.0
Total	**300**	**38**	

HBsAg = Hepatitis B surface antigen, No. = number, % = percent.

TABLE 3: Distribution of HBsAg Based on Trimester

Trimester	No. screened	No. positive	(%)
1st (1-3 months)	8	0	0
2nd (4-6 months)	243	34	11.3
3rd (7-9 months)	49	4	1.3
Total	**300**	**38**	

HBsAg = Hepatitis B surface antigen, No. = number, % = percent, 1st = First, 2nd = Second, 3rd = Third.

TABLE 4: Distribution of HBsAg with Respect to Risk Factors

Age (years)	No. screened	No. positive	(%)
1. Sharing with sharp object			
Yes	80	14	17.5
No	220	24	10.91
Total	**300**	**38**	
2. Blood transfusion			
Yes	16	3	18.75

No	284	35	12.32
Total	**300**	**38**	
3. Vaccination			
Yes	67	1	1.49
No	233	37	15.88
Total	**300**	**38**	
4. Family status			
Monogamy	239	27	11.29
Polygamy	61	11	18.03
Total	**300**	**38**	

HBsAg = Hepatitis B surface antigen, No. = number, % = percent.

TABLE 5: Distribution of HBsAg Based on Educational Status

Education	**No. screened**	**No. positive**	**(%)**
Primary	50	3	6.0
Secondary	136	21	15.4
Tertiary	20	6	30.0
Informal	94	8	8.5
Total	**300**	**38**	

HBsAg = Hepatitis B surface antigen, No. = number, % = percent.

DISCUSSION

The prevalence rates of HBV vary according to the endemicity of the infection in a given area. Kong *et al*., [9] reported prevalence rate of 10.0% among pregnant women in Hong Kong, Lin *et al*., [10] reported 12.0% prevalence rate from Taiwan, while 17.3% was reported for Burkina Faso [11]. In Nigeria, 11.6% prevalence rate has reported from Maiduguri, 4.3% from Port Harcourt, 5.7% from Ilorin, in Lagos, prevalence was reported to be 4.4% and 8.3% from Zaria [12, 13, 14, 15 and 16]. Very high prevalence rate are mostly reported from the developing nations in Asia and Africa.

Hepatitis B is one of the diseases of mankind and is a serious global health problem, caused by the hepatitis B virus. It has been established that HBV infection can be transmitted from mother to child during birth. High prevalence of HBV among pregnant women increases chances of

HBV in children. From the result obtained in this study, out of 300 samples screened for HBsAg, 38 samples were found positive to hepatitis B virus infection (12.7%). This is in agreement with earlier reports of 13.8%, 10.0%, 11.6% and 12.0% from Lagos, Hong Kong, Maidurugi and Taiwan respectively [15, 9, 12, and 10].

Within Nigeria, results from this study is higher than the 4.3%, 5.7% and 8.3% reported from Port Harcourt, Ilorin and Zaria respectively [1, 2 and11]. The decrease in prevalence rates among some Nigerians cold be due to anti HBsAg vaccination policy of the government. Detection of HBsAg among the study population has confirmed statement that detection of HBsAg in serum is indicative of active acute or chronic hepatitis B virus infection [17].

On the basis of age group, the highest prevalence rate (15.0%) was found among those below 20 years, followed by 20 - 29 years with 12.4% while 40 – 49 years had 0.0% prevalence. This age of infection correlate well with the age of greatest sexual activity especially among women of childbearing age, supporting the role of sexual intercourse in the transmission of hepatitis B virus infection. In this study, women of their second trimester of pregnancy had the highest prevalence of 13.9%, contrary to observations of Lilavati *et al*, [8] that the third trimester in pregnant women had the highest prevalence rate.

Considering various risk factors, pregnant women with history of blood transfusion have the highest prevalence of 18.7%, indicating the significance of screening blood for HBV infection, followed by sharing sharp object with 17.5%, which might be one of the most pre-disposing of HBV infection among these pregnant women. From the study, it was observed that highest number of HBV infectious was found among polygamy type of family (18.0%), while there are few positive cases of HBV infection among gamonomy family type, this shows that family type (monogamy or polygamy) does not have much significant in the prevalence of HBV infection in Argungu metropolis, this is because the spread of most STD's does not depend on family type but defend on so much on the faithfulness of partners which are involved. Those who belong to the polygamy family who are infected may be due to sharing of husband who is unfaithful or who becomes infected by an unfaithful co-wife.

CONCLUSION

The conclusion from this study is that it is evident that HBV infection is present or occurred among these pregnant women hence there is still need to educate them about the danger associated with this virus infection, its possible routes of transmission and possibilities of vertical transmission to their new born babies from infected mothers.

RECOMMENDATIONS

Based on the result obtained in this study the following are recommended.

1. Every pregnant woman for ante-natal visit should be screened for HBsAg and government should subsidize HBsAg screening not only for pregnant women but also for those preparing for pregnancy so that adequate precaution should be taken.
2. There should be campaign to create awareness on the modes of transmission, the risk factors as well as how to control the spread of HBV should be intensified and increase where there is no trust for one another.
3. Blood for transfusion, blood should be properly screened with latest and modern equipment and reagents that can detect minute antibody or antigen in the blood.
4. Sharing of personal items such as tooth brush, razor blades should be discouraged among the populace.
5. Health personnel in close contact with infected individuals should be given HBV vaccine and possible precautions to avoid hospital infection
6. Infected individual should be treated to reduce spread of the virus in the community.
7. Routine vaccination of previously unvaccinated children and vaccination of adults at increased risk for infection.
8. prevention of perinatal HBV infection through routine screening of all pregnant women for HBV infection and by providing immunoprophylaxis to infants born to infected women or to women of unknown infection status.

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