

## **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 in General Hospital Argungu. 300 serum samples were assayed using ACON Rapid Test Strip Kit. 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. 2<sup>nd</sup> trimester (4 – 6 months) had the highest prevalence rate of 11.3%, followed by 3<sup>rd</sup> trimester (7 – 9 months) with 1.3%, while the 1<sup>st</sup> 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

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

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

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

## MATERIALS AND METHOD

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### Study Area

53  
54 The research was designed in order to study the prevalence rate of Hepatitis B surface antigen  
55 infection among pregnant women in Argungu metropolis. General Hospital Argungu was used  
56 for the purpose of this study.

### Ethical Clearance:

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

### Study Population

60  
61 The study population comprised of three hundred pregnant women attending ANC in Argungu  
62 metropolis, kebbi state.

63 **Sample Collection**

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

68 **Laboratory Methods**

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

73 **Principle of the Test**

74 The ACON HBsAg Rapid Test Strip (serum/plasma) is a qualitative, solid phase, two-site  
75 sandwich immunoassay for the detection of HBsAg in whole blood, serum or plasma. The  
76 membrane is pre-coated with anti-HBsAg antibodies on the test line region of the strip. During  
77 testing, the whole blood, serum or plasma specimen reacts with anti-HBsAg antibodies  
78 conjugated particles. The mixture migrates upward on the membrane chromatographically by  
79 capillary action to react with anti-HBsAg antibodies on the membrane and generate a coloured  
80 line. The presence of this coloured line in the test region indicates a positive result, while its  
81 absence indicates a negative result. To serve as a procedural control, a colored line will always  
82 appear in the control line region indicating that proper volume of specimen has been added and  
83 membrane wicking has occurred.

84 **Procedure**

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

91 **Interpretation of Test Results**

- 92
- 93 • POSITIVE: Two distinct coloured lines appear. One line should be in the control region  
94 (C) and another line should be in the test region (T).
  - 95 • NEGATIVE: One coloured line appears in the control region no apparent coloured line  
96 appears in the test region (T).
  - 97 • INVALID: Control line fails to appear. Insufficient specimen volume or incorrect  
98 procedural techniques are the most likely reasons for control line failure. Review the  
99 procedure and repeat the test with a new test strip. If the problem persists, discontinue  
using the test kid immediately.

100

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## RESULTS

102 A total of three hundred (300) serum samples were collected from pregnant women attending  
103 ante-natal clinic, General Hospital Argungu. Out of the three hundred serum samples screened  
104 for HBsAg, thirty eight 38 (12.7%) women were positive for Hepatitis B surface antigen and 262  
105 (87.44%) were negative for Hepatitis B surface antigen. (Table ).

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

110 Table 3. Shows the Prevalence of HBsAg in relation to trimester of subjects. 2<sup>nd</sup> trimester (4 – 6  
111 months) had the highest prevalence rate of 13.9%, followed by 3<sup>rd</sup> trimester (7 – 9 months) with  
112 8.2%, while the 1<sup>st</sup> trimester (1 – 3 months) had zero prevalence (0%).

113 Table 4. Show the prevalence of HBsAg in relation to risk factors. Those that shared sharp  
114 objects had the prevalence of 17.5%. Those that had blood transfusion had prevalence of 18.7%  
115 while those that are unvaccinated had prevalence of 15.8%. The family type or status i.e.  
116 monogamy or polygamy, from the three hundred subjects screened, two hundred and thirty nine  
117 family type of the subjects were monogamous and sixty one were polygamous which represent  
118 11.2% and 18.0% respectively.

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

124

125 **TABLE 1: Overall Result of HBsAg Prevalence**

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

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

128 **TABLE 2: Age Distribution of HBsAg Among the Patients**

129

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
<b>Total</b>	<b>300</b>	<b>38</b>	

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

131 **TABLE 3: Distribution of HBsAg Based on Trimester**

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

133 HBsAg = Hepatitis B surface antigen, No. = number, % = percent, 1<sup>st</sup> = First, 2<sup>nd</sup> = Second, 3<sup>rd</sup> =  
134 Third.

135

136 **TABLE 4: Distribution of HBsAg with Respect to Risk Factors**

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

No	284	35	12.32
<b>Total</b>	<b>300</b>	<b>38</b>	

### 3. Vaccination

Yes	67	1	1.49
No	233	37	15.88
<b>Total</b>	<b>300</b>	<b>38</b>	

### 4. Family status

Monogamy	239	27	11.29
Polygamy	61	11	18.03
<b>Total</b>	<b>300</b>	<b>38</b>	

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

139 **TABLE 5:** Distribution of HBsAg Based on Educational Status

140

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
<b>Total</b>	<b>300</b>	<b>38</b>	

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

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## DISCUSSION

143 The prevalence rates of HBV vary according to the endemicity of the infection in a given area.  
 144 Kong *et al.*, [9] reported prevalence rate of 10.0% among pregnant women in Hong Kong, Lin *et*  
 145 *al.*, [10] reported 12.0% prevalence rate from Taiwan, while 17.3% was reported for Burkina  
 146 Faso [11]. In Nigeria, 11.6% prevalence rate has reported from Maiduguri, 4.3% from Port  
 147 Harcourt, 5.7% from Ilorin, in Lagos, prevalence was reported to be 4.4% and 8.3% from Zaria  
 148 [12, 13, 14, 15 and 16]. Very high prevalence rate are mostly reported from the developing  
 149 nations in Asia and Africa.

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

153 HBV in children. From the result obtained in this study, out of 300 samples screened for HBsAg,  
154 38 samples were found positive to hepatitis B virus infection (12.7%). This is in agreement with  
155 earlier reports of 13.8%, 10.0%, 11.6% and 12.0% from Lagos, Hong Kong, Maidurugi and  
156 Taiwan respectively [15, 9, 12, and 10].

157 Within Nigeria, results from this study is higher than the 4.3%, 5.7% and 8.3% reported from  
158 Port Harcourt, Ilorin and Zaria respectively [1, 2 and 11]. The decrease in prevalence rates among  
159 some Nigerians could be due to anti HBsAg vaccination policy of the government. Detection of  
160 HBsAg among the study population has confirmed statement that detection of HBsAg in serum  
161 is indicative of active acute or chronic hepatitis B virus infection [17].

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

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

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## CONCLUSION

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

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## RECOMMENDATIONS

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

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

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