

Hepatitis B Virus Infection In A Rural Settlement of Northern Nigeria

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ABSTRACT

Background: Hepatitis B virus (HBV) infection has been present in our communities for quite sometime now. However, majority of the people especially in rural areas are not aware of its devastating effects as adjudged by their socio-cultural practices.

Methods: Three hundred randomly selected residents of Zawan community (comprising 193 males and 107 females) were screened for hepatitis B surface antigen (HBsAg) presence in their sera. Other information was obtained with the aid of a structured questionnaire and results analysed using Epi Info 6 statistical software.

Results: The prevalence of HBV in Zawan village was found to be 12.6% (9% among males and 3.6% among females). The risk factors associated with HBV transmission were tonsillectomy, tattooing, use of sharp objects as well as trading. Marital status was also found to be a significant risk factor as there was a high prevalence of HBV infection among the widowed/divorced/separated group.

Conclusion: HBV infection is endemic in our rural communities just as it is in the urban areas and efforts should be made to step up its health education campaign as well as the interventional mechanisms including immunization.

KEYWORDS: Hepatitis B virus; Rural settlement; Northern Nigeria.

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INTRODUCTION

Hepatitis B virus infection was discovered in 1966 by Blumberg¹. It was originally called Australia antigen because it was first noticed in the serum of an Australian Aborigine^{2,3}. It is a double stranded DNA virus of the Hepadnaviridae family^{4,5}. At present it is estimated that at least 350 million people are infected by the virus worldwide^{5,6}. Africa, South East Asia and Latin America constitute over 75% of the global prevalence^{6,8}. Norway is reputed for having one of the lowest prevalence of Hepatitis B virus infection (0.4%) in the world while a prevalence of 29% has been recorded in Egypt⁹.

In Nigeria HBV infection is a serious health problem as currently about 18 million Nigerians are infected^{10,12}. Many of these people may not be aware of the infection and hence fail to seek appropriate medical attention therefore eventually progressing

into chronic liver disease, cirrhosis and hepatocellular carcinoma¹³. Similarly this infectious group constitutes a serious public health risk towards the spread of the virus.

Although a lot of work has been done on HBV in the urban areas¹¹⁻¹⁴, there is still limited information from the rural settings, which in Nigeria constitutes over 75% of its entire population. This study was therefore designed to establish the prevalence of hepatitis B virus (HBV) infection and to ascertain those cultural practices that predispose to its infection in this rural community.

MATERIALS AND METHODS

Study Area

The study was carried out in Zawan Village, a settlement about 20 kilometres outside Jos city. It is located in Jos South Local government Area of Plateau State. It has a projected population of about 6,120 people based on the 1991 population census figure of 4,443. The majority of the inhabitants of the settlement are natives of the land and farming is their major occupation. The community also carries out mining activities in collaboration with visitors who come in and go from time to time.

Selection of Subjects

The churches, market square and traditional heads were used to mobilize people in the community to our lady of Apostles (OLA) Hospital Zawan, the only Cottage hospital in the community. A written consent was obtained from each subject who was recruited into the study by a simple random sampling method from January to April 2003. Three hundred (300) subjects aged 11 to 70 years were recruited into the study. A structured questionnaire was self administered to each of the subjects and appropriate information obtained.

Ethical Approval

This was sought and obtained from the ethical committee of Jos University Teaching Hospital (JUTH).

Collection of Samples

Five millilitres (5ml) of blood was obtained from each subject for the detection of Hepatitis B surface antigen (HBsAg) and antibodies against HIV. The blood was allowed to clot, and this was later centrifuged and the serum separated and stored at

-20°C.

Processing Of Samples

All the laboratory procedures were carried out at the Immunology Laboratory of JUTH.

HBsAg Assay

The HBsAg assay was done by Latex agglutination method. It detects HBsAg in serum using antibody coated latex particles. Kits were obtained from Biotec laboratories Middlesex UK.

Statistical Analysis

Results obtained were subjected to statistical analysis using EPI-INFO software version 6 where applicable. Comparison of proportion was done using chi-square test while p values less than or equal to 0.05 were considered significant.

RESULTS

Out of 300 subjects recruited into the study, 107(35.7%) were females while 193(64.3%) were males, and 38 (12.6%) were reactive to HBsAg. The peak age range for males was 31-40 years (3.6%) with overall prevalence of 9.0%. Similarly the peak age range for females was 21-30 years (1.7%) with an overall prevalence of 3.6% for females (Table I).

Table II shows the significant risk factors in the community likely to be associated with HBV transmission. Of the 83 subjects who admitted to have had tonsillectomy in the past, 18 (21.7%) subjects were HBsAg reactive ($p < 0.05$). Also, of the 80 subjects who had circumcision by traditional method, 12(15%) were reactive for HBsAg ($P > 0.05$).

Twenty-one out of 101 subjects (20.8%) who practised tattooing were HBsAg reactive ($P < 0.05$). Twelve out of 80(15%) male subjects who had circumcision by traditional method were reactive for HBsAg ($p > 0.05$).

One hundred and sixty eight subjects engaged in the use of sharp objects out of which 31 (18.5%) were reactive for HBsAg ($P < 0.05$).

There was significant association between marital status and HBV infectivity. Among the 27-divorcee/separated subjects, 17 (62.9%) were reactive for HBsAg ($P < 0.05$).

Table III shows the occupational distribution of HBsAg seroprevalence. There was no significant association among farmers, students, housewife, and civil servants ($P > 0.05$). However, of the 45 subjects who were traders, 14 (4.7%) were reactive for HBsAg. This finding is statistically significant ($P < 0.05$).

Table I. Age and Sex Distribution of Hepatitis B Surface Antigen Seroprevalence in Zawan Village, Plateau State

Age (Years)	Reactive HBsAg		Non Reactive HBsAg		Total
	M	F	M	F	
11-20	5(1.7)	3(1.0)	10(3.3)	4(1.3)	22(7.3)
21-30	7(2.3)	5(1.7)	62(20.7)	44(14.7)	118(39.3)
31-40	11(3.7)	1(0.3)	42(14.0)	27(9.0)	81(27.0)
41-50	3(1.0)	1(0.3)	31(10.3)	12(4.0)	47(15.4)
51-60	1(0.3)	1(0.3)	17(5.7)	7(2.3)	26(9.0)
61-70	0(0)	0(0)	4(1.3)	2(0.7)	6(2.0)
Total	27(9.0)	11(3.7)	166(55.3)	96(32.0)	300(100)

Table II. Seroprevalence Of Hepatitis B Surface Antigen By Associated Risk Factors In Zawan Village, Plateau State

Risk Factors	HBs Ag		χ^2	P Values
	Reactive	Non-Reactive		
Tonsillectomy n = 83	18(21.7)	65(78.3)	6.25	<0.05
Male Circumcision By Traditional Method n = 80	12(15.0)	68(85.0)	0.76	>0.05
Tattoo = 101	21(20.8)	80(79.2)	4.67	<0.05
Use of Sharp Objects n = 168	1(18.5)	137(81.5)	4.67	<0.05
Married n = 172	1(6.4)	161(93.6)	0.18	>0.05
Single n = 101	10(9.9)	91(90.1)	0.17	>0.05
Divorced n = 27	17(62.9)	10(37.1)	4.00	<0.05

Table III. Seroprevalence Of Hepatitis B Surface Antigen By Occupation In Zawan Village, Plateau State

Occupation	HBsAg		χ^2	P Values
	Reactive	Non-Reactive		
Farmer n = 99	11(3.7)	88(29.3)	0.49	>0.05
Student n = 51	6(2.0)	45(15.0)	0.19	>0.05
Trader n= 45	14(4.7)	31(10.4)	8.76	<0.05
Housewife n= 41	3(1.0)	38(12.7)	0.06	>0.05
Civil Servant n = 23	2(0.6)	21(7.0)	0.00	>0.05
Others n= 31	2(0.6)	29(9.7)	0.03	>0.06

DISCUSSION

The prevalence of HBsAg in Zawan village was found to be 12.6%. A 9% and 3.6% prevalence was found among the males and females respectively. This finding is high and comparable with findings from other parts of the country¹¹⁻¹⁴ which further confirms the endemicity of HBV in our community. The presence of the infection among all the age groups under study also shows the depth of the disease in this community. In addition, the higher prevalence among the males could be due to their adventurous nature, which places them at higher risk to this infection.

Although, other markers for HBV infection such as anti-HBc, HBeAg and anti-HBs were not sought for, this would have detected a few extra positive samples. This does not however affect these findings adversely; nevertheless, this limitation is highly noted.

The prevalence of HBsAg of 12.6% in Zawan village is similar to the finding of Okolo *et al*¹⁵ who found 15.5% prevalence among patients attending Jos University Teaching Hospital, Jos. This finding is also similar to the finding of Baba *et al*¹¹ in Maiduguri of 14% among blood donors. It is interesting to note that, the design of this study was rural, and community based. It therefore has the tendency of reporting more accurate figures of the community and by extension that of the larger Nigerian community. On the contrary, several other studies

on HBV were urban and hospital based^{4, 5,10,12}, and have the tendency of reporting slightly higher figures.

This study found a strong association of HBV infection with certain sociocultural practices that the people hold in high esteem. These include tonsillectomy, tattooing, use of sharp objects. These practices are associated with the use of unsterilized contaminated instruments, which would enhance the transmission of hepatitis B virus. A similar study carried out in Maiduguri¹¹ strongly suspected similar practices as the cause of high HBV prevalence, however, there was no direct proof as it is in this study. There was a strong association of HBV infection with the widowed/divorced/separated group. This group of people are prone to multiple sexual contacts as well as the tendency to patronize commercial sex workers with the attendant risks of HBV transmission. Other researchers had similar findings^{4,11}.

It is also interesting to note that, male circumcision by traditional method, which is commonly practised here, had no significant association with HBV infection. This could be as a result of the herbal concoctions applied shortly after the procedures may have antiviral properties. The community does not gladly practice female circumcision.

Among the different professions found in the community, there was significant increase in HBV infection among traders. This is not unexpected since the nature of the profession requires travels; this would enhance socialization and predispose to multiple sexual contacts.

Generally, the inhabitants of Zawan village appear to have very little knowledge about the medical risks associated with their cultural and social behaviours. This could account for the free transmission of HBV and its consequent high prevalence in the locality. The high prevalence of HBV in other parts of the country could be attributed to similar factors.

This study strongly established the fact that HBV infection is common in our community. Findings from other parts of the country such as Maiduguri^{11,16}, Jos^{4,10} and Benin-City¹⁷ further strengthen this fact¹⁸.

This calls for a thorough evaluation and re-evaluation of the government healthcare policy at federal, state and more especially at the local government levels with the aim of enhancing preventive health policies.

The following points need to be considered for a better policy implementation.

i. Health education and Government advocacy:

The mode of transmission and prevention should be preached to the communities by the local authorities, the state and federal government, community based organizations as well as non-governmental organizations (NGOs).

- ii. More primary health centres should be opened up in the community and other Nigerian communities to afford them easy access to healthcare delivery and hence discourage the hazardous local treatment methods of these people. Similarly, the government should train more health personnel especially the community health officers (CHO) and other primary health-care workers who will work in the rural communities and help in health education at the grass root level.
- iii. Local, state and federal government should help supply reagents for proper screening and early diagnosis of this infection at costs conveniently affordable by the majority of the populace.
- iv. The federal government should procure hepatitis B virus vaccines and distribute to all the health institutions in the country at all levels and make it affordable and readily available to all children and adults. Similarly, the government should further strengthen the efficiency of the cold chain system in the country. This will maintain the potency of the vaccines wherever they are stored in the rural communities and hence make NPI successful.
- v. Finally, the federal government should continue to sustain the inclusion of hepatitis B virus vaccine in the present "National Programme on Immunization" (NPI), since hepatitis B virus infection is endemic in our community.

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