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Seroprevalence of Hepatitis B Surface Antigen among Clients Attending Private Medical Laboratory Diagnostic Centre in Karshi, Abuja Nigeria

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Abstract

Hepatitis B virus infection is one of the global public health problem, viral hepatitis especially B form a considerable percentage of liver disease worldwide. This study aims to determine the seroprevalence of hepatitis B virus among clients attending private medical laboratory diagnosis center in Karshi, Abuja, Nigeria. Blood samples were collected from clients and analysed to determine the presence of hepatitis B surface antigen (HBSAg) using Agary® HBSAg test kit. The study was carried out among 378 clients aged 11 and 50 years between August, 2019 to March, 2020. Out of 378 clients screened 70 (18.5%) were positive for hepatitis B surface antigen (HBSAg). Gender, age, education and marital status related prevalence of hepatitis B virus was determined. There was no statistically significant relationship between all the variables and prevalence of hepatitis B infection. The high prevalence of HBV infection amongst the clients studied strongly suggest that urgent preventive measures, particularly health education on HBV modes of transmission, prevention should be promoted and strengthened also compulsory universal vaccination of adults and children against HBV.

Keywords: Hepatitis B virus, Seroprevalence, Nigeria and demographic data.

Introduction

Hepatitis B virus infection is one of the global public health problems. It is however an endemic disease in Asia and Saharan African [1,2]. Hepatitis B virus is 50-100 times more infectious than HIV, and it is the aetiologic agent of hepatitis B, an infection that is endemic in Nigeria [3;4]. Hepatitis B virus is a partially double-stranded virus of a complex structure and a member of Hepadnaviridae family and genus Orthohepadnavirus causes infection of the liver [1;5;6]. The virus is the most cause of chronic liver diseases: hepatocellular carcinoma, necrotizing vasculitis and cirrhosis [7;8]. Globally, it has been reported that about two billion people are infected with hepatitis B virus. An estimated 257 million people are chronically infected with HBV, with the majority of cases occurring in regions of Asia and Africa where the virus is endemic [9; 10]. HBV can cause both acute and chronic infections, and during the acute phase of infection, symptoms are not experienced by most people. Nevertheless, certain individuals develop acute illness with symptoms that last several weeks, including yellowing of the skin and eyes (jaundice), nausea, dark urine, extreme fatigue, abdominal pain and vomiting [1;11]. Acute hepatitis individuals, a small subset can develop life-threatening acute liver failure whereas in certain individuals, HBV establishes a chronic liver infection that progresses to cirrhosis or cancer of the liver and annually causes over a million deaths [4;11].

The mode of transmission of the disease is largely through unprotected sex, mother-to-child transmission (MTCT), contaminated blood to blood product and use of contaminated objects or instrument [12], body fluids, intravenous drug use, scarifications, tattooing, institutional care and intimate care with carriers [13;14]. Neonates born of chronically infected mothers have a 70-90% risk of the infection progressing to a chronic phase. Prevalence of HBV infection has been reported to vary according to ethnic groups, regions and countries with the

most endemic areas being middle- and low-income countries. In the continents of Africa and Asia, it remains a major cause of morbidity and mortality [15; 16]. Nigeria is endemic area of viral hepatitis, and studies carried out by various authors had shown that HBV infection are highly prevalent among Nigerians [17], reported 8.3% among healthy looking adult in Edo state, [18], reported 7.3% in federal capital territory Abuja among one residents of a staff quarters, [19] analysed the results of HBSAg screening among patients in Abeokuta, south western Nigeria was found to be 4.0%. 23.3% was reported among patient attending all clinics at the Aminu Kano Teaching Hospital [20] and [21] reported 8.3% from Zaria. [22], showed that prevalence of Hepatitis B virus infection among people of a local community in Keffi, Nigeria was 13.2%.

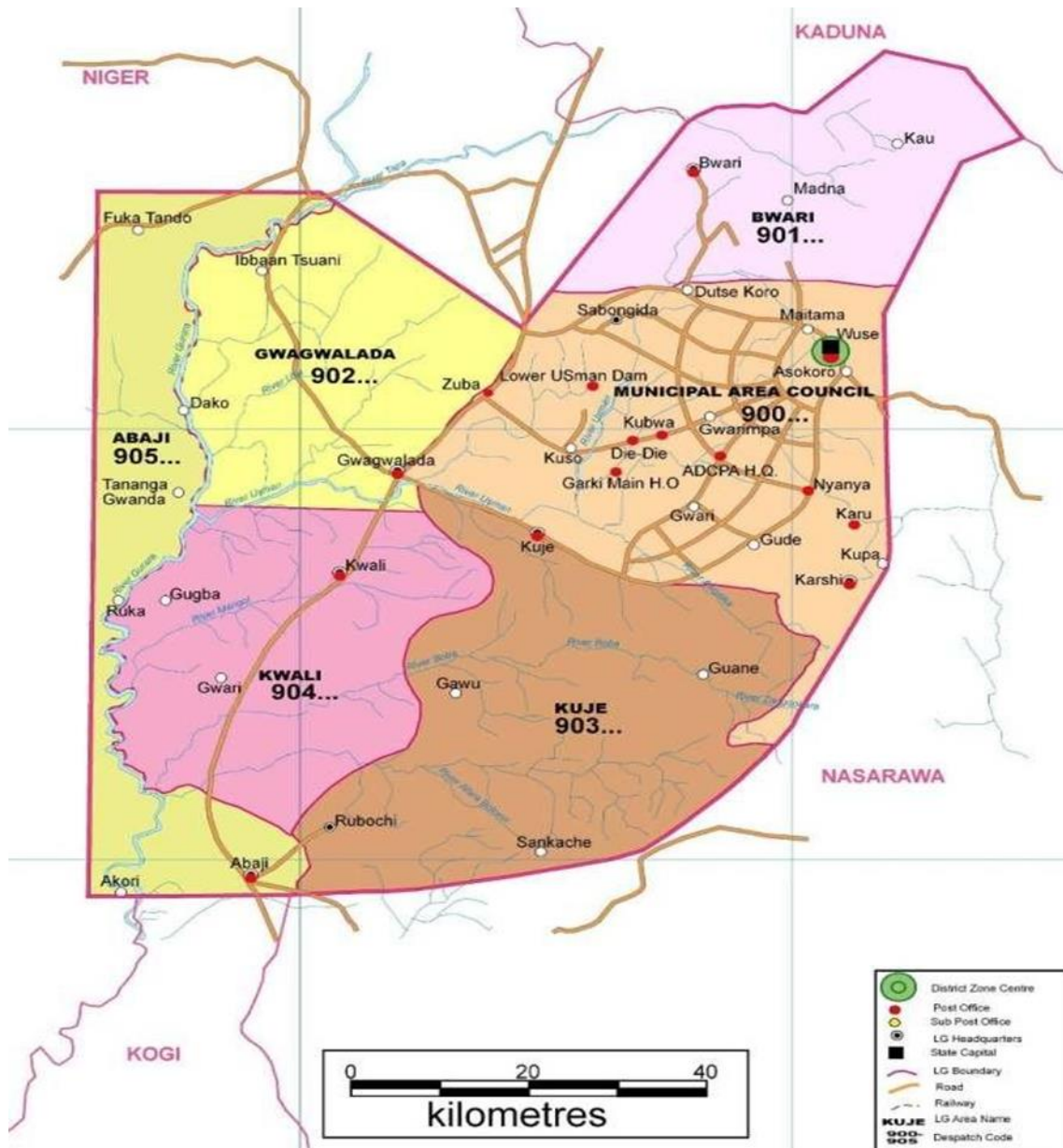
Laboratory diagnosis of HBV includes detection of markers such as HBSAg, HBSAb, HBCAb, HBeAg and HBeAb in the serum [23]. Detection of HBSAg in the serum is indicative of HBV infection and this marker is the most frequently used in testing for HBV infection [24].

However, no research had been conducted with regard to the sero-prevalence of Hepatitis B virus in Karshi, Abuja Nigeria. Therefore, the aim of this research was to determine the sero-prevalence of Clients attending Private Medical Laboratory Diagnostic Center in Karshi, Abuja, Nigeria

Materials And Method

Study Area

The study was carried out at Decency Amana Medical Laboratory Karshi Abuja, Nigeria. Karshi is a satellite town situated in Abuja Municipal Area Council in Federal Capital Territory Abuja, Nigeria. Karshi geographical coordinates are 8° 49' 40" North, 7° 33' 0" East. Karshi is about 38 km to Federal capital city of Abuja and 41 km from Karshi to Apo. Karshi has a population of about 30,000 people. The predominant tribe in Karshi is Gwandaras who constitute about 85% of the total population. Other minority tribes in Karshi are Gade, Gbagyi, Hausa, Fulani, Igbo, Idoma and Tiv [25:26:27].



Map of Abuja showing the six area councils (study area Karshi)

Study Population

The study was carried out among 378 clients between the aged 11 and 50years attending Decency Amana Medical Laboratory Karshi Abuja. The study was carried out between August, 2019 and March, 2020. The population include clients with no history of hepatitis or prior treatment against hepatitis virus infection were screen for the study.

Ethical Approval

Ethical approval informed consent was obtained from all the recruited clients. We obtained permission to carry out the study from the management of the Private laboratory.

Blood Samples Analysis

Three (3ml) of whole blood was aseptically collected by venipuncture from each subject and transfer into EDTA bottles. The blood samples were centrifuged at 3000rpm for 5minutes and the plasma was collected for HBSAg test. This was done using invitro diagnostic kit Agary HBSAg test kit Manufactured by Nantong Egens Biotechnology Co, Ltd, China (Accuracy:99.76%, Relative Sensitivity:100%,

Relative specificity:99.68%), designed for qualitative determination of HBSAg in human plasma. The strip was labeled with sample code for easy identification and the strips were immerse into the plasma in the EDTA bottles separately for 8-10seconds. The strips were removed and placed on a clean, dry flat table for 15minutes and result interpretation were carried out according to the manufactures instructions. The result is interpreted as the presence of two colour bands (Test-T band and Control C band) within the result window indicated a positive result. The presence of only one pink colour band on the control indicated a negative result. The test was invalid if control line fails to appear or no distinct color line visible in both the test and control region [28; 29; 30].

Statistical Analysis

Chi square test was used to determine the level of significant between age, gender, educational background and marital status. P value <0.05 was considered significant at 95% confidence interval.

Result

Table.1: The Distribution of Seroprevalence of HBSAg base on Socio-demographic Characteristics.

Social characteristic	Total Number Tested (n=378)	Number Positive	Positive (%)	P-Value
Sex				
Male	215	40	10.6	0.999
Female	163	30	7.9	
Age				1.000
11-20	75	14	3.8	
21-30	152	28	7.4	
31-40	124	23	6.1	
41-50	27	5	1.3	
Educational status				0.249
Primary	128	20	5.3	
Secondary	100	13	3.4	
Tertiary	30	5	1.3	
Non-Formal	120	32	8.5	
Marital status				0.280
Single	173	40	10.6	
Married	115	21	5.5	
Divorced	50	6	1.6	
Widowed	40	3	0.8	

This study showed that out of the 378 clients tested only 70(18.5%) were positive for HBSAg. The distribution among the clients based on gender showed that male had the highest prevalence of 40 (10,6%) and female 30(7.9%). Although the difference is no statistically significant association between the sexes.

The distribution of seroprevalence based on age showed that high prevalence of 28(7.4%) was recorded among the age group of 21-30years, followed by 31-40years 23(6,1%),11-20years 14(3.8%) and 41-50years had the least prevalence 5(1.3%). The result showed that there is no statistically significant relationship between the prevalence and age group.

The prevalence of HBSAg based on educational status revealed that high prevalence of 32(8.5%) was recorded among those with no formal education, followed by primary 20(5.3%) while those with secondary and tertiary levels education had lower prevalence 13(3.4%) and 5(1.3%) respectively. However, no statistical significant difference observed between the educational status and prevalence of HBSAg .

The distribution of HBSAg according to marital status the

highest prevalence was recorded among single individual 40(10.5%), followed by married 21(5.5%), Divorced 6(1.6%) and widowed had the least prevalence 3(0.8%). There was no statistical significance difference between the marital status in relation to HBSAg infection.

Discussion

This finding revealed that out of 378 clients tested 70(18.5%) were positive. The prevalence of 18.5% in this study was relatively higher than the 13.3% reported by [22] among people of a local community in Keffi, Nigeria, 10% reported by [31] among pregnant women attending ante-natal in Garki, Abuja. The figure reported in this study is also higher than the 9.5% reported by [32] among ante-natal patients in Gwagwalada, Abuja, Nigeria, 9.7% reported by [33], among young people in central Nigeria and 11.9% reported by [34], among HIV-infected patients in Nigeria. In contrast, it is less than 20.0% found by [35], in Otukpo, an urban area of Benue state;31.5% [36], among apparently healthy students of tertiary institution in North Eastern, Nigeria, [37] reported (10%) among pregnant women in Garki, Abuja and 19.05% reported by [38],

among blood donors in Shirioro LGA Niger, State, Nigeria. The prevalence of Hepatitis B virus infection with respect to gender was found high in male (10.6%) than female (7.9%). However, there was no statistical significance different between the sexes. This finding is in consistent with the finding of [22; 39; 40; 41], which reported a high prevalence rate among male and no significant association between gender and viral infection. ($p>0.05$). But in contrast with the finding of Sule *et al.*, [42], which reported high prevalence rate among female.

In relation to age, high prevalence of (7.4%) was recorded among age group of 21-30years, while those between 41-50years had the least prevalence rate of (1.3%). These findings agreed with the report of Olokoba *et al.*, [43], who reported that women between the ages 25-29years had a greater prevalence rate. This study disagrees with finding of Ezeonu *et al.*, [44] which showed that high prevalence of HBsAg among HIV infected patients in the age group >45 years and Isa *et al.*, [41] who reported higher prevalence among aged >50 years among patient attending Sokoto specialist hospital. However, in most of the prevalence studies of HBV younger age are always reported to be vulnerable, due to being sexually active group. Although, no statistically significant differences were observed between the different age groups $P>0.05$.

The distribution of HBV infection according to educational qualification was analyzed, high prevalence occurred among those with non-formal education (8.3%), followed by those attained primary education (5.3%) and those with tertiary education had the least prevalence. However, no statistically significant was recorded between educational level and hepatitis B infection $p>0.05$. This finding disagrees with Isa *et al.*, [41], who shows that high prevalence was found among those with primary education, followed by secondary education.

Prevalence according to the marital status, there was high prevalence of HBV among single (10/6%), followed by married (5.5%) and the widowed had the least prevalence of (0.8%). But there is no statistical significance difference between the marital statuses. This may imply that marital status is not really a risk factor for HBV infection, but an indicator to consider the sexual partner as a risk factor for the infection, since unmarried people may tend to have many sexual partner or unprotected sex. This finding is in line with Isa *et al.*, [39], who indicates, prevalence of (8.0%) and (14.4%) among single. Also, agreed with Eke *et al.*, (16) which shown no statistical significance relationship was observed between HBV infection and marital status $p>0.05$. This study could serve to direct any national effort toward reducing the HBV burden of our private health facility. This study will be of immense value as a public health tool to include our private laboratory for planning, delivery, monitoring and evaluation of HBV intervention

Conclusion

This study recorded a higher prevalence rate of hepatitis B infection among clients Karshi Abuja, Nigeria. This study suggested the need for free and compulsory screening of hepatitis B among all patients attending any private and public health facility for the first time. The high prevalence of HBV infection amongst the clients studied strongly suggest for immediate intervention. It is recommended that reduction in hepatitis B virus infection could be achieved

by public health enlightenment campaign on HBV modes of transmission and prevention should be promoted and strengthened. Compulsory universal vaccination of adults and children against HBV. An integrated approach involving all stakeholders on health should be adopted with inclusion of Private Medical Laboratory into government health policies on HBV.

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Competing Interests Disclaimer

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. These is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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