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Original Research Article

Prevalence of Hepatitis B Surface Antigen (HBsAg) and Hepatitis B Antibodies among Commercial Motor Park Workers in Jos North, Nigeria

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Abstract

Although there are several reports on the prevalence of HBsAg in Nigeria, there is paucity of data on the prevalence of HBsAg and HBAb among motor park workers in the country. ***Objective:*** This study aimed to determine the seroprevalence and risk factors among commercial Motor park workers in Jos, Nigeria. ***Methods:*** One hundred and thirty one (131) commercially motor park Workers who consented to take part in this study were recruited. Aseptically, 5ml of venous blood was collected from each participant and screened for HBsAg and HBAbs markers using one step, rapid chromatographic immunoassay and associated risk factors using structured questionnaire which was voluntarily completed by the participants and the data were thereafter analysed. ***Results:*** Of the 131 participants, 105 were males and 26 females with age range between 16-75 years. An overall HBsAg seropositivity of 16.8% and HBAbs positivity of 74.8% were observed. On multivariate analysis, factors such as multiple sexual partners: HBsAg (35.0%), anti-HBs (10.0%), anti-HBe (20.0%) and anti-HBc (35.0%); history of surgery: HBsAg (64.3%), anti-HBs (21.4%), anti-HBe (7.1%) and anti-HBc (7.1); lack of condom usage: HBsAg (15.7%) anti-HBs (28.7%), anti-HBe (18.3%) and anti-HBc (27.8%) were among some determinants of HBV infection in this study. ***Conclusion:*** The data results suggest high prevalence of HBV among this mobile group of people;, and with the increasing number of individuals and corporate bodies engaged in one or more activities at motor parks, there is the need for deliberate efforts for preventive measures.

Keywords: Seroprevalence, HBV, Sserologic Markers. Motor Park Workers, Jos.

INTRODUCTION

Infection with Hepatitis B Virus (HBV) is among the world's most common and serious infectious diseases. Hepatitis virus infection with its associated sequelae is a disease of major public health importance globally [1]. An estimated 350 million individuals are chronic carriers with about 1.5 million dead recorded annually from HBV related causes [2]. The most common outcome after infection is the expression of diverse serological markers of varying epidemiological and clinical significance including Hepatitis B surface antigen (HB*s*Ag), Hepatitis B surface antibody (HB*s*Ab), Hepatitis B core antibody (HB*c*Ab), Hepatitis B early antigen (HB*e*Ag), Hepatitis B e antibody (HB*e*Ab) and Hepatitis B core IgM antibody (HB*c*IgM) [3] with each having clinical significance depending on the natural history of the infection. Therefore, prevalence of hepatitis B surface antigen (HBsAg) alone may be an underestimation of the current hepatitis B status in any population. Although most publications from Nigeria investigated the surface antigen prevalence [4]; data from other parts of the world have shown that this is not sufficient to predict latent infections. The recovery of HBV for many years in the blood of infected persons following clinical recovery and the induction of HBV-specific antibodies and cytotoxic T lymphocytes corroborated this fact [5]. Also HBV transmissions have been reported from surface antigen negative but hepatitis B core antibody (HBcAb) positive healthy individuals under various circumstances [6]. Despite the continuous effort on immunization, the prevalence of HBV infection among Nigerians remains high.

Studies of commercial drivers which are the major constituents of motor park workers in sub-Saharan Africa, Thailand, and India have reported high levels of unsafe sexual activity with commercial sex workers (CSWs), frequent change of sexual partners, and multiple partners [7, 8, 9] and condom use was rare even in sexual encounters with CSWs [10]. This study focuses on motor park workers in Jos North Local

Government Area of Plateau State in Nigeria, a group identified as important in the transmission of HBV infection.

MATERIALS AND METHODS

Study Area and Study Population

The study was cross-sectional study was designed to take place using and samples were collected from two selected motor parks; NURTW Motor Park, opposite NTA in Jos -North Local Government Area (L.G.A) and Plateau Riders Park in Jos, Plateau State, in Nigeria which have high rate of activities. One hundred and thirty one (131) consented motor park workers participated in this study.

Ethical Consideration and Consent

Ethical clearance was sought from the Medical and Ethics committee of Bingham University Teaching Hospital before commencement. Consenting Motor park workers who volunteered and participated in this research were included while workers who withheld their consent were excluded.

Sample Collection and Processing

Under aseptic technique, 5 mL of venous blood was collected into a plain vacuum blood collection tube (Micropoint Diagnostics, Santa Clara, CA, USA). The blood was allowed to clot and retract at room temperature. Sera were separated by centrifugation at 3000 rpm for 5 minutes. The supernatant sera were aspirated into vials and preserved at −20°C until analyzed. One step strips (Skytel Diagnostics, USA), rapid chromatographic immunoassay for the quality detection of HBsAg, HBsAb, HBeAb and HBcAb were used to screen the participant's serum sample following the manufacturer's instructions. According to the manufacturer's data sheet, the sensitivity and specificity for this test method was 99%.

Data Analysis

Data were analyzed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). Comparison of categorical data was done using the chi-square test. A *p*P-value of 0.05 or less was considered statistically significant.

RESULTS

A total of 131 blood samples were collected among motor park workers in Jos among which 105 were males and 26 females with age range between 16-75 years. All participants were tested for HBsAg and HBAb (HBsAb, HBeAb and HBcAb) markers with overall prevalence of 16.80% and 74.8% respectively were recorded. Among the males, prevalence of HBsAg and HBAb was 19.0% and 78.1% respectively and the prevalence among females was 8.3% and 69.2%. Based on occupation in the park, the prevalence of HBsAg and HBAb were respectively 23.7% and 76.3% among Drivers; 21.4% and 83.3% among conductors and 12.5% and 87.5% among officials of the Pparks. Those who had Primary Education, HBsAg and HBAb were 14.5% and 79.7% respectively; 17.2% and 95.1% for those without prior screening for HBV and 14.0% and 71.0% for married, 29.2% and 91.7% for the single respectively (Table-1). Table-2 presents analysis of some risk factors such as Smoking, injection Drug use, alcohol, history of tooth extraction, condom use, share sharp objects, history of dialysis, history of surgery, number of sexual partners) among the motor park workers in Jos. We observed that HBsAg, HBeAb and HBCAb positive individuals who have the history of smoking (27.8%), the prevalence was low among injection drug use HBsAg (25.0%), HBcAb (50.0%), those with history of alcohol had HBsAg (20.7%,) HBcAb (24.1%). History of tooth extraction HBsAg (18.2%), HBcAb ((31.8%), condom use: HBsAg (25.0%), HBcAb (37.5%), history of surgery: HBsAg (64.3%), HBcAb (7.1%), number of sexual partners: HBsAg (16.3%), HBcAb (29.8%). The risk factors studied did not have significant association ($p > 0.05$) with HBV serologic markers except for HBsAb with p value of= 0.05. However, HBsAg was detected with highest frequency among the individuals with history of surgery.

Table-1: Hepatitis B viral serologic markers distribution in relation to demographics of (Age, Sex, Occupation, Educational and Marital Status) factors among the Commercial Motor Park Workers

Variables	HBsAg No (%)	HBsAb No (%)	HBeAb No (%)	HBcAb No (%)
Age Category				
16-25yrs	3(16.7)	2(11.1)	3(16.7)	4(22.2)
26-35yrs	9(20.0)	11(24.4)	12(26.7)	12(26.7)
36-45yrs	4(13.3)	9(30.0)	2(6.7)	7(23.3)
46-55yrs	4(20.0)	6(30.0)	6(30.0)	10(50.0)
56-65yrs	1(6.3)	6(37.5)	2(12.5)	4(25.0)
66-75yrs	1(50.0)	0(0.0)	1(50.0)	1(50.0)
p. value	0.610	0.500	0.174	0.324
Sex				
Male	20 (19.0)	26 (24.8)	23 (21.9)	33 (31.4)
Female	2 (8.3)	8 (33.3)	3 (12.5)	7 (26.9)

p-value	0.208	0.390	0.300	0.304
Occupation				
Driver	14 (23.7)	11 (18.6)	14 (23.7)	20 (33.9)
Official	4 (12.5)	13 (40.6)	6 (18.7)	9 (28.1)
Conductor	3 (16.7)	4 (22.2)	5 (27.8)	6 (33.3)
Trader	1 (7.7)	6 (46.2)	1 (7.7)	3 (23.1)
p-value	0.170	0.199	0.159	0.263
Educational Status				
≤Primary	10 (14.5)	19 (27.5)	14 (20.3)	22 (31.9)
Secondary	11 (27.5)	11 (27.5)	8 (20.0)	11 (27.5)
Tertiary	1 (4.5)	4 (18.2)	4 (18.2)	5 (22.7)
p-value	0.052	0.660	0.977	0.690
Marital Status				
Single	7 (29.2)	5 (20.8)	8 (33.3)	9 (37.5)
Married	15 (14.0)	29 (27.1)	18 (16.8)	29 (27.1)
p-value	0.073	0.527	0.067	0.310

Table-2: Hepatitis B viral serologic markers distribution in relation to risk factors among Commercial Motor Park Workers

Variables	**HBsAg No (%)**	**HBsAb No (%)**	**HBeAb No (%)**	**HBcAb No (%)**
Smoking				
Yes	5(27.8)	3(16.7)	5(27.8)	5(27.8)
No	17(16.7)	31(30.4)	21(20.6)	33(32.4)
p-value	0.180	0.333	0.364	0.901
Injection Drug Use				
Yes	1(25.0)	0(0.0)	1(25.0)	2(50.0)
No	21 (18.1)	34 (29.3)	25 (21.6)	36 (31.0)
p-value	0.737	0.084	0.591	0.791
Alcohol				
Yes	6(20.7)	6(20.7)	7(24.1)	7(24.1)
No	16 (15.7)	28 (27.5)	19 (18.6)	31 (30.4)
p-value	0.525	0.464	0.511	0.513
History of tooth extraction				
Yes	4(18.2)	9(40.9)	2(9.1)	7(31.8)
No	18 (18.4)	25 (25.5)	24 (24.5)	31 (31.6)
p-value	0.985	0.153	0.118	0.985
Condom use				
Yes	4(25.0)	1(6.3)	5(31.3)	6(37.5)
No	18 (15.7)	33 (28.7)	21 (18.3)	32 (27.8)
p-value	0.349	0.055	0.220	0.424
Share sharp objects				
Yes	19(21.8)	22(25.3)	19(21.8)	27(31.0)
No	3 (9.1)	12 (36.4)	7 (21.2)	11 (33.3)
p-value	0.042	0.639	0.531	0.625
History of dialysis				
Yes	0(0.0)	0(0.0)	1(100.0)	0(0.0)
No	26 (20.0)	36 (27.7)	27 (20.8)	41 (31.5)
p-value	0.652	0.552	0.617	0.521
History of Surgery				
Yes	9(64.3)	3(21.4)	1(7.1)	1(7.1)
No	19 (16.2)	39 (33.3)	24 (20.5)	35 (29.9)
p-value	0.330	0.683	0.032	0.002
No of Sexual Partners				
1	17(16.3)	33(31.7)	23(22.1)	31(29.8)
>2	7(35.0)	2(10.0)	4(20.0)	7(35.0)
P-value	0.190	0.066	0.550	0.462

DISCUSSION

Migration and mobility of people has its fair share in the transmission of HBV and contributes significantly in the cause of some epidemics and infections as a result of risky behaviours adopted by mobile population including multiple sexual partners, participation in commercial sex, as well as poor condom usage [11, 12]. Commercial drivers, a major constituent of motor park workers is one of such migrant groups. In this study, one hundred and thirty one (131) consenting Motor Park Workers in Jos with age range of 16-75years were recruited and examined for presence of markers of HBV infections. All participants, including 105 males and 26 females were screened for HBsAg and HBAbs.

The overall seroprevalence of HBsAg and HBAb were 16.80% and 74.8% respectively. The prevalence of HBsAg observed in this study is higher than the results of similar studies conducted in India which documented 5.7% prevalence [13] and 14.2% reports of [14] in Ghana. However, this is in contrast with to the results of [15] with 32.3% in Brazil. This study therefore adds to the growing evidence that commercial drivers represent a high-risk group for HBV. It is suggestive of the growing rate of infection among this mobile group. Anti-HBc prevalence of 74.8% indicates past exposure to HBV.

Statistically, the risk of HBV do not correlates with increasing age, however, a good proportion of commercial drivers who tested positive for HBsAg were in the age range 66-75 year. About 37.5% in the age category, 56-65yrs have been vaccinated as indicated by anti-HBs marker prevalence while 50% of those showing sign of previous exposure were in the age categories of 46-55years and 66-75years. This disparity is unclear and conclusions remain tentative.

Although the study was gender bias, higher HBsAg prevalence of 19.0% among males and 8.3% among females was recorded, with 24.8% males and 33.3% females indicating marker for anti-HBs antibody which could be as a result of more women participating in the established HBV vaccination program within the country. About 21.9% males with inactive carrier state and 12.5% females were observed while histories of previous exposures were marked by 31.4% anti-HBc in males and 26.9% in females. These observed differences could be attributed to the more numbers of males taking driving as an occupation than their female counterparts in the country, hence are more at risk of infection.

The study also attempted to categorize the motor park workers into drivers, officials, conductors and traders based on the activities performed at the park into Drivers, Officials, Conductors and Traders. Higher HBsAg prevalence of 23.7% and 16.7 was recorded among the drivers and their conductors with the traders indicating 46.2% anti-HBs antibody as a result of vaccination. The mobile nature of these drivers and their conductors (inter and intra states mobility) with reported sexual encounters with commercial sex workers and lack of consistent condom use were attributable factors. However, the low prevalence of HBV among drivers who have tertiary education and who are married shows that education, awareness, fidelity isare vital in ameliorating stemming the transmission of the infection.

Based on marital status, proportion of those with previous exposure was 37.5% among the singles and 27.1% among the married; however, evidence of active infection among the singles was higher with about 29.2% and 14.0% in the married. Having multiple sexual partners and inconsistent condom usage has been implicated to this observed prevalence.

The analysis of risk factors such as number of sexual partners, condom usage, hard drugs/injectable, smoking, history of tooth extraction, history of dialysis, history of surgery and use of sharp objects showed HBsAg to be more prominent among the commercial drivers who answered ‘yes’ and could be associated with the increase risk of acquiring infection among this group of individuals. With regards to the growing number of individuals and corporate bodies in the commercial driving business, the higher seroprevalence of HBV is of public concern. Therefore, the need to increase awareness on the dangers of some risky habits among this group cannot be overemphasized in reducing the transmission rate of hepatitis B virus. Finally, the present study had some limitations. The participants in this study are unlikely representative of the general commercial drivers using the two major motor parks in the state. Additionally, the study was based on self-reporting information gained from questionnaire, which could be biased by the commercial drivers recall ability. Despite these limitations, results may suggest an increased potential risk of HBV infections among Motor Park Workers. Infections among this mobile group could probably be the bridged to the broader population through sexual contacts without strong preventive programmes.

This study did not find any correlation between Age, sex, marital, occupation and education status, ($P > 0.05$). There was also no statistical association of the markers with history of smoking, injection drug use, alcohol history of tooth extraction, surgery and number of sexual partners except for the presence of anti-HBs antibody which is indication of immune response to HBsAg. However, overall, the finding suggests that these factors may need to be further evaluated in a larger study to verify their involvement the transmission of HBV in a target population.

However, the highest prevalence of HBsAg was recorded among the individuals within age group 26-35 years old, and this suggests that the screening HBsAg status and other serological markers are key to intervention strategies for hepatitis B prevention program.

CONCLUSION

The prevalence rate of anti- HBV (16.8%) recorded from this study was high, though the factors analyzed did not show statistical significance, however, there is the need for sensitization and enlightenment on the various risk factors that can predispose our individuals to HBV infections, there is the need for knowledge of HBV infection and available screening, vaccination and treatment management options of infected individuals. This and amongst other measures would help to reduce the transmission cycle in the general population.

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