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PREVALENCE OF HEPATITIS B VIRUS MARKERS IN SURGEONS IN LAGOS, NIGERIA.

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ABSTRACT

Objective: To determine the prevalence of hepatitis B virus (HBV) markers in surgeons in a major city in Nigeria.

Design: A cross-sectional, descriptive study.

Setting: Three major hospitals in Lagos, Nigeria.

Subjects: One hundred and sixty seven surgeons(study group)and 193 administrative staff(controls).

Interventions: Blood samples were taken from subjects and analysed for hepatitis B virus markers (HBsAg, antiHBs and antiHBc) using the ELISA technique.

Main outcome measures: Hepatitis B virus marker sero-positivity

Results: The prevalence of hepatitis B surface antigen (HBsAg) in the surgeons was found to be 25.7% as compared to 15% in the control group ($p=0.01$). The frequency of antibody to the surface antigen (antiHBs) was 22.2% among the surgeons and 4.1% in the control group ($p< 0.001$) and that of antibody to the core antigen (antiHBc) was 61.7% in the surgeons as compared to 53.4% in the control ($p= 0.11$). At least one HBV marker was found in 76.6% of the surgeons as compared to 57% in the control group ($p=0.0009$).

Conclusion: Health care workers should be immunised against HBV. In Nigeria, HBV immunisation should be considered for inclusion in the EPI.

INTRODUCTION

It is estimated that about one to two million people die annually from HBV-related acute and chronic liver disease worldwide(1).The majority of chronic carriers of HBV are found in South East Asia and sub-Saharan Africa(2). Twenty five per cent of carriers are at risk of chronic hepatitis and eventual death from liver cirrhosis and hepatocellular carcinoma(3).

In endemic regions, HBV related diseases exert a heavy toll socio-economically by affecting mainly the young and economically active age group(4). The demands on health care resources are also enormous.

It has been established that most infections in endemic regions were acquired in childhood(5). It is also known that prevalence increases with age and transmission occurs mostly through parenteral and sexual exposure and in special risk groups such as health care workers (HCWs) and the sexually active(4). The risk of HBV infection in HCWs depends on the prevalence of HBV infected patients that the HCWs are exposed to, and the frequency of exposure to infected blood and body fluids(6). Among HCWs, surgeons have the highest risk of HBV infection from their patients(7). Although it is recognised that surgeons are at a high risk of acquiring HBV infection there has been little investigation of this problem in Nigeria. The aim of this study is to determine the prevalence of HBV markers in surgeons in Lagos.

MATERIALS AND METHODS

This was a cross-sectional, descriptive study involving 167 surgeons working in three large hospitals in Lagos, Nigeria. Surgeons in training or in practice were eligible to participate in this voluntary survey. The control group was made up of 193 administrative staff of the hospitals. The exclusion criteria were previous history of jaundice, blood transfusion and liver disease. A questionnaire consisting of demographic data(7), occupational and non-occupational risk factors to HBV (surgical specialty and duration of surgical practice, grade, frequency of contact with blood and body fluids, frequency of needle stick/sharps injuries, glove tears, types of protective devices used) was completed by each subject.

Blood sample was obtained from each subject and centrifuged to separate serum. They were stored frozen at -20°C at the Central Public Health Laboratory, Lagos until analysed. The serum samples were coded and screened for HBsAg, antiHBs and antiHBc by ELISA technique(Murex HBsAg, Murex Diagnostics England, Antisurase B-96 and Anticorase B-96-General Biological Corporation Taiwan for antiHBs and antiHBc, respectively).

The proportions of subjects with HBV serological markers were analysed. The Chi-square test was applied for comparing proportions between groups. Differences of $p<0.05$ were taken to be statistically significant. Ethical approval for the study was obtained from the Lagos University Teaching Hospital Ethics Committee. Informed consent was obtained from each subject, each assured of maximum confidentiality.

RESULTS

One hundred and sixty seven surgeons were tested for serological markers of HBV infection. The male to female ratio was 121(72.5%) to 46 (27.5%). The mean age was 32.3years and the mean duration of surgical practice was 7.9 years. One hundred and ninety three people made up the control group of which 132 (68.8%) were male and 60(31.3%) were female. The mean age was also 32.3 years (Table 1).

Table 1*Demography*

Age group (years)	Surgeons (n=167)	Controls (n=193)
20 - 30	38 (22.9%)	59 (30.6%)
31 - 40	100 (60.2%)	98 (50.8%)
41 - 50	28 (16.8%)	33 (17.1%)
51 - 60	1 (0.6%)	3 (1.6%)

Table 2*Frequency of HBV markers in surgeons and controls*

	HBsAg		AntiHBs		AntiHBc	
	+ve	-ve	+ve	-ve	+ve	-ve
Surgeons (n=167)	43 (25.7%)	124 (74.3%)	37 (22.2%)	130 (77.8%)	103 (61.7%)	64 (38.3%)
Controls (n=193)	29 (15.0%)	164 (85.0%)	8 (4.1%)	185 (95.9%)	103 (53.4%)	90 (46.6%)
2 value	6.43		26.55		2.53	
p value	0.01		<0.001		0.11	

Table 3*Overall frequency of HBV markers*

	Surgeons	Controls
At least one HBV marker	128 (76.6%)	110 (57.0%)
No HBV marker	39 (23.4%)	83 (43.0%)

Odds Ratio = 2.48

² =15.43

p = 0.0009

The prevalence of HBsAg among the surgeons was 25.7% compared to 15.0% in the control group (p=0.01). The prevalence of antiHBs was 22.2% in the surgeons and 4.1% in the control (p=0.001) and that of antiHBc was 61.7% in the surgeons compared to 53.4% in the controls (p= 0.11). At least one HBV marker was found on 76.6% of the surgeons compared to 57% of the control group (Table 3). No HBV marker was detected in 23.4% of the surgeons as against 43% of the control group. The difference was statistically significant (p=0.0009, Odds ratio 2.48 at 95% confidence interval).

DISCUSSION

This study showed a higher prevalence of HBV infection among surgeons than in the general population in Lagos, Nigeria. Previous studies in the pre-HBV vaccine era demonstrated an increased risk of HBV infection in various categories of hospital workers especially surgeons(7). Goldsmith and colleagues(8) found that among HCWs, specialties with the highest risk of HBV infection (29% to 53%) were Surgery, Emergency Medicine, Infectious Disease Units and Obstetrics and Gynaecology. Overall, 30% of HCWs were positive for HBsAg while 27.5% were antiHBs positive. Olubuyide *et al*(9) working in Ibadan, Nigeria showed a 39% frequency of HBsAg in doctors than in blood donors with 20% frequency of HBsAg (p< 0.5). The common factor for those at high risk has been high frequency of contact with patients' blood(6) HBV marker prevalence in surgeons in Lagos was comparable to those of Romieu *et al*(10) who found HBsAg seropositivity of 17.8% and antiHBs positive in 79.2% of hospital workers in Senegal.

Previous studies in Africa have shown that there was no difference between prevalence of HBV in HCWs and the general population(4,11). The variations between these studies and our study may possibly be due to actual difference in risk at different hospitals and to difficulty in controlling for confounding factors not related to occupation, for example, socio-economic class, overcrowding, poor hygiene and sexual transmission.

This study, again confirms the previously reported high prevalence of HBsAg in this part of the world(12), but unlike those reports, the rates in this study appear slightly higher. Previous studies employed the radio-immunoassay (RIA) technique in analysing the serum samples while ELISA technique was used in this study. Although ELISA is known to have comparable sensitivity with RIA, it has been reported to have a lower specificity due to slightly higher false positive reactions(13). The higher prevalence of HBsAg could also be that the prevalence of HBV infection is increasing. This is particularly so in view of the falling socio-economic standard in the country.

The prevailing poor economic situation has compromised standards giving rise to inadequate provision of barrier devices for the HCWs.

A high rate of HBV exposure (combined HBV marker frequency) which was found in the control population (57%), is similar to the findings of Nasidi *et al*(57.8%) in blood donors in Lagos(14). The antiHBs prevalence of 22.2% found in the surgeons this study is also similar to that reported by Goldsmith *et al.* in Egypt (27.5%). The antiHBs prevalence in this study was unexpectedly low in the control group (4.1%). This is much lower than that reported in previous studies(12,14).

This study shows that surgeons in Nigeria have higher HBV infection prevalence than the general population. There is a need for urgent intervention to reduce the rate

of HBV infection in this high risk group. Also, in view of the risk of transmission of HBV to patients and the consequences of its chronic infection, there is a strong need to consider immunisation of all at risk healthcare workers in Nigeria as done in the developed countries.

Some studies in Africa(4,11) have suggested that there was no need to vaccinate HCWs with HBV vaccine since there was no difference in the prevalence of HBV markers in HCWs and the general population in these studies and thus suggested the adoption of universal precautions (UPs). Although the benefits of UPs may be significant, the cost of implementing them are enormous.

Doebbeling and Wenzel(15) have estimated that the UPs cost at least 336 million dollars per year in the USA to implement and maintain. In addition, adverse exposure can occur while using protective devices(16).

The high prevalence of HBsAg carrier in developing countries might therefore justify vaccination of HCWs at risk. Taiwan and Saudi Arabia have seen the tremendous impact of a mass programme of HBV immunisation and the integration of HBV vaccine in the Expanded Programme of Immunisation (EPI) in controlling HBV infectivity in the general population(17,18). This is a route which Nigeria might well consider.

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