

Seroprevalence of Hepatitis B Surface Antigen and Occupational Risk Factors Among Health Care Workers in Ekiti State, Nigeria

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ABSTRACT

Introduction: Hepatitis B virus (HBV) infection is contracted from blood and other body fluid making healthcare workers (HCW) prone to the infection especially in the developing world. Though it is a vaccine preventable disease, the level of awareness and universal precaution among HCW is low in sub-Saharan African and Asia.

Aim: The study was aimed at determining the seroprevalence of hepatitis B surface antigen and occupational risk factors among health care workers at Ekiti State University Teaching Hospital, Ado Ekiti.

Materials and Methods: One hundred and eighty-seven (187) blood samples were collected from volunteer subjects who comprised of medical doctors, nurses, health attendants, and porters who are in regular contact with blood, body fluids and

patients after informed consent. Well detailed and structured questionnaires were used to obtain demographic and other relevant data from the subjects. Blood samples were tested by Enzyme Linked Immunosorbent assay (ELISA) for hepatitis B surface antigen.

Results: Out of the 187 HCWs there were 91 males (48.7%) and 96 (51.3%) females. Only 2 participants tested positive to hepatitis B surface antigen with a prevalence of 1.1%. Also, only 30 (16.0%) of the participants had been fully vaccinated against the infection while the remaining 157(84.0%) had no adult vaccination.

Conclusion: It is obvious that the awareness of the infection is low among the HCWs studied thus the need to incorporate screening for HbsAg and vaccination against HBV into the periodic/pre-employment health intervention programmes by employers to help in the protection of HCWs and control the spread of the virus.

Keywords: Hepatitis B Virus, Health Workers, Screening

INTRODUCTION

Hepatitis B is an infectious disease caused by the Hepatitis B virus (HBV) which affects the liver. It can cause both acute and chronic infections. Many people have no symptoms during the initial infection. Studies have shown that the worldwide prevalence rate of hepatitis B infection is about a third of the population while 240 million to 350 million have had chronic infections have been infected at one point in their lives [1,2]. Over 750,000 people die of hepatitis B each year and about 50% of these are due to liver cancer [1,3]. Prevalence of the disease is higher in East Asia and sub-Saharan Africa where between 5 and 10% of adults has the chronic disease than in Europe and North America with a prevalence of less than 1% [1]. In hospitals, it is estimated that approximately 30 injuries occur per 100 beds per year. These injuries are due to contact with devices that may contain blood or other potentially infectious materials [4]. Hepatitis B virus (HBV) is the greatest threat of infection for healthcare workers (HCW) and the risk of contracting Hepatitis B by healthcare personnel is four times greater than that of the general adult population, among those who do not work in healthcare institutions [5]. Transmission of Hepatitis B virus results from exposure to infectious blood or body fluids containing blood. However, in the adult population, about 30% of reported hepatitis B cannot be associated with an identifiable risk factor [6]. HBV infection with its associated complications is a disease of major public health importance worldwide [7].

Abdhalah et al., found out that among 370 participants, the seroprevalence of current Hepatitis B virus infection was 8.1% among HCWs in a Uganda tertiary hospital [8]. As a result of daily handling of biomedical wastes and exposure while performing invasive procedures, HCWs constantly come in contact with blood and its products [9]. Thus, the awareness of risk of contracting HBV and its prevention cannot be over emphasized. The present study

was aimed at investigating the HBV infection related awareness and occupational risk perception of the HCWs.

MATERIALS AND METHODS

Study Area

This cross-sectional descriptive study was carried out between June and September, 2015 to know the extent of universal precaution as a risk factor to hepatitis B infection and its prevalence among HCWs in Ekiti State University Teaching Hospital, Ado- Ekiti. All HCWs in the hospital including medical doctors, nurses, health attendants, and porters who are in regular contact with blood, body fluids and patients and who volunteered to participate after explaining the aim and objectives of the work were included in this study while those who declined were excluded.

Subject

One hundred and eighty seven (187) blood samples were collected from volunteer HCWs in Ekiti State University Teaching Hospital, Ado- Ekiti. Well detailed and structured questionnaires were used to obtain demographic and other relevant data from the subjects.

Ethical Clearance/Consent

This study was done in accordance with the Helsinki Declaration of 1975. Ethical clearance was sought and granted from the Ethics and Research Committee of Ekiti State University Teaching Hospital, Ado Ekiti after fulfilling all the ethical requirements for using humans as study subjects. Also, informed consent was obtained as a response to the consent form issued to each subject recruited for the study.

Collection of samples and detection of HBsAg: The procedure was well explained to each participant after which questionnaires with

informed consent were filled on the risk of exposure to the virus. This was followed by health education on the topic Hepatitis B virus infection among health workers. Subsequently, the area (end of the fingertip) to be lanced was cleaned with an alcohol swab, and then the end of the fingertip was squeezed and pierced with a sterile lancet. The first drop of blood was wiped away with a sterile cotton wool and with the use of a micropipette, about 100µl of fresh whole blood was obtained and dropped onto the sample pad of a clinically validated micropoint[®] ELISA kit to which a drop of the whole blood diluents was added. The kit was then observed for 10–20 minutes. A negative result showed no band in the test region, only one pink band appeared in the control region. A positive result showed a band in both the control and the test region, while an invalid result revealed no band in the control region regardless of the presence or absence of a line in the test region and so such result is repeated. Since, they were all at risk of contracting the virus, those tested negative were given the first dose of HBV vaccination and given appointment for the subsequent two doses of vaccines against the infection though seroconversion was not observed after full vaccination. Also, those tested positive were referred to the gastroenterology clinic for proper check-up. Data generated were subjected to comparative statistical analyses using the statistical program SPSS version 17 for the variables.

RESULTS

In this study 187 people participated out of which there are 91 males (48.7%) and 96 (51.3%) females. Among the total, 90 (48.1%) of the subjects are single while 96 (51.3%) are married and 1(0.5%) widowed. The distribution according to their profession are doctors 80 (42.8%), nurses 77 (41.2%) and other health workers 30 (16%) comprising of 17 health attendant and 13 porters. As shown in [Table/Fig-1].

Characteristics	Frequency	Percentage (%)
Gender		
Male	91	48.7
Female	96	51.3
Age (years)		
16-20	18	9.5
21-25	41	22.6
26-30	30	16.4
31-35	42	23.0
36-40	19	10.4
41-45	17	9.4
46-50	11	6.0
51-55	5	2.7
56-60	1	0.5
61-65	1	0.5
66-70	1	0.5
71 & above	1	0.5
Marital Status		
Single	90	48.1
Married	96	51.3
Widow	1	0.5
Profession		
Medical Doctors	80	42.8
Nursing	77	41.2%
Others	30	16.0

[Table/Fig-1]: Demographic details of respondents (n = 187).

[Table/Fig-2] showed that out of the 187 participants 90 (48.1%) have had hepatitis B screening done in the past while 97 (51.9%) have

never had the screening. Also, only 30 (16.0%) of the participants had been fully vaccinated against the infection while the remaining 157 (84.0%) had no adult vaccination.

	Yes N (%)	No N (%)
Have you had hepatitis B surface antigen screening in the past?	90 (48.1)	97 (51.9)
Have you been recently fully vaccinated against hepatitis B infection?	30 (16.0)	157 (84.0)

[Table/Fig-2]: Past medical history of screening and immunization against the infection

Exposure to potentially infectious body fluids at the work place was assessed using a set of variables as shown in [Table/Fig-3]. It was discovered that 138 (73.8%) of the respondent always dispose sharp objects in the safety box while 41 (21.9%) often use the safety box and just 8 (4.3%) never make use of the safety box to dispose their sharp objects. Only 53 (28.3%) respondents never recap needles after use but even at that 157 (84.0%) of the participants still ensure that they prevent injuries to themselves when using sharp objects. Also, [Table/Fig-3] shows that for safe disposal of clinical waste; 153 (81.8%) responded they always ensured safe disposal of waste while 32 (17.1%) often ensured it and just 2 (1.1%) never ensured proper waste disposal. Among the total 153 (81.8%) always wear gloves before taking blood and body fluid samples from patients, only 65 (34.8%) participants always put on ward coat and other protective clothing while in the hospital premises. It was also gathered that 132 (70.6%) of the people always ensure disinfection of reusable equipment while 7 (3.7%) never ensure disinfection of reusable equipments. About 70% of the respondents always ensure adequate procedure for routine cleaning and 28.3% often ensure adequate cleaning while 1.6% never ensures adequate cleaning.

Risk Factor	Always N (%)	Often N (%)	Never N (%)
Do you dispose sharp objects in the sharp box?	138 (73.8)	41 (21.9)	8 (4.3)
Do you recap needle before disposing?	59 (31.6)	75 (40.1)	53 (28.3)
Do you prevent injuries when using sharp devices?	157 (84.0)	27 (14.4)	3 (1.6)
Do you ensure safe clinical waste management?	153 (81.8)	32 (17.1)	2 (1.1)
Do you wear gloves before taking blood samples and other body fluids from patients?	153 (81.8)	31 (16.6)	3 (1.6)
Do you change your gloves in between patients?	134 (71.7)	46 (24.6)	7 (3.7)
Do you clean your hand properly after each procedure?	135 (72.2)	48 (25.7)	4 (2.1)
Do you wear ward coats?	65 (34.8)	109 (58.3)	13 (7.0)
Do you disinfect reusable equipment?	132 (70.6)	48 (25.7)	7 (3.7)
Do you ensure use of adequate procedure for routine cleaning?	131 (70.1)	53 (28.3)	3 (1.6)

[Table/Fig-3]: Prevalence of occupation risk factors

Only two people tested positive to the virus which represent 1.1% of the total participants while the remaining 185 (98.9%) are negative. Among those positive was a male doctor and a female nurse who are both within 26 to 30 years of age and are both single with, years of experience less than five years. The nurse had done the test about one year ago and the result then was positive so she is aware of her hepatitis B virus status but has since not been on follow up. But for the medical doctor, his response in the questionnaire showed that he is often exposed to the risk of the infection by recapping needles before disposing, he is not consistent with ensuring safety precautions such as wearing gloves when taking blood samples and body fluids from patients and wearing protective clothing and ward coat during clinical activities.

DISCUSSION

The problem of the HCW in the developing world which include lack of access to vaccine and dearth of information on the mode of contracting HBV make them particularly prone to the infection thus accounting for its high prevalence among health workers due to pre-cutaneous occupational exposure. In our study, we found out that only 30 (16.0%) participants have had full vaccination against the infection which is in agreement with a study carried out by Olubuyide et al., [10]. Studies have shown that the low level of vaccination could be due to the level of awareness about the infection and the cost implication of the vaccination [11]. As observed by Luiz et al., 73%, Costa et al., 39.3% and Luz et al., 58.9%, a high degree of vaccination is as a result of availability of vaccines and vaccination being made compulsory for each health worker [11-13]. In our study, it was also shown that two (1.1%) are HbsAg seropositive which is contrary to that obtained by Ndako et al., 17.0%, Ajayi et al., 4.3% and Martin et al., -5.5% [9,14,15]. Generally, a high endemicity of HBV is said to be HbsAg prevalence of 7% [16]. In our study, the overall prevalence of HbsAg is 1.1%. As HCWs are already at a high risk of exposure, the low level of prevalence may be due to the fact that amongst the general population there are other common modes of transmission including sexual contact [17], blood transfusions and transfusion with other human blood products [18], re-use of contaminated needles and syringes [19], and vertical transmission from mother to child (MTCT) during childbirth. Duration of practise was also noted to be contributory to the acquisition of the viral infection as observed by Luiz et al., Coelho et al., and Janzen et al., that extended time in service increases the exposure to the infection which is in contrary to this study because the two participants who are seropositive have less than three years work experience [11,20,21]. This is also in agreement with the findings by Ajayi et al., [14]. This may be due to the level of awareness that increases over time as individuals acquire more experience on the job.

LIMITATION

A limitation to this study however is that the risk of relative occupational exposure especially in high-risk sectors, such as haemodialysis, emergency and blood bank was not assessed as the location of working areas was not included in the demographic detail.

CONCLUSION

As revealed from this study, there is need for increasing the awareness and prevention of contracting and transmitting HBV

infection. Also, there is need to incorporate screening for HbsAg and vaccination against HBV into the periodic health intervention programmes by employers to help in the protection of health workers and control the spread of the virus.

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