



Global Advanced Research Journal of Medicine and Medical Sciences (ISSN: 2315-5159) Vol. 1(10) pp. 280-285, November, 2012
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Full Length Research Paper

Hepatitis B vaccination rate among medical students at the Niger Delta University Teaching Hospital, Bayelsa State, Nigeria

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Accepted 02 December, 2012

Hepatitis B virus (HBV) infection is an important cause of morbidity and mortality worldwide. As a result of occupational exposure, health care personnel and medical students are at risk of acquiring HBV infection, and many authorities recommend vaccination. Unfortunately, significant proportions of health care workers do not receive HBV immunization, and remain susceptible to HBV infection. A study was carried out at the Niger Delta University Teaching Hospital (NDUTH) to determine the hepatitis B vaccination rate among medical students and to determine their knowledge of HBV infection. Seventy eight medical students at NDUTH completed Self-administered questionnaires which included questions about demographic characteristics, HBV vaccination status, knowledge of hepatitis B vaccine and reasons for not receiving the vaccine. All (100%) of the respondents had heard of hepatitis B vaccine. Sixty eight (87.2%) of them thought they were at risk of acquiring hepatitis. Forty one (52.6%) had received at least one dose of hepatitis B vaccine while 37 (47.4%) had never received the vaccine. Fifteen of the respondents had received 3 doses of hepatitis B vaccine, giving a vaccination rate of 19.2%. Fourteen (17.9%) had received 2 doses, while 12 (15.4%) had received one dose. The hepatitis B vaccination rate among medical students at the Niger Delta University Teaching Hospital is low. Adequate funding by the Government is needed for HBV vaccination and legislation at both the National and Institutional level, need to be introduced for adult vaccination against HBV infection, especially for those at high risk.

Keywords: Hepatitis B, vaccine, rate, medical students

INTRODUCTION

Hepatitis B virus (HBV) infection is an important cause of morbidity and mortality worldwide (Shepard et al., 2006). HBV can cause acute hepatitis, which in some cases leads to acute liver failure. Approximately 5% of infected

individuals become chronic carriers and are at risk of developing liver cirrhosis and hepatocellular cancer (Beasley et al., 1982). The World Health Organization (WHO) estimates that two billion people world wide have a serologic evidence of past or present HBV infection (Shepard et al., 2006). While the prevalence of chronic HBV infection is low (<2%) in most developed countries, it is high (>8%) in all countries in Africa (Centers for

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Disease Control and Prevention, 2007).

Hepatitis B virus (HBV) is very efficiently transmitted in the setting of a percutaneous injury that involves an instrument coated with or containing HBV-infected blood. As such, health care workers as well as medical students are a high risk group due to high occupational exposure (Sepkowitz, 1996). Epidemiologic studies in the United States in the 1970's demonstrated that healthcare workers (HCWs) had a seroprevalence rate of HBV infection that was 5 to 10 times higher than the general population (Sepkowitz, 1996). The risk of acquiring HBV from a needlestick injury ranges from 1% to 6% (source patient HBsAg-positive, HBeAg-negative) to 22% to 40% (source patient HBsAg-positive, HBeAg-positive) (Sepkowitz, 1996). The risk of non-percutaneous exposure may account for a significant proportion of HBV transmission in the healthcare setting. Hepatitis B virus can survive in dried blood for up to a week and thus may be transmitted via discarded needles or fomites, even days after initial contamination. Indeed, many healthcare workers infected with HBV cannot recall an overt needlestick injury, but can remember caring for a patient with hepatitis B (Sepkowitz, 1996).

Medical students may be at a higher risk of acquiring hepatitis B infection in the hospitals as they are learning to do procedures and may be less cautious than other health workers. They are also less likely to practice universal precautions and are more likely to sustain needle stick injuries due to inexperience.

Immunization against hepatitis B viral infection has assumed a primary role in the control of hepatitis B infection (Updated US, 2001). Hepatitis B vaccine has been found to effectively reduce the prevalence of HBV infection (Chen et al., 1996). La Torre et al (La Torre et al., 2008) demonstrated that introduction of compulsory HBV vaccination contributes in decreasing HBV incidence rates. After a standard 3-dose vaccination regime at 0, 1, and 6 months, the rate of response on the basis of an anti-HBsAg titer of ≥ 10 mIU/mL is 90%–95% (Payton et al., 1993). Because of the possibility of high occupational exposure, immunization of health care workers and medical students against hepatitis B infection has become a major issue in countries like Israel (Ginsberg and Shouval, 1992), Canada (Barre et al., 1994) and the United States of America (Hersey and Martins, 1994). Unfortunately, a significant proportion of health care workers do not receive HBV immunization, and remain susceptible to HBV infection.¹² In one relatively recent report in the United States,¹² approximately 45% of eligible hospital employees declined HBV vaccination. The vaccine refusal rate was highest in groups at higher risk of exposure to HBV, and even among nurses, nearly 30% chose to forego vaccination (Louther et al., 1998). Fatusi et al (Fatusi et al., 2000) during a mass HBV vaccination campaign at the Obafemi Awolowo University Teaching Hospital, Ile-

Ife, Nigeria, found that the lowest vaccination rate was among the clinical staff in spite of their better knowledge.

Presently in Nigeria, efforts aimed at controlling hepatitis B viral infection remain feeble. There are no policies at both the National and Institutional levels on vaccination of high risk groups like health care workers and medical students.

The present study was carried out to determine the hepatitis B vaccination rate among medical students who could readily come in contact with infected body fluids from patients and hospital equipment during their clinical posting. This will generate information required to advocate for pre-vaccination policies for all high risk groups.

METHODS

The study was carried out in the Niger Delta University Teaching Hospital where first year to third year clinical students of the Niger Delta University, Bayelsa State are trained. During their clinical postings, the students assist in caring for patients under supervision. They perform clinical procedures which involves contact with infected blood and body fluids. Ethical clearance for the study was sought and obtained from the Niger Delta University Teaching Hospital ethics and research committee. Verbal consent was obtained from the respondents. Self-administered questionnaires given to all clinical students, included questions about demographic characteristics, HBV vaccine status, knowledge of hepatitis B vaccine and reasons for not receiving the vaccine. First year clinical students were excluded from the study as they had not started their clinical posting at the time.

Students who had received 3 doses of the hepatitis B vaccine were considered to be fully immunized against hepatitis B infection.

The data was analyzed using statistical package for social sciences (SPSS) version 15.0 statistical package. Test of significance between proportions was assessed using Chi-square, and a p value of 0.05 or less was considered significant at a 95% confidence interval.

RESULTS

There were ninety three clinical students of which seventy eight returned completed questionnaires, giving a response rate of 83.9%.

Table 1 shows the general characteristics of the respondents. The majority 50 (64.0%) were in the age range of 25 to 29 years. There were 47 males and 31 females giving a male to female ratio of 1.5: 1. Fifty six (71.8%) of the students were in second year clinical, while 22 (28%) were in their third year. Sixty five (83.3%) were single, 12 (15.4%) were married and only one

Table 1. General characteristics

Age range (years)	Males (%)	Females (%)	Frequency (%)
20 - 24	2 (3.0)	4 (5.0)	6 (8.0)
25 - 29	30 (38.0)	20 (26.0)	50 (64.0)
≥ 30	15 (19.0)	7 (9.0)	22 (28.0)
Total	47 (60.0)	31 (40.0)	78 (100.0)
Level	Males (%)	Females (%)	Frequency (%)
2 nd year	34 (43.6)	22 (28.2)	56 (71.8)
3 rd year	13 (16.7)	9 (11.5)	22 (28.2)
Total	47 (60.3)	31 (39.7)	78 (100)
Marital status	Males (%)	Females (%)	Frequency (%)
Single	41 (52.6)	24 (30.8)	65 (83.3)
Married	6 (7.7)	6 (7.7)	12 (15.4)
Separated	0 (0)	1 (1.3)	1 (1.3)
Total	47 (60.3)	31 (39.7)	78 (100)
Religion	Males (%)	Females (%)	Frequency (%)
Christianity	45 (57.7)	30 (38.5)	75 (96.2)
Jehovah's witness	1 (1.3)	0 (0)	1 (1.3)
Atheist	1 (1.3)	1(1.3)	2 (2.6)
Total	47 (60.3)	31 (39.7)	78 (100)

Table 2. Knowledge of hepatitis B infection

Source of knowledge	frequency	Percentage (%)
Lectures	74	94.9
Mass media	26	33.3
Friends	24	30.8
Parents	7	9.0
Books	3	3.8
Potential source of infection	frequency	Percentage (%)
Contact with blood and body fluids	74	94.9
Needle stick injury	60	76.9
Contact with patients	47	60.3
Hospital equipment	37	47.4
Sexual exposure	34	43.6

(1.3%) was separated. Most of the respondents (96.2%) were Christians, with 2 (2.6%) atheist and one (1.3%) Jehovah's Witness.

Sixty eight (87.2%) of the respondents thought they were at risk of acquiring hepatitis B vaccine while 10 (12.8%) of them did not.

All (100%) the respondents had heard of hepatitis B vaccine. As shown in table 2, the major source of their knowledge was from lectures 74 (94.9%), followed by the mass media 26 (33.3%) and friends 24 (30.8%). Table 2 also shows the respondents knowledge of the possible sources of acquiring hepatitis B infection, with the highest number 74 (94.9%) saying they could acquire the infection through contact with blood and body fluids.

While the least (43.6%) thought they could acquire the infection from sexual exposure.

Forty one of the respondents (52.6%) had received at least one dose of hepatitis B vaccine while 37 (47.4%) had never received the vaccine. Fifteen of the respondents had received 3 doses of hepatitis B vaccine, giving a vaccination rate of 19.2%. Fourteen (17.9%) had received 2 doses, while 12 (15.4%) had received one dose. The HBV vaccination rate is as shown in table 3.

As shown in table 4, more students (60.0%) in the 25 to 29 years age group were immunized against hepatitis B infection but this difference was not statistically significant, $p = 0.179$. More females (61.3%) were completely immunized as compared to males

Table 3. Hepatitis B vaccination rate

Number of vaccine doses	Frequency	Percentage
One	12	15.4
Two	14	17.9
Three	15	19.2
Total	41	52.6

Table 4. Vaccination rate according to demographic characteristics

Characteristic	Vaccine uptake		Total	χ^2 (P value)
	Yes (%)	No (%)		
Age				
20 – 24	3 (50.0)	3 (50.0)	6 (100.0)	3.44 (0.179)
25 – 29	30 (60.0)	20 (40.0)	50 (100.0)	
≥ 30	8 (36.4)	14 (63.6)	22 (100.0)	
Sex	Yes	No	Total	χ^2 (P value)
Male	22 (46.8)	25 (53.2)	47 (100.0)	1.57 (0.210)
Female	19 (61.3)	12 (38.7)	31 (100.0)	
Marital status	Yes	No	Total	χ^2 (P value)
Married	7 (58.3)	5 (41.7)	12 (100.0)	1.15 (1.104)
Single	33 (50.8)	32 (49.2)	65 (100.0)	
Separated	1 (100.0)	0 (0)	1 (100.0)	
Level	Yes	No	Total	χ^2 (P value)
2 nd year	30 (53.6)	26 (46.4)	56 (100.0)	0.08 (0.776)
3 rd year	11 (50.0)	11 (50.0)	22 (100.0)	

Table 5. Reasons for not receiving HBV vaccine

Reason	Frequency	Percentage (n = 37)
I will take it later	10	27.0%
The vaccine was not available	8	21.6%
No time	7	18.9%
No reason	6	16.2%
The nurses refused to give me the vaccine	2	5.4%
I don't think it is important	1	2.7%
I don't know where to go for the vaccine	1	2.7%

(46.8%). This difference was also not statistically significant. There was also no significant difference in the vaccination rates according to marital status or level.

Table 5 shows the reasons given for not receiving the hepatitis B vaccine. Of the thirty seven students that had never received the hepatitis B vaccine, 10 (27.0%) said they planned to take the vaccine later, while 8 (21.6%) had not received the vaccine due to non availability at the time they went for it. One student each had not received the vaccine because they did not think it was important and did not know where the vaccine was being given, respectively.

DISCUSSION

The hepatitis B vaccination rate (19.2%) among medical students attending the Niger Delta University Teaching Hospital is low. Olubuyide et al (Olubuyide et al., 1997) also found a low HBV vaccination rate of 20% among doctors and dentists at the University College Hospital, Ibadan. The low HBV vaccine rate in the present study is also similar to findings by Topuridze et al (Topuridze et al., 2010) in Georgia, where the HBV vaccination rate among health workers was 12%. In contrast, Azodo et al (Azodo et al., 2010) found a higher HBV vaccination rate

of 51.8% among dental auxiliaries at the University of Teaching Hospital, Nigeria. The HBV vaccination rate of 19.2% in the present study may be much lower than the rate reported by Azodo et al (Azodo et al., 2010) because in the present study, having at least 3 doses of the vaccine was considered being immunized whereas at least one dose was used in Azodo's study. In the present study 52.6% of the medical students had received at least one dose of the HBV vaccine, which is similar to the 51.8% vaccination rate reported by Azodo et al. Fatusi et al (Fatusi et al., 2000) studied the acceptance of hepatitis B vaccine by health workers at the Obafemi Awolowo Teaching Hospital (OAUTH), Ile-Ife. Like in the present study, they found that 91.9% of the hospital workers received at least one dose of the HBV vaccine but only 53.8% of them, completed the 3 doses. Their comparably higher rate of vaccine completion may be due to the fact that the study was carried out just after a mass hepatitis B vaccine campaign was carried out at their centre.

Though the majority (87.2%) of the medical students thought they were at risk of acquiring hepatitis B infection, the vaccination uptake was still low. This is similar to findings by Olubuyide et al (Olubuyide et al., 1997) in Ibadan, who noted that the highest proportion of HBV unvaccinated health care personnel were surgeons in spite of their knowledge and higher exposure to HBV infected body fluids. Fatusi et al (Fatusi et al., 2000) at Ile-Ife also found that hepatitis B vaccination rate at the OAUTH was highest among non clinical staff and lowest among nurses and doctors. Reilly (Reilly, 2010) also reported stagnant HBV vaccination rates among adults in Atlanta in spite of their high knowledge and high risk behaviour.

Less than half (43.6%) of the respondents in the present study thought they could contract HBV infection through sexual exposure. This shows low knowledge of sexually transmitted infections.

Some respondents (27.0%) said they would take the vaccine later, 18.9% said they had no time to take the vaccine while 16.2% had not taken the vaccine for no reason. This shows a poor attitude to the vaccine uptake. This is not surprising as presently, no national adult hepatitis B program exists that is similar to those that have proven successful for children and adolescents (Chang et al., 1997). These barriers to HBV vaccine uptake are similar to reports by the National Foundation for Infectious Diseases in Washington DC where survey findings showed how lack of awareness and a disturbing sense of apathy are obstacles to adult vaccination rates (Krisberg, 2008). Components of a national adult vaccination program must include policies for vaccination, including methods for achieving higher vaccination rates among adults at greatest risk and appropriate resources to support implementation. Other barriers to receiving the HBV vaccine included unavailability of the vaccine in 21.6% of the respondents. There is need for the Nigerian Government to ensure uninterrupted supply of HBV

vaccine in all health care centres to avoid missed opportunity. Interestingly, 2 respondents (5.4%) had not received the HBV vaccination because the nurses at the immunization centre refused to administer the vaccine to them, saying it was for only infants. This highlights the fact that even health care workers administering vaccines have poor knowledge of the vaccine target groups and as such need to be trained and re-trained on a regular basis.

CONCLUSION

The hepatitis B vaccination rate among medical students at the Niger Delta University Teaching Hospital is low. Adequate funding by the Government is needed for HBV vaccination and legislation needs to be introduced for adult vaccination against HBV infection, especially for those at high risk.

ACKNOWLEDGEMENT

The authors thank Napoleon N Ofuruma for assisting in the distribution and retrieval of questionnaires.

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