Hepatitis B Vaccination Rate Among Medical Students At The University Of Port Harcourt Teaching Hospital (UPTH), Nigeria

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ABSTRACT

BACKGROUND

Hepatitis B virus (HBV) infection causes significant morbidity and mortality worldwide. Occupational exposure of health care workers and medical students increases their risk of acquiring HBV infection, and many authorities recommend vaccination. However, significant proportions of health care workers do not receive HBV immunization, and remain at increased risk to HBV infection. The objective of this study was to determine the hepatitis B vaccination rate among Medical students at the University of Port Harcourt Teaching Hospital (UPTH) and to determine their knowledge of HBV infection.

METHODS

Three hundred and sixteen medical students at UPTH 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.

RESULTS

All (100%) of the respondents had heard of hepatitis B vaccine. Two hundred and twenty two (70.2%) of them thought they were at risk of acquiring hepatitis. Two hundred and seventy (85.4%) had received at least one dose of hepatitis B vaccine while 46 (14.6%) had never received the vaccine. One hundred and ten of the respondents had received 3 doses of hepatitis B vaccine, giving a vaccination rate of 34.8%. One hundred and sixteen (36.7%) had received 2 doses, while 44 (13.9%) had received one dose. There was a statistical significant relationship between marital status(p=0.01), clinical level (p=0.02) and hepatitis B vaccine uptake.

CONCLUSION

The hepatitis B vaccination rate among medical students at the University of Port Harcourt Teaching Hospital is low. National and institutional legislation for adult vaccination against Hepatitis B should be promulgated for those at higher risk.

KEYWORDS

Hepatitis B, vaccination rate, Medical students; Nigeria.

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INTRODUCTION

The hepatitis B virus (HBV)which was discovered in 1966 has infected over 350 million people worldwide[1]. HBV can cause acute hepatitis and is a leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, accounting for 1 million deaths annually.

The World Health Organization (WHO) estimates that two billion people world wide have serologic evidence of past or present HBV infection[2]. While the prevalence of chronic HBV infection is low (<2%) in most developed countries, it is high (>8%) in all countries in Africa.3However, the acute and chronic consequences of hepatitis B infection are major problems in both the developed and developing world.

Hepatitis B virus is very efficiently transmitted in the setting of a percutaneous injury that involves an instrument coated with or containing HBV-infected blood. So, health care workers as well as medical students are a high risk group due to high occupational exposure[5]. 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[4]. There is a risk of 1-6% of acquiring HBV from a needle stick injury when the source patient is only HBsAg-positive, this risk however, increases to 22-40% when the source patient is both HBsAg-positive and HBeAg-positive.

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 needle stick injury, but can remember caring for a patient with hepatitis B4. 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 with hepatitis B vaccine is the most effective means of preventing hepatitis B infection and its consequences. The recommended strategy for preventing this infection is selective vaccination of persons with identifiable risk factors. The Advisory Committee on Immunization Practices (ACIP) recommends hepatitis B vaccine for every one 18 years of age and younger as well as for adults over 18 years of age who are at risk of hepatitis B infection. Adults who are at increased risk of infection and who should receive vaccination include: sexually active heterosexual adults with more than one sex partner in the prior 6 months or a history of sexually transmitted disease; men who had sex with men; illicit injection drug users, hemodialysis patients and persons at occupational risk of infection. The health care workers/medical students fall in the last category of high-risk group[5].

Hepatitis B vaccine has been found to effectively reduce the prevalence of HBV infection.6 La Torre et al[7] 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-HBsAgtiter of $\geqslant$ 10 mIU/mL is 90–95%[8]. 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, Canada and the United States of America[9-11]. The approach of vaccinating medical students has the advantage of ensuring that future healthcare workers have adequate protection from hepatitis B virus before they enter the period of possible intensive occupational exposure. 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. Fatusi et al 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[13]. 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 at the University of Port Harcourt Teaching Hospital. This will generate information required to advocate for pre-vaccination policies for all high risk groups.

METHODOLOGY

This study was carried out in October 2013 at the University of Port Harcourt Teaching Hospital where first year to third year clinical students of the College of Health Sciences, University of Port Harcourt are trained. It was a descriptive cross sectional study. Ethical clearance for the study was sought and obtained from the University of Port Harcourt Teaching Hospital ethics and research committee. Verbal consent was obtained from the respondents. A self administered questionnaire was used to obtain information on socio-demographic characteristics, HBV vaccine status, knowledge of hepatitis B vaccine and reasons for not receiving the vaccine. 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 17.0. 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

A total of 350 questionnaires were administered and 316 were completed and returned giving a response rate of 90.3%. About 50% of the students were aged between 20-24years while 194(61.4%) were males. One hundred and sixty two (51.3%) were in their second clinical year, 300(95.0%) were single and 312(98.7) were Christians.

Table 1: Socio-demographic characteristics of the study population.

	Sex		
Age Years)	Male (%)	Female (%)	Total (%)
20-24	74(23.4)	82(26.0)	156(49.4)
25-29	104(32.9)	32(10.1)	136(43.0)
⩾30	16(5.1)	8(2.5)	24(7.6)
Total	194(61.4)	122(38.6)	316(100))
Level	Male (%)	Female (%)	Total (%)
1st year	30 (9.5)	20(6.3)	50 (15.8)
2nd year	100 (31.7)	62 (19.6)	162(51.3)
3rd year	64 (20.3)	40 (12.6)	104(32.9)
Total	194(61.4)	122(38.6)	316(100)
Marital status	Male (%)	Female (%)	Total (%)
Single	190 (60.2)	110 (34.8)	300 (95.0)
Married	3 (0.9)	11 (3.5)	14(4.4)
Separated	1 (0.3)	1 (0.3)	2(0.6)
Divorced	0 (0)	0 (0)	0 (0)
Total	194	122	316
Religion	Male (%)	Female (%)	Total (5)
Christianity	192 (60.8)	120 (37.9)	312 (98.7)
Islam	2 (0.6)	2 (0.6)	4 (1.2)
Traditionalist	0 (0)	0 (0)	0 (0)
Total	194 (61.4)	122 (38.6)	316 (100)

All (100%) of the respondents had heard about hepatitis B vaccine. Table 11 shows that the major source of knowledge about hepatitis B vaccine was from lectures (79.8%). One hundred and seventy four (42.9%) admits that the potential source of infection was by needle stick injury, while 2.5% admits that it is via faeco-oral source.

Table 2: Knowledge of Hepatitis B virus infection.

Source of knowledge	Frequency (n)	Percentage (%)
Lectures	284	79.8
Friends	44	12.4
Mass Media	28	7.9
Potential source of infection	Frequency (n)	Percentage (%)
Needle stick injuries	174	42.9
Sexual exposure	82	20.2
Faeco-Oral	10	2.5
Air-borne	4	1.0
Contact with Hospital equipment	80	19.7
Contact with patients	56	13.8

Table 3 shows that 270 (85.4%) of the respondents had received at least one dose of the vaccine while 46 (14.6%) never received the vaccine. One hundred and ten of the respondents had received the three doses of the vaccine giving a vaccination rate of 34.8%.

Table 3: Hepatitis B vaccination rate

No of vaccine doses	Frequency (n)	Percentage (%)
1	44	13.9
2	116	36.7
3	110	34.8
Total	270	85.4

Table 4 shows the reason for not receiving the vaccine. Of the forty six who did not receive any vaccine, 14(30.4%) said they had no time, 8(17.4%) had no reason for not taken the vaccine, while 3(6.5%) said they were not at risk of acquiring the infection.

Table 4: Reasons for not receiving vaccine

Reason	Frequency (n)	Percentage (%)
No Time	14	30.4
I'll take it later	10	21.8
I don't think it is important	0	0.0
Fear of side effects	8	17.4
No reason	8	17.4
Vaccine was not available	3	6.5
Not at risk of HBV	3	6.5
Total	46	100.0

The vaccine uptake among the various age groups was near equal, a higher proportion of females (90.2%) than males (82.5%) received the vaccine but this was not statistically significant p=0.085. Significantly more proportion of the singles (86.7%) and separated (100.0%) had the vaccine than the married (57.1%). P=0.01. Also, the higher the clinical class the higher the vaccine uptake and this difference was statistically significant. P=0.02. Table 5

Table 5: Vaccine uptake according to demographic characteristics.

Characteristics	Vaccine Uptake			
Age	Yes (%)	No (%)	Total	X2 (p-value)
20-24	136 (87.2)	20 (12.8)	156 (100.0)	2.48
25-29	116 (85.3)	20 (14.7)	136 (100.0)	(0.289)
⩾30	18 (75.0)	6 (25.0)	24 (100.0)	
Sex	Yes	No	Total	
Male	160 (82.5)	34 (17.5)	194 (100.0)	2.97
Female	110 (90.2)	12 (9.8)	122(100.0)	(0.085)
Marital Status	Yes	No	Total	
Married	8 (57.1)	6 (42.9)	14 (100.0)	7.11 (0.01)
Single	260 (86.7)	40 (13.3)	300 (100.0)	
Separated	2 (100.0)	0 (0.0)	2 (100.0)	
Level	Yes	No	Total	
1st year	40 (80.0)	10 (20.0)	50 (100.0)	7.77 (0.02)
2nd year	133 (82.1)	29 (17.9)	162 (100.0)	
3rd year	97 (93.3)	7 (6.7)	104 (100.0)	
Religion	Yes	No	Total	
Christianity	266 (85.3)	46 (14.7)	*312* (100.0)	0.01
Islam	4(100.0)	0 (0.0)	4 (100.0)	(0.907)

DISCUSSION

The significance of hepatitis B as a major occupational hazard of health care workers has had good attention in the literature and the medical world. Without any doubt, immunization against hepatitis B infection has important implications for the well-being of health care workers/medical students and, ultimately, their families and the health system. While it is tempting to assume that health workers and medical students will likely show a high level of compliance with regards to beneficial health procedures and programmes, evidence from literature caution otherwise[14-16]. In the case of hepatitis B immunization, significant level of nonacceptance has been reported among various groups of healthcare workers and in different settings even among those at greater risk such as those of the accident and emergency units, dental practitioners, and surgical residents[14-16].

In the present study, the hepatitis B vaccination rate among medical students of the University of Port Harcourt was low as reflected in the proportion of those who received the three doses of the vaccine (34.8%)although this was much higher when at least one dose of the vaccine was considered (85.4%).The finding of this study compares with that of Fatusi et al in Obafemi Awolowo

Teaching Hospital (OAUTH) Ile-Ife, where 91.9% of the health care workers received at least one dose of hepatitis B vaccine and then a drop to 53.8% in those who completed the three doses of the vaccine[13]. This high vaccination rate of at least receiving one dose of the vaccine found in this study is probably due to concerted effort made regularly by this institution to promote hepatitis vaccination among its health care workers and also the fact that promotion of hepatitis B vaccination is part of the orientation given to medical students on inception of their clinical posting. The high dropout rate is worrisome and should be a matter of serious concern to the hospital management as only about 34.8% of those who started the vaccine completed the three doses (spread over six months) required to provide adequate immune protection. Therefore, activities aimed at reinforcing the benefits of the initial orientation should be geared up.

The vaccination rate found in this study is at variance with that found in some other studies[17-20]. While Peterside et al reported a lower vaccination rate of 52.6% for taking at least one vaccine and 19.2% for receiving the three vaccines among medical students in the Niger Delta University Teaching Hospital in Bayelsa State[19], Azodo et al found a higher vaccination rate of 51.8% for receiving all three vaccines among dental auxillaries at the University Teaching Hospital Nigeria[18]. Also,simard et al in a study among health care workers-doctors and nurses in the United States of America (USA), found that 81% of the doctors and nurses had received at least three doses of the vaccine[17]. The reasons proffered for this disparity in hepatitis B vaccination uptake ranged from; busy daily work schedule in the hospital, procrastination, to long queues at the immunization centres and also to the fact that these immunizations are not offered on a daily basis[18-20]. Increasing education and awareness of hepatitis B contributed to the high uptake in the USA study[17].

All the students had heard of hepatitis B vaccine and 79.8% of this knowledge was from lectures while 12.4% and 7.9% were from friends and the mass media respectively. This portrays the importance of classroom lectures in medical education and information dissemination especially among medical workers. This method of medical education must be protected despite advances in modern methods of information dissemination.

The general awareness of hepatitis B immunization was high among these students but this seems to lack depth as only 42.9% and 20.2% thought it could be acquired by needle stick injury and sexual intercourse respectively. It also shows the poor knowledge of sexually transmitted diseases among these students. Other sources of contagion highlighted included faeco-oral and air-borne in 2.5% and 1.0% of the respondents respectively. This further supports the lack of depth in the knowledge of some of these students on hepatitis B infection. Such misconceptions if not corrected will guide their choice of decision on hepatitis B vaccine uptake and may also lead to wrong information dissemination about hepatitis B.

None of the respondents thought it unimportant to receive the vaccine, however, there was a general sense of apathy towards hepatitis B vaccine uptake as the reasons for lack of uptake ranged from; no time (30.4%), I'll take it latter (21.8%), no reason (17.4%) to fear of side effects (17.4%). These obstacles are similar to those found in other studies[19,20] and are probably due to lack of an adult hepatitis B vaccination program similar to ones that have proven successful among children and adolescents. Components of a national adult vaccination program should include policies for immunization, including methods for achieving higher immunization rates among adults at greatest risk and appropriate resources to support implementation. Other limitations to vaccine uptake included unavailability of vaccine in 6.5% of cases and the belief of being not at risk of contracting hepatitis B in 6.5% of cases. There is need for the Nigerian Government to ensure uninterrupted supply of HBV in all

immunization centres to prevent missed opportunities. Also, such misconception of not being at risk of acquiring hepatitis B needs proper health education.

This study also found a statistically significant relationship between marital status p=0.01, clinical level of the students p=0.02 and vaccine uptake. This interesting finding that the singles and the separated among these students are more likely to receive Hepatitis B vaccine than the married needs further evaluation using a more representative sample size of the married population. The probable explanation for this finding is that adding family life to already didactic medical school training makes it more cumbersome and leaves no room for any extracurricular activity even when it may be beneficial. This however has not been documented in other studies and requires further evaluation. The finding that the higher the clinical level the more the chances of hepatitis B vaccine uptake probably represents an increasing awareness and a better depth of knowledge among these medical students as they progress to their final year of medical training.

In conclusion, the Hepatitis B vaccination rate among medical students at the University of Port Harcourt Teaching Hospital is low. An in depth education and increased awareness about hepatitis B infection is advocated among these students to improve vaccine uptake. Also, the present system of vaccination, in which the student has to take the initiative, is not very efficient, therefore a national and institutional legislation for adult vaccination against Hepatitis B needs to be promulgated especially for those at higher risk.

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