

Hepatitis B Vaccination among Physicians, Dentists and Nurses in Bahrain

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Background: Hepatitis B is one of the major causes of morbidity and mortality throughout the world. It is a well-documented occupational hazard for health care workers.

Objective: To assess hepatitis B vaccination among physicians, dentists and nurses in Bahrain.

Design: Cross-sectional study.

Setting: Occupational health group and immunization group of the disease control section in the Public Directorate of the Ministry of Health, Bahrain.

Method: All physicians, dentists and nurses working in the Ministry of Health, Bahrain recorded in the immunization health care workers software system were included in the study. In 2012, there was a total of 3,051 physicians, dentists and nurses. Data on vaccination against hepatitis B virus were reviewed and analyzed from October to January 2012.

Result: Three thousand fifty-one health care workers (HCWs) were enrolled in the study; seven hundred sixteen (23.5%) were physicians, eighty-three (2.7%) dentists and two thousand two hundred fifty-two (73.8%) nurses.

Seven hundred sixty-five (25.1%) HCWs had completed the vaccination against hepatitis B, 416 (13.6%) did not complete their vaccination and 1,870 (61.3%) had not received any dose.

Nurses had better vaccination completeness. Four hundred forty-eight (19.9%) nurses, one hundred ten (15.4%) physicians and seven (8.4%) dentists had completed their vaccination.

Conclusion: The study revealed that hepatitis B vaccination coverage among physicians, dentists and nurses is very low. There is a need to improve the health care workers software system and to implement the ministry of health policies on immunization of healthcare workers.

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Hepatitis B virus (HBV) infection is blood borne pathogen disease. It is estimated that more than 2 billion people have been infected with HBV, of whom over 360 million are chronically infected and at risk of liver cirrhosis and hepatocellular carcinoma, which are estimated to cause 500,000-700,000 deaths each year worldwide^{1,2}.

Because healthcare workers' (HCWs) activities involve frequent contact with blood and/or other body fluids from infected patients, HBV is a well-recognized occupational hazard for HCWs³⁻⁵.

The annual exposure of HCWs of HBV infection, due to sharp injuries, is estimated to be about 66 000 cases and 261 early deaths⁶.

In developing countries, percutaneous occupational exposure is responsible for 40-65% of HBV infections in HCWs; while in developed countries 10%, largely because of immunization and post-exposure prophylaxis (PEP)⁶.

Hepatitis B is a vaccine preventable disease since 1982⁷. The primary 3-dose vaccine series induce protective antibody concentrations in >95% of healthy infants, children and young adults^{8,9}. The estimated risk of contracting HBV infection in an unvaccinated person after an occupational exposure ranges from 6-30%, and depends on the hepatitis B e antigen (HBeAg) status of the source¹⁰.

Increased HBV vaccination is associated with a significant decline in the incidence of acute hepatitis B among HCWs^{11,12}. Therefore, many health authorities recommend hepatitis B vaccination for HCWs at risk¹³⁻¹⁷.

The World Health Organization (WHO) has estimated that the mean HBV vaccination rate amongst HCWs ranges from 18-39% in developing countries and 67-77% in developed countries⁶.

In 1991, the Ministry of Health (MOH), Bahrain had included hepatitis B vaccine as an integral part of its national immunization programs for preschool children¹⁸. The routine hepatitis B vaccination coverage in Bahrain is above 95% for preschool children¹⁹.

MOH has acknowledged the need for immunization protocols for health professionals. To implement the HCWs vaccination, the MOH established a schedule and a policy. The schedule is specific for each job category¹⁸. The MOH established HCWs software system (HCWI) in 2006 where vaccination data is registered in a secure central database, accessible by authorized personnel. The HBV vaccine is available to HCWs in Bahrain free of charge. Finally, a ministerial order for HCWs vaccination was introduced in May 2012.

The aim of this study is to assess hepatitis B vaccination among physicians, dentists and nurses in the Ministry of Health, Bahrain.

METHOD

The study was performed from October to January 2012. Physicians, dentists and nurses working in the MOH Bahrain and recorded in the HCWI software since 2006 were included in the study. In 2012, a total of 3,051 physicians, dentists and nurses were

registered. Vaccination is administered by trained staff; the schedule and doses are given according to WHO^{20,21}.

Data of HCWI software and vaccination forms were reviewed and analyzed using SPSS version 15.

RESULT

Five hundred ninety-three (19.4%) were males, a mean age of 42.6 years. Two thousand four hundred fifty-eight (80.6%) were females, a mean age of 39.4 years. One thousand eight hundred sixty-three (61.1%) were Bahrainis and 1,188 (38.9%) were non-Bahrainis. The age of study subjects ranged from 23 to 72 years. One thousand four hundred and nine (46.2%) were aged 30-39 years. Seven hundred sixteen (23.5%) were physicians, 83 (2.7%) were dentists and 2,252 (73.8%) were nurses, see table 1.

One thousand seven hundred ninety-two (58.7%) HCWs were working in Salmaniya Medical Complex (SMC), 801 (26.3%) in local health centers (LHC), 445 (14.6%) in periphery hospitals and 13 (0.4%) in public health directorate, see table 2.

Table 1: Personal Characteristics of Healthcare Workers

Characteristics	Male			Female			Total		
	Number and Percentage			Number and Percentage			Number and Percentage		
Gender		593 (19.4)		2458 (80.6)			3051 (100)		
Nationality	Bahraini	416 (22.3)		1447 (77.7)			1863 (61.1)		
	Non-Bahraini	177 (14.9)		1011 (85.1)			1188 (38.9)		
Age (years)	Mean	42.6		39.4			40.0		
	Median	42.0		38.0			38.0		
Age Groups	20-29	53 (19.9)		213 (80.1)			266 (8.8)		
	30-39	198 (14.1)		1211 (85.9)			1409 (46.2)		
	40-49	193 (21.4)		707 (78.6)			900 (29.5)		
	50-60	117 (28.5)		293 (71.5)			410 (13.5)		
	>60	32 (48.5)		34 (51.5)			66 (2.2)		
Professional Groups	Physician	339 (47.3)		377 (52.7)			716 (23.5)		
	Dentist	25 (30.1)		58 (69.9)			83 (2.7)		
	Nurse	229 (10.2)		2023 (89.8)			2252 (73.8)		
Place of Work	SMC	357 (19.9)		1435 (80.1)			1792 (58.7)		
	LHC	104 (13)		697 (87)			801 (26.3)		
	Periphery H*	128 (28.8)		317 (71.2)			445 (14.6)		
	Public Health	4 (30.8)		9 (69.2)			13 (0.4)		

* Periphery Hospital

Four hundred forty physicians (61.5%) were working in SMC, 234 (32.7%) in LHC, 32 (4.5%) in periphery hospitals and 10 (1.4%) in public health directorate. One thousand three hundred forty-six (59.8%) nurses were working in SMC, 490 (21.8%) in LHC, 413 (18.3%) in periphery hospitals and 3 (0.1%) in public health directorate. Seventy-seven (92.8%) dentists are working in LHC and 6 (7.2%) are working in SMC, see table 2.

Table 2: Distribution of Healthcare Workers in Bahrain

Category	SMC	LHC	Periphery Hospital	Public Health	Total
Physician	440 (61.5)	234 (32.7)	32 (4.5)	10 (1.4)	716 (23.5)
Dentist	6 (7.2)	77 (92.8)	0 (0.0)	0 (0.0)	83 (2.7)
Nurse	1,346 (59.8)	490 (21.8)	413 (18.3)	3 (0.1)	2,252 (73.8)
Total	1,792 (58.7)	801 (26.3)	445 (14.6)	13 (0.4)	3,051 (100)

Seven hundred sixty-five (25.1%) HCWs had completed the vaccination against hepatitis B, 416 (13.6%) did not complete their vaccination and 1,870 (61.3%) have not received any dose, see figure 1.

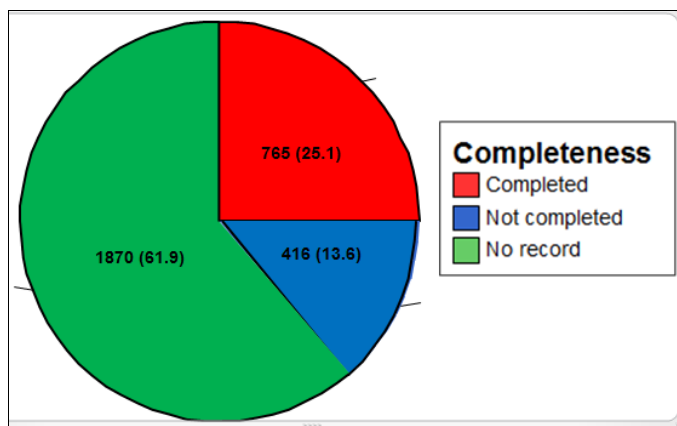


Figure 1: Vaccination Completeness

Although the number of females who had completed their vaccination was higher than males, the percentage of completeness among males was higher than females. One hundred seventy-three (29.2%) of males and 592 (24.1%) of females had completed their vaccination. Ninety-four (15.8%) of male HCWs and 322 (13.1%) female HCWs did not complete their vaccination. Three hundred twenty-six (55%) male HCWs and 1,544 (62.8%) female HCWs did not receive any dose of vaccination, see table 3.

Table 3: Prevalence of Vaccination Completeness

Category		Completed	Not Completed	No Record	Total
		Number and Percentage			
Gender	Male	173 (29.2)	94 (15.8)	326 (55)	593 (19.4)
	Female	592 (24.1)	322 (13.1)	1,544 (62.8)	2,458 (80.6)
Nationality	Bahraini	406 (21.8)	252 (13.5)	1,205 (64.7)	1,863 (61.1)
	Non-Bahraini	359 (30.2)	164 (13.8)	665 (56)	1,188 (38.9)
Age Group	20-29	65 (24.4)	28 (10.5)	173 (65)	266 (8.7)
	30-39	304 (21.6)	146 (10.4)	959 (68.1)	1,409 (46.2)
	40-49	259 (28.8)	173 (19.2)	468 (52)	900 (29.5)
	50-60	115 (28)	56 (13.7)	239 (58.3)	410 (13.4)
	>60	22 (33.3)	13 (19.7)	31 (47)	66 (2.2)
Professional Group	Physicians	195 (27.2)	121 (16.9)	400 (55.9)	716 (23.5)
	Dentist	15 (18.1)	10 (12)	58 (69.9)	83 (2.7)

	Nurse	555 (24.6)	285 (12.7)	1,412 (62.7)	2,252 (73.8)
Location	SMC	373 (20.8)	218 (12.2)	1,201 (67)	1,792 (58.7)
	LHC	255 (31.8)	135 (16.9)	411 (51.3)	801 (26.3)
	Periphery	133 (29.9)	62 (13.9)	250 (56.2)	445 (14.6)
	Public Health	4 (30.8)	1 (7.7)	8 (61.5)	13 (0.4)

Health Care Workers more than 60 years age group had the highest proportion (33.3%) of vaccination completeness; and those aged 30-39 years had the lowest proportion (21.6%) of vaccination completeness. As for the rate of not receiving any vaccination, HCWs aged 30-39 years had the highest rate of not receiving any vaccination (68.1%), and those more than 60 years age group had the lowest rate (47%), see table 3.

Physicians had 27.2% vaccination completeness; 69.9% of dentists did not receive any dose of vaccination. Three hundred seventy-three (20.8%) of SMC, 255 (31.8%) of LHC, 133 (29.9%) of periphery and 4 (30.8%) Public Health had completed their vaccinations.

DISCUSSION

Hepatitis B is one of the major causes of morbidity and mortality throughout the world. Hepatitis B virus infection is a well-documented occupational hazard for HCWs. The introduction of vaccination programs for HCWs internationally has resulted in significant reduction of HBV infections due to accidental exposure^{11,12}.

Five hundred sixty-five (18.5%) had completed vaccination against Hepatitis B; it is much lower than other studies^{11,22-24}. Hepatitis B vaccination coverage in this survey was consistent with that estimated by the WHO in developing countries⁶.

This survey revealed that HCWs vaccination system is not implemented satisfactorily and there is a need for a more robust system to ensure that the MOH policy on HCWs vaccination is executed. It is recommended that all new HCWs should prove their prior vaccination or documented immunity through serological testing. Knowledge, awareness and attitude towards occupational risk of HBV and the need for vaccination are important reasons for vaccine non-compliance²⁵.

It has been reported that the implementation of an educational campaign addressed to HCWs for the prevention of blood borne viral infections is reflected on the overall vaccine coverage among HCWs^{11,25,26}.

This cross-sectional survey has potential limitations; only physicians, dentists and nurses were surveyed. Therefore, other high-risk HCWs (such as laboratory personnel, other dental professionals and cleaners) were excluded. Information bias may have distorted the data because the survey was mainly based on data entered in the HCWI software, older HCWs might have completed their vaccination prior to HCWI software system establishment and not included in the new software. Also, personal characteristics in HCWI software could be distorted because human resources did not update the actual workforce of the MOH.

CONCLUSION

The study revealed that hepatitis B vaccination coverage among physicians, dentists and nurses is very low. There is a need to improve the health care workers software system to ensure an increase in hepatitis B vaccination among health care workers and to implement the Ministry of Health policy on immunization health care workers.

The authors recommend creation of a system that enforces the ministry of health policy on health care worker vaccination and stresses on finishing the course of three doses by generating personal reminders to be sent to those who fail to attend their vaccination appointment. In addition, there is a need for a study to analyze the reasons of non-vaccination among health care workers.

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