

Original Research Article

Efficacy of Hepatitis B Vaccination in Students of Dentistry in Kermanshah University of Medical Sciences, Kermanshah, Iran

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Abstract: Hepatitis B virus (HBV) vaccination is a well-known, safe and effective way for protection against HBV infection; however, non-responders remain susceptible to infection with HBV. The aim of this study was to evaluate the efficacy of the HB vaccination on HB infection in dentistry students in Kermanshah, Iran. In a cross-sectional study, 61 dental students of Kermanshah University of Medical Sciences, Kermanshah, Iran, referred to this study. The HBsAb test was done with ELISA method and IEMA well-RADIM kit (made in Belgium). The sensitivity of kit was 99% and specificity was 99.8%. Antibody titer ≥ 10 IU/L was as HBsAb-positive. The age range of students was 18-30 years. Out of 61 students, 56 students (91.8%) were HBsAb positivity that 38 students (62.3%) were men. There was just a significant correlation between the duration of injection of vaccination and HBsAb status. In conclusion, for better response to HBsAb, the observance of duration of vaccination is a more important factor compared with age, sex or time after the third injection.

Keywords: Hepatitis B, Vaccination, Dental students, Iran

INTRODUCTION

Hepatitis B virus (HBV) vaccine therapy has two major areas of application: for preventive purposes and for treating patients with chronic HB [1]. HBV infection causes 600000 to 1200000 deaths every year around the world [2]. It can be transmitted through percutaneous or mucosal exposure to infected blood or body fluids, and health-care personnel are at risk of acquiring the disease from needle stick injuries or other types of occupational exposures [3]. HBV vaccination is a well-known, safe and effective way for protection against HBV infection; however, non-responders remain susceptible to infection with HBV [4]. Several factors affect the antibody response to hepatitis B surface antigen (HBsAg), including the site of injection, sex, advancing age, being overweight and immunodeficiency [5]. Three injections, given at 0, 1 and 6 months, produce seroconversion rates and HBsAg [6]. Studies showed that HBV vaccination and consequent level of hepatitis B surface antibody (HBsAb) are not completely adequate among dentists despite performance of highly exposure prone procedures [7]. Reports from different countries indicated that HBV vaccine coverage rate in dental health care workers ranged between 26% and 96.6% [8] and in Iran, this coverage rate ranged between 74.8% and 94.9%; on average 70% of dentists care workers

received at least one dose of HBV vaccine [9]. Therefore, the principles of infection control are necessary to take into by the dentists for prevention of the spread of infectious diseases and their consequent risks [10]. The aim of this research was to evaluate the effect of the HB vaccination on HB infection in dentistry students in Kermanshah, Iran.

MATERIALS AND METHODS

In a cross-sectional study, 61 dental students of Kermanshah University of Medical Sciences, Kermanshah, Iran, were selected for sampling. The 5cc of venous blood were taken from the forearm of each student with disposable syringes and sterile conditions. The samples quickly were centrifuged and separated their serums. Then, the serums were kept in special test tube and temperature of -70°C . The HBsAb test was done with ELISA method and IEMA well-RADIM kit (made in Belgium). The sensitivity of kit was 99% and specificity was 99.8%. Antibody titer ≥ 10 IU/L was as HBsAb-positive [11, 12]. The data were analyzed by IBM SPSS version 19 with Chi-square test.

RESULTS

The age range of students was 18-30 years. Out of 61 students, 56 students (91.8%) were HBsAb positivity, 33(54.1%) were 18-22 years and 28(45.9%)

were 23-30 years (Table 1) that 38 students (62.3%) were men. Time after the third injection in 44(72.1%) was <5 years and 47(77%) had regular vaccination. The correlation between these variables with HBsAb status

has been shown in Table 1. There was a significant correlation between injection of vaccination and HBsAb status ($P < 0.05$).

Table 1: The characteristics of students based on HBsAb status (n=61)

Variables	Total n=61	HBsAb-positive n=56	HBsAb-negative n=5	P-value*
Age, years				
18-22	33(100)	32(96.9)	1(3.1)	>0.05
23-30	28(100)	24(85.7)	4(14.3)	
Sex				
Male	38(100)	35(92.1)	3(7.9)	>0.05
Female	23(100)	21(91.3)	2(8.7)	
Time after the third injection, years				
<5	44(100)	42(95.4)	2(4.6)	>0.05
≥5	17(100)	14(82.3)	3(17.7)	
Injection of vaccination (0, 1, 6 months)				
Regular	47(100)	45(95.7)	2(4.3)	<0.05
Irregular	14(100)	11(78.6)	3(21.4)	

*Chi-square test

DISCUSSION

This study evaluated the anti-HBs antibody titers of Iranian students in dental school and investigated the correlation between demographic features with anti-HBs antibody titer in this population that out of 61 students, 5 students (8.2%) were HBsAb negativity (HBV infection). The observance of duration of vaccination-0,1,6 months- was a risk factor for HBV infection that out of 14 students with irregular vaccination, 3(21.4%) had antibody titer <10 IU/L (HBsAb negativity) compared, but out of 47 students with regular vaccination, 2(4.3%) had antibody titer <10 IU/L. Peto *et al.* [13] reported that out of 255 vaccinated participants, 2 participants (80.%) had HBV infection. Mendy *et al.* [14] and Whittle *et al.* [15] showed that vaccine efficacy against infection with HBV was 85.4% and 80%, respectively, which did not vary significantly between age groups [14], but was significantly lower in the oldest age group [15, 16]. Adolescents and young adults vaccinated in infancy are at increased risk of HB infection [14]. One study, [17] aimed to check the protective efficacy of HB vaccine against infection in 720 children aged 10 years who were vaccinated in infancy. HB infection occurred in 6.8% of the vaccinated children. Another study [18], concluded that of HB vaccine recipients who were seronegative before immunization, 94.5% had a specific anti-HBs response, whereas, in study of Minakari *et al.* [4] response rate (HBsAb titer >10 IU/L) was 100%. Lum *et al.* [14] reported that protective vaccine responses (anti-HBs ≥ 10 IU/L) were observed in 38 of 49 (78%) their completers [19]. Momeni *et al.* [7] showed that (72.3%) of dentists who received their third dose of vaccination <5 years were completely immune compared to those who had completed all three doses in a longer period (64.3%) and the levels of anti-HBs were significantly associated with gender, age, duration of dental practice engagement ($P < 0.05$). In this study,

age, sex and time after the third injection had not significant correlation with vaccine responses, but the observance of duration of vaccination was significant.

CONCLUSION

To better response to HBsAb, the observance of duration of vaccination is a more important factor compared with age, sex or time after the third injection.

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