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Short Article

Evaluation of Health Care Students Immunization against Hepatitis B Virus in Population of Iran

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A B S T R A C T

Background and Aims: Hepatitis B virus (HBV) infection is a serious global health problem affects many people. Recently, because of vaccination, the incidence of HBV infection has been reduced, but in high risk population also health care students (HCS) adequate immunization is serious. The aim of this survey was to evaluate HBV immunization in the population of the paramedical students based on the demographic characteristics in Iran.

Materials and Methods: Anti-HBsAg titer was prospectively assayed in all vaccinated of the 95 HCS using Enzyme-linked immunosorbent assay.

Results and Conclusions: Anti-HBsAg titer in the studied population was estimated about 92.8±80.5 mIU. Anti-HBsAg titer response was significantly higher in females to males. A low proportion of vaccinated HCS had low titers antibody against HBV infection. Therefore, measuring anti-HBsAg titer may help to drop in HBV incidence in HCS. This reduction can be correlated with the effectiveness of national immunization program.

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Introduction

Hepatitis B disease is a worldwide health problem [1, 2]. Healthcare workers and also health care students (HCS) consist medical and paramedical students are at a higher risk of contact with Hepatitis B virus (HBV) infection [3-5]. Therefore, proper and complete vaccination can prevent HBV infection among them. Adequate immunization is an important part of preventative work related of health care workers against potential infections. Hepatitis B vaccination (series of 3 vaccines given over a 4 to 6 month period) as a preventive method, plays a noticeable role in disease control of the HBV infection [6, 7]. In many countries, including the United States and some regions of East Asia and Europe, because of the national HBV vaccination, saw a significant decrease in prevalence of the HBV infection. The effects of HBV vaccination and its response are studied in some particular studies and conditions. However, we still lack data in some high risk groups such as individuals in work related occupations and the effectiveness of vaccination in these groups not still efficient [7-10]. To the best of our knowledge, a few surveys have been conducted on immunization rate anti-hepatitis B surface antigen (anti-HBsAg) against HBV after vaccination among HCS in Iran. Therefore, our study was performed to evaluate the immunization of HCS towards hepatitis B vaccination.

Materials and Methods

Our study population (ninety-five paramedical students of Urmia University of Medical Sciences, Urmia, Iran) that vaccinated against HBV (Hepavax-gene, DNA recombinant hepatitis B vaccine, 100 µg) admitted in April 2012 until June 2013. The study protocol was reviewed and approved by the Ethics Committee of Urmia University of Medical Sciences. Our population did not obtain a hepatitis B vaccine booster dose. Also, all subjects have not had the history of HBV infection. Two months after the first vaccination, all subjects were vaccinated for the second dose. Four months after the second dose, they received the third dose. After filling testimonial form, pre-tested, self-administered questionnaires were distributed among the students according to: the hepatitis B immunization history, hepatitis B infection history, family history of hepatitis B infection, work related risk factors for hepatitis B infection consists needle stick, eye and skin contacts with contaminated body fluid (blood, urine, etc.) and demographic features included: age, weight, height, blood group, etc. The questionnaires were distributed in one day to prevent data sharing. After ten months from third dose of vaccination of all studied subjects, venous blood samples were obtained from them and serum was isolated. All serum samples were analyzed for antibody to HBsAg using enzyme-linked immunosorbent assay (ELISA) method (ABNOVA, USA). The data were analyzed with SPSS (version 21) software, using T-test and Pearson Chi-square test.

Results and Discussion

All of the 95 distributed questionnaires were returned, and the response rate was 100%. All

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studied population (mean age = 21.6±1.9 years) maintained their vaccination records 38 (40%) male and 57 (60%) female). Mean range of anti-HBsAg titer in studied population were 92.8±80.5 mIU (38.5-200.6 mIU). In further analysis in gender-based classification that presented in table 1, higher anti-HBsAg titer response coverage was seen in female compared to males. ($p<0.05$).

Table 1. Anti-HBsAg titer and demographic parameters in gender-based classification

Gender	Age (year)	Height (Cm)	Weight (Kg)	Anti-HBs titer (mIU)
Male	21.4±1.4	179.89±5.27	74.97±9.37	82.26±98.18 *
Female	21.2±1.02	165.09±4.76	56.61±7.31	103.64±109.49

Data is presented as mean ±SD. *$p<0.05$

The distribution of ABO blood group were: A^+ (50%) B^+ (17.3%) AB^+ (8%) O^+ (23%) O^- (1.7%), respectively; anti-HBsAg titer response among these sub groups were higher in A^+ followed by O^+, AB^+, B^+ and O^- , but differences between groups did not reach to the significant level. In a classification based on needling exposure, eye and skin exposure to potentially infected patients body fluids (blood, urine, cerebro spinal fluid, etc), hepatitis B infection family background, and ethnicity origin, anti-HBsAg did not have significant differences among the subjects. In fact, the adequate response (anti-HBsAg titer) was more commonly seen in our population. In a study by Baghianimoghadam et al. in Yazd, Iran, similar findings to were reported. They stated that, 99.2% of the studied group had anti-HBsAg in adequate response range of immunization [11]. These data are close to our results. Also, in Zamani et al. study in Iran, they indicated that the HBV vaccine immunization program had obtained excellent efficacy in their population [12] that is agree with our data. We also found that, there was a significant difference between sex and anti-HBsAg levels. Female participants had higher anti-HBsAg titer compared to the males that it may be related to different immune response compared to the males. Likewise, anti-HBsAg is affected by sexual elements such as different pattern of hormones in female. This result is contrast with Baghianimoghadam et al study [11]. There was a positive correlation between weight, height and age with anti-HBsAg titer among students [Pearson correlation coefficient were: 0.192, 0.307, 0.288, respectively ($p<0.05$)]. These results indicated that there were significant differences between age, weight and height as well as antibody levels. It would be concluded that with increasing age, the significant decrease in humoral and cellular immunity against HBV vaccines occurred [11]. Overall, it is important to check anti-HBsAg titer regularly after HBV vaccination in the HCS. These students probably have higher susceptibility to contact with potential infected body fluids. Therefore, they should be given vaccination at their initial entry to health services.

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Conclusion

In conclusion, antibody titer should be checked regularly for HCS.

Conflict of Interest

The authors declare that there is no conflict of interest.

Acknowledgement

There is no aknowledgement to declare.

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