

Research Article

**Investigating the Level of Immunity to Hepatitis B in Medical Staff
of Shahid Beheshti Hospital in Yasouj City**

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ABSTRACT:

Background and goal: Hepatitis B virus is serum hepatitis factor and in the virus group Hepadna, is classified. Among the risk factors for the infection of jobs in healthcare high risk of hepatitis B infection in health care workers, compared to the general population is due to higher exposure to HBV-infected patients. In this group of people infected needle contact with mucosal surfaces contaminated liquids transferred important way. This study aimed to assess the level of immunity to hepatitis B in staff of Shahid Beheshti Hospital in Yasouj city was designed.

Materials and Methods: This cross-sectional descriptive study was conducted. The study population consisted of all medical personnel working in the Shahid Beheshti Hospital in 2014 were related to Yasouj medical science university. Sampling all the numbers, all the personnel who have inclusion criteria and wish to participate in the scheme were enrolled and finally 270 health care workers in Shahid Beheshti medical science university in 2014 were selected. After completing the questionnaire included demographic and review vaccination records, 5 ml of blood was taken from them. After separating serum using an ELISA kit specific IgG antibody levels were measured against hepatitis B virus. Data collected using descriptive statistics, chi-square test were analyzed.

Results: The results showed that 97.4 percent of employees surveyed in specific IgG antibody titer against hepatitis B virus surface antigen over 10 international units per liter, which is considered safe, and in 2.6% (n = 7) of the antibody titer was below 10 units that are deemed unsafe. Of these, 22.5% (n = 68) of the headlines, between 10 and 100 that is border safety.

Conclusion: This study showed that the samples examined have a favorable safety level. Safety and the safety of those without borders have knowledge about these people, according to their risk, their immunization as soon as possible. However, people with a history of vaccination, they were not acceptable level of safety have come under scrutiny in addition to receiving this vaccine and a review of the level of antibodies, if they test negative, about the preventive measures to be applied.

Keywords: hepatitis B, immunization of IgG antibody

INTRODUCTION:

Hepatitis B virus is serum hepatitis factor and in the virus group Hepadna, is classified. The virus

also causes chronic infections in infants infected and an important factor in the development of

cirrhosis of liver disease, including liver cancer in humans. The genome of the virus DNA double chain ring is composed of a chain that is shorter than the other chains. HbeAg, which is a soluble protein with viral replication, high titers of virus in serum and serum infectivity is associated (1). Hepatitis B may antigenic protests without clinical symptoms (2). HbsAg, Hepatitis B surface antigen in the serum measured (1). People who are chronic carriers of hepatitis and HbsAg them for more than six months despite HbeAg or anti Hbe is stable, HbsAg may persist for years after the disappearance of serum HbeAg and the virion particles containing HbsAg to many more infected are released into the serum of infected individuals (3). It is estimated about two billion people have been in contact with HBV infection and about six percent (more than 350 million people) of the world population are carriers of the virus fifteen to twenty percent of cases that are likely to lead to acute liver disease (4). The prevalence of hepatitis B virus infection in different regions encompasses a broad spectrum that ranges from 8% to 15% (5). According to various studies, 5 to 17 percent of the population carries the hepatitis B (HBV) (6). In our country, over 6 to 10 percent of patients with acute hepatitis B infection better not leave early and go to the chronic carrier state (7). Transmitted primarily through blood and blood products, contaminated needles and sexual contact occurred (8).

Among the risk factors for the infection of jobs in healthcare high risk of hepatitis B infection in health care workers compared to the general population is due to higher exposure to HBV-infected patients (7). In this group of people, infected needles and contaminated fluids contact mucosal surfaces with important way transmission (9). The Center for Disease Control and Prevention (center of disease control and prevention = CDC) declared that 200 to 100 health care workers die each year due to complications of hepatitis B career (10). On the recommendation of WHO, with mass vaccination of HBV infection be prevented by existing vaccines can be used (11).

Although not completely immune response to the vaccine, but the vaccine induces, an immune response in most cases can lead to (7). From the second half of 1992 vaccination against hepatitis B in children is done. It should be noted that researchers of different factors such as gender, older age, obesity, location and method of vaccination, immune status and smoking have an effect on the response to hepatitis B vaccine (12). The mentioned standard to establish appropriate immunization of 95% (range 100-80%) (11). In most sources, the effectiveness of the vaccine produced protective antibody titers after vaccination three times more than 90% expressed and in people who have not had an adequate response to hepatitis B vaccine, revaccination at three times, about 50% of cases induces immune (13). Generally after vaccination, three methods are available to assess the safety of individual vaccines that include giving up their individual had been vaccinated, evaluation of antibodies against hepatitis B 1 to 3 months or one month after receiving the third dose of vaccine, and the third way to periodically evaluate antibody levels after vaccination is completed. To assess immunity to hepatitis B, RIA and ELISA methods for observing antigens and antibodies are highly sensitive (14). Due to the lack of study of the immune status of medical staff in hospitals Yasouj in addition to dramatic cost and high risk of disease due to occupational status and exposure to patients, the medical team threatens. This study aimed to determine the immune status of medical staff in Shahid Beheshti Hospital of Yasouj against the virus that causes hepatitis B was conducted. It has been reviewing the status of health and safety box for Anti-HBs titer to below protective level (mIU / ml 10 HBsAb <) take appropriate measure such as vaccination reminder.

MATERIALS AND METHODS:

This study was cross-sectional and descriptive analysis. The study population consisted of all personnel martyr Beheshti Hospital in 2014 were

related to medical science. The sampling method, 270 personnel were selected.

The list by staff of the nursing office was prepared. After explaining the participants in the study and informed consent of those working in different shifts, different researchers referred to hospital and required information and blood samples were collected. The research instrument was a questionnaire included demographic details (age, sex, marital status, height, weight, and smoking history), clinical conditions (chronic disease and hepatitis B in the family), a history of high-risk behaviors (sex, number of sexual partners, a history of blood transfusion, time interval after blood transfusion, alcohol consumption and contamination of the tip of the needle, etc.), vaccination status (number of turns vaccination against Hepatitis B, time interval after receiving the last dose of vaccine and vaccine with enough time) and specific disease (lung disease, diabetes, etc) was recorded.

After completing the relevant forms from each 5 cc venous blood to measure antibody against hepatitis B virus surface antigen ELISA method was used.

After collecting, the samples sent to the laboratory in a suitable container. Blood in less than two hours was centrifuged, the serum separated and frozen at -20°C until the tests were kept. In addition, the specific IgG antibodies against Hepatitis B (HBsAb) using the kit PISHTAZ-TEB made in Iran were measured by ELISA. The test is that microplates included in the kit with HBsAg are coated.

By adding serum containing antibodies to HBsAg antibody binds to the antigen, after 4 times washing with buffer for PBS, at a later stage HBsAg by enzyme Horse Radish Peroxidase (HRP) conjugate is added.

The antigen to another antibody that binds to the antigen is not connected and then after 4 times washing with PBS by adding a chromogenic substrate and color are color obtained by ELISA Reader device manufacturing company BIOTEK America was read at 450 nm. Compared with

standard vials and the curve obtained from antibody samples were determined.

The proper response HBsAb level of safety equal to or more than 10 units per ml were considered. Values below 10 units per ml of safety, 10-100 relative safety units per ml and above 100 units per ml were considered complete safety.

The collected data into SPSS software were entered and using descriptive statistics, chi-square test were analyzed. People with a proper immune response against HBsAg prevalence and incidence according to sex and body mass index, duration of administration of the last dose of vaccine and were calculated and the relationship between quantitative and qualitative factors likely in the immune response and the immune response by statistical analysis was evaluated.

Findings

A total of 270 personnel of Shahid Beheshti Hospital Yasouj were investigated and 112 patients (41.5 percent) were male and 158 (58.5%) were female.

The results of this study showed that 97.4 percent of employees surveyed in specific IgG antibody titer against hepatitis B virus surface antigen over 10 international units per liter, which is considered safe, and in 2.6% ($n = 7$) of the antibody titer was below 10 units that are deemed unsafe. Of these, 22.5% ($n = 68$) of the headlines, were between 10 to 100 is borderline safety.

Comparison of personnel evaluated against the virus that causes hepatitis B by age, sex, vaccination status and the number of vaccines received are shown in Table 1 accordingly 97.3 percent of males and 97.5 per cent of immunity against the virus that causes hepatitis B females have had ($0.05 < P$).

In addition, 77.4 percent and 22.6 percent partially received complete vaccination and full vaccination in males and females respectively 81 percent and 72.3 percent and 27.7 and 19% had incomplete ($0.05 P >$). In general, the people who had received vaccination, immunization rate were 97.1%.

Table 1: Comparison of relative frequency immune status of medical staff of Yasouj Shahid Beheshti Hospital against the virus that causes hepatitis B in 2014

Vaccine immunity		Unsecured (under 10)		Border Safety (between 10 and 100)		Safety (top 100)		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
The total safety		7	2.6	68	25.2	195	72.2	270	100
Safety in terms of gender P = 0.996	Male	3	2.7	28	25	81	72.3	112	100
	Female	4	2.5	40	25.3	114	72.2	158	100
The safety of their marital status P = 0.531	Married	6	3.3	46	25.6	128	71.1	180	100
	Single	1	1.1	22	24.4	67	74.4	90	100
Safety in terms of vaccination P = 0.080	Full	6	2.9	46	22	157	75.1	209	100
	Partial	1	1.6	22	36.1	38	62.3	61	100
Safety in terms of smoking history P = 0.885	Yes	0	0	3	30	7	70	10	100
	No	4	2.7	37	25	107	72.3	148	100
Safety in terms of the history of tobacco P = 0.200	Yes	0	0	7	43.8	9	56.2	16	100
	No	4	2.8	33	23.2	105	73.9	142	100
Safety in terms of jaundice P = 0.558	Yes	0	0	2	22.2	7	77.8	9	100
	No	4	2.7	38	25.5	107	71.8	149	100
Safety in terms of BMI P = 0.6954	Below 25	5	3	40	23.7	124	73.4	169	100
	Above 25	2	2	28	27.7	71	70.3	101	100
In terms of safety in high-risk sexual behavior P = 0.298	Yes	0	0	1	8.3	11	91.7	12	100
	No	7	2.7	67	26.1	183	71.2	257	100
Vaccination status in the group men P = 0.350	Full – Man	2	2.5	19	23.5	60	74.1	81	100
	Partial-man	1	3.2	9	29	21	67.7	31	100
Vaccination status in women P = 0.285	Full-woman	4	3.1	27	21.1	97	75.8	128	100
	Partial-woman	0	0	13	43.3	17	56.7	30	100

DISCUSSION

Hepatitis B, results of this study showed that 97.4 percent of employees surveyed in specific IgG antibody titer against hepatitis B virus surface antigen over 10 international units per liter, which is considered safe, and in 2.6% (n = 7) of the antibody titer was below 10 units that are deemed unsafe. A survey by Turk Zaban et al (2009) conducted, researchers found that the lack of effect of vaccination was 9.8% and concluded that the efficacy of HBV vaccine is acceptable (95.1%) (15). In another study by Asgharian et al (2009) were recruited. Results revealed that 57.8% of the samples against hepatitis B were non-secure and secure scuffle (16). Mansourghanaei et al (2008) reported in their study that 95.1% (233) had shown a good immune response (IU / dl HBs Ab > = 10). Immunization rates were lower in men and women had a significant relationship with the lack of appropriate immune response (P <0.01) (17).

The results Azarhoosh et al (2006) showed that 13% of subjects had not been vaccinated. 74.6% complete vaccination and other vaccinations were incomplete (18). Talebi Taher et al (2004) in their study showed that the mean titer of Anti-HBs, 70.43. Moreover, 29.4% of the cases there was no protection against hepatitis B (19). Habibian (2003) in their study to evaluate the safety of hepatitis B vaccine in health care workers did, found that 13.7% of the cases against hepatitis B were safe. 37.9% relative safety and 48.8% safety were acceptable (20). In another study by animating and colleagues (2002) conducted, researchers found that a total of 138 subjects 69.6 percent (96) of an appropriate response to the vaccine and 30.4 percent (n = 42) did not respond. 58 percent of people over 40 years and less than or equal to 1.76% of the population 40 years and had a good response to the vaccine, and this difference was statistically significant (P <0.05)

(21). Savad Kohi et al (2001) showed in their study that the 68.6% of the samples against hepatitis B was protected. Given that safety and decreased survival after three doses was seen in 31.4% of staff proposed that the first two to three months after vaccination levels Anti-HBS are checked, Anti-HBS level periodically controlled. The Anti-HBS titer to below protective level (10mIU / ml) should receive booster shots (22). According to Luther et al (1998) also found that 10% to 12% of health workers able to produce the right amount of antibody after vaccination (23). Comparison of personnel evaluated in this study against the virus that causes hepatitis B by sex showed that 97.3 percent of males and 97.5 percent of females have had hepatitis B immunity against the virus that causes , however, no significant difference was found between males and females ($0.05 < P$). Also, 77.4 percent and 22.6 percent partially received complete vaccination and full vaccination in males and females respectively 81 percent and 72.3 percent and 27.7 and 19% had incomplete ($0.05 > P$). In total, in those who had received vaccine, the immunization rate was 97.1%. The results of a similar study showed that dentist's vaccination is not effective in dealing with irregular vaccinations and immunizations for more than 5 years (15). In the present study between variables such as age, sex, weight and body mass index, time passed from the last dose of vaccine, tobacco use, sexual risk behavior specific antibody level against hepatitis B infection, a significant relationship was not found. Hajibagheri et al (2006) between the sex, age, obesity and chronic disease did not find a statistically significant relationship was consistent with the results of the present study (24). In another similar study, researchers concluded that age, smoking, genetics, obesity and associated HbSAb vaccination titer (16). The results of our study did not match. Mansourghanaei et al (2008) also stated that 2% of the cases (5 patients) had a history of smoking. Smokers with the lack of appropriate immune response showed a significant relationship ($P < 0.05$). 56.25% of participants

(135 people) less than or equal to 24 months after administration of the last dose of vaccine. The duration of administration of the last dose of vaccine was more than 24 months had a significant relationship with the lack of appropriate immune response ($P < 0.05$) (17). Talebi Taher et al. (2004) Anti-HBS headline significant correlation between age and the passage of time since vaccination against Hepatitis B found (19). In Habibian (2003) between antibody level and weight, time passed from the last vaccination as well as contact with HBs Ag with statistically significant relationship was found with increasing age reduced the amount of antibody. It compared to non-smokers as well as smokers and women versus men had higher antibody (20). Janbakhsh et al (2002) also stated that there is no significant relationship between gender, weight and time elapsed since the last vaccination and smoking in the response to the vaccine, (21).

CONCLUSION

Overall, this study showed that the samples examined have a favorable safety level. Safety of people without the awareness of the people is according to their risk, their immunization as soon as possible. However, people with a history of vaccination, they were not acceptable level of safety, you should come under scrutiny in addition to receiving this vaccine and a review of the level of antibodies, the test is negative for them, preventive measures need to be applied.

Suggestions:

- 1- It recommended, non-immune personnel who, after completion of the vaccination, the vaccine immunity be examined, and in the absence of immunogenicity, the next steps to be done about them.
2. Personnel about the importance of the disease, ways of transmission, prevention and post exposure prevention, through workshops, training is necessary.

3. In order to reduce the prevalence of hepatitis B among people, especially medical staff, mandatory testing indicators of hepatitis B, hepatitis A and B vaccinations complete continuing education about the routes of transmission, preventive measures and post exposure prevention, be done.

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