Journal of Medical Sciences

ISSN 1682-4474

science alert

ANSInet
an open access publisher
http://ansinet.com

Research Paper

J. Med. Sci., 7 (7): 1214-1217
1st October, 2007

Long-Term Protection of Hepatitis B Vaccine in Adult

[1]G.H. Ghorbani, [2]S.M. Alavian and [3]A.A. Esfahani

The aim of this study is evaluation long term protection of HBV vaccine in adult. Hepatitis B vaccine is one of the safest vaccines available in the world. This study is a descriptive cross-sectional that conducted in five hundred five settled person of military in capital city of Iran in 2006. All subjects that have past history of HBV vaccination recruited to study. Demography data and date of recent HBV vaccine and anti HBS antibody and HBs Ag and HBc Ab were record. Data was analyzed with SPSS 13 program and Chi-square and t-test were used. All subjects were man with mean age 33.9±8.9 SD years old. Education level in 81.4% was in diploma degree and above. Anti HbsAb was positive in 498 (98.6%) of staff and 2(0.04%) had HbsAg and HbC Ab positive. This study showed that three dose of vaccine protective until ten years after HBV vaccination. Therefore, Booster HBV vaccine will not require at least until ten years after complete vaccine program.

Key words: Hepatitis B virus, vaccine, HbsAb, protection, long term, adult

JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued eight times per year on paper and in electronic format.

For further information about this article or if you need reprints, please contact:

Gholam Ali Ghorbani
Health Research Center and Gastroenterology and Liver Diseases Research Center of Baqiyatallah University of Medical Sciences,
Mollasadra Ave.,
Tehran, Iran

Tel: 0098 021 88600062
Fax: 0098 021 88600062

ANSInet
Asian Network for Scientific Information

[1]Department of Infectious Diseases, Health Research Center,
[2]Department of Gasteroentrology, Gasteoentrolgy and Liver Research Center,
[3]Health Research Center, Baqyiatallah University of Medical Sciences, Tehran, Iran

INTRODUCTION

Viral hepatitis due to hepatitis B virus (HBV) is a major worldwide public health concern leading to acute and chronic liver disease including cirrhosis and hepatocellular carcinoma. It is currently estimated that over 2.5 billion people are exposed and over 350 million people are chronically infected with the virus and that 1.2 million people die annually from HBV-related disease. The prevalence of HBV is known to be higher through Asia and the Middle East, Africa, South America and the Mediterranean countries. In these regions, transmission occurs mainly through vertical and horizontal routes. In North America and Northern Europe, where HBV prevalence is lower, sexual and intravenous drug use are the major modes of transmission (Saravanamuttu *et al*., 2007).

According to Iranian studies, about 2 to 3% of general populations in this country are HBcAb positive and about 1.3 to 8.69% of the populations are chronic HBV carriers. Compared to the United States where HBV is the cause of 25% of chronic hepatitis cases, HBV accounts for up to 70 to 80% of chronic hepatitis cases in Iran. Therefore, HBV alone is the leading cause of chronic liver disease in Iran and it is evident that HBV transmission prevention can be one of the health priorities in the country (Adibi *et al*., 2004).

In Iran, universal neonatal vaccination against HBV started in 1993 according to WHO recommendations. It means that Iranians adult at the time of this study received no prevention services against HBV and so most of them could contract the infection if attacked by the virus (Adibi *et al*., 2004).

More than 20 years have elapsed since 1984, when vaccination against Hepatitis B began, first with a plasma-derived vaccine and later a recombinant DNA-derived vaccine and mortality of fulminate hepatitis B in infants and the incidence of hepatocellular carcinoma have been effectively reduced by approximately 25% (Shepard *et al*., 2006)). Finally, it has been proven that the hepatitis B vaccine is one of the safest vaccines available in the world (Vildozola, 2007).

Because military persons were at risk for HBV infection, they vaccinated against it (German *et al*., 2006), on the other hand response to this vaccine in adult remains largely unknown in our country (Alavian *et al*., 2001). Because military adult person of our country vaccinated for HBV in adult age that was not as routine vaccination program and protection against hepatitis B virus was unknown, this study ordered to evolution of long term protection of HBV vaccination and if they were not protect to repeat HBV vaccination for them.

MATERIALS AND METHODS

This study is a descriptive cross-sectional that conducted in five hundred five settled person of military that site of study was earth force of Sepah in Tehran as capital city of Iran in winter of 2006. All individual with past history of HBV vaccine recruited to this study. Some of them vaccinated with recombinant Cuban HB vaccine and the other vaccinated with Korean HB vaccine. Demographic data were containing age, married condition, education level, date of latest vaccine injection. Form each subjects five ml blood sample take and then their serum was examined for Hbs Ab, total HBC Ab and HBS Ag by ELISA test of Diapro kit manufactured in Italy country. Anti-HBs was quantitatively measured according to manufacturer recommendation and expressed as MIU mL^{-1}.

Hbs Ab titer more than 10 MIU mL^{-1} were accounted as protective and less than it was not protect. These data was analyzed with SPSS 13 program and Chi-square, students t-test and ANOVA were used for statically association between of Hbs Ab and other variants. p-values less than 0.05 were considered as significant.

RESULTS AND DISCUSSION

In here all subjects were man and mean age was 33.9±8.9 SD, Rang 19-55 year old. Education level in 81.4% was in diploma degree and above. Anti HbsAb was positive in 498 (98.6%) and mean titer was (183.1±13.27 SD MIU (95%CI; 171.11-195.1). Twenty four (4.9%) of person had HbcAb positive test and 2(0.4%) had HbsAg positive test other results were showed in Table 1.

Table 1: Titer of anti HBS antibody and variants in soldiers

Variables		No.	Mean titer (MIU mL^{-1})	SD	95% confidence interval (CI)	p-value
Type of vaccine	Cubaian	59	229.51	115.470	-	<0.001
	Korean	320	171.96	112.080	-	
Married condition	Negative	46	180.99	13.940	152.90-209.08	>0.974
	Positive	326	181.58	6.508	168.77-194.33	
Age	<25 year	68	175.84	99.210	151.83-199.86	>0.821
	25-35 year	135	185.33	116.250	165.54-205.12	
	>35 year	166	178.73	118.060	160.64-196.82	
Long of vaccination	1-5 year	31	220.84	123.410	175.57-266.11	<0.003
	5-10 year	293	199.50	116.800	129.51-236.24	

This study determined that three doses of HBV vaccine in adult produced enough anti HbS antibody immunity in 98.6% of persons after ten years after complete their vaccination.

Three does vaccine against HBV can protective adult individuals from HBV infection, that it confirmed in our and other study (Hussain *et al*., 2005). In this study a little of vaccinated subjects had HbC Ab and HbS Ag positive. These individuals may be infected before of vaccination program, in country with high HBV carrier prevalence screening of HbsAb and HbsAg should be done before vaccination but in our country did not indicate. HBV vaccination in subjects with HbsAb and HbsAg produced good response and HbsAb and HbsAg screening before vaccination hadn't cast benefit in country with low prevalence of hepatitis B virus infection (Sunbul *et al*., 2000). Adults in this study were not vaccinated in their childhood and after employment were vaccinated because they were near the risk of B hepatitis. Therefore, no screen of HbcAb and HbsAg was done before vaccination. So in countries that have low hepatitis prevalence, there is no indication to screen HbcAb and HbsAg before vaccination, because it is not cost effective (Kabir *et al*., 2006). Moreover, because hepatitis B vaccination in the people who are HbsAg and HbcAb positive has not any adverse effect, hepatitis mass vaccination in field can be done before screen for people who face danger (Sunbul *et al*., 2000).

Geometric Main Titer (GMT) of HbsAb was 180 MIU mL^{-1} in this study and more than 98% of subjects had protective level more than 10 MIU mL^{-1} HbsAb titer and they are protective (Garcia *et al*., 2001). Protectively against HBV did not different insignificant between less and more than five years after complete of vaccine program and booster dose vaccine was not probably need until ten years after latest vaccine injection (McMahon *et al*., 2005). Geometric main titer of HbsAb was high in 25-35 year old subjects but without significant different with other age group resemble to other study (Hussain *et al*., 2005; Das *et al*., 2003), older man may be needed additional dose for immunity against HBV infection but this matter did not show in our study (Hussain *et al*., 2005).

Two types of Cubaian and Korean vaccine was used in this study, GMT of HbsAb was significantly high in Cubaian than Korean, although sample was little in this study and more study was needed (Keating and Noble, 2003).

Adult and military person in our country did not immunize against hepatitis B in mass vaccination program and therefore, they are at risk for this infection and a strategy for HBV vaccination should be considered for them that this recommendation is resemble to other study (Alavian *et al*., 2001; Alizadeh *et al*., 2005).

In here long time protective against hepatitis B did not different between two these group less and more than five years after latest vaccination. So individuals with three dose HBV vaccine was protective against hepatitis B virus infection and booster does was not need as far as possible until ten years after latest vaccine (McMahon *et al*., 2005; Hassan and Ziba, 2007).

Married person had more immunity to hepatitis B virus that reason may be due to vaccination at married time in Iran (Alavian *et al*., 2001).

CONCLUSION

In here showed that three dose of HBV vaccine in adult can produced immunity for long time. So three dose of hepatitis B vaccine in adult protect them for life long. Therefore we recommend, adults with history of three dose HBV vaccines will not need to repeat booster dose minimally until ten years after latest vaccination.

ACKNOWLEDGMENT

We thanks of Military Institute of Baqiyatallah Medical Science University for Funding of this study.

REFERENCES

Adibi, P., M. Rezailashkajani and D. Roshandel *et al*., 2004. An economic analysis of premarrage prevention of hepatitis B transmission in Iran. BMC. Infect. Dis., 4 (4): 31-35.

Alavian, S.M., M. Saadati and A. Mirzadeh *et al*., 2001. Frequency of HBV vaccination and their related variants in health worker of sepah pasdaran in Iran. Military. Med. J., 3 (3): 107-111.

Alizadeh, A.H., M. Ranjbar and S.M. Alavian *et al*., 2005. Intra-familial prevalence of hepatitis B virologic markers in HBsAg positive family members in Nahavand, Iran. World J. Gastroenterol., 11 (31): 4857-4860.

Das, K., R.K. Gupta and V. Kumar *et al*., 2003. Immunogenicity and reactogenicity of a recombinant hepatitis B vaccine in subjects over age of forty years and response of a booster dose among nonresponders. World J. Gastroenterol., 9 (5): 1132-1134.

Garcia, L. Llop, A. Asensi, Alcoverro, P. Coll and Mas *et al*., 2001. Anti-HBs titers after a vaccination program in children and adolescents. Should a booster dose be given? An. Esp. Pediatr., 54 (1): 32-37.

German, V., G. Giannakos and P. Kopterides *et al*., 2006. Serologic indices of hepatitis B virus infection in military recruits in Greece (2004-2005). BMC. Infect. Dis., 14 (6): 163-165.

Hassan, S. and F. Ziba, 2007. Antibody titer in Iranian children 6 years after hepatitis B vaccine administration. Vaccine, 25 (17): 3511-3514.

Hussain, Z., S.S. Ali and S.A. Husain *et al*., 2005. Evaluation of immunogenicity and reactogenicity of recombinant DNA hepatitis B vaccine produced in India. World. J. Gastroenterol., 11 (45): 7165-7168.

Kabir, A., S.M. Alavian and N. Ahanchi *et al*., 2006. Combined passive and active immunoprophylaxis for preventing perinatal transmission of the hepatitis B virus in infants born to HBsAg positive mothers in comparison with vaccine alone. Hepatol. Res., 36 (4): 265-271.

Keating, G.M. and S. Noble, 2003. Recombinant hepatitis B vaccine (Engerix-B): A review of its immunogenicity and protective efficacy against hepatitis B. Drugs., 63 (10): 1021-1051.

McMahon, B.J., D.L. Bruden and K.M. Petersen *et al*., 2005. Antibody levels and protection after hepatitis B vaccination: Results of a 15-year follow-up. Ann. Int. Med., 142 (5): 333-341.

Saravanamuttu, G., I. Samreen and M. Joanne *et al*., 2007. International public health repository for hepatitis B. Nucleic. Acids Res., 35 (2): 367-370.

Shepard, C.W., E.P. Simard and L. Finelli *et al*., 2006. Hepatitis B virus infection: Epidemiology and vaccination. Epidemiol. Rev., 28 (1): 112-125.

Sunbul, M., H. Leblebicioglu and S. Esen *et al*., 2000. Response to hepatitis B vaccine in HBsAg/anti-HBs negative and anti-HBc positive subjects. Scand. J. Infect. Dis., 32 (3): 315-316.

Vildozola, G.H., 2007. Vaccination against hepatitis b: 20 years later. Rev. Gastroenterol. Peru, 27 (1): 57-66.