

Hepatitis B Vaccination Coverage Among Iranian Medical Students and Nursing Staff

¹Seddiqe Amini-Ranjbar and ²Mohammad Esmaeel Motlagh

¹Kerman Neuroscience Research Center,

²Ministry of Health, Department of Pediatrics, Afzalipoor Hospital,
Kerman University of Medical Sciences, Kerman, Iran

Abstract: After elapsing more than a decade since the beginning of hepatitis B vaccination program in Iran, this study was designed to investigate the level of hepatitis B vaccination coverage in medical students and nursing staff of Kerman teaching hospitals and to explore the main barriers to vaccination. This cross-sectional study was performed on 493 randomly selected medical students and hospital staff working in different wards of the four teaching hospitals of Kerman, Iran (I.R.). Data gathering was done by using a questionnaire including items related to vaccination history and the main barriers to vaccination. Although 86.8% of the health care workers (HCWs) had been vaccinated against hepatitis B, complete vaccination had been performed in only 71.7% of them. Barriers to complete vaccination, in spite of good knowledge of subjects in this regard (93.6%), were negligence (44.6%), unavailability of vaccine (27.7%), fear of complications (9.2%) and lack of knowledge (6.2%). There was significant difference between the students and nurses in regard to their vaccination coverage level ($p < 0.02$) and barriers to complete vaccination ($p < 0.001$). From 83 subjects who had tested their HBSAg prior to the vaccination, 8 ones (9.6%) were positive HBSAg. There was also significant difference between the two groups in the rate of performing vaccination before entering the hospital (76.2% of students vs. 32.5% of nurses, $p < 0.001$). Considering high rate of positive HBSAg among hospital staff, insufficient knowledge about the necessity of complete vaccination against hepatitis B and high risk of exposure in the studied groups, enhancing the uptake of the vaccine by this target population should be a priority to the health policy experts in Kerman and possibly Iran.

Key words: Hepatitis B vaccination, health care workers, Iran

INTRODUCTION

Hepatitis B infection due to its various risk factors and transmission routes is seen in all ages and all around the world. According to global statistics more than two billions are infected with hepatitis B of whom 350 millions (5%) are chronic carriers^[1]. Every year more than one million of the affected individuals die due to complications such as cirrhosis and liver carcinoma, while there is an effective vaccination without any side effect for this infection^[2].

The Healthcare Workers (HCWs) and medical students are at risk of infection with hepatitis B through occupational exposure to blood and infectious body fluids^[2,3] and HBV is also the most easily transmitted bloodborne pathogen. Some reports from Iran show that the age-and sex-standardized prevalence for HBsAg positivity is up to 8.1% in adult population^[4], so it is very important for HCWs residing in endemic areas such as Iran to have effective seroprotection against

HBV through vaccination. In Iran hepatitis B vaccination for HCWs and medical students is free of charge.

Considering the mentioned statistics and the importance of the issue and also lack of any report about the immunity level of high risk groups (health-treatment personnel) after elapsing more than a decade since the beginning of hepatitis B vaccination program in Iran, the present study was performed to investigate the level of vaccination coverage and main barriers to vaccination in medical students and HCWs in Kerman University of Medical Sciences with the aim of improving the health statue of the community.

MATERIALS AND METHODS

The present cross-sectional study was done on 493 individuals [medical students, nurses, nurse's aids (*Behyars* and *Komak-Behyars*)] working in different parts of the 4 teaching hospitals of Kerman (laboratory,

operation room, pediatrics ward, medical-surgical ward, emergency room, hemodialysis ward and ICU) during 2004-2005. Kerman is the center of the largest province of Iran located in the south of the country.

Sampling was done by convenient method. After explaining the aims of the study for the subjects and obtaining their consent, a questionnaire including data on demographic characteristics and vaccination history (performing HBSAg test before vaccination, history of vaccination, number of doses, and barriers to vaccination) was given to each participant. Data were gathered anonymously. Collected data were analyzed by SPSS 14 by using Chi-square test, Exact test, and student's t-tests. P less than 0.05 was considered as significant.

RESULTS AND DISCUSSION

Of the subjects studied, 60.0% were hospital personnel and 40% were medical students. Most of the subjects were females (69.4%) and 69.3% of them were 20-30 years.

Overall 86.8% had been vaccinated but complete vaccination had been performed in only 71.7% of the subjects. HBSAg had been checked in 83 ones (19.4%) before vaccination and 8 ones (9.6%) were found to be positive.

Most of the students (76.2%) had been vaccinated before entering the hospital, while most of the hospital personnel (76.5%) had done their vaccination after entering the hospital. Subjects had been encouraged for performing vaccination, respectively by the individual himself (57.9%), coworkers (25.5%), physicians (9%) and system required regulation (7.9%).

As it is shown in Table 1 the frequency of vaccination was 91% in nurses, 88.7% in *Behyars* (nurse's aids), 78.6% in *Komak-behyars* (nurse's aids) and 82.5% in medical students that showed a significant difference between medical students and hospital personnel ($p = 0.02$).

The most important barriers to vaccination or completing vaccination were respectively negligence (44.6%), unavailability of vaccine (27.7%) and fear of side effects (9.2%). There was significant relationship between barriers to vaccination and subjects' type of work ($p < 0.001$) (Table 2). While fear of vaccine side effects was reported only by personnel (19.4%), in medical students more significant barrier was vaccine unavailability (47% against 6.4%) (Table 2). The percentage of negligence was almost the same in the studied groups.

Table 1: The frequency distribution of hepatitis B vaccination (one dose or more) in health care workers and medical in Kerman, Iran*

	Medical Students (n = 194)	Hospital staff (n = 299)	Total (n = 493)
Vaccination status			
Yes	160 (82.5)	268 (89.6)	428 (86.8)
No	34 (17.5)	31 (10.4)	65 (13.2)
Total	194 (100)	299 (100)	493 (100)

*: Values in parentheses show percents

Table 2: The frequency distribution of barriers to hepatitis B vaccination in health care workers and medical students in Kerman, Iran*

Barriers	Medical students	Hospital personnel	Total
Negligence	14 (41.2)	15 (48.4)	29 (44.6)
Vaccine unavailability	16 (47)	2 (6.4)	18 (27.7)
Fear of side effects	0 (0)	6 (19.4)	6 (9.2)
Lack of knowledge	2 (5.9)	2 (6.4)	4 (6.2)
Others	2 (5.9)	6 (19.4)	8 (12.3)
Total	34 ()	31 (100)	65 (100)

*: Values in parentheses show percents

Around 36 million HCWs face the risk of getting a needlestick injury worldwide^[2]. In contrary to the fact that HBV vaccine is offered free of charge to HCWs in Iran as in some other developing countries, the claims on the compliance to HBV vaccination among HCWs had been conflicting^[5]. The present study showed that although most of the studied subjects (86.8%) had been vaccinated against hepatitis B, the complete vaccination program had been done in 71.7% of them. The rate of vaccination in our subjects was almost similar to that of physicians practicing in Tehran^[6], HCWs of Saudi Arabia^[5], and US^[3] (74, 72 and 75%, respectively) but is higher than the rate of vaccination reported in the studies of north Sydney^[7], south London^[8], Sweden^[9] and Egypt^[10] (56, 33, 40 and 16%, respectively).

The significant difference between students and hospital personnel in regard to the rate of vaccination ($p = 0.02$) may be due to higher fear in personnel resulting from their frequent exposure to patients and blood or the availability of vaccination center in their work place^[5]. Most of the hospital personnel (67.5%) had been vaccinated after entering the hospital and only 6.4% of them had not completed their vaccination due to unavailability of vaccine at due time.

The most important barriers to vaccination in the current study were negligence (44.6%), vaccine unavailability (27.7%), fear of vaccine or its side effects (9.2%) and lack of knowledge (6.2%). Lack of knowledge (54.4%), unaware of the necessity of vaccination (35%) and cost of vaccination (17%) have

been the most important barriers to vaccination in Tehran physicians^[6] and vaccine unavailability (62.7%) has been the most reported barrier in health care personnel of the Army of Guardians of Islamic Revolution^[11]. In south London, fear of vaccination and its side effects, poor knowledge about the transmission routes of hepatitis B, work pressure and negligence have been the most important barriers to vaccination^[8]. As it was seen in the present study, although 63.9% of the studied subjects had enough knowledge about vaccination, the same mentioned factors have caused them not to complete their vaccination, while by providing necessary facilities and requiring vaccination for hospital personnel these factors could be eliminated to achieve a 100% vaccination coverage.

The presence of 8 (9.6%) positive HBSAg cases in 83 subjects who had performed HBSAg test prior to their vaccination shows the high prevalence of this infection in this high risk group. It seems that if all our subjects had checked HBSAg, the rate of positive cases was even more. This shows the necessity of hepatitis B vaccination. The rate of vaccination in medical students before their entering to the hospital (76.2%) is indicative of their good knowledge in this relation. Fear of vaccination and its side effects has been 0% in this group, while in 19.6% of nurses the same factor has been as a barrier to vaccination (Table 2).

CONCLUSION

Considering high prevalence of positive HBSAg among HCWs, insufficient knowledge about the necessity of complete vaccination against hepatitis B and high risk of exposure in the studied groups, enhancing the uptake of the vaccine by this target population should be a priority to the health policy experts in Kerman and possibly Iran.

REFERENCES

1. Safioleas, M., N.J. Lygidakis and C. Manti, 2007. Hepatitis B today. *Hepatogastroenterology*, 54: 545-548.
2. Deisenhammer, S., K. Radon, D. Nowak and J. Reichert, 2006. Needlestick injuries during medical training. *J. Hospital Infect.*, 63: 263-267.
3. Simard, E.P., J.T. Miller, P.A. George, A. Wasley, M.J. Alter, B.P. Bell and L. Finelli, 2007. Hepatitis B vaccination coverage levels among healthcare workers in the United States, 2002-2003. *Infect. Control. Hosp. Epidemiol.*, 28: 783-790.
4. Roshandel, G., S. Semnani, A. Keshtkar, H. Joshaghani, A. Moradi, K. Kalavi, D. Roshandel and N. Abdolahi, 2007. Seroprevalence of hepatitis B virus and its co-infection with hepatitis D virus and hepatitis C virus in Iranian adult population. *Indian J. Med. Sci.*, 61: 263-268.
5. Panhotra, B.R., A.K. Saxena, H.A. Al-Hamrani and A. Al-Mulhim, 2005. Compliance to hepatitis B vaccination and subsequent development of seroprotection among health care workers of a tertiary care center of Saudi Arabia. *Am. J. Infect. Control.*, 33: 144-150.
6. Alavian, S.M. and S. Hatami, 2003. Hepatitis B vaccination rates among physicians practicing in Tehran. *Med. Council. J.*, 3: 224-207.
7. Stanford, M.P. and Tr. Black *et al.*, 1995. Hepatitis B vaccination rates among staff at a district general hospital. Public health unit, Northern Sydney Area health services. *Med. J. Aust.*, 62: 304-306.
8. Briggs, J.M. and Thomas, 1994. Obstacles to hepatitis B vaccination uptake by health care staff. *J. Public Health*, 108: 137-148.
9. Dannetun, E., A. Tegnell, A. Torner and J. Giesecke, 2006. Coverage of hepatitis B vaccination in Swedish healthcare workers. *J. Hosp. Infect.*, 63: 201-204.
10. Talaat, M., A. Kandeel, W. El-Shoubary, C. Bodenschatz, I. Khairy, S. Oun and F.J. Mahoney, 2003. Occupational exposure to needlestick injuries and hepatitis B vaccination coverage among health care workers in Egypt. *Am. J. Infect. Control*, 31:469-474.
11. Alavian, S.M., M. Saadati, A. Mirsadeh, A. Razaghi, R. Mehrabani and S. Hatami, 2001. hepatitis B vaccination rates among health care personnel of the Army of Guardians of Islamic Revolution. *Army Med. J.*, 3: 107-111.