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Original Article

Comparing Liver Enzymes Variations and Hepatitis B Risk Factors Among Military and Civilian Chronic Carriers of Hepatitis B

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Abstract

Background and Aim: Hepatitis B is a major health problem in the world and also in our country, Iran. Presence in war zones is among the most important risk factors for developing hepatitis B. This study was conducted to compare liver enzymes variations and hepatitis B risk factors among military and civilian chronic carriers of hepatitis B.

Methods: This was a cross-sectional descriptive-analytical study. All chronic male carriers of hepatitis B referring to the Infectious Diseases and Tropical Medicine Private Clinic, Birjand, Iran, during 2005–2015 were studied. A demographic questionnaire (containing items such as gender, employment, and marital status), laboratory report sheets, and a hepatitis B risk factor data collection form were used for data collection. The form contained risk factors such as history of endoscopy, surgery, tattoo, ethanol abuse, cupping, injections, foreign travel, and war zone presence. The data were entered into the SPSS software (v. 16.0) and were analyzed through conducting the independent-samples, the chi-square, and the Fisher exact tests at the significance level of 0.05.

Results: In total, 486 chronic carriers of hepatitis B were studied among whom, 77 (16%) were militaries and 409 (84%) were civilians. The most important risk factor for hepatitis B infection among all participants was a history of surgery (13.6%) while the main risk factors among militaries and civilians were respectively a history of war zone presence and war wounds (19.5%) and a history of surgery (13.45%). The prevalence of coincident hepatitis B among civilians' wives, fathers, and mothers was 2.9%, 5.9%, and 12% respectively while in the militaries group, these values were respectively 5.2%, 2.6%, and 2.6%. Most participants (38.9%) had received a hepatitis B diagnosis during non-specific periodical laboratory tests. The participating militaries and civilians did not differ significantly from each other regarding the serum levels of alanine aminotransferase, aspartate aminotransferase, and alkaline phosphatase ($P>0.05$).

Conclusion: Study findings indicate that except for a history of war zone presence which was longer among the participating militaries, the main risk factors for hepatitis B among militaries and civilians were histories of surgery, endoscopy, and cupping. Consequently, a history of direct contact with blood should be considered as a major risk factor for hepatitis B infection.

Keywords: Hepatitis B, Military, Civilian, Risk factors.

Introduction

Hepatitis B is among the major health problems in the world and also in our country, Iran. Before the nationwide vaccination program in 1991, hepatitis B was highly prevalent in Iran (1,2). However, after the program, hepatitis B prevalence was decreased significantly (3). It is estimated that among the total six-billion people population of the world, two billion people have hepatitis B infection. Currently, the number of patients suffering from chronic hepatitis B infection has been estimated to be more than 350 million from which, one million people die due to chronic liver disease (4-6).The prevalence of hepatitis B in the Southern Khorasan province, Iran, has been reported to be 1.3% (7).

The most important risk factors for hepatitis B transmission are exposure to infected blood, mother-to-child transmission during pregnancy, unsafe sex, and direct contact with infected medical, surgical, or dental equipment (1,2). In Iran, the most important risk factors include masculinity, bachelorhood, a history of contact with infected people, illegal drug injection, illegitimate sexual relationship, and certain types of employment such

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as serving in military (8).

Given the higher risk for war wound among militaries and the greater probability of unsterile surgical practice during wartime, hepatitis B virus is considered as one of the main health risks for militaries (9). The results of a study conducted in Iranian military institutions illustrated a hepatitis B prevalence of 2.2% among war victims and a significant correlation between the length of presence in war zone and a positive hepatitis B surface antigen (HBsAG) result (10). Studies conducted in other countries also reported that hepatitis B infection rate is high among militaries. Moreover, these studies have introduced a history of war damage as a risk factor for the infection (10-13).

Given the work condition of militaries, hepatitis B and its risk factors are of great importance to them. This study was conducted to compare liver enzymes variations and hepatitis B risk factors among military and civilian chronic carriers of hepatitis B.

Methods

This was a cross-sectional descriptive-analytical study. All 486 militaries and civilians referring to the Infectious Diseases and Tropical Medicine Private Clinic, Birjand, Iran, during 2005–2015 were studied. After obtaining ethical approval from the Ethics Committee of Birjand University of Medical Sciences, Birjand, Iran, all HBsAG-positive patients were interviewed and examined by a physician. The aims of the study were explained to the participants and they were asked to complete a demographic questionnaire and a hepatitis B risk factor data collection form. The form contained risk factors such as history of endoscopy, surgery, tattoo, ethanol abuse, cupping, injections, foreign travel, and war zone presence. Then, a five-milliliter blood sample was obtained from the brachial vein of each participant. The samples were entered into complete-blood-count test tubes containing EDTA 5% and then, they were sent to the laboratory of the Research Center of Birjand University of Medical Sciences. In the laboratory, the serum part of each sample was extracted and frozen. Finally, the samples were unfrozen and tested regarding antibodies to hepatitis B e-antigen (anti-HBe) and hepatitis C antigen (anti-HCV). The tests were performed via the enzyme-linked immunosorbent assay (ELISA) method and by using the DIA.Pro Diagnostic Bioprobes, srl kits (Italy). The levels of liver enzymes were also assessed simultaneously.

The data were entered into the SPSS software (v. 16.0) and were analyzed through conducting the independent-samples, the chi-square, and the Fisher exact tests at the significance level of 0.05.

Results

From among 486 patients who were studied, 77 (16%) were militaries and 409 (84%) were civilians. All patients were male. Moreover, 67 militaries (87%) and 301 civilians (74%) were married.

The most important risk factor for hepatitis B among all participants was a history of surgery (13.6%) while the most important risk factors among militaries and civilians were respectively a history of war zone presence (15 ones; 19.5%) and a history of surgery (55 ones; 13.45%). Except for the relative frequency of war zone presence which was significantly greater among the participating militaries, there were no significant differences between the two groups of participants regarding the relative frequencies of the other risk factors (Table 1). The most common method of diagnosing affliction with hepatitis B was non-specific periodical laboratory tests (38.9%). The two groups did not significantly differ from each other in terms of the method of hepatitis B diagnosis ($P > 0.05$).

Table 2 shows the prevalence of hepatitis B among participants' family members. Study findings showed that compared with other family members, hepatitis B prevalence was greater among militaries' wives (5.2%) and civilians' mothers (12.1%).

In overall, the mean values of the participants' serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), and alkaline phosphatase (ALP) were respectively 43.37 ± 38.20 IU/ml, 34.77 ± 27.42 IU/ml, and 224.09 ± 132.52 IU/ml. These values in the militaries group were 38.34 ± 23.18 IU/ml, 29.07 ± 11.91 IU/ml, and 191.72 ± 118.24 IU/ml while among civilians were equal to 44.31 ± 40.09 IU/ml, 35.63 ± 29.08 IU/ml, and 224.58 ± 132.81 IU/ml, respectively. The study groups did not differ significantly concerning the serum levels of liver enzymes ($P > 0.05$).

Discussion

The study findings indicated that the prevalence of

Table 1. Comparing the Relative Frequency of the Risk Factors for Hepatitis B Among Militaries and Civilians

Risk Factors	Militaries (77)	Civilians (409)	Total (486)	The Results of Statistical Tests
	No. (%)	No. (%)	No. (%)	
History of endoscopy	6 (7.8)	49 (12.2)	55 (11.5)	0.29
History of surgery	11 (14.3)	55 (13.7)	66 (13.8)	0.84
History of tattoo	0 (0)	20 (5)	20 (4.2)	0.06
History of ethanol abuse	0 (0)	6 (1.5)	6 (1.3)	0.59
History of cupping	6 (6.5)	32 (7.9)	37 (7.7)	1.00
History of injections	1 (1.3)	14 (3.5)	15 (3.1)	0.48
History of foreign travel	1 (1.3)	4 (1)	5 (1)	0.58
History of war zone presence	15 (19.5)	36 (9)	51 (10.5)	0.005

Table 2. Comparing the Relative Frequency of Coincident Hepatitis B Infection Among the Family Members of the Participants

Family Members	Militaries (77)	Civilians (409)	Total (486)	*P* Value
	No. (%)	No. (%)	No. (%)	
Spouse's affliction	4 (5.2)	12 (2.9)	16 (3.3)	0.29
Mother's affliction	2 (2.6)	49 (12)	51 (10.5)	0.01
Father's affliction	2 (2.6)	24 (5.9)	26 (5.3)	0.41

coincident hepatitis B infection among civilians' wives, fathers, and mothers was respectively 3%, 5.9%, and 12.1%, resulting in a total prevalence of 21% among family members. Among the family members of the participating militaries, these values were equal to 5.2%, 2.6%, 2.6%, and 10.4%, respectively. Coincident hepatitis B infection rate among militaries' parents and wives was respectively lower and higher than civilians'. Alavian et al (14) also found that 16.3% of Iranian civilians family members and 2% of militaries' family members were HBsAG-positive and this difference between the groups was statistically significant. They also reported that the highest hepatitis B prevalence rate among the family members of both militaries and civilians was related to their mothers (33.3%) while only 8% of their wives were HBsAG-positive (14). In line with the findings reported by Alavian et al (14), we also found that coincident family member infection was greater among civilians' mothers. However, contrary to their findings, our findings revealed that in the militaries group, the highest coincident infection prevalence rate was related to their wives. These findings denote the greater likelihood of getting infection through other transmission routes such as direct contact with infected blood and sharp injuries, war wounds, or sexual relationship. On the other hand, the greater prevalence of hepatitis B among civilians' mothers can show the likelihood of mother-to-child transmission during pregnancy. In agreement with our findings, the results of a study made in Singapore also showed that the prevalence of positive HBsAG results among the spouses of infected patients was 10% (15).

The most important risk factors among all participants, militaries, and civilians were respectively a history of surgery, a history of war wounds, and a history of surgery. Todd et al assessed risk behaviors associated to hepatitis B among injection drug users in Afghanistan and reported needle sharing as the most important risk factor (16). This confliction can be attributed to difference in the vaccination and awareness-raising programs implemented in Iran and Afghanistan. Other studies reported factors such as a history of tattoo, cupping, direct contact with infected individuals, and employment in high-risk jobs as the risk factors for hepatitis B. These factors were also found in the present study. In agreement with our findings, Alavian et al also found that a history of war zone presence was the most common risk factor for hepatitis B (14). The results of another study made by Alavian et al (8) on Iranian militaries and civilians also illustrated that the relative risk for hepatitis B among individuals with a history of war wounds was 1.6 times greater than individuals who did not have such a history. Another study conducted on the victims of Iran-Iraq war reported that the length of war zone presence was significantly correlated with a history of hepatitis and a positive HBsAG result (9).

In line with our findings, studies conducted in other countries also confirmed a history of surgical operations (19,20) and military employment (20) as the risk factors for hepatitis B. Consequently, the risk for hepatitis B transmission during surgeries can be reduced through conducting injections, blood transfusions, and surgical operations under strict sterile conditions and safety regulations. On the other hand, a history of war zone presence and war wounds has been reported by different studies as a main risk factor for hepatitis B among militaries (8,9,20). Direct contact with bloods and body secretions of war victims, use of shared equipments and devices such as razorblades, and infliction by war wounds are among the most important factors which increase the risk for hepatitis B among militaries. The findings of the present study revealed no significant difference between the participating militaries and civilians regarding the levels of liver enzymes, denoting that the severity of the disease among these two groups was the same.

Conclusion

Study findings suggest that except for a history of war zone presence which was longer among the participating militaries, the main risk factors for hepatitis B among militaries and civilians were histories of surgery, endoscopy, and cupping. Consequently, a history of direct contact with blood should be considered as a major risk factor.

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