



Seroprevalence of Hepatitis B and C in Clinical Staffs (Doctor and Nurse) of the Hospitals in Khorramabad City, Western Iran

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ABSTRACT

Health care workers who have contact with blood and secretions have an increased occupational risk for blood transmitted infections. The aim of this study was to determine the seroprevalence of Hepatitis B and C infections and evaluation of the level of HBV antibody titer in clinical staffs (doctor and Nurse) of the four hospitals in Khorramabad city, Iran. This cross-sectional study investigated 462 clinical staffs (doctor and nurse) in the government hospitals of Khorramabad city. The history of HB vaccination and contact with blood and secretions and body fluids recorded. 5cc blood was collected from each person and HBSAg and HBSAb and HCVAb were measured by ELISA method. Among 462 participants 381 (82.47%) were women and 81 (17.53%) were men, 9(1.95%) participants were positive for hepatitis, there were 7 (1.52%) cases positive for HBs Ag, 2 (0.43%) cases for HCV Ab. HCV and HBV prevalence was highest in the age group of 45 to 54 and 30 to 40 years respectively, prevalence rates were higher in females compared to males, from a total of 9 Infected participants, 3 had a history of needle stick injury, 6 had a history of surgery, also, none of these nine hepatitis positive subjects had the experience of blood reception, hepatitis patients have work experience in the surgical ward, operating rooms and emergency. According to the results of this study prevalence of HBV and HCV in clinical staffs (doctor and nurse) in hospitals less than other people. The doctors and nurses have the highest rate of knowledgeable about preventive and control methods of hepatitis.

Keywords: Antibody Titer, Clinical Staffs, Prevalence, Hepatitis B, Hepatitis C

INTRODUCTION

Among the occupational threats to staff in the medical profession is the transmission of viral infections such as Hepatitis B and C through cutaneous contacts (piercing by needles or cuts by sharp objects) and mucus contact and non-intact skin with blood and biological fluids [1-5]. The infection risk depends on the number of patients, the carrier of infection and the personnel working with the patients [6]. Hepatitis B and C creates chronic diseases and is debilitating for the individual and according to reports a serious blood-borne infection can cost the equivalent of a million dollars for tests, follow up treatments and disability costs and the loss of working time [7]. Transmitted infections caused by occupational exposure consists of 37%, 39% and 4% of all cases of Hepatitis B and C in personnel assigned to the medical profession [8]. It is reported that the occupational exposure per year is an average of 3.5 per 100 employees and 0.5 per 100 patient reception [9,10].

Hepatitis B has over 385 million carriers around the world (11) and the risk of transmission of the hepatitis B virus depends on the patients contact with blood and the patients HBe-Ag status and has a 1-40% chance of exposure in the patient [12, 13]. In Iran 2-3% of the population are carriers of the Hepatitis B virus [14] and 67.8% have chronic Hepatitis and 82% of the patients infected with Hepatitis C in Iran have at least one positive sign of serologic Hepatitis virus [15,16]. With the implementation of vaccination programs against Hepatitis B a high immunogenic potential is created for the recipients of the vaccine. In healthy people there is no need for the periodic review of the antibody or the need for a booster injection and it is noted that 95% of healthy people are immunized with 3 doses of vaccine and even if the titer antibody is low, the safety levels in the body are still at a level which prevents infection in the person [17]. It has been studied that in 40% of the people that received vaccine, titer antibody against HBs-Ag over time (7 years after receiving the vaccine) reduces and is even negative in tests carried out but the strength of immunogenicity is still intact [18]. The present study was carried out with the goal to survey and determine the prevalence of Hepatitis B and C and the assessment of HBV antibody amongst the staff (doctors and nurses) working in 4 hospitals of Khorramabad city, West of Iran in 2015.

MATERIALS AND METHODS

Study design and Participants

This cross-sectional study investigated 462 clinical staff (doctors and nurses) in four hospitals of Khorramabad city, (Shohadai Ashayer, Shahid Madani, Shahid Rahimi and Asalian), West of Iran. After reviewing their personnel files in terms of test results of Hepatitis B, C and the amount of antibody titer recorded in the personnel files and given the necessary explanations to the people whom were chosen statistically and their basic demographic information including their age, sex, job, contact with blood and body fluids, experience, history of vaccination for Hepatitis B, history of tattooing, unprotected sexual contact, serologic situation of disease and etc... were recorded.

Sample collection

Totally 462 serum samples from participants were collected and tests including an examination of Hepatitis B, C and HCVAb (antibody against Hepatitis c) were conducted. Since vaccination is done for hepatitis B, reviews for screening these people included their vaccination and whether their bodies respond to the vaccine according to standard parameters were carried out.

Serological tests

All the serum samples were tested for HBsAg, HBsAb and HBcAb using the commercially available Enzyme-linked immunosorbent (ELISA) kit (Dia.Pro, Milano, Italy). Analyses were performed following the manufacturer's instructions. The interpretations of the results are as follows:

HBsAg negative, HBsAb negative, HBcAb negative: The person does not have Hepatitis B, hasn't been vaccinated or his body has not been effective against the vaccine, because there is no HBsAb antibody (must be vaccinated).

HBsAg negative, HBsAb positive, HBcAb negative: This person does not have Hepatitis B, has been vaccinated and the vaccine has been effective and the antibody is positive (positive vaccination)

HBsAg negative, HBsAb positive, HBcAb positive: This person currently does not have Hepatitis B but has had contact with the virus in the form of viral infection; the body of the patient has built an antibody against the virus (natural positive).

HBsAg positive, HBsAb negative, HBcAb negative: This person is a carrier of Hepatitis B. His body has not excreted the virus and the virus remains in his body and is in need of more studies (carrier)

The antibody titer (HBsAb) was also measured and classified as below:

Negative: If the antibody titer was less than 10 IU/ml

Weak Positive: If the antibody titer was between 10-100 IU/ml

Positive: If the antibody titer was more than 100 IU/ml

Statistical analyses

Analytical and descriptive statistics was carried out using SPSS 17.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were reported in terms of per cent (for categorical) and mean (SD) (for continuous) variables. Chi-square test was applied to access the univariate association between independent variables and outcome. $P < 0.05$ was considered to be statistically significant.

RESULTS

According to the study results, amongst the 462 participants in the study 381 (82.47%) were women and 81 (17.53%) were men. Nine (1.95%) were infected with hepatitis which were all positive cases of women and from the 9 infected 7 (1.52%) had HBsAg and 2 (0.43%) had HCV-Ab. Hepatitis C was mostly observed between the ages 45 to 54 and hepatitis B was mostly seen between the ages 30 to 40. Most of the infected were women. From the 9 infected 3 of them had a history of needle stick in their workplace and 6 had a history of surgery and none of them had a history of receiving blood but in terms of work history all had worked in surgery rooms and emergency sections. There was no history of sexually transmitted diseases amongst them. Eight of the 9 infected persons (88.88%) had a history of dental care, 2 (22.22%) had a history of scissors cut and one had a history of bloodletting and also tattooing. In this study the prevalence of hepatitis B was (1.51%) and the prevalence of hepatitis C was (0.43%). Although the findings of this study do not show the original transmission of the disease but it can be said that the people working in the health care sectors are more prone to this disease.

DISCUSSION

Mucocutaneous contact with blood and body secretions cause blood-borne infections in people that are exposed to them which the most important of them are Hepatitis B and C. Hospital staff are among the high risk personnel for the transmission of viral infectious diseases, but because they have a higher knowledge of prevention and control of hepatitis compared to the general population and vaccination of Hepatitis B therefore leading to the reduction of the incidence of hepatitis.

The results of the present study show that from the 462 people that were sampled, 9 had hepatitis infection (1.95%), 7 of which were infected with HBsAg (1.52%) and 2 with HCV-Ab (0.43%). People infected with hepatitis C was mostly observed between the ages 45 to 54 and hepatitis B was mostly seen between the ages 30 to 40. Most of the infected were women. From the 9 infected 3 of them had a history of needle stick in their workplace and 6 had a history of surgery [19]. The abundance of infection to hepatitis B virus among the medical sector staff in the United States is 0.4% to 1.6% and in western European countries 1.2% to 2.0% [20]. This abundance in Iran has been stated in different studies from 1.6% to 6% [21]. HBsAg has been reported between 2.7% to 9.8% in Saudi Arabia, 0.5% to 5% in Italy and 2% to 3% in Iran [22]. In a study carried out in Nepal, no positive cases among the medical staff were observed [23]. In a study that was carried out in Canada 3 people were found positive for HCV [24] and in another study in Italy 77 out of 800 staff of hospitals were found positive for HCV and HBs [25]. The amount of infected cases in different studies differs according to the workplace of personnel, amount of interaction with infected patients and history of work.

CONCLUSION

The people participating in this study were educated people with more knowledge of the ways of infection therefore it was expected that the abundance of the virus would be lower compared to the public. The present study showed that the health sector personnel are vaccinated once or twice during their service. Medical jobs are in more danger of infection compared to the public. This study was unable to determine the main pattern of disease transmission, but transmission has a significant relationship with the workplace ($P < 0.05$).

Constraints and Suggestions

The main constraint of the study was the lack of employee participation for blood sample collection. It is essential to promote awareness and knowledge with workshops and ongoing training.

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