Prevalence of viral infection of blood donors in Ilam blood transfusion center

Farajolah Maleki[1], Saeid Hemati[1], Zahra Mahdavi[1], Zahra Ghobadian[1], Mitra Azizian[1], Mansour Amraei[2*]

1. Clinical Microbiology Research Center, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran
2. Department of Physiology, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran

[*]**Corresponding author:** Tel: : +98 8432235724; fax: +98 8432235724
Address: Department of Physiology, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran
E-mail: amraei_m@yahoo.com
Received; 3/03/2015 revised; 5/03/2015 accepted 8/03/2015

Abstract

Introduction: Blood-borne infectious agents are one of the main anxieties of Blood Transfusion Organization in all countries. According to WHO, the blood healthy and blood safety is included ensuring and monitoring of quality and efficiency for all patients requiring blood transfusion. We at the current study intend that survey prevalence HIV Ab, HCV Ab, HBS Ag Among blood donors refer to the Blood Transfusion Organization of Ilam in 2010-2011.

Materials and methods: The sample size was folders of 4005 subjects who entered into the study with census method. Screening test was performed for hepatitis B surface antigen, Antibodies against hepatitis C virus and HIV Ab. For confirmed positive result that obtain by screening test we use for HBV, HCV, HIV respectively.

Results: Number (percent) of subjects with hepatitis B (HBV), hepatitis C (HCV) and HIV among the infected blood donors were 29 (70.7%), 11 (26.8%) and 1 (2.5%), respectively. There was no significant association between education level and disease ($P>0.05$), Significant correlation ($P<0.01$) was found between job variables and disease

Conclusion: The low prevalence of HIV infection in this study and other similar studies in Iran May be due to the higher percentage of more regular volunteer donors in Iran As the World Health Organization studies show that voluntary donors are with the lowest prevalence of HIV, hepatitis viruses and other blood-borne infections

Keywords: Prevalence, Viral Infection, Blood, Donors

Introduction

In spite of the blood transfusion and process of receiving blood products are the only ways to save the patient's at the sometime, however, some pathogen transfer from this way (1). The main goal of the Blood Transfusion Organization, provide an adequate and safe blood for regular and conditions. Transfusion-transmitted bacterial infection and contaminated blood products with bacteria is a main concern of Blood Transfusion Organization worldwide. The use of greater amount of blood transfusion is associated with a transfusion-transmitted bacterial infection particularly for HIV and Hepatitis viruses (2,3).

There are many steps taken to ensure quality of the blood products, at first, perfect Health history obtained in order to inspection primary health. All Blood

[Downloaded from jbrms.medilam.ac.ir on 2026-11-13]

donors are tested in terms of HBS, HIV Ab, HCV Ab, syphilis, and in some parts of in order to antibodies HTLV-I and II (4). According to WHO, the blood healthy and blood safety is included ensuring and monitoring of quality and efficiency for all patients requiring blood transfusion (5). Thus the eventually purpose of these strategies is reduce risk of the transfusion-transmitted bacterial infection (6).

Blood Transfusion Organization Strategies for reduce the risk of transfusion-transmitted bacterial infection through blood and blood products transfusion are various. Strategies including Public education about of blood-borne diseases, Recommendations to blood donors in order to the study manuals and posters that is containing general and special conditions of blood transfusion, Medical examination and investigate apparent health blood donors by the doctor, to questions by doctor about the history of diseases, especially viral diseases, possession of drug injection and uncertain sexual risk behaviors. Also could mention to the confidential self-exclusion system (7,8).

In our country for the screening of donated blood in term of HBS.Ag, HCV.Ab, HIV Ab, at the beginning use enzymatic methods (ELISA). Afterward positive sample been re-evaluated by a confirmatory system that is for HBV by neutralization, HIV by western blots and for HCV by RIBA method.

Since the volunteer blood donors are samples of the normal population, epidemiologic study of HIV and hepatitis viruses can represent the overall state of susceptibility to these diseases in the public. In addition by identifying high-risk populations could carry out careful planning in order to prevent this disease. Therefore, in current study we intend that analysis prevalence of HIV Ab،HCV Ab, HBS Ag among blood donors refer to the Blood Transfusion Organization in Ilam city (2010-2011).

Materials and methods

We conducted a cross-sectional study based on medical records. We recruited all blood donors that referred to donate blood to the Elam Blood Transfusion Organization on 2010-2011. Total sample size was 4005 subjects who entered into the study with use of census method. Evaluated variables in this research were the number of blood donors, demographic characteristics (age, sex, marital status, education and occupation) and the results of confirmatory HIV Ab, HCV Ab, HBS Ag tests of all blood donors. Chi square test used for data analysis with the statistical software of SPSS. Screening test for hepatitis B surface antigen, antibodies against hepatitis C virus and HIV Ab were commercial kits from Biorad and Avicena, respectively.

Confirmed tests included Behring (German) Innogenetic, RIBA, MP Diagnostica (western blot) for HBV, HCV, HIV were used respectively.

Results

Among all studied population, 3516 (87.8%) of them were males and 489 (12.2%) were female. In terms of education level, 148 (3.7%) were illiterate, 929 (23.2%) without the college degree, 1542 (38.5%) diploma, 601 (15%) associated degree, 709 (17.7%) bachelor, 52 (1.3%) MS and 24 (0.6%) had a PhD.

From the point of view job, 1446 (36.1%) self-employed worker, 953 (23.8%) employee, 541 (13.5%) students, 72 (1.8%) soldier, 216 (5.4 %) military jobs, 376 patients (9.4%) unemployed, 72 (1.8%) labor 329 (8.2%) was housewives.

Also 1622 (40.5%) married, and 2383 patients (59.5%) were unmarried. Prevalence of infection with hepatitis B (HBV), hepatitis C (HCV) and HIV in blood donors, 29 patients (70.7%), 11 (26.8%) and 1 (2.5%), respectively.

The results of this study shows that there was a significant association between sex and disease variables ($P<0.05$) so the

[Downloaded from jbrms.medilam.ac.ir on 2026-11-13]

disease was more prevalent in males. There was no significant association between education level and disease (P>0.05), Significant correlation (P<0.01) was found between job variables and disease. Also the outbreak at the self-employed worker was more people than other occupational groups. Significant association between marital status and disease (P<0.05) were found and There was much sickness among married than unmarried people.

The ultimate goal of all blood centers is to provide safe and adequate blood and blood products and to minimize the risk of infection transmitted through blood and one of the best ways to promote donated blood healthy is choice safe donors in any circumstance (9). According to this study, 41 blood donors were diagnosed with viral illnesses. The largest number, 29 (70.7%) were associated with hepatitis B virus. During the previous study at the years 1997 and 1998, in order to diagnosis of HBV at the patients referred to the Blood Transfusion Center of Ilam, Prevalence of hepatitis B among patients was 2.3% and 2.9% respectively (10). According to previous epidemiological study, Iran is lactated to area with a medium-prevalence of the hepatitis B. The basis one of the best seroepidmiological studies in which the taken in all age groups, the prevalence of HBsAg is estimated 1.7% (11). In a study on the prevalence of viral infections in blood donors referred to the Gorgan blood transfusion organization, of 38920 volunteer blood donors, the amount estimated is 886 patients (2.3%) (12). Also in studies conducted in Mashhad (13), Tehran (14), jahrom (15) has been reported respectively, 1.17, 0.6 and 0.4%.

Hepatitis C is the most common hepatitis following blood transfusion in some countries such as Japan. America and Western Europe has been responsible for 90 % of all cases of HCV. In our study we found 11 cases (26.8%) were infected with hepatitis C virus (16) .

The most common and the most important way for infected with this disease has been receiving blood products contaminated with hepatitis C virus (17).

Other studies in this context was performed in Mashhad (13), Tehran (14), jahrom (15) and Gorgan (12), and results shows that prevalence of HCV infection were 0.1, 0.2, 0.3 and 0.6%, respectively.

Numerous studies throughout worldwide have been shown that prevalence of HCV in the general population, which are often volunteers, from 0.16 to 6 %. Alavian et al found that the prevalence of HCV among Iranian donors (by using confirmatory test) was less than 0.2 percent (18).

Based on our results, only one case (2.5%) was observed with HIV infection which is similar to other studies .In other previous reports HIV infection in blood donors were 0.003 (14), zero (12,15), 0.05 (19), 0.008 (20), 0.017 (21) and 5.5% (22).

Similar studies in Italy, France and America from the years 1995-2002 shows significant reductions a possible explanation for this might be that lifestyle changes and reduce of the prevalence of HIV and also careful screening of blood donors (23-25).

The number of people living with HIV infection worldwide is increasing and has been in 2009 to 33.3 million, i.e. more than 23% in 1999. In 2009, 2.6 million new HIV infections and 1.8 million deaths from HIV/AIDS are estimated. At 2009, incidence of new cases of HIV infection have been 19% lower than in 1999 that reflecting the greater than before efficacy of anti-HIV drug to extend the life of these patient people (26).

The results of other reports showed that the incidence of viral infections was higher in men that are married and self-employed worker which is similar to the results of other studies (10,19). However in some studies, infection was higher in single and self-employed (13). In some other studies, the prevalence was similar in both sexes (14). In the present study, there was no significant association between the disease

[Downloaded from jbrms.medilam.ac.ir on 2026-11-13]

and education level. While in some studies the disease was common in those with less education diploma (14), which indicates the importance of awareness of the disease and its effect on the prevalence or prevention of disease.

The low prevalence of HIV infection in this study and other similar studies in Iran May be due to the higher percentage of more regular volunteer donors in Iran. A world Health Organization study shows that voluntary donors are with the lowest prevalence of HIV, hepatitis viruses and other blood-borne infections. Another important point is that blood can be a good way to detect the disease in people who are not aware of their infection.

Acknowledgment

This study was supported by the research grant Ilam University of Medical Sciences. Deputy will appreciate the cooperation of Ilam Blood Transfusion Center.

References

1. Burke JP. Patient safety: Infection control - a problem for patient safety. N Engl J Med. 2003; 348(7):651-656.
2. Busch MP, Klein SH, Nemo GJ. Current and Emerging Infectious Risks of Blood Transfusions. JAMA 2003; 289(8):959-62.
3. Giuseppe A. Safety in transfusion medicine. Blood Transfus 2008; 6(3): 121-6.
4. Christopher H. Blood Banking And Transfusion Medicine, 2nd Edition, New York Blood Center, New York, USA 2007; P.110.17.
5. Dzik WH, Corwin H, Goodnough LT, Hiqqins M, Kaplan H, Murphy M, et al. Patient safety and blood transfusion: new solutions. Transfus Med Rev. 2003; 17(3): 169-80.
6. Klein HG, Spahn DR, Carson JL. Red blood cell transfusion in clinical practice. Lancet. 2007; 370(9585): 415-26.
7. Brian MC, Contreras M. Appropriateness and safety of blood transfusion. B M J. 2005; 330(7483): 104-5.
8. Hoots WK, Charol A, Don T. The Food and Drug Administration's perspective on plasma safety. Transfus Med Rev. 2001; 15(2): 20-6.
9. Downes KA. Blood safety and surveillance. Transfus Med Rev. 2003; 43(9): 1338-9.
10. Sayehmiri k. [risk factors among donors at blood transmission center of Ilam]. SJIMU. 1380; 9(31):19-23.(Persian)
11. Zali M, Mohammad A, Noorbala AA, Noorimayer B, Shahraz S. Rate of hepatitis B seropositivity following mass vaccination in the Islamic Republic of Iran. East Mediterr Health J. 2005;11(1-2):62-7.
12. Moradi A KB, Sadeghipour M, Besharat S, Tabarraei A. Concurrent infections of hepatitis C and HIV in hepatitis B patients in the north-east of Iran. Trop Doct. 2011; 41(3): 129-31.
13. Ramezani H, Bozorgi SH, Nooranipour M, Sadri M, Molaverdikhani S, Alavian SM. Successful exclusion of blood-borne viral disease in blood donors. Eur J Intern Med. 2011; 22(6): 71–4.
14. Omidkhoda A, Jamali M, Ahmadbeigi N, Hashemi SM, Rahimi A, Soleimani M. Comparison of the prevalence of major transfusion-transmitted infections among Iranian blood donors using confidential unit exclusion in an Iranian population: Transfusion-transmitted infections among Iranian blood donors. Hepat Mon. 2011; 11(1):11-3.
15. Emamghorashi F, Fathi GH, Mohtashami A. Evaluation of demographic characteristics and

[Downloaded from jbrms.medilam.ac.ir on 2026-11-13]

hepatitis B,C and HIV prevalence among blood donors in Jahrom. Sci J Iran Blood Transfus Organ. 2006; 2(7):373-8.

16. Ghany, MG, Nelson DR, Strader DB, Thomas DL, Seeff LB. An update on treatment of genotype 1 chronic hepatitis C virus infection: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011;54(4):1433-44.
17. Wilson KI. Blood borne viruses. B D J. 2005; 198(3):149.
18. Alavian SM, Gholami B, Masarrat S. Hepatitis C risk factors in Iranian volunteer blood donors: A case–control study. J Gastroenterol Hepatol. 2002;17(10):1092-7.
19. Kolivand M, Safari S. Assessment of HIV prevalence in blood donors in Kermanshah province, 2005. Behbood Journal. 2011;14(4):353-6.
20. Rezvan H, Abolghassemi H, Kafiabad SA. Transfusion-transmitted infections among multitransfused patients in Iran: a review. Transfus Med. 2007; 17(6):425-33.
21. Masaeli Z, Jaberi MR, Magsudlu M. A comparison of seroprevalence of blood-borne infections among regular, sporadic, and first-time blood donors in Isfahan. BLOOD(KHOON). 2006; 2(7):301-7.
22. Kasraian L, Torab Jahromi SA. Prevalence of major transfusion transmitted viral infections (HCV, HBV, HIV) in Shiraz blood donors from 2000 to 2005. Sci J Iran Blood Transfus Organ 2007; 3(5):373-8.
23. Pillonel J, Le Marrec N, Girault A, David D, Laperche S. Epidemiological surveillance of blood donors and residual risk of blood-borne infections in France, 2001 to 2003. Transfus clin boil. 2005; 12(3):239-46.
24. Tripodi, G, Imberciadori G. Transfusion-transmissible infections: diagnosis, prevention and residual risk. Blood Transfusion 2005; 3(17):19-31.
25. Zou S. Patterns of age-and sex-specific prevalence of major blood-borne infections in United States blood donors, 1995 to 2002: American Red Cross blood donor study. Transfusion. 2004; 44(11):1640-7.
26. Mazloomy SS, Baghianimoghadam MH. Knowledge and attitude about HIV/AIDS of schoolteachers in Yazd, Islamic Republic of Iran. East Mediterr Health J. 2008; 14(2):292-7.

[Downloaded from jbrms.medilam.ac.ir on 2026-11-13]