SEROPREVALENCE OF HEPATITIS B,C AND HIV INFECTION IN HEALTHY BLOOD DONORS; A SINGLE CENTER STUDY IN PESHAWAR

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ABSTRACT

Objective: To determine the prevalence of Hepatitis B, hepatitis C and HIV in healthy blood donors of Peshawar Pakistan.

Materials and Methods: Retrospective study of viral infection in the blood donated by healthy donors. Study period was from Jan 2016 to Dec 2017. The blood was screened by chemiluminescence technique at Rehman Medical Institute Peshawar, Pakistan.

Results: Out of the total 11760 blood donors, 338(2.87%) were positive for various viral infection.1.6% were HBsAg positive , 1.1% were positive for anti HCV and 0.16% for anti HIV. Out of these 97.7% were male and 2.1% were female. Average age of these donors was 31 years.HBV infected donors were much younger than HCV positive donors.

Conclusion: A significant number of blood donors are carrier for Hepatitis B, Hepatitis C and HIV infections. In order to supply safe blood to recipient standard protocol for blood donor's recruitment and strict microbiological screening of donor's blood must be acquired. This study also indicates the rise in HBV and HCV seroprevalence in blood donors and a low prevalence of HIV in KPK population.

INTRODUCTION

Transfusion of blood and blood components is saving millions of lives across the world but on the other hand transfusion of unsafe blood is responsible for transmission of transfusion transmitted infections (TTIs) to large number of recipitents.[1]Most commonly transfusion transmitted infections are HBV,HCV and HIV not only in Pakistan but across the globe. HBV is most important cause of chronic liver disease and carries high mortality both in developed and under developed countries.[2]Each year around 81 million units of blood are donated worldwide with about 18 million units of blood not tested for transfusion transmissible viruses. With every unit of blood, there is a 1% chance of transmittingtransfusion transmitted infections.[3]In Pakistan; about 1.5 million units of bloods are required each year. This demand is accomplished partly by public sector (40%) and partly by private sector(60%). World Health Organization (WHO) member countries in 2005 agreed on a document for the safe blood and blood products and it was agreed that blood donor should be screened for HCV, HBS, HIV malarial parasite and syphilis in order to ensure safe supply of blood products to the recipient.[4]

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Blood donation is a process in which blood and blood components are collected, tested, prepared and stored. Blood donors are of two types. Voluntary blood donor donates blood without payment as a community responsibility. A replacement donor on the other hand is either a friend or relative of the recipient who donates blood in order to replace the blood that is used for transfusion.[5] Worldwide human Immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus are the most notable transfusion related risks due to their high prevalence rate.

Globally 250 million people are affected chronically with Hepatitis B and 130-150 million with Hepatitis C. Pakistan and Egypt bears majority of the burden.[6]The burden of HIV infection in Pakistan is low with about 0.1% of adult population currently infected with HIV.[7]Despite high prevalence of chronic infection with hepatitis B and C, most people remained unaware of their infections. Most of these individuals are diagnosed accidently on pre-donation screening for HBV, HCV and HIV thus decreasing the risk of transmission of theseagents through blood. Despite this due to poor health care system, unsafe transfusion practices and lack of awareness the prevalence of hepatitis B, C and HIV is rising in our community. Therefore, continuous monitoring of transfusion-transmissible infections in the blood donors was considered necessary to establish an estimate of this risk.

MATERIAL AND METHOD

It was a hospital based retrospective study conducted at the blood bank of Rehman Medical Institute (RMI) Peshawar. Blood bank records were analyzed from January 2016 to December 2017. Written consent

was taken from all blood donors. Sample technique of Non probability consecutive sampling was used. A total 11760 blood donors were screened.

All individuals fulfilling donor's inclusion criteria were included in this study such as Age range between 18 to 55 years with a weight of more than 50 Kg and hemoglobin of 12-13g/dl.

While donors not fulfilling thestandard criteria of a donor such as anemic, jaundiced, drug addict etc were excluded from this study.

Five ml of blood sample was taken from each donor. Serum was separated after proper centrifugation. All blood samples were screened for HIV-I and II Ag/ Ab, HBSAg and Anti-HCV on Abbott, Model- Architect plus Ci8200 by using chemiluminescence technique according to manufacturer instruction.

Statistical Analysis

The data was evaluated with the help of computer software SPSS version 20. The results for all variables were given in the form of rates (%).

RESULTS

A total of 11760 retrospective blood donors were screened from January 2016 to December 2017. Out of this, 11491 (97.7%) were males and 252 (2.1%) were females. The minimum age of donors was19 years and maximum age was 56 years. Out of 11760 blood donors 338 donors (2.87%) were found positive for HBV, HCV and HIV infections.Highest prevalence was for HBV (184 donors- 1.5%) followed by HCV (135 donors-1.1 %) and HIV (19 donors- 0.16%).

Most of the patients with hepatitis B virus infection were of younger age group ranging from 19 to 30 years , on the other hand majority of the patients with hepatitis C virus infection were in the age range etween 19 to 40 years.No female blood donor had viral infection, all infected donors were male.

Table 1: Prevalence of different viral infections

Year of donation	Total screened	Hbv positive n (%)	Hcv positive n (%)	Hiv positive n (%)	Total seroprevalance n (%)
2016	5516	90 (1.63%)	62(1.12%)	10 (0.18%)	162 (2.94%)
2017	6244	94 (1.50%)	73 (1.17%)	09 (0.14%)	176 (2.82%)
TOTAL	11760	184 (1.6%)	135 (1.1%)	19(0.16%)	338 (2.87%)

Table 2: Age group distribution of various viral infections in donors

Age group (yrs)	HBV positive	HCV positive	HIV positive
19—30	104	55	06
31—40	60	55	07
41—50	15	20	06
51—56	05	05	00
Total	184	135	19

DISCUSSION

Blood transfusion helps in saving people lives all over the world but at the same times it is an important source of transmission of various infections to the recipients. At present the prevalence of TTIs are much high in developing countries and will require greater efforts for reducing it to lower levels.[8]Subjecting blood donors to strict viral screening serves collecting safe blood products on one hand and estimating prevalence of these infections in healthy populations on other hand. [9]Different studies in Pakistan tried to correlate disease burden with screening of blood donors. Though some studies consider it to closely reflect infection burden however according to other studies prevalence rate of these infection may be overestimated or under estimated as it may not be accurately representative of the population in question.[10,11,12]

All subjects included in this study were voluntary or replacement healthy blood donors. The sero-prevalence of HBV, HCV and infection among blood donorswere found to be 1.6%, 1.1% and 0.16% respectively. The worldwide prevalence of HBV, HCV and HIV infections among blood donors varies according to WHO from 0.008% to 6.08%, 0.004% to 1.96%, and 0.0004% to 2.0%, respectively.[13]Ina study conducted in Kyrgyzstan the prevalence of HBV, HCV and HIV were found to be 3.6%, 3.1% and 0.78% respectively much higher than our study.[14]

The risk of transfusion-transmitted infections (TTI) varies from country to country depending upon the prevalence of positive cases in that particular pop-

ulation. In a study conducted in Africa the prevalence for HBV, HCV, HIV was calculated to be 10. 9 %, 0.4 % and 0.1 % in healthy blood donors indicating that HBV is more prevalent as compared to HCV and HIV.[15]

Our study showed almost similar results for prevalence of HBS (1.5%), HCV (1.1%) and HIV (0.16%) to the study conducted in Karachi by Arshad et alwith a prevalence of HBS (1.84%), HCV (1.7%) and HIV (0.04%).[16]

Our values are lower as compared to the study performed by Zaheer et al who found a prevalence of HBV (2.35%),HCV (3.26%) and HIV (0.17%)[17]while higher to a another study performed by Ahmad et al in Peshawar during 2017 with a prevalence of HBV(1.4%), HCV(0.60%) and that of HIV(0.10%).[2]

In current study the prevalence of HBV is higher as compared to HCV and HIV most likely due to increased infectivity of HBV rather than HCV and HIV. Similar results were recorded in earlier studies too.[18,19]

The seroprevalence of all viral infections in this study was low in females as compared to male gender. This gender difference in infection frequency reflects difference in social activities, life style and sexual behavior. The reason for this may be less involvement of women in social activities and high-risk behaviors such as multiple sex relationships and intravenous drug use.

CONCLUSION

A sufficient number of the blood donors carry transfusion-transmissible infections which poses a serious threat to the community. Therefore prevention of these transmissible infections should be the main aim of safe blood services. Proper selection of blood donors through strict screening for HIV, HBV, HCVwill not only control the proliferation of these infections in the community but also improve blood services, clinical outcome and response totreatment. These measures will improve public health and would increase blood safety and quality.

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