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ORIGINAL RESEARCH

Seroprevalence of transfusion transmissible infections among healthy blood donors at KIMS blood bank

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Abstract

Background: Safe blood is a critical component in improving health care and in preventing the spread of infectious diseases.

Aims & Objectives: Blood transfusion can cause the transmission of infectious to recipients. This is an important mode of infection. The aim of the study was to assess the prevalence of such type of infection among blood donors and to compare the seroprevalence of transfusion transmitted diseases in blood donors. Retrospective study was conducted for 5 years from January-2009 to December-2013 at KIMS Blood Bank, Secunderabad, India.

Materials and methods: All donors reporting to the blood bank during the period January-2009 to December-2013 were screened for human immunodeficiency virus (HIV) 1 & 2, hepatitis C viruses, malaria and syphilis. Screening of HIV, hepatitis B and hepatitis C viruses were done by chemilluminescences and syphilis was screened by RPR method.

Results: A total of 39780 voluntary blood donors were screened, of which 38697 were males and 1083 were females. Seropositivity of HIV, hepatitis B, hepatitis C viruses & syphilis were 0.26%, 1.28%, 0.51% and 0.03% respectively. No blood donors test showed positivity for malaria parasite.

Conclusion: With the implementation of strict donor selection criteria and use of sensitive screening test, it may be possible to reduce the incidence of TTIs.

Keywords: Human immunodeficiency virus; Hepatitis B virus; Hepatitis C virus; Seroprevalence; Transfusion transmitted infections

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Introduction

Blood transfusion, an integral part of medicine and surgery, also carries the risk of transfusion-transmissible infections like hepatitis B, hepatitis C, human immunodeficiency virus (HIV) 1 & 2, syphilis, malaria and infrequently toxoplasmosis, brucellosis & viral infections like cytomegalovirus (CMV), Epstein-Barr virus (EBV) and herpes [1] measuring their severity. World Health Organization (WHO) has recommended pre-transfusion blood test for HIV, hepatitis B (HBV), hepatitis C viruses (HCV), syphilis and malaria as mandatory [1]. All these diseases are capable of causing significant mortality, morbidity along with a financial burden for both the affected person and the country [2].

Every unit of blood transfusion there is a 1% chance of transfusion related complications including transfusion transmitted infections [1]. An increase in transfusion related infection has been reported in India [3]. India is already carrying a burden of 50 million of HBV carriers and 2,027 million of HIV cases. Keeping in mind the grave consequences of these infections and to restrain the transmission to minimum, it is very important to remain vigilant about the possible spread of these diseases through blood transfusion [4].

In our study, we aimed to estimate the prevalence of HIV, HBV, HCV and syphilis among blood donors. Accurate estimates of risks of transfusion transmitted infections (TTIs) are essential for monitoring safety of blood supply. Monitoring the incidence of TTIs in blood donors is important for estimating the risk of transfusion and optimizing donor recruitment strategies to minimize transmission. This knowledge might give us the idea of disease burden of the society and the basic epidemiology of these diseases in the community.

Materials and methods

A total number of 39,780 samples of blood were collected from donors from January 2009 to December 2013 at KIMS Blood Bank, Secunderabad. Donors were selected by taking history, clinical examination and also following strict donor's selection criteria to eliminate professional donors.

Samples were screened by Chemilluminesces method (Architect Plus) for HIV-1 P24 antigen and anti-HIV 1 & 2 (4th generation ELISA), anti-HCV, and HBsAg Rapid Plasma Reagin (RPR) test kits (Carbogen, Tulip) are used for screening syphilis and parbank kits for screening malaria parasite. All reactive samples were labeled as seropositive, disinfected and discarded.

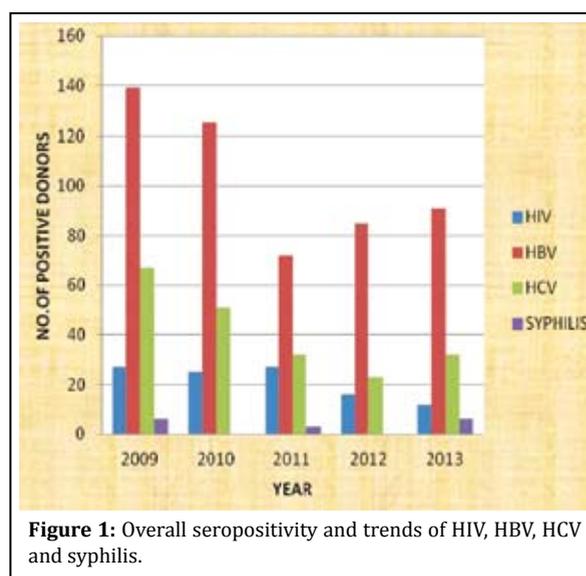
Results

In the present study, out of total 39780 blood donors, 97.2% were males and 2.73% were females, which show predominance of males as compared to females [Table 1].

The prevalence of HBs Ag, anti-HCV, VDRL, and anti-HIV among voluntary blood donors in the study population were shown in [Figure 1]. The overall seroprevalence of HIV, HBV, HCV, syphilis were 0.26%, 1.28%, 0.51% and 0.03% respectively. The highest prevalence was observed for HBV followed by HCV, HIV and syphilis in decreasing order.

Table 1: Sex wise distribution of healthy donors.

Year	Total Donors	Males (%)	Female (%)
2009	9582	9277 (96.8%)	305 (3.18%)
2010	8163	7865 (96.3%)	298 (3.65%)
2011	6699	6518 (97.2%)	181 (2.70%)
2012	7302	7175 (98.2%)	127 (1.71%)
2013	8034	7862 (97.8%)	172 (2.14%)
Total	39780	38697 (97.27%)	1083 (2.73%)



Discussion

Blood and blood products are an integral and life saving procedures of modern medicine, but simultaneously it carries the risk of transmitting the life threatening transmissible infectious [2]. Screening of blood is now mandatory for many diseases and it is undertaken routinely in blood banks. Transmission of TTIs during the serologically window period still poses a threat to blood safety in environments where there is high rate of TTIs [4].

Our study seroprevalence of TTIs was as follows HIV 0.26%, HBV 1.28%, HCV 0.51% and syphilis 0.03%. No Blood donor test showed positivity for malaria parasite. The present study revealed overall prevalence of HIV seropositivity was 0.26%, which was similar to findings by Rajvir Singh et al. (0.25%) [2], Das BK et al. (0.32%) [5], Arora D et al. (0.3%) [6] and Patel SV et al. (0.30%) [7]. Variable results of 0.01% [8], 0.1% [9] and 0.64% [10] have also been reported in various other studies.

Present study revealed seroprevalence of HBV at 1.28% was lower than that reported by other studies by Arora D et al. (1.7%) [6], Sinha SK (2.27%) [10], Garg S (3.44%) [11], Nilima sawke (2.9%) [12], whereas few studies reported lower level of prevalence Arumugam et al. (0.74%) [8] and Luna Adhikari et al. (0.78%) [13].

HCV infection is an evolving public health problem globally. For hepatitis C, the estimated prevalence in this study was 0.51% familiar reported by Nilima Sawke et al. (0.57%) [12], yet another set of studies reported 1.0%, 0.23%, 0.35% by Aora D et al. [6], Pallavi et al. [14] and Das BK [5] respectively.

In this study, syphilis positivity was 0.03%, which are similar with the study done by S.T. Arumugam et al. [8] i.e. 0.03% whereas other studies reported 0.25%, 0.35%, 0.9%, 0.62% by Sangita Patel et al. [7], Das BK et al. [5], Arora D et al. [6] and Rajvir Singh et al. [3] respectively.

Conclusion

The time and cost involved in screening donated blood can be reduced by an effective donor education and selection criteria. Blood is still one of the leading risk factor of spread of the TTIs i.e. HIV, hepatitis B, hepatitis C viruses and syphilis.

Conflict of interest

The authors declare no conflict of interest.

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