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Original Article

Others Section

How Safe is Blood? A 5 Year Retrospective Study

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ABSTRACT

Introduction: Blood is a scarce and life saving resource, however blood transfusion can be a source for transmitting life threatening infections if screening is not carried out properly.

Aim: The objective of the present study was to assess the prevalence and trend of transfusion transmitted infections (HIV, HBsAg, HCV and syphilis and malaria infections in the pretransfusion blood) among voluntary and replacement donors in the Department of transfusion Medicine in a multispecialty hospital of Mohali during the period from Jan 2008 to Dec 2012.

Methods: A retrospective review of donors' record covering the period from 2008 to 2012 was carried out. All samples were screened for HIV, HBsAg, HCV, Syphilis and Malaria.

Results: Of the 45,337 samples studied, 4144 (9.1%) were voluntary donors and the remaining 41193 (90.8%) were replacement donors. The overall prevalence of HIV, HbsAg, HCV and syphilis were 0.44, 1.27, 0.23 and 0.28%, respectively. One blood donor tested revealed positivity for malarial parasite. Majority were replacement donors with male preponderance. In all the markers tested there was increased prevalence of TTI among the replacement donors as compared to voluntary donors.

Conclusion: By implementing strict donor criteria and using sensitive screening tests, it may be possible to reduce the incidence of TTI in the Indian scenario.

Keywords: Transfusion transmitted infections, Nucleic acid testing, Blood donation

INTRODUCTION

Blood is a scarce and life saving resource. However transfusion of blood and its components can be a source for transmitting life threatening infections if screening is not carried out properly [1]. Blood transfusion service (BTS) is an integral and indispensable part of the healthcare system. The priority objective of BTS is to ensure safety, adequacy, accessibility and efficiency of blood supply at all levels [2]. With every unit of blood, there is 1% chance of transfusion-associated problems including transfusion-transmitted diseases [3]. A majority of known cases of post transfusion diseases have been caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), *Treponema pallidum* and Malaria parasites. Preventing the transmission of infectious diseases through blood transfusion is difficult because of certain reasons like inability of the test to detect the disease in the window phase of their infection, high cost of screening, a lack of funds and trained personnel, immunologically variant viruses, non-seroconverting chronic or immuno silent carriers and inadvertent laboratory testing errors. Transfusion departments have always been a major portal as they not only screen TTI but also give clue about the prevalence of these infections in healthy populations [4]. We report the trends in the detected seroprevalence of hepatitis B (HBV), hepatitis C (HCV), HIV, Syphils and Malaria over a period of 5 years from 2008 to 2012 in a tertiary care hospital based study. This provides information regarding the safety of blood transfusion and an accurate assessment of known risks versus benefits of blood transfusion.

MATERIALS AND METHODS

A retrospective review of donors' record covering the period from 2008 and 2012 at the blood transfusion department in a multispeciality hospital, Mohali, was carried out. The inclusion criteria were: Hb more than 12.5 gm% for both male and female, weight > 45 kg with no history of hepatitis, chronic infections or high risk behaviour. A total of 45,337 units of blood were screened for HIV, HBsAg, HCV, syphilis and malaria. Serological assays for HIV, HbsAg and HCV were done by Vitros Eci kit. An RPR test was done for Syphilis. One step,

rapid, immunochromatographic test was done for detection of *Plasmodium falciparum* and *Plasmodium vivax* antigen. All the reactive samples were retested to confirm before labeling them seropositive and the respective units were discarded.

RESULTS

A total of 45337, apparently healthy, adult donors were screened during the study period. Among them 44701 (98.5%) were males and (1.4%) were females. 4144 (9.1%) were voluntary donors (VD) while 41193 (90.8%) were replacement donors (RD).

The overall prevalence of HIV, HbsAg, HCV, Syphilis and Malaria were 0.17, 0.71, 1.04, 0.03 and 0.002%, respectively as is shown in [Table/Fig-1].

Year	2008	2009	2010	2011	2012	Total
Total units	9524	8485	8823	9451	9054	45337
HIV positive	28 (0.29%)	12 (0.14%)	15 (0.17%)	14 (0.14%)	12 (0.13%)	81 (0.17%)
Hbs Ag positive	74 (0.77%)	60 (0.70%)	68 (0.77%)	76 (0.80%)	45 (0.49%)	323 (0.71%)
HCV positive	109 (1.14%)	87 (1.02%)	87 (0.98%)	99 (1.04%)	92 (1.01%)	474 (1.04%)
RPR positive	1 (0.01%)	Nil	4 (0.04%)	7 (0.07%)	2 (0.02%)	14 (0.03%)
Malaria	nil	Nil	1 (0.01%)	nil	Nil	1 (0.002%)
Total positive cases = 893 (1.96%)						

[Table/Fig-1]: Results of seropositive donor blood samples for HIV, HbsAg, HCV, Syphilis and Malaria

It was also been observed that there was an increased positivity rate among the Replacement donors as compared to the Voluntary donors.

DISCUSSION

Blood transfusion is a potentially significant route of transmission, although risk may be reduced by the vigorous screening of donors and donated blood [5].

Moreover, it should never be forgotten that blood donations collected in the latent period of infection may be infectious despite a negative antibody test [6]. Efforts to ensure an adequate and safe blood supply should include striving for optimal use of blood and its products. It should be transfused only when its administration is absolutely essential to the care of the patient.

The majority (98.5%) of the donors in our study were males which are comparable to the studies done by Rao and Annapurna et al., [7] in Pune, and Fernandes et al., [8] in Mangalore noting more than 90% of the male donors.

Voluntary donors (VD) are those blood donors who donates blood at regular intervals and replacement donors (RD) are usually one time blood donors who donates blood only when a relative is in need of blood [9]. In our study, of the total blood donors VD constituted 9.1% while RD were 90.8%.It is shown that replacement donors constitute the largest group of blood donors in India [10], reflecting the lack of awareness amongst the general population. The overall seroprevalence of HIV, HBsAg, HCV and Syphilis were 0.17, 0.71, 1.05 and 0.03 and 0.002%.

The National AIDS Control Organization (NACO), India suggested an overall prevalence of HIV is 0.27% in India in 2013 [11]. The present study showed a HIV prevalence of 0.17%.

The major concern in transfusion services today is increased seropositivity among RD for HCV, HIV, HBsAg and Syphilis. With the advent of nucleic acid amplification techniques (NAT), the window period of these TTIs can be decreased and hence increase in blood safety.

CONCLUSION

Our study revealed that most of the donors were replacement donors with male preponderance. There was increased positivity rate of TTI markers amongst the replacement donors as compared to the voluntary donors. Hence, Voluntary blood donation should be encouraged to ensure safe transfusions for patients.

LIMITATIONS

The samples in the study were tested by Eci, RPR and Malaria card test. Newer and better methods like NAT were not available which can reduce the window period and hence decrease the transmission of TTIs.

RECOMMENDATIONS

Based on these results non remunerated and repeat voluntary blood donor services are needed. Extensive donor selection and stringent screening procedures can improve the blood safety. Voluntary blood donation has to be made a part of life. Also better screening methods like NAT should be encouraged on large scale to increase the blood safety.

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