Prevalence of blood transmitted infections among the blood donors: A study in a tertiary care unit in Telangana

Sujatha Margam1, Kruthika Margam2, Priya3, Hari Shankar4

1Professor, 2MBBS Scholar, 3Assistant Professor, 4Professor, Dept. of Pathology, Malla Reddy Institute of Medical, Hyderabad

*Corresponding Author:
Email: drsujathamargam@gmail.com

Abstract
Introduction: Diseases that can be caused through transfusion are by Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Malarial parasites and Treponema pallidium. All blood samples must be routinely checked for all the above diseases. This study was undertaken to study the prevalence of these transfusion transmitted infections in our geographical area among the voluntary and replacement blood donors.

Materials and Method: The sera of all the donors were tested for antibodies to HIV-1 and HIV-2, HBsAg, HCV, for syphilis and malaria parasites. MP were also detected by regular microscopy method.

Results: The male gender was predominant (98%) among the blood donors, whether voluntary or replacement. About 0.036% of the total samples had transfusable transmitted diseases. HBsAg was the most common with 0.02% samples being positive while malaria was the least with only 4 samples in the past 4 years. In the year 2015, there were no cases of malaria among the blood donors. HIV was 0.007% and HCV 0.003%.

Conclusion: Availability of safe blood is important in transfusion for the patient as well the community. This is obtained by regular screening of the blood donated before transfusion for these transfusible diseases.

Keywords: Transfusion Transmitted Diseases, Voluntary Blood Donors, Replacement Blood Donors, Prevalence.
Professional donors, donors with present medications, recent history of having undergone a surgical procedure, serious illness, previous blood transfusions, weight <50 kg, age <18 and >60 years, pregnant and lactating women were also excluded from the study.

5ml of blood was collected from the subjects directly into plain vacutainers with no anticoagulant after obtaining informed consent from them. These samples were then centrifuged to obtain the sera. These sera were tested for antibodies to HIV-1 and HIV-2 by ELISA (J. Mitra) and Tridot method (J. Mitra), HBsAg by sandwich ELISA (J. Mitra), HCV by ELISA (J. Mitra), for syphilis by RPR method (Span Diagnostics) and by strip method (ASPEN) and malaria parasites by strip method (SPAN diagnostics). MP were also detected by regular microscopy method.

The data was entered onto a Microsoft Excel worksheet and analysis was done using chi square and fisher’s test.

Results

Out of the 4322 donors, 3285 (76%) were replacement donors and 1037 (24%) were voluntary blood donors (Fig. 1).

Out of the positive samples, only two cases were coinfections were observed, one was in 2014 and the other in 2015. Both the coinfections were of HBsAg and syphilis.

The male gender was predominant (98%) among the blood donors, whether voluntary or replacement (Fig. 2).

About 157 (0.036%) of the total samples had transfusible transmitted diseases. HBsAg was the most common with 77 (0.02%) samples being positive while malaria was the least with only 4 samples in the past 4 years. In the year 2015, there were no cases of malaria among the blood donors (Table 1).

Out of the positive samples, only two cases were coinfections were observed, one was in 2014 and the other in 2015. Both the coinfections were of HBsAg and syphilis.
Discussion

Blood transfusion is one of the integral part of the life saving procedures of modern medicine, although it carries a risk of transmitting the very dangerous diseases such as HIV, HBV HCV, Syphilis and malaria. Blood transmission is only one of the mode of transmission albeit a potential one, as all of them barring malaria can also be transmitted via sexual contact, parenteral, and vertical.\(^1\)\(^2\)\(^3\)\(^4\)

We have reported a total of 76% to be replacement donors while 24% were voluntary blood donors, which was concurrent to other studies where replacement donors were more than voluntary donors.\(^5\)\(^6\)\(^7\)\(^8\) In a by Gupta et al,\(^1\)\(^2\) majority of the donors were voluntary rather than replacement. Similar was the case in a study by Fernandez et al,\(^6\) where in 61% of the donors were voluntary and 39% were replacement blood donors.

The number of males were considerably higher than females with nearly 98%, which was similar to the study by Fernandez et al,\(^6\) where nearly 97% of the donors were males, by Karmakar et al with 85%.\(^1\)\(^3\)

Among the blood donors in India, it is reported that the prevalence of the transfusible diseases is: HBV \(-\) 0.66% to 12%, HCV \(-\) 0.5% to 1.5%, HIV \(-\) 0.084% to 3.87%, and syphilis \(-\) 0.85% to 3% respectively.\(^9\) The overall transfusion transmitted diseases in our study was 0.036% which was very low compared to many other studies.\(^6\)\(^1\)\(^2\)\(^3\)\(^4\)

In our study, we found the prevalence of HIV to be 0.007%, while in a study by Giri et al,\(^1\)\(^6\) the prevalence was found to be 0.07%, while Gupta et al\(^1\)\(^2\) reported 0.084% and Tiwari et al\(^1\)\(^7\) reported 0.054%, 0.06% by Fernandez et al\(^6\) which were also higher to our results. Still higher prevalence of 0.26% was reported by Kaur et al\(^1\)\(^9\) and 0.47% by Garg et al.\(^1\)\(^1\)\(^5\) A 0.0% prevalence was reported by Muntaz et al\(^1\)\(^9\) from a study in Pakistan. Around the world, in the African countries, the prevalence was far higher, with 3.8% in Ethiopia\(^2\)\(^0\) and 11.7% in Tanzania.\(^9\)

The present study revealed a seroprevalence of 0.02% prevalence of HBsAg and 0.003% of HCV, which was far less than the study conducted by Giri et al,\(^1\)\(^6\) Chatteraj et al,\(^1\)\(^4\) Kaur et al,\(^1\)\(^8\) and Singh B et al.\(^1\)\(^1\)\(^0\) Variable results of 0.66% by Gupta et al\(^1\)\(^2\) 2.45% by Choudhary et al,\(^2\)\(^1\) 3.44% by Garg et al,\(^1\)\(^1\)\(^5\) 5.86% by Muntaz et al,\(^1\)\(^9\) 25% by Dessie\(^2\)\(^0\) have also been reported. Seroprevalence of HBV among blood donors differs. The major route of HBV transmission is parenteral and it is most infective among blood-borne viruses and chronic carrier state is associated with chronic liver disease, cirrhosis and hepatocellular carcinoma.

We had a 0.007% of seroprevalence of syphilis among the donors in our study which was low compared to the study by Giri et el (0.07%).\(^1\)\(^6\) Gupta et al (0.85%)\(^1\)\(^2\) and Dessie et al (1.2%).\(^2\)\(^0\) There were only 4 cases of malaria among the donors in the past 4 years bringing the prevalence to less than 0.001%.

The prevalence of these diseases in general population in our area is considerably higher than those among the blood donors. It has been inferred by the present study as well as general questions asked randomly to the population that there is a great understanding of the hazards of these infections among the general population. So, when known, the people generally refrain from donating the blood even to their near and dear ones.

Conclusion

Availability of safe blood is important in transfusion for the patient as well the community. This is obtained by regular screening of the blood donated before transfusion for these transfusible diseases. Moreover a proper health education program regarding the mode of transport of these diseases should be readily made to the patients within the hospital as well as within the community. We have observed a reduced prevalence of these transfusible diseases, probably showing that the health education programs in this community as taken proper effect. Proper blood donor selection by the blood bank authorities and proper regular screening play a major role in reducing the transmission of the infection.

References

10. Singh B, Verma M, Verma K. Markers for transfusion associated hepatitis in north Indian blood donors:

Indian Journal of Pathology and Oncology, April-June 2017;4(2):324-327

326