

Prevalence of Transfusion Transmitted Infections among Blood Donors: Five Years Retrospective Study from Rural Tertiary Care Hospital of South Karnataka

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ABSTRACT

Background: Blood transfusion is life saving intervention. Transfusion transmitted infections are one of the major side effects of blood transfusion, which can be prevented by proper screening of blood products and public awareness. The aim of the study was to find out the prevalence and trends of transfusion transmitted infections over 5 years among voluntary blood donors in a blood bank at a rural tertiary care hospital.

Method: Hospital records of all voluntary blood donors, who donated their blood in the blood bank from January 2014 to December 2018 was reviewed. In this retrospective study 9771 blood donor records were reviewed. Data was studied to determine prevalence of transfusion transmitted infections among blood donors. Sera samples were screened for hepatitis B surface antigen, antibodies to hepatitis C virus and human immunodeficiency virus 1 and 2 using commercially available Enzyme Linked Immunosorbent assay technique based kits. Rapid plasma regain test was carried out for screening of syphilis and rapid card test for malaria. Percentage of reactive samples for all three markers was calculated.

Result: Overall positivity for hepatitis B, hepatitis C, and human immunodeficiency virus markers was 0.77 %. There was no cases of syphilis and malaria. Hepatitis B (0.55%) showed highest seroprevalence over 5 years among the three markers, followed by human immunodeficiency virus (0.12%) and hepatitis C (0.10%).

Conclusion: Most common transfusion transmitted infections in blood donors was hepatitis B followed by human immunodeficiency virus and hepatitis C. Proper

donor selection and sensitive screening tests are key steps in improving the blood safety.

Keywords: Hepatitis B, Hepatitis C, Human immunodeficiency virus, Transfusion transmitted infections

INTRODUCTION

Reducing the risk of transfusion transmitted infections (TTI) remains a crucial measure of blood transfusion safety. The diseases transmitted by blood transfusion are human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis, malaria and infrequently cytomegalovirus, Epstein Barr virus, brucellosis etc. [1] Due to availability of nucleic acid amplification technologies classic TTI like HIV, HBV and HCV are detected during window period of disease. [2] Nowadays donor evaluation, highly sensitive laboratory screening tests and pathogen inactivation procedures are important measures to decrease the risk of TTI. [3] Apart from increased recipient safety, composite research efforts along with blood donor screening data are of important scientific value in prevention of TTI. [4-6] Although TTI are very common in south India, studies on TTI in donors from rural Indian areas are lacking. With this background, the present study was undertaken, to assess the prevalence and trends transfusion transmitted infections over 5 years among blood donors in a blood bank at a rural tertiary care hospital.

MATERIALS AND METHODS

Hospital records of all blood donors, who donated their blood in the blood bank of Adichunchanagiri institute of medical sciences, Balangangadharanatha Nagar, Karnataka from January 2014 to December 2018 was reviewed. All available data for each donor was studied in detail to determine prevalence of transfusion transmitted infections among blood donors. Sera samples were screened for HBV surface antigen, antibodies to HCV and HIV 1 and 2 using commercially available Enzyme Linked Immunosorbent assay (fourth generation) technique based kits. Rapid plasma regain test was carried out for screening of syphilis and rapid card test for malaria.

Data Analysis: Data were compiled and tabulated by using standard appropriate statistical technique, which includes numbers and percentages.

In this study 9771 donors details were reviewed. All donors were male. Table 1 shows the distribution of seroprevalence of TTI among blood donors. Overall positivity for HBV, HCV C, and HIV markers was 0.78 %. There was no cases of syphilis and malaria. HBV (0.55%) showed highest seroprevalence over 5 years among the three markers, followed by HIV (0.12%) and HCV (0.10%). The highest prevalence for HBV was seen in the year 2015(0.13%) and lowest in 2018(0.06%). The prevalence of HCV was highest in 2016 (0.06%) and lowest in 2014 and 2015 (0%). HIV prevalence decreased gradually from 0.05% in 2014 to 0.01% in 2018 except for a no cases in 2015. Table 2 shows age wise distribution of seroprevalence of TTI among blood donors. Maximum number of HBV positive donors (27) belonged to 3rd decade. HIV positive donors (6) and HCV positive donors (5) were more in number in 2nd decade.

RESULTS

Table 1: Total number of donations and seroprevalence of TTI among blood donors

Year	Number of donations	HIV(%)	HBV(%)	HCV(%)	SYPHILIS	MALARIA	Total number of seropositive patients (%)
2014	1683	5(0.05%)	12(0.12%)	0(0%)	0(0%)	0(0%)	17(0.17%)
2015	1950	0(0%)	13(0.13%)	0(0%)	0(0%)	0(0%)	13(0.13%)
2016	1783	3(0.03%)	11(0.11%)	6(0.06%)	0(0%)	0(0%)	20(0.20%)
2017	2810	3(0.03%)	12(0.12%)	2(0.02%)	0(0%)	0(0%)	17(0.17%)
2018	1545	1(0.01%)	6(0.06%)	2(0.02%)	0(0%)	0(0%)	9(0.09%)
Total	9771	12(0.12%)	54(0.55%)	10(0.10%)	0(0%)	0(0%)	76(0.77%)

Table 2: Age wise distribution of seroprevalence of TTI among blood donors

Type of infection	<20years	20-30 years	31-40years	>40years	Total
HIV	0	6	5	1	12
HBV	2	15	27	10	54
HCV	1	5	3	1	10
SYPHILIS	0	0	0	0	0
MALARIA	0	0	0	0	0
Total number of seropositive patients	3	26	35	12	76

DISCUSSION

Due to economic constraints developing countries like India face more threat due to TTI than developed countries. Viral infections like HBV, HIV, and HCV are the main cause of morbidity and mortality in blood recipients. The seroprevalence of TTIs found in this study was 0.77 % which is less as compared to seroprevalence of 1.35% found in Leena MS study. [7] In this study we found that highest numbers of blood donors were

having Hepatitis B (0.55%) followed by HIV (0.12%), hepatitis C (0.10%), malaria (0%) and syphilis (0%) similar results found in Leena MS study. [7] The seroprevalence was <1% for all TTI. Various studies reported that seroprevalence of HBV among blood donors was higher than HIV, HCV and syphilis. [8-11] Percentage of HBV (0.55%) in this study was closest to the study by Sidhu et al (0.5%). [12] In present study the HIV seroprevalence was 0.12%. The HIV seroprevalence of present

study far less than other studies from various parts of India but more than study by Sidhu et al . [7,9-12] In this study the seroprevalence for HCV was 0.10% which is less as compared to the previous studies but more than study by Chougale et al . [7,9-12] The seroprevalence of malaria was 0% in this study, similar finding observed in study of Srikrishna. [13] The seroprevalence of Syphilis was 0% in this study, which is less than the previous studies. [7,13] Total 35 from 76 seropositive blood donors belonged to age group 31-40 years. This finding underscores that higher seroprevalence among sexually active age group. Previous studies showed similar finding. [7,10] The limitations of our study included a single gender (males), small sample size as well as lack of cases of malaria and syphilis; there was no classification of donors as voluntary and replacement donors.

CONCLUSION

Most common transfusion transmitted infections in blood donors was HBV followed by HIV and HCV. Proper donor selection and sensitive screening tests are key steps in improving the blood safety. More population based studies with large sample size needed in future; various geographical areas and populations should be considered.

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