

SEROPREVALANCE OF TRANSFUSION TRANSMITTED INFECTIONS AMONG HEALTHY DONORS IN A TERTIARY CARE HOSPITAL IN SOUTHERN PUNJAB, PAKISTAN

AKHTER N.,¹ FATIMA S.,² BATOOL Y.,³ SAMAD A.,⁴ FAYYAZ N.⁵ AND KHAN Z.M.⁶
Departments of Pathology,^{1,4,5,6}Ibn-e-Sina Hospital, Multan Medical & Dental College
^{2,3}Nishtar Medical University & Hospital, Multan

ABSTRACT

Background and Objectives: Blood transfusion is a lifesaving procedure but is not risk free. There is a potential risk of transfusion related infection transmission. Five common infections transmitted through transfusion are hepatitis B virus (HBV), hepatitis C virus (HCV), human immune deficiency virus (HIV), Syphilis and malaria. The aim of the current study was to know the seroprevalance and trend of different infections in healthy blood donors and compare it with local and international data on transfusion transmitted infections.

Methodology: Study design was cross sectional descriptive study, conducted in department of haematology and blood bank in Ibn-e-Sina Hospital Multan from January 2016 to December 2018. Every blood donor was screened by predefined questionnaire to know the eligibility of the donor. Blood sample were screened for HCV, HBV, HIV, Syphilis and Malaria according to manufacturer instructions.

Results: 7270 blood donors were screened and 326 (3.89%) were infected. The overall frequency of HbsAg, anti-HCV, Syphilis, HIV and malaria was 1.26%, 2.69%, 0.52%, 0% and 0% respectively. Infections showed a decreasing trend except for HbsAg which raise in 2017 before falling again in 2018.

Conclusion: Blood transfusion though a lifesaving process, can be the cause of transfusion transmitted infections. The prevalence of HCV and HBV is decreasing while that of syphilis and HIV is increasing that is a alarming situation. These can be controlled by effective screening according to WHO guidelines and effective policies that should be implemented.

Keywords: Seroprevalance, transfusion transmitted infections, healthy blood donors.

INTRODUCTION

Blood transfusion is one of the lifesaving processes and like other processes free of hazards.¹⁻⁶ Infection transmission is a great danger which is called transfusion transmitted infection,¹⁻⁶ which exerts a huge burden on healthcare system.⁷ But has reduced morbidity and mortality to a significant extent.⁸ Pakistan is a developing country with a population over 180 million where almost 1.2 million donations are given per year.^{9,10} Transfusion system in Pakistan is under the process of development.¹¹ There is a risk of transfusion related infections like viral, bacterial and protozoal diseases. Among these common one are HCV, HBV, HIV, Malaria and Syphilis, rarely CMV, EBV, Herpes, Toxoplasmosis and brucerosis.¹²⁻¹⁵ WHO has recommended safe blood transfusion as right of every person and has made it compulsory to screen for HCV, HBV, HIV, Malaria and Syphilis.^{4,6,16} To further reduce the risk of transmission of HIV and HCV new and advanced diagnostic techniques like NAT had been approved by FDA, though country like Pakistan cannot afford it.¹⁷

Policy of safe blood transfusion has been made with the help of SBTP and Deutsche Gesellschaft Fur International Zusammenarbeit GmbH (GIZ) with the aim of safe blood to everybody in Pakistan².

Demands of blood transfusion are on increase because of transfusion for thalassemia, dialysis, haemophilia and road traffic accidents. With this increasing requirement of blood, there is increasing risk of acquiring infection related to transfusion.^{1,18}

Transfusion transmitted infections are the major health concern for all and unchecked underdeveloped blood transfusion centres are responsible for this. Most donors in window period cannot be detected because the costly tests are required for that¹. Frequency of infections in blood and donors can be assessed by evaluating the data on prevalence of transfusion transmitted infections.¹⁹

So the aim of the current study is to know the prevalence of transfusion transmitted infections among healthy donors, its trend and also to compare it with national and international data.

MATERIAL AND METHODS

It was hospital based study which was conducted in blood bank of Ibn-e-Sina Hospital, Multan Medical and Dental College, Multan from January 2016 to December 2018. It was a prospective descriptive study done on healthy asymptomatic blood donors who were selected according to WHO guidelines after obtaining informed consent.

Study Variables like transfusion transmitted infection frequency, its trend over years and comparison with previous data were noted.

3-5 ml of the donor blood sample was collected and screened for HCV, HBV, HIV, syphilis and malaria according to the manufacturer instructions.

Data was collected, entered and analysed by using SPSS 20. Frequencies and percentages were calculated by using descriptive statistics. Study was approved by institutional ethical committee.

Low female population so cannot be generalized to general population. HCV, HIV, HBV screened by using kit method were the limitations of the study.

RESULTS

7270 blood donors were screened and out of 7270, 326 (3.89%) were infected by one of the infecting agent and 6944 (96.11%) were safe for blood transfusion (Fig. 1).

The overall frequency of HbsAg, anti-HCV, Syphilis, HIV and malaria was 1.26%, 2.69%, 0.52%, 0% and 0% respectively (Fig. 2).

If we break the rate the rate of infection year wise, it showed a decreasing trend except for HbsAg which rais in 2017 before falling again in 2018 (Fig. 3).

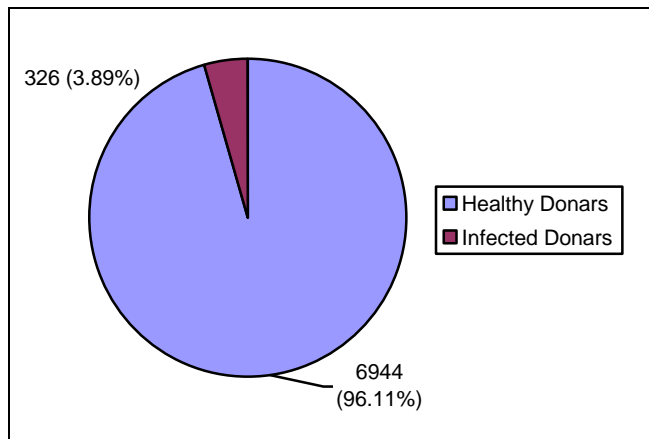


Fig. 1: Frequency of infections among healthy donors.

During this period a total of 7270 donors presented to blood bank of Ibn-e-Sina Hospital, with range of 150-250 donors per month as shown in table 1.

DISCUSSION

Lives can be saved by blood transfusion across, which

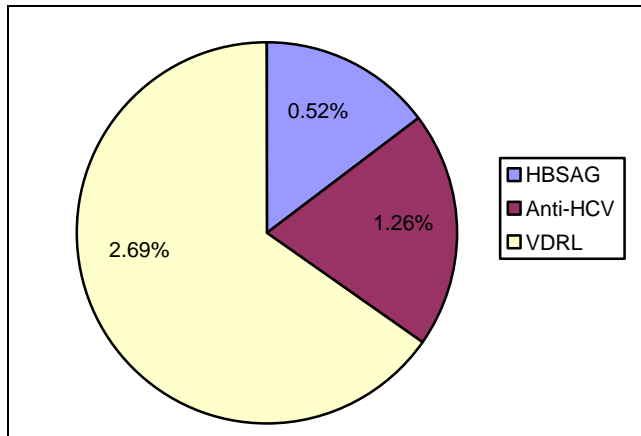


Fig. 2: Frequency of different infecting agents in healthy donors.

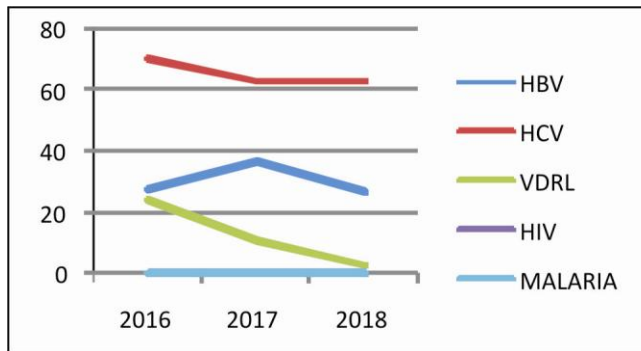


Fig. 3: Trend of different infections in healthy donors during 2016-2018.

seemed to be simple process but may has potentially hazardous outcomes.^{2,3,7} Healthy blood donors are considered to be a healthy part of society.⁺ But blood transfusion carries risk of many diseases including viral, bacterial and protozoal diseases. Among these the most common are HBV, HCV, HIV, syphilis and malaria. WHO had recommended screening at least for these five infections to ensure safe supply of blood to the recipient which everybody has right to have.^{1-6,16} The prevalence of transfusion related infection rate is much higher in developing countries compared to developed world.² In our study we screened a total of 7270 healthy blood donors and found that among these 326 donors were infected by some of transfusion transmitted infection. So the frequency of TTI over this period was found to be 3.89% in our study. It was slightly less than as reported by Saeed et al in Lahore which was 5.07%.¹ Another study conducted in Multan during 2013 showed frequency of 5.9%²⁰. It was higher than our study; difference may be due to better screening services and awareness among population.

The frequency of different infections as observed in our study for HbsAg, anti-HCV, syphilis, HIV and malaria was 1.26%, 2.69%, 0.52%, 0% and 0% respec-

Table 1: Number of donors presented to Ibn-e-Sina Hospital during 2016-2018.

	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEPT	OCT	NOV	DEC	Total
2016	193	202	204	180	205	191	199	258	205	228	198	188	2451
2017	195	181	190	221	219	130	250	235	202	238	147	145	2431
2018	176	174	202	200	234	138	223	178	162	156	180	196	2388

Yearly data on infective donors and healthy donors is shown in figure 4.

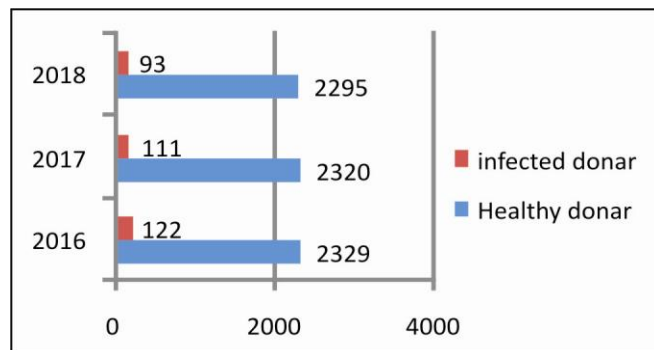


Fig. 4: Yearly data of healthy and infected donors.

tively. These frequencies were also lower compared to the previous studies conducted in the area²⁰ and also in Lahore by Zameer et al (1.59%, 3.85%, 2.08%, 0.11% and 0.39% for HBsAg, Anti-HCV, Syphilis, HIV and malaria respectively) and Waheed et al in Islamabad (3.91%, 8.34%, 0.89%, 0% and 1.20% for HBsAg, Anti-HCV, Syphilis, HIV and malaria respectively).^{2,11} In our study frequency of HIV and malaria was found to be zero compared to other studies^{1,2,6,11,20} (Table 2).

If we compare these with international data and with neighbouring countries, we can observe that we fall in between of these. Like in India prevalence of HCV is less than HBV infection which is reverse in our study. Another thing is that prevalence of HIV is higher in India as compared to Pakistan.^{7,8,14,21} One study

from Iran showed that Iran has lower prevalence of TTI compared to Pakistan that is 0.15%, 0.1%, 0.004% for HBsAg, Anti HCV and HIV respectively⁷. Africa has higher prevalence of transfusion transmitted infections compared to Pakistan^{3,5,19} (Table 3).

In the current study we observed that HCV and VDRL followed a decreasing trend. While HBV showed a rise in 2017 and again fell down in 2018. Our findings are in conformity with other local studies. This may be because of better diagnostic facilities for donors, effective treatment, prevention by vaccination and also raising the awareness among people^{1,2,6} (showed in line graph-Fig. 3).

In most of the hospitals both in public and private setup are doing screening tests with device method which is cost effective but can miss cases. In our hospital we are using screening kits of SD Bioline by Abbot which claims specificity and sensitivity of above 99%. A study conducted in Nigeria by Adeyemi AA et al compared the kit method with Elisa technique and found that 38 (5.7%) out of 660 subjects tested positive for HBS Ag with immunochromographic method while 71 (10.8%) were positive using ELISA. None is positive for hepatitis C antibody using immunochromatographic method while 4 (0.6%) subjects were positive using ELISA method So it should be confirmed on ELISA especially in high risk cases.²² The risk of Transfusion Transmitted Infections can only be reduced by following the guidelines for selection and screening of blood donors. In addition to this there should be a monitoring authority that should keep a check on this process.

Table 2: Comparison of current study of local studies.

Author	Place of Study	Year of Study	Hbsag +ve	Anti-HCV	VDRL	HIV	MP	Reference
Muhammad et al	Lahore	2014 – 2015	1.10%	2.62%	1.55%	0.02%	0.10%	01
Zameer et al	Lahore	2015 – 2016	1.59%	3.85%	2.08%	0.11%	0.39%	02
Arshad et al	Karachi	2013 – 2015	1.84%	1.7%	2.1%	0.04%	0.07%	06
Niazi et al	Rawalpindi	2010 – 2012	1.48%	2.61%	0.95%	0.02%	-	09
Waheed et al	Islamabad	2010 – 2011	3.91%	8.34%	0.89%	0%	1.20%	11
Hussain et al	Multan	2013	2.32%	3.44%	0.07%	0.01%	0.06%	20
Akhter et al	Multan	2016 – 2018	1.26%	2.69%	0.52%	0%	0%	Present study

Table 3: Comparison of current study with international studies.

Author	Place of Study	Year of Study	Hbsag +ve	Anti-HCV	VDRL	HIV	MP	Reference
Mohammad et al	Ethopia	2010 – 2013	10.9%	0.4%	0.1%	0.1%	-	03
Ali et all	Libya	2008 – 2015	0.12%	0.24%	0.014%	0.014%	-	04
Baize et al	Sudan	2014	5.5%	3.4%	-	0.7%	-	05
Kalpana et al	India	2013 – 2017	1.15%	0.11%	0%	0.24%	-	07
Chaurasia et al	India	2011 – 2016	2.131%	0.624%	0.1.30%	0.139%	0%	08
Yadav et al	India	2013	1.77%	0.099%	0.04%	0.14%	0%	14
Farshadpour et al	Iran	2004 – 2014	0.15%	0.1%	-	0.004%	-	15
Siraj et al	Eritrea	2010 – 2016	2.0%	0.7%	0.07%	0.6%	-	16
Mavenyengwa et al	Namibia	2012	0.6%	0.1%	0.3%	0.3%	-	17
Bisetegen et al	Ethopia	2015	9.5%	8.5%	7.5%	6.4%	-	19
Sheikh et al	India	2015	2.43%	1.89%	0.27%	0.27%	0%	21
Akhter et al	Multan	2016 – 2018	1.26%	2.69%	0.52%	0%	0%	Present study

It is **concluded** that Blood transfusion though a lifesaving process, can be the cause of transfusion transmitted infections. The prevalence of HCV and HBV is decreasing while that of syphilis and HIV is increasing as observed in other studies which is an alarming situation though none of the positive case was found in our study of syphilis, HIV and malaria. These can be controlled by effective screening according to WHO guidelines and effective policies that should be implemented.

Authors’ Contribution

NA: Study design, data collection, writing the manuscript, formulation of tables reviewed and approved. SF: Statistical analysis, result interpretation, manuscript writing and revising it critically for important intellectual content. YB: Statistical analysis, interpretation of results, Reviewed and approved the manuscript. AS: Data collection, writing the manuscript, formulation of tables reviewed and approved. NF: result interpretation, manuscript writing and revising it critically for important intellectual content. ZM: Manuscript writing and revising it critically for important intellectual content.

Conflict of Interest

This study has no conflict of interest to declare by any author.

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