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Original Research Article

Seroprevalence of Transfusion Transmitted Infections among Blood Donors in a Teritiary care teaching hospital SIMSRH, Blood Bank Tumkur, Karnataka

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Abstract: Blood is a lifesaving unit. Transfusion of blood and blood components is a specialized modality of both medical and surgical emergencies and critical care management as well as routine management of diseases. It saves millions of lives each year worldwide thereby reducing the morbidity. It is well known that blood and blood components transfusion is also associated with a number of complications, some are only acute life threatening and others are potentially life threatening, Pre transfusion testing and screening particularly for transfusion transmissible infections (TTI) will reduce the burden. The objective of the present study is to assess the seroprevalence of transfusion transmitted infections (TTI) amongst the apparently healthy blood donors at the SIMSRH, Blood bank, Tumkur and also to compare the observations of the relevant studies with other parts of India. This is a retrospective study and study period is two years i.e from Jan 2014 to Dec 2015. All donor blood samples were screened for five transfusion transmissible diseases namely HBsAg, HIV, HCV, Syphilis and Malaria. Of the 3378 donors tested 28 donors were positive for serological tests amounting to 0.82% prevalence. The overall prevalence of individual TTI's, HBsAg, HCV, HIV and Syphilis were 0.50, 0.11, 0.08 and 0.11% respectively. All the blood donors were negative for malarial parasite. All seropositive blood bags are considered as positive for TTI's and blood bags were discarded as per standard biomedical waste protocols. All blood and blood components should be tested for TTI's to ensure safe blood supply to the recipients. With the implementation of strict donor criteria and use of sensitive screening tests, it may be possible to reduce the incidence of TTI in the Indian scenario. Studies of seroprevalence of TTI were not done in Tumkur. Hence study has been conducted to know the seroprevalence of TTI in Blood donors of a tertiary care hospital Blood bank.
Keywords: Transfusion transmissible infections, HBsAg, HCV, HIV, Syphilis

INTRODUCTION:

Blood transfusion saves many lives, but at the same time the persons receiving blood transfusions are at risk of acquiring transfusion transmissible diseases (TTIs) which are still a major concern in the field of transfusion medicine. The major transfusion-transmissible infections include Hepatitis B virus (HBV), Hepatitis C virus (HCV), Human immunodeficiency virus (HIV), Syphilis (Treponema pallidum) and Malaria. With every unit of blood transfusion, there is 1% chance of transfusion associated complications including transfusion transmissible infections [1]. An increase in Transfusion related infection has been reported in India [2]. India is already carrying a burden of 50 million of HBV carriers [3] and 2.27 million of HIV cases [4].

MATERIAL AND METHODS:

Data was collected retrospectively for a 2 year period from January 2014 to December 2015 from Blood bank records of SIMSRH, Tumkur. Donor data including demographic details and results of the screening tests were recorded. All samples were screened for five transfusion transmissible diseases namely HBsAg, HCV, HIV, Syphilis and Malaria. The seropositivity among donors for HBsAg, HCV, HIV and Syphilis were 0.50%, 0.11%, 0.08% and 0.11%, respectively. No Malarial Parasites were picked up in the study period

RESULTS:

In this study there was 3378 donor in a two year period from Jan 2014 to December 2015. Among them, 3358 donors were males and 20 donors were females. They were in the age group of 18 to 50 years. Pre donor counselling and screening reports were evaluated.

All the donors' blood samples were tested for appropriate serological tests. Out of the 3378 donors tested, 28 donors were positive for serological tests, among them 1 was female donor and the 27 male donors. The donors who tested positive formed 0.82% of the total number of donors. The overall seroprevalence of HBsAg, HCV, HIV and Syphilis were 0.50%, 0.11%, 0.08% and 0.11%, respectively. There was no case with smear positive for malaria parasite. All seropositive blood bags are considered as positive for TTI's and blood bags were discarded as per standard guidelines and protocols.

Our study showed higher seroprevalence of HBV as compared to other TTI's. Further *t*here is increase prevalence of HCV as compared to HIV.

There is not of much significant change in prevalence between two years.

Table 1: Year wise distribution of TTI among blood donors

Year	Donors	HBsAg	HCV	HIV	VDRL	MP
2014	1434	10	1	1	3	0
2015	1944	7	3	2	1	0
Total	**3378**	**17**	**4**	**3**	**4**	**0**
Percentage		**0.50**	**0.11**	**0.08**	**0.11**	**0**

Table 2: Distribution of Positive Blood donors for TTI's

Donors	HBsAg		HIV		HCV		VDRL		MP		Total	
3378	No	%	No	%	No	%	No	%	No	%	No	%
28 Positives	17	0.50	3	0.08	4	0.11	4	0.11	0	0	28	0.74

There is increased incidence of HBsAg as compared to the seroprevalence of other transfusion transmissible infections. The second commonest in our study is HCV infection which is increasing as compared to HIV.

DISCUSSION:

Blood and its components transfusion is a life saving measure. However blood transfusion is an important mode of transmission of infection to the recipients also. Human beings are reservoirs of blood borne viruses like HBV, HCV and HIV. These viruses are of importance because of prolonged viremia and also their as latent and as well as carrier state.

In India the common transfusion transmitted infections are HBV, HCV, HIV, Treponema pallidum and malarial parasites. Hence screening the blood donors for these infections has been made mandatory as per NACO guidelines in India.

Various studies have been conducted in different regions of the country. The studies from eastern, western, central, northern, and southern parts of India were compared with our present study. The studies across the country revealed the seroprevalence of transfusion transmitted infections varies from one region to another and also variation within the different types of infection.

In Eastern India, the seroprevalence for HBsAg varies from 1.19 to 2.27%, the seroprevalence for HIV varies from 0.11 to 0.64%, and the seroprevalence for HCV varies from 0.20 to 1. 62 %, the seroprevalence for Syphilis varies from 0.23 to 1.31 %. A study in 2016 Kolkata showed a seroprevalence of HBsAg - 1.41%, HCV – 0.54%, and HIV – 0.60%. And Syphilis - 0.23% of transfusion transmissible infections [5]. In Eastern India HBV infection is more common as compared to other infection.

In Western India, the seroprevalence for HBsAg varies from 0.38 to 3.40%, the seroprevalence for HIV varies from 0.14 to 0.49 %, the seroprevalence for HCV varies from 0.06 to 0.10 %, and the seroprevalence for Syphilis varies from 0.14 to 0.52 %. A study from Western India (2016) showed a prevalence of HBsAg – 0.60%, HCV – 0.10%, HIV – 0.16% and Syphilis – 0.52% [10]. In Western India also, HBV infection is more common as compared to other infection.

In Central India, the seroprevalence for HBsAg varies from 1.76% to 3.15 %, the seroprevalence for HIV varies from 0.13 to 0.53%, the seroprevalence for HCV varies from 0.20 to 0.57%, and the seroprevalence for Syphilis varies from 0.0.07 to 0.23%. Recent study from Chattisgarh (2016) showed a seroprevalence of HBsAg - 1.76%, HIV – 0.53%, HCV – 0.20%, and Syphilis – 0.07 %,(14) In Central India, HBV infection is more common.

In Northern India, the seroprevalence for HBsAg varies from 0.20 to 1.96%, the seroprevalence for HIV varies from 0.08 to 0.30%, the seroprevalence for HCV varies from 0.20 to 1.09%, and the seroprevalence for Syphilis varies from 0.01 to 0.90%. Recent study from New Delhi (2015) showed a seroprevalence of HBsAg - 1.18%, HIV – 0.24%, HCV – 0.43%, and Syphilis – 2.3%,(17) . In Northern India, HBV infection is more common

In Southern India, the seroprevalence for HBsAg varies from 0.34 to 3.20 %, the seroprevalence for HIV varies from 0.06 to 0.90%, the seroprevalence for HCV varies from 0.07 to 1.02 %, and the seroprevalence for Syphilis varies from 0.04 to 1.60 %. In Southern India also HBV infection is more common,

In our study also there is increased prevalence of Hepatitis B which was on higher side as compared to HCV, HIV and Syphilis which were lower. In South India, a study from Andhra Pradesh showed a seroprevalence of HBsAg - 1.41%, HCV – 0.84%, HIV – 0.39% and syphilis 0.08%.

Studies from Karnataka state also showed slight differences in seroprevalence of TTI. A study from Mysore in southern Karnataka showed a seroprevalence of HBsAg - 1.77%, HCV – 0.13%, HIV – 0.63% and syphilis 0.28%[29] . and another study from Mysore showed seroprevalence of HBsAg, HIV, HCV and syphilis were 1.27%, 0.44%, 0.23% and 0.28%, respectively. The figures from these studies were slightly higher when compared to our study except for the incidence of Hepatitis C. A study from a Blood bank in the urban area of Mangalore showed a seroprevalence of HBsAg –0.34%, HCV – 0.06%, HIV – 0.06% and syphilis 0.11%. This seroprevalence results were much lower than that found in our study.

Seroprevalence of Transfusion Transmissible Infections varies with different regions of India as shown in Table 3.

Table -3: Comparative study showing seroprevalence of TTI s in different regions of India

Regions	Study	HBsAg	HIV	HCV	Syphilis	MP	Author	
Eastern India	Kolkata [5]	1.41%	0.60%	0.54%	0.23%		Prasantha K Ray	2016
	Kolkata [6]	1.19%	0.11%	0.2%			Ashis kumaer	2016
	Kolkata [7]	1.75%	0.28%	0.37%	0.44%		Sukla	2013
	Calcutta[8]	2.27%	0.64%	1.62%	1.31%		Swapan k Sinha	2012
	Kolkata [9]	1.55%,	0.32%.	0.35%			Das BK	2011
Western India	Gujarath [10]	0.60%	0.16%	0.10%	0.52%		Om Bhadarya	2016
	Gujarath [11]	0.38%	0.14%	0.06%	0.14%		Pragnesh J Patel	2014
	Ahmedabad [12]	0.89%	0.15%	0.10%	0.22%		Nirali Shah	2013
	Rajasthan Jodhpur [13]	3.40%,	0.44%	0.28%,	0.20%.		Garg S	2001
Central India	Chattisgarh [14]	1.76%	0.53%	0.20%	0.07%	0	Alokkumar	2016
	Gwalior [15]	3.15%	0.13%	0.45%	0.17%	0.03%	Dharmesh Chandra Sharma	2014
	Bhopal [16]	2.90%	0.51%	0.57%	0.23%		Nilima	2010
Northern India	Delhi [17]	1.18%	0.24%	0.43%	0.23%		R N Makroo	2015
	Ranchi [18]	1.01%	0.08%	0.14%	0.03%	0.33%	Shalini	2015
	Delhi[19]	0.2%	0.25%	0.70%			M Chandrashekar	2013
	Jammu [20]	0.65%	0.08%	0.20%			Meena Sindhu	2013
	Harayana [21]	1.70%	0.30%	1.00%	0.90%		Dimple Arora	2010
	Lucknow [22]	1.96%,	0.23%	0.85%,	0.01%.		Chandra T	2009
	Ludiyana [23]	0.66%,	0.08%	1.09%,	0.85%,		Gupta N	2004
South India	Andrapradesh [24]	1.41%	0.39%	0.84%	0.08%		Bhawani	2011
	Maharastra [25]	1.09%	0.74%	0.07%	0.07%		Giri P A	
	Dakshina Kannada [26]	0.53%	0.08%	0.09%	0.09%		K.Lathamani	2013
	Bellary[27]	3.20%	0.90%	0.35%	0.04%		Nagarekha	2012
	Mangalore [28]	0.34%,	0.06%	0.06%,	0.11%.		Fernandes	2011
	Mysore [29]	1.27%	0.44%,	0.23%	0.28%,		Pallavi	2011
	Mysore [30]	1.77%,	0.63%	0.13%,	0.28%.		Amrutha KB	2011
	Bangalore [31]	1.86%	0.44%	1.02%	1.60%		Srikrishna	1999
Present study	SIMSRH Tumkur	0.50%	0.08%	0.11%	0.11%	0	Raman M H	2016

The prevalence of Hepatitis B, HIV, Hepatitis C, Sypjhilis were comparable to other studies showed not much significant in seroprevalence. The observations made in this study are in concurrence

with those of various studies in different regions of the country.

CONCLUSION:

The greatest challenge in any blood and blood component transfusion is the prevention of transfusion transmitted infections. The seroprevalence of TTI is relatively minimal in our institution. Transfusion of blood and blood components is a life-saving procedure. However, every blood and blood component transfusion has a potential risk of transmitting infections which are hazardous to the recipient. This risk can be greatly minimized by continuous improvement in donor selection practices and the quality of screening tests for TTIs. In view to have safe blood transfusion, there must be strict and better donor selection criterias, motivation of voluntary donors and public awareness in the community regarding safe blood and also about the TTI must be implemented.

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