



SEROPREVALENCE OF TRANSFUSION-TRANSMITTED INFECTIONS AMONG BLOOD DONORS AT A TERTIARY CARE LEVEL HOSPITAL IN NORTH ASSAM

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ABSTRACT **INTRODUCTION:** Blood/blood components transfusion is an important component of the modern health care system and most of the time, a life saving one. However, blood/blood components transfusion is not free of its various risks. One of the risks is transfusion-transmitted infections if not properly screened. **AIMS AND OBJECTIVES:** To study the seroprevalence of TTIs among blood donors in the blood bank of Tezpur Medical College and Hospital, Tezpur. **MATERIALS AND METHODS:** The present study was carried out in the blood bank of Tezpur Medical College and Hospital, Tezpur during the period of 05 years from January, 01, 2016 to December, 31, 2020. **RESULTS AND OBSERVATIONS:** Out of screened 20617 donors, 61 donors (0.3%) were found to be positive for TTIs. Out of all 61 TTI positive blood donors 05 (8.2%) was female blood donors and 56 (91.8%) were male blood donors. Out of all TTIs, HBsAg was found to be most prevalent (n-20, 0.1%) followed by HCV (n-15, 0.07%), MP (n-14, 0.07%), VDRL (n-10, 0.05%) and HIV (n-02, 0.01%). **CONCLUSION:** The present study showed low prevalence of TTIs among the blood donors. This may be due to proper donor screening and public awareness.

KEYWORDS : Blood donors, Blood transfusion, Seroprevalence.

INTRODUCTION

Blood/blood components transfusion is an important component of the modern health care system and most of the time, a life saving one. However, blood/blood components transfusion is not free of its various risks. Out of such risk, one of the risks of blood/blood components transfusion is transfusion-transmitted infections (TTIs). TTIs are infections that transmit pathogens into blood/blood components recipient through improper blood testing and transfusions. Among these HBV, HCV, HIV, malaria and syphilis are common in India. Lack of quality system in blood bank, lack of proper testing facilities, inappropriate lab services, poor or nonstandard laboratory testing procedure, inadequate testing of donated blood, lack of trained hands or out dated reagents and inappropriate use of blood/ blood components may contribute spreading of TTIs. TTIs are also a cause of health threat for the health-care providers. Therefore, it is mandatory for every blood bank in India to screen every unit of donated blood for HBV, HCV, HIV, malaria and syphilis.

Tezpur Medical College and Hospital, Tezpur is a tertiary care level Hospital. The Medical College Hospital not only caters patients from North Assam but also from the neighbouring State Arunachal Pradesh. People of North Assam and Arunachal Pradesh donate blood frequently in the blood of this institution. Previously, no study had been undertaken in this part of Assam regarding seroprevalence of TTIs among blood donors. A study may help us to roughly estimate the prevalence of TTIs among the general asymptomatic population of this geographic area.

Keeping this in mind, the present study was undertaken with the objective to estimate the seroprevalence of TTIs among blood donors in the blood bank of Tezpur Medical College and Hospital, Tezpur.

MATERIALS AND METHODS

The present study is a retrospective descriptive study carried out in the blood bank of a tertiary care hospital in North Assam, Tezpur Medical College and Hospital, Tezpur during the period of 05 years from January, 01 2016 to December, 31 2020. All blood donors whether voluntary or replacement, irrespective of sex during the study period was the study population.

The blood bank collected blood from the donors during the study period as per guidelines framed by NACO and NBTC. The blood bank collected blood from donors of age between 18 to 60 years with haemoglobin concentration 12.0 gm% or more, body weight 45 kg or more, normotensive having neither temporary or permanent deferral criteria for blood donation. Two millilitres of pilot samples was collected from each donor and serum was separated. Serums were tested for 5 mandatory screening tests (HBsAg for HBV, HCV antibody for HCV, HIV antibodies 1, 2 for HIV, RPR for syphilis and malaria antigen for malaria parasites) as per direction of NACO and NBTC^[1]. HBsAg screening was done in serum using Hepalisa ELISA kit, anti-HCV screening was done using Hepa-scan ELISA kit, and HIV screening was done using MERILISA HIV 1-2 Gen 3 ELISA kit. RPR was done using Carbogen of Tulip Diagnostic (P) Ltd. Malaria screening was done using malaria dual antigen kit (Malcard by J. Mitra). All reactive cases were retested before marked as reactive and

discarded as per standard biomedical waste disposable procedure. All reports were recorded in the appropriate registrars and reactive donors were referred to higher centres for confirmation and treatment.

The data were collected from the registrar books of blood donors maintained in the blood bank from January, 01, 2016 to December, 31, 2020 for the present study.

RESULTS AND OBSERVATIONS

During the study period of 05 years from January 01, 2016 to December 31, 2020, a total of 20617 blood donors donated blood at the blood bank of the Tezpur Medical College and Hospital, Tezpur. Out of these, 16412 (79.60%) were male donors and 4205 (20.40%) were female donors with M: F of 3.9:1. Out of 20617 blood donors, voluntary donation comprised 1905 (9.2%) and replacement donation comprised 18712 (90.8%) with voluntary: replacement donation of 1:9.8 (Table-1).

Table-1: Total Number Of Voluntary And Replacement Blood Donors In Both Sex In Total And Year Wise

Year	Voluntary Donors			Replacement Donors			Total Donors		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
2016	128	77	205	2825	692	3517	2953	769	3722
2017	279	79	358	3059	761	3820	3338	840	4178
2018	413	81	494	2881	757	3638	3294	838	4132
2019	328	83	411	3169	819	3988	3497	902	4399
2020	352	85	437	2978	771	3749	3330	856	4186
Total	1500	405	1905	14912	3800	18712	16412	4205	20617

Out of 20617 blood donors, 61 donors (0.3%) were found to be positive for TTIs. No voluntary donors were positive for TTIs; all TTI positive donors belonged to replacement donation. Out of all 61 TTI positive blood donors 05 (8.2%) were female blood donors and 56 (91.8%) were male blood donors. The seropositivity for various TTIs were as- 20 positive for HBsAg out of 20617 blood donors (0.1%), 15 positive for HCV out of 20617 blood donors (0.07%), 02 positive for HIV out of 20617 blood donors (0.01%), 10 positive for syphilis (VDRL) out of 20617 blood donors (0.05%) and 14 positive for MP out of 20617 blood donors (0.07%). Out of all TTIs, HBV is found to be most prevalent (n-20, 0.1%) followed by HCV (n-15, 0.07%) (Table-2).

Table-2: Prevalence Of Different Transfusion-transmissible Infections Among The Blood Donors

Year	HBV		HCV		HIV		VDRL		MP		Total	
	VD	RD	0	RD	VD	RD	VD	RD	VD	RD	VD	Total
2016	0	6	0	5	0	1	0	3	0	6	0	21
2017	0	4	0	2	0	1	0	3	0	4	0	14
2018	0	5	0	3	0	0	0	2	0	2	0	12
2019	0	3	0	3	0	0	0	1	0	1	0	8
2020	0	2	0	2	0	0	0	1	0	1	0	6
Total	0	20	0	15	0	2	0	10	0	14	0	61

DISCUSSION

In our study we found low female blood donors. This may be due to lack of awareness among them. Our study showed low voluntary donation which indicates low awareness regarding blood donation among the population. In our study, 0.3% of donors were positive for any of the TTIs. Low seroprevalence of TTIs among women than male in our study may be due to lower blood donation by female and low risk behaviours amongst female. Nil seropositivity for voluntary blood donation indicates self deferral by high risk donors. Table-3 shows the prevalence of various TTIs in our study and various other Indian studies.

Table-3: Transfusion-transmissible Infections Among The Blood Donors In Various Studies

Study	Area	Duration	HBV (%)	HCV (%)	HIV (%)	VDR L (%)	MP (%)
Present Study	Assam	2016-20	0.1	0.07	0.01	0.05	0.07
Omhare et al. ^[2]	Kanpur	2014-15	1.45	0.33	0.068	0.15	0.007
Bhutia et al. ^[3]	Sikkim	2013-17	0.91	0.22	0.15	0.04	-
Patil et al. ^[4]	Maharashtra	2011-18	1.027	0.1409	0.131	0.001	0.01
Karmakar et al. ^[5]	Kolkata	2011	1.41	0.59	0.60	0.23	-
Mandal R et al. ^[6]	Darjeeling	2010-12	1.24	0.62	0.64	0.65	-
Rawat et al. ^[7]	Delhi	2008-14	1.61	0.73	0.32	1.62	0.06
Negi et al. ^[8]	Uttarakhand	2000-10	1.2	0.9	0.2	0.3	0.002

In our study HBV is the most prevalent TTI (0.1%) which is lower than many other Indian studies, where seroprevalence ranges from 0.91% to 1.61%. In recent years, vaccination against HBV significantly reducing the HBV infection in our society. Most of the previous studies also showed the HBV is predominant among the blood donors. Hepatitis C is the second most common TTI in our study (0.07%) which is lower than many other Indian studies, where seroprevalence ranges from 0.1409% to 0.9%. Various previous studies also showed HCV as second TTI. In our study, HIV seroprevalence was 0.01%, which is lower than many other Indian studies, where seroprevalence ranges from 0.068% to 0.64%. Strict donor screening, pre-donation counselling, public awareness, self deferral of donation by high risk donors and low prevalence of HBV, HCV and HIV in our geographical area may be the reason of low prevalence of these TTIs among the blood donors in our blood bank.

The seroprevalence for syphilis in our study was 0.05%, which is comparable to other Indian studies. The seroprevalence of malaria in our study was 0.07%, which is higher than many Indian studies. This may be as most of donors in our blood bank are from the population surrounding Tezpur Medical College, they are mostly tea garden population and tribal population, and malaria is endemic amongst these populations.

CONCLUSION

To transfuse the safest blood/blood components to needy patients, it is globally accepted that the best source of blood is from voluntary blood donations. Voluntary blood donation is associated with reduced prevalence of TTIs. Proper donor selection, counselling, strict screening and use of proper testing to detect the TTIs in the donated blood are necessary to reduce the incidences of TTIs among the blood recipients. Hence we recommend voluntary blood donation along with proper counselling and more sensitive tests like NAT to reduce the chances of spreading TTIs during window period.

REFERENCES

1. National AIDS Control Organization (NACO, INDIA). Standards of Blood Banks and Blood transfusion Services. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India; 2007.
2. Omhare A, Purwar N, Singh SK, Rana U. Study of serological prevalence of transfusion transmissible infections among blood donors in a tertiary care hospital in North India. *Ind J Pathol Oncol* 2018; 5: p. 212-215.
3. Bhutia CT, Das D. Prevalence of transfusion transmissible infections from Eastern part of India: A 5-years experience. *ANNALS Pathol Lab Med* 2019; p.600-604.
4. Patil PU, Gowai S, Joshi A. Seroprevalence of transfusion transmissible infections among blood donors: A 8 year regional blood bank experience. *Gal INT J Health Sci Res* 2020, 5: p.1150-1154.
5. Karmakar PR, Shrivastava P, Ray TG. Seroprevalence of transfusion transmissible infections among blood donors at blood bank of a Medical College of Kolkata, *Indian J Public Health* 2014; 58. P.61-64.
6. Mandal R, Mandal K. Transfusion transmissible infections among blood donors from sub-Himalayan rural tertiary care centre at Darjeeling, India. *J Tradit Complement Med* 2016;6.p.2240119.
7. Rawat A, Diwakaer P, Gogoi P, Singh B. Seroprevalence and changing trends of transfusion transmissible infections among blood donors in a Regional Blood

8. Negi G, Gaur DS. Trends of transfusion transmissible disease among blood donors at Uttarakhand. *Indian J Community Med* 2014; 39:p.183-186.