

Seroprevalence of transfusion transmitted infections among blood donors at a tertiary Care Teaching Hospital of North Gujarat, India

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Abstract

Introduction: Transfusion transmitted infections (TTIs) are matter of great concern in today's world. Meticulous testing of Blood and blood components is must before transfusion so as to avoid risk of getting TTIs. Present study was conducted to find out the seroprevalence of transfusion transmitted infection among the blood donors attending blood bank of rural tertiary care institute.

Materials and Method: All blood donors who donated blood at Blood Bank of present institute were screened for transfusion transmitted infections (HIV, HBsAg, HCV, Syphilis) for the year 2010 to 2016 (upto June)

Result: Out of total 5434 blood donors, number of male donors were 5275 (97.1%) while 159 (2.9%) were female donors. Voluntary donors were more 76.8% as compared to replacement donors (23.3%). Maximum donors were belonged to 18-30 yrs in all categories. All replacement donors were males. Seroprevalence was more in case of Hepatitis B (1.21%) as compared to other infections. Year wise seroprevalence of transfusion transmitted infections exhibit decreasing trend for all infections excluding Hepatitis B. Significantly high seroprevalence was present in replacement donors.

Conclusion: Yearly trend of seroprevalence of HBV was on rise among blood donors as compared to seroprevalence of HIV, HCV and Syphilis. Adult vaccination for hepatitis B should be promoted. Seroprevalence was significantly high among replacement donors which suggest the requirement to motivate voluntary donors for regular blood donation.

Keywords: Seroprevalence, HIV, HBsAg, HCV, Syphilis, Blood Donors

Introduction

No synthetic substitute is invented for blood loss till date. That is why voluntary blood donors are always in demand. Replacement donors usually donate blood, when a relative or a friend is in need of blood. Transfusion transmitted infections (TTIs) are matter of great concern in today's world. Meticulous testing of Blood and blood components is must before transfusion so as to avoid risk of getting TTIs. Life saving modalities may turn to life threatening herald, if any error remains in pre-transfusion testing. Transfusion transmitted infections (TTIs) can be caused by various microorganisms which may be present in the blood used for transfusion. Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Treponema pallidum and malaria parasite are major prevalent TTIs in the world. In India, it is mandatory to screen blood donors for above mentioned infections.³ Seroprevalence of TTIs may vary from place to place. Seroprevalence of transfusion transmitted infections among blood donors is important to know current status of infection in blood donor. Due to increase awareness of community regarding Hepatitis B vaccination and awareness about prevention of HIV, HCV and Syphilis, the prevalence of transfusion transmitted infection is changing with time period. Present study was conducted to find out the seroprevalence of transfusion transmitted infection among the blood donors attending blood bank of rural tertiary care institute of North Gujarat.

Aims & Objectives

1. To study the seroprevalence of transfusion transmitted infections amongst blood donors at Blood Bank
2. To correlate the findings of seroprevalence with various demographic factors.

Materials and Methods

This study has been done retrospectively by including data of blood donors for five consecutive years (January 2010 to June 2016). All blood donors who donate blood, either at Blood Bank or at various out door blood donation camp organized by blood bank were incorporated in this study. No single blood donor during given five year were excluded in this study. Confidentiality of donor is maintained as per guideline. Serum Samples from Donors were tested for prevalence of markers for TTIs viz., HIV, HBsAg, HCV antibody & RPR for syphilis. ELISA method was used for screening of HIV, HBsAg and Anti-HCV testing. Test for Syphilis was done by RPR method. All the reactive samples were tested in duplicate. Prior permission to perform this study was received from institutional ethical committee. Data were entered and analyzed using Microsoft Excel.

Results

Out of total 5434 blood donors, number of male donors were 5275 (97.1%) while 159 (2.9%) were

female donors. No donor were excluded from study. Voluntary donors were more 76.8% as compared to replacement donors (23.3%) Table 1. The reason behind more number of voluntary donors is that they are motivated donors and replacement donors usually donate blood only when a relative or a friend is in need of blood. Maximum donors belonged to 18-30 yrs in all categories. Gender wise breakup of voluntary and replacement donors showed that cent percent of replacement donors were males. (Table 2)

Table 1: Age and sex wise distribution of voluntary and replacement donors

Age	Male (Voluntary)	Female (Voluntary)	Male (Replacement)	Female (Replacement)
18-30	3186 (79.5%)	128 (80.5%)	782 (61.8%)	00
31-45	752 (18.7%)	30 (18.8%)	360 (28.5%)	00
46-60	72(1.8)	01(0.7%)	123 (9.7%)	00
Total	4010	159	1265	00

Table 2: Gender wise breakup of Voluntary v/s Replacement donors from 2010- 2016

Year	Voluntary		Replacement	
	Male	Female	Male	Female
2010	400	10	176	00
2011	406	12	134	00
2012	644	17	125	00
2013	534	28	112	00
2014	740	47	295	00
2015	799	33	325	00
2016 upto June	487	12	98	00
Total	4010	159	1265	00

Table 5: Year Wise Trends of seroprevalence of Transfusion transmitted infections

Year	HIV		HBsAg		HCV		Syphilis	
	N	(%)	N	(%)	N	(%)	N	(%)
2010	1	0.17	7	1.19	3	0.51	3	0.51
2011	1	0.18	4	0.72	1	0.18	6	1.09
2012	0	0.00	9	1.15	0	0.00	8	1.02
2013	1	0.15	13	1.93	0	0.00	1	0.15
2014	0	0.00	11	1.02	2	0.18	4	0.37
2015	1	0.09	13	1.12	2	0.17	3	0.26
2016 upto June 2016	1	0.17	7	1.17	1	0.17	1	0.17

Year wise seroprevalence of transfusion transmitted infections exhibit decreasing trend for all infections excluding Hepatitis B. (Table 5, Fig. 1)

Seroprevalence for various transfusion transmitted diseases is shown in Table 3. Maximum seroprevalence was found for Hepatitis B (1.21%) as compared to other infections. Replacement donors were found to have significantly more seroprevalence for Hepatitis B, Hepatitis C and Syphilis infections.

Table 3: Distribution of sero positive cases

Infections	Voluntary Donors	Replacement Donors	Total	OR	P Value
HIV	02(0.05%)	03(0.24%)	06 (0.11%)	0.2	>0.05
HBsAg	24(0.58%)	44(3.48%)	66 (1.21%)	0.16	<0.001
HCV	03(0.07%)	07(0.55%)	10 (0.18%)	0.12	<0.001
SYPHILIS	14(0.34%)	12 (0.95%)	26 (0.48%)	0.35	<0.05
Total Donors	4169	1265	5434		

Total number of male donors were 5275 (97.1%) while 159 (2.9%) were female donors. As far as gender was concerned, seroprevalence was not differed significantly (p>0.05). (Table 4)

Table 4: Gender wise difference in Seroprevalence

Seroprevalence	Male N (%)	Female N (%)	OR	P value
HIV	5(0.09)	0	0.33	>0.05
HBsAg	62(1.18)	2(1.26)	0.93	>0.05
HCV	9(0.17)	0	0.57	>0.05
Syphilis	26(0.49)	0	1.61	>0.05

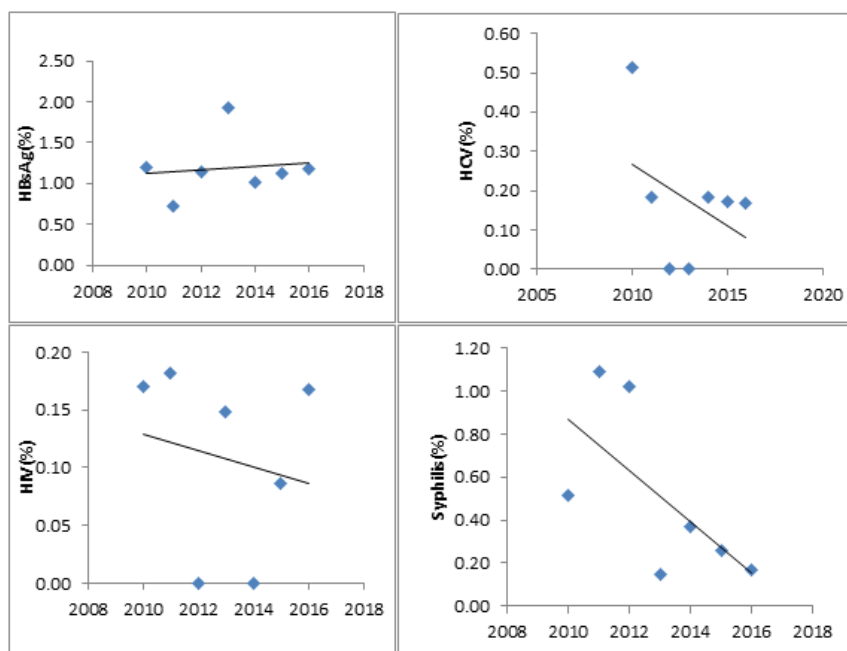


Fig. 1: Time trend of seroprevalence for all transfusion transmitted infections

Discussion

Seroprevalence of all four transfusion transmitted infections were calculated. It was observed that maximum seroprevalence was found for Hepatitis B (1.21%) as compared to other infections. Seroprevalence was compared with other studies conducted across India. Almost similar findings were found in present study. (Table 6) Seroprevalence was significantly more among replacement donors for Hepatitis B, Hepatitis C and Syphilis infections. Finding was similar to other studies.^{4,9,10} As far as gender was concerned, seroprevalence was not differed significantly ($p > 0.05$). This finding was different from other study carried out by Makroo et al.⁷ Number of female donors are very less in the present study, that may be the reason behind low seroprevalence among them. Year wise seroprevalence of transfusion transmitted infections exhibit decreasing trend for all infections excluding Hepatitis B. Hepatitis B vaccination can reduce the prevalence of infection among general population.

Table 6 comparison of seroprevalence with various studies across India

Place	HIV %	HCV %	HBsAg%	Syphilis %	Reference
Banglore	0.44	1.02	1.86	1.6	Srikrishna A et al(1999) ²
Ludhiana	0.084	1.09	0.66	0.85	Gupta N et al (2004) ³
West Bengal	0.28	0.31	1.46	0.72	Bhattacharya P et al (2007) ⁴
Delhi	0.56	0.66	2.23	-----	Pahuja S et al(2007) ⁵
Lucknow (UP)	0.23	0.85	1.96	0.01	Chandra T et al (2009) ⁶
Southern Haryana	0.3	1.7	1	0.9	Arora D et al (2010) ⁷
Present Study	0.11	0.18	1.21	0.48	2016

Conclusion

As per the findings of present study, seroprevalence of HBV was on a rise among blood donors, whereas seroprevalence of HIV, HCV and Syphilis was reducing. Adult vaccination for hepatitis B should be promoted in the particular region where the study had been carried out. Seroprevalence was significantly high among replacement donors which suggest the requirement to motivate voluntary donors for regular blood donation. Less number of female

donor in this study can limit the findings in this study. Motivation of female donor is required for voluntary blood donation.

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