

Prevalence of HIV, HBsAg, HCV and Syphilis in Voluntary & Replacement donors at a Tertiary care Blood bank

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Abstracts: Background & Objectives: To study the prevalence of HIV, HBsAg, HCV & syphilis in blood donors.

Methods: The seroprevalence of HIV, HBsAg & syphilis among voluntary and replacement donors was analyzed for a period of 16 years (January 1996 to December 2011) and for HCV for a period of 10 years and 7 months (June 2001 to December 2011) at Department of Immunohaematology & Blood Transfusion, Civil Hospital, Ahmedabad. In this period, a total of 2, 81,665 donors were tested, out of which, 2, 00,903 (71.3%) were replacement donors and 80,762 (28.7%) were voluntary donors. HIV, HBsAg & HCV were tested by ELISA method and syphilis by RPR method. **Results:** Total seropositivity was 1071(0.380%) for HIV, 2900 (1.102%) for HBsAg, 599 (0.306 %) for HCV & 1522(0.540 %) for syphilis. In replacement donors, seropositivity for HIV was 891(0.443%), HBsAg was 2299(1.144%), HCV was 437(0.330%) & syphilis was 1130(0.562%). In voluntary donors, seropositivity for HIV was 180(0.222%), HBsAg was 601(0.744%), HCV was 162(0.257%) & syphilis was 392(0.485%). **Conclusion:** The present study indicates that higher seroprevalence rates for HIV, HBsAg, HCV & syphilis were observed in replacement donors as compared to voluntary donors.[Sonani RV et al NJIRM 2012; 3(4) :34-37]

Key Words: Blood donors, Infectious markers, Replacement, Voluntary

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Introduction: Blood transfusion is a lifesaving procedure but it can cause serious transfusion transmitted infections, if not tested properly for the presence of micro-organisms. Provision of safe blood is of paramount importance and its responsibility lies solely with blood transfusion services and to ensure this, only non- infected blood is given to any patient¹.

The infections transmitted through blood can be divided into two groups:

Exogenous: Those which are introduced into a blood unit from an external source i.e. during manoeuvring of blood unit at the time of tapping, cross-matching, supply & transfusion.

Endogenous: Those which are already present in the blood of donor.

The infectious agents known to be transmitted through blood are:

Viruses : Hepatitis B virus, Hepatitis C virus, Human Immunodeficiency virus (HIV I & II), Hepatitis D virus, Human Papilloma virus, Human T cell leukemia virus I & II, Human Parvo virus, Epstein Barr virus, Cytomegalo virus, Herpes Virus(HSV I & HSV II)

BACTERIA	PARASITES
Spirochetes –	Plasmodium species (Malaria)
Treponema Pallidum	Trypanosoma cruzi (Chagas disease)
Salmonella	Toxoplasma gondi
Brucella abartus	L. Donovan
Yersinia enterocoliticus	Microfilaria
	Babesia Microti

In recent years, numerous infectious agents (found worldwide) have been identified as potential threats to blood supply. These newly discovered agents namely transfusion transmitted virus(TTV), SEN-V(SEN virus), Human Herpes virus-8(HHV-8), Hepatitis G virus(HGV), West Nile virus and prions present a unique challenge in assessing the possible risk they may pose to the safety of blood & blood products².

Mandatory screening tests in India are:

- HBsAg.
- Antibody to Treponema Pallidum.
- Antibody to HIV I & II.

- Antibody to Hepatitis C virus.
- Malarial Parasite³.
- Other optional tests are:
- Antibody to Cytomegalovirus
- Antibody to Plasmodium falciparum
- Antibody to HTLV - I

Screening tests are usually directed at the antibody to infectious agent rather than antigen for the agent, except in the case of Hepatitis B Virus. Presence of specific antibody is suggestive of persistent or chronic infection.

Screening for HCV infection was made mandatory in January 2001 by Drug Controller General of India. Present study was carried out to assess the prevalence of infectious markers in blood donors, difference if any in voluntary and replacement donors and comparison of the results with other Indian studies.

Materials And Methods: The aims and objective of this study was to compare the sero-reactivity rates of HIV, HBsAg, HCV & Syphilis in voluntary and replacement donors.

A total of 2,81,665 blood units were collected from blood donors (Voluntary & Replacement) during the period from January 1996 to December 2011 at Dept of IHBT, Blood Bank, Civil Hospital, Ahmedabad, both voluntary and replacement. The replacement donors came to the centre to donate blood in replacement to the blood required for the patients admitted in the civil hospital. They were family members, close relatives or friends of the patients. Voluntary donors donated blood in the department or in the blood donation camp. Care was taken to exclude professional donors by taking appropriate history and examination of the donors.

All samples were screened for HIV, HBsAg, HCV (All 3 using Enzyme Linked Immunosorbent Assay-ELISA) & syphilis (using non-treponemal tests). All the reactive samples were repeated in duplicate before labelling them as a sero-positive & the units

found sero-positive on repeat testing were discarded.

Results : During the study period (January 1996 to December 2011), 2,81,665 donors were screened. Out of this, 80,762(28.6%) were Voluntary donors and 2,00,903 (71.4%) were Replacement donors. HCV was analyzed for 10 years and 7 months (June 2001 to December 2011). A total of 1,95,182 donors were screened. Out of this, 62,804(32.17%) were voluntary and 1,32,378 (67.83%) were replacement.

Table 1 shows the distribution of blood donors (Voluntary & Replacement) at Blood Bank, Civil hospital, Ahmedabad.

YEAR	TOTAL	REPLACEMENT	VOLUNTARY
1996	15,149	13,090 (86%)	2,059 (14%)
1997	15,498	12,469 (80%)	3,029(20%)
1998	15,499	12,382(80%)	3,117 (20%)
1999	16,367	11,350 (69%)	5,017 (31%)
2000	17,433	13,551(78%)	3,882(22%)
2001	17,481	14,535(83%)	2,946(17%)
2002	17,232	12,046(70%)	5,186(30%)
2003	17,166	14,136(82%)	3,030 (18%)
2004	16,242	12,790(78%)	3,452 (22%)
2005	14,719	11,601(79%)	3118 (21%)
2006	15,545	11,115 (71%)	4430(29%)
2007	18,499	14,558(79%)	3,941(21%)
2008	20,502	11,414(56%)	9,088(44%)
2009	20,582	11,224(54%)	9,358(46%)
2010	20,300	12,067(59%)	8,233(41%)
2011	23,451	12,580(54%)	10,871(46%)
Total	2,81,665	2,00,903 (71%)	80,762(29%)

Discussion : As seen in Table I, replacement donors constitute the largest group of blood donors in our set up. Sometimes, in practice, a replacement donor could even be a professional donor who is paid by the patient's relatives, which is possibly the reason for increase in sero-reactivity rates in replacement donors. The proportion of voluntary donors shows an increase during the study period,

though not consistent which is comparable to other studies⁴.

As seen in Table II, the seroprevalence of HIV in our study is 0.38%. The seroprevalence of HIV in

Indian scenario has been reported between 0.2% to 1.0%^{4,5,6,7,8,9}. It was also observed that the years where voluntary donations were more, seroreactivity of HIV was low.

Table II shows the trends in seropositivity of HIV, HBsAg, HCV, & syphilis in blood donors in our set up.

	HIV Reactive			HbsAg Reactive			RPR Reactive			HCV Reactive		
	Total %	V %	R %	Total %	V %	R %	Total %	V %	R %	Total %	V %	R %
1996	87 0.574	7 0.339	80 0.611	193 1.274	14 0.679	179 1.367	45 0.297	3 0.145	42 0.320			
1997	74 0.477	6 0.198	68 0.545	164 1.058	11 0.363	153 1.227	35 0.225	2 0.066	33 0.264			
1998	55 0.354	3 0.096	52 0.419	151 0.974	15 0.481	136 1.098	25 0.161	4 0.128	21 0.169			
1999	61 0.372	8 0.159	53 0.466	135 0.824	20 0.398	115 1.013	26 0.158	2 0.039	24 0.211			
2000	69 0.395	4 0.103	65 0.479	138 0.791	23 0.592	115 0.848	79 0.453	3 0.077	76 0.560			
2001	111 0.634	20 0.670	91 0.626	146 0.835	21 0.712	125 0.859	15 0.085	2 0.067	13 0.089	25 0.228	2 0.083	23 0.268
2002	73 0.423	13 0.250	60 0.498	199 1.154	43 0.829	156 1.295	102 0.592	11 0.212	91 0.755	32 0.185	7 0.134	25 0.207
2003	89 0.518	9 0.297	80 0.565	287 1.671	51 1.683	236 1.669	41 0.238	3 0.099	38 0.268	118 0.687	23 0.759	95 0.672
2004	57 0.351	13 0.376	44 0.344	227 1.391	66 1.912	161 1.258	26 0.160	1 0.028	25 0.195	123 0.757	35 1.013	88 0.688
2005	57 0.387	14 0.449	43 0.370	153 1.039	26 0.833	127 1.094	33 0.224	0 0.00	33 0.284	32 0.217	7 0.224	25 0.215
2006	45 0.289	5 0.112	40 0.359	161 1.035	37 0.835	124 1.115	93 0.598	6 0.135	87 0.782	30 0.192	3 0.067	27 0.242
2007	55 0.297	11 0.279	44 0.302	200 1.081	28 0.710	172 1.181	180 0.973	25 0.634	155 1.064	41 0.221	4 0.101	37 0.254
2008	68 0.331	19 0.209	49 0.429	193 0.941	50 0.550	143 1.252	404 1.970	167 1.837	237 2.076	36 0.175	13 0.143	23 0.201
2009	58 0.281	20 0.213	38 0.338	182 0.884	62 0.662	120 1.069	221 1.073	87 0.929	134 1.193	15 0.072	4 0.042	11 0.098
2010	56 0.275	10 0.121	46 0.381	165 0.812	54 0.655	111 0.919	121 0.596	50 0.607	71 0.588	47 0.231	21 0.255	26 0.215
2011	56 0.238	18 0.165	38 0.302	206 0.878	80 0.735	126 1.001	76 0.324	26 0.239	50 0.397	100 0.426	43 0.395	57 0.453
Total	1071 0.380	180 0.222	891 0.443	2900 1.102	601 0.744	2299 1.144	1522 0.540	392 0.485	1130 0.562	599 0.306	162 0.257	437 0.330

Table III shows the comparison of seroprevalence of HIV, HBsAg, HCV & syphilis in our set up with other Indian studies.

	HIV Reactive			HbsAg Reactive			RPR Reactive			HCV Reactive		
	Total %	V %	R %	Total %	V %	R %	Total %	V %	R %	Total %	V %	R %
Present study	0.38	0.22	0.44	1.10	0.74	1.14	0.54	0.48	0.56	0.30	0.25	0.33
Garg et al	0.44	0.27	0.46	3.44	2.57	3.52	0.22	0.12	0.23	----	----	0.33
Sharma et al	0.3	----	----	0.99	----	----	0.66	----	----	0.4	----	----
Nanu et al	0.55	----	----	2.4	0.52	----	----	----	----	1.49	----	----
Singh et al	0.8	0.8	0.8	1.8	1.2	1.9	2.7	1.3	3.0	0.5	----	----

The seroprevalence of HBsAg in our study is 1.10% which is much less than in other Indian studies. Seroprevalence of HBsAg in various other Indian studies has been shown to range between 1.86% to 4.0%^{5,10,11}. The seroprevalence of VDRL in our study is 0.54% which is comparable with other studies^{4,5,6,7}. The seroprevalence of HCV in our study is 0.30%. Indian studies show a range between 0.3% to 1.4%^{4,6,7,10}. Studies in India and worldwide have reported a higher seroprevalence of transfusion transmitted diseases in replacement donors as compared to voluntary blood donors.

Conclusion: From the present study, it is concluded that there should be a drive to increase voluntary donations by widespread propaganda to minimize the risk of blood transfusion transmissible diseases. More so, repeat voluntary donations would ensure the repeated testing / screening of a donor for all these diseases which would reduce all probabilities of transmitting these diseases. Hence, stress should be laid on recruiting voluntary non-remunerated repeat donors.¹²

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