

Seroprevalence of HIV, HbsAg, HCV, Syphilis in Blood Donors at Blood Bank in a Tertiary Care General Hospital – A Retrospective study

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Abstracts: Introduction: Transfusion of blood and blood products has an important role in saving lives. With every unit of blood there is a 1% chance of transfusion associated problems including transfusion transmitted diseases^[1]. This study was carried out to know the Sero-prevalence of transfusion transmitted infections in blood donors in Bhavnagar. This will help in knowing trends of common transfusion transmitted diseases like Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Syphilis and implementation of advance test methods if required. **Objectives:** To know the prevalence rate & trend of Transfusion Transmitted in blood donors at Blood Bank, Sir T General Hospital, Bhavnagar. **Materials & Method:** This retrospective study was carried out over a period of five year from January 2007 to December 2011 at blood bank, Sir Takhtsinhji general hospital attached with Government Medical College, Bhavnagar (Gujarat). Blood collection was carried out from voluntary donors as well as replacement donors (relatives and friends of the patients). Total 34051 of blood donors were tested for detection of antibodies against HIV, HCV, syphilis, Hepatitis B antigen (HbsAg). **Results:** Out of 34051 donors the prevalence of different transfusion transmitted infections (TTIs) were 825(2.42%) from which voluntary sero-reactive donors were 424(1.72%) & remaining 401(4.32%) were replacement donors. The prevalence of TTIs in male donors was 809(2.53%) & in female donors 27(1.33%). The trend of TTIs was decreasing over period of five years. The most common TTI was HBV infection in both voluntary (1.06%) & replacement donors (2.69%). **Conclusion:** The time and cost involved in screening donated blood can be reduced by an effective donor education & selection program that promotes self-exclusion by donors at risk of transfusion-transmissible infections.

Key Words: Blood Transfusion, Transfusion Transmitted Infection, Replacement blood donors, Voluntary blood donors

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Introduction: Transfusion of blood and blood products has an important role in saving lives. As there is no absolute substitution of blood and its products, one has to be very careful in screening/selection of donors and testing of blood otherwise the purpose of saving life may end up with transfusion of life threatening infections. With every unit of blood there is a 1% chance of transfusion associated problems including transfusion transmitted diseases^[1]. A majority of known cases of post transfusion diseases have been caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), Treponema Pallidum and Malaria parasites. This study was carried out to know the Seroprevalence of transfusion transmitted infections in blood donors in Bhavnagar. This will help in knowing trends of common transfusion transmitted diseases like HIV, HBV, HCV, Syphilis and implementation of advance test methods if required.

Objectives: To know the prevalence & trend of Transfusion Transmitted in blood donors at Blood Bank, Sir T General Hospital, Bhavnagar.

Material and Methods: This retrospective study was carried out over a period of five year from January 2007 to December 2011 at blood bank, Sir T general hospital & Government

Medical College Bhavnagar. Blood collection was carried out from voluntary donors as well as replacement donors (relatives and friends of the patients). Voluntary donation were obtained from in house voluntary donors and outdoor camps organised by religious and social organisations, clubs and political parties.^[2,11] After filling the registration forms, all the donors were screened as per criteria and guide line from drug and cosmetic act^[3] and National AIDS Control Organization (NACO).^[4] to accept as healthy donor. Donors fulfilling the requirements were selected. Total 34051 of blood donors were tested for detection of antibodies against Human Immunodeficiency Virus (HIV), hepatitis C Virus (HCV), syphilis, hepatitis B antigen (HbsAg). For HIV, HbsAg and HCV third generation enzyme linked immunosorbent assay (ELISA) testing was performed and for Syphilis, Rapid Plasma Reagin test (RPR)/ third generation ELISA was used as test method. All positive/gray zone results were repeated in duplicate for the same test using the same sample obtained from the donor at the time of blood donation and bags were discarded. If found positive on repeat testing, the donors were considered as 'positive' and called for post-test counselling. The data were recorded tabulated and analysed and compared with similar studies by others.

Result:

Total 34051 donors (including both voluntary and replacement) were screened. Out of these, 24715(72.6%) donors were voluntary donors. Remaining 9336 (27.4%) were replacement donors. Male donors contributed to 32023(94.04) % donation. Only 2028(5.96%) donors were females. Total No. of male positive donors were 809(2.53%) and female positive donors were 27(1.33%).

Out of 34051, total donors reactive for different transfusion transmitted infections (TTIs) were 825(2.42%) and from which were voluntary sero-reactive donors 424(1.72%) & remaining 401(4.32%) were replacement donors. Amongst voluntary donors & replacement donors, year wise seropositivity rate for different TTIs was given in Table 1 (Table-1). Table-2 shows that the most common TTI in voluntary donors was HBV 1.06%.

Table 1: Prevalence of TTIs among Voluntary & Replacement donors

Year	Voluntary		Replacement		Grand Total	
	Tested	Positive	Tested	Positive	Tested	Positive
2007	963	32(3.32%)	3777	196 (5.19%)	4740	228(4.81%)
2008	1608	34(2.11%)	3459	107(3.09%)	5067	141(2.78%)
2009	5352	118(2.20%)	1548	49(3.17%)	6900	167(2.42%)
2010	7960	109(1.37%)	255	40(15.69%)	8215	149(1.81%)
2011	8832	131(1.48%)	297	9(3.03%)	9129	140(1.53%)
Total	24715	424(1.72%)	9336	401(4.30%)	34051	825(2.42%)

Figure 1: Trend of TTIs from year 2007-2011

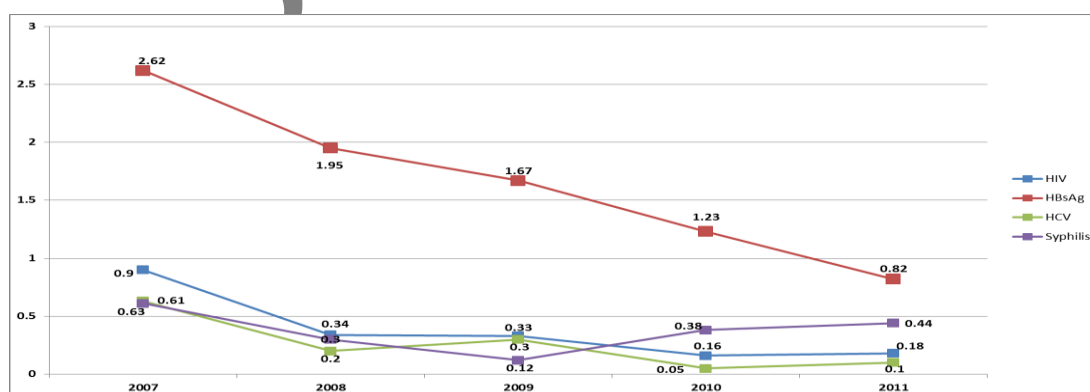


Figure 1 shows that prevalence of HIV, HCV & HbsAg was decreasing from year 2007 to 2011 while trend of syphilis was increased during 2010 & 2011.

Table 2: Prevalence of different TTIs in voluntary donors (N=24715)

Year	Voluntary donors (in Numbers)	HIV	HBV	HCV	Syphilis
2007	963	7(0.73%)	19(1.97%)	3(0.31%)	3(0.31%)
2008	1608	5(0.31%)	21(1.31%)	3(0.19%)	5(0.31%)
2009	5352	18(0.34%)	80(1.5%)	16(0.3%)	4(0.08%)
2010	7960	9(0.11%)	71(0.89%)	2(0.03%)	27(0.34%)
2011	8832	14(0.16%)	72(0.82%)	8(0.09%)	37(0.42%)
Total	24715	53(0.22%)	263(1.06%)	32(0.13%)	76(0.31%)

Table 3: Prevalence of different TTIs in replacement donors (N=9336)

Year	Replacement donors (in number)	HIV	HBV	HCV	Syphilis
2007	3777	38(1.01%)	105(2.78%)	27(0.72%)	26(0.69%)
2008	3459	12(0.35%)	78(2.26%)	7(0.20%)	10(0.29%)
2009	1548	5(0.32%)	35(2.26%)	5(0.32%)	4(0.26%)
2010	255	4(1.57%)	30(11.77%)	2(0.78%)	4(1.57%)
2011	297	2(0.67%)	3(1.01%)	1(0.34%)	3(1.01%)
Total	9336	61(0.65)	251(2.69%)	42(0.45%)	47(0.50%)

Prevalence of different TTIs among the replacement donors are shown in (Table 3). The most common TTI was HBV (2.69%) in replacement donors followed by HIV, syphilis & HCV.

Discussion:

Table-4: Comparison with different studies

Studies	HIV	HBV	HCV	Syphilis	Total
Gupta et al ^[5]	0.08	0.66	1.09	0.85	2.68
Bhawani et al ^[6]	0.39	1.41	0.84	0.08	2.72
Chandra et al ^[7]	0.23	1.96	0.34	0.01	2.54
Jasani et al ^[8]	0.25	1.35	0.85	0.90	3.35
Patel et al ^[9]	0.08	0.3	0.09	0.06	0.5
Present study (our study)	0.33%	1.51%	0.22%	0.36	2.42%

Results of present study have been compared with similar studies carried out in different region of Gujarat and India. Total Seroprevalence of our study (2.42%) matches with other studies of Gupta N et al (2.68%)^[5], Chandra et al (2.54%)^[7], and bhawani et al (2.72%)^[6]. Commonest TTI found was HbsAg followed by Syphilis, HIV and HCV in our study. HBV is also the commonest TTI found in Chandra et al^[7], and bhawani et al^[6] and Jasani et al^[8] studies. This is because of higher prevalence of HBV in the community as compared to other infections.

In our study male positive donors were 809 (2.53%) and female positive donors were 27 (1.33%). In all the studies no. of female donors are very less this is because of the fact that most of the time due to some social limitations and cultural misbeliefs females usually do not come forward themselves for donation. Also in developing country like India, large no. of females are anaemic due to poor/inadequate nutrition status so they are declared unfit for blood donation during screening.^[9] In female donors prevalence of TTIs is low (1.33%) because overall population of female donors is very small and also females who are voluntary blood donors belong to the well socio-economic background.

Seroprevalence of HIV and HBV in Present study correlates with the Chandra et al^[7] and bhawani et al^[6] and Jasani et al^[8] study. Whereas seroprevalence of HCV is low as compared to other studies except Patel et al^[9] studies. This is because that overall seroprevalence as well as disease wise seroprevalence is low amongst all compared studies. There is changing trends of HIV, HBV, HCV in downward direction which is also seen in Patel et al^[9], Jasani et al^[8] and Sawke et al^[10] studies. This is because of stringent screening of blood donors due to which donors with high risk behaviour are eliminated at basic level of pre donation screening and counselling. Another important contributor lowering Seroprevalence, is Large pool of voluntary non remunerated blood donors Post donation counselling has been (started in our set-up after October 2010), which also helps in preventing repeat blood donation by donors who know their seropositivity status.

In present study, Seroprevalence of Syphilis has increased in year 2010 and 2011. This may be because of use of more sensitive test method i.e. third generation ELISA as compared to RPR method of testing. Existing Seroprevalence of above mentioned TTIs can be further decreased by promoting voluntary blood donation

activity. People should be made educated about essential inclusion and exclusion criteria for blood donation so self exclusion can be made. By generating unique identification number of every donor using advanced computerised system, repeat donation from seropositive donor can be prevented. This can also help in reducing overall cost of the testing.

In spite of all above mentioned measures, donors in window period / latent period of infections are difficult to detect by routinely used test methods due to limitations of tests. e.g. even though the tests are negative for HbsAg person cannot be 100% labelled as disease free, this is because of the possibility of containing HBV viral DNA. ^[11] Use of advanced test methods like fourth generation ELISA and NAT (Nucleic acid Amplification Technique) testing can be helpful in shortening the window period but this requires additional financial resources, trained staff which may further add economic burden on overall health economy. At last, absolutely effective way for safe transfusion is rational use of blood and blood products. It should be transfused only when it is absolutely essential for the care of the patient. ^[11]

Conclusion:

The present study showed that most of donors were voluntary donors with male preponderance. HbsAg is the commonest TTI amongst all blood donors followed by Syphilis, HIV, HCV. Over a period of five years, the prevalence is decreasing in HBV, HIV, HCV. Repeated voluntary blood donation should be encouraged for prevention of transfusion-transmissible diseases. The present study concludes that motivating voluntary blood donors are the most effective way of ensuring adequate supplies of safe blood on a continuing basis.

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