



Original Article:

Seroprevalence of HIV, HBV, HCV and Syphilis in Blood Donors in Saurashtra Region of Gujarat: Declining Trends Over a Period of 3½ Years

Dhruva Gauravi A, Professor & Head,

Agravat Amit H, Associate Professor,

Pujara Krupal M, 2nd year Resident,

Department of Pathology, PDU Medical College, Rajkot, Gujarat.

Address for Correspondence:

Pujara Krupal M,

“Matru Ashish”,

3, Navjyot Park,

Kalavad Road, 150ft Ring Road,

Rajkot-360 005, Gujarat.

E-mail: path.pdumc@gmail.com

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Abstract: Background: Transfusion of blood and blood products is a life saving intervention and benefits innumerable patients worldwide. At the same time it could be an ominous mode of infection transmission to recipients. In 15 percent of total patients infected with HIV, blood transfusion has been the responsible mechanism of transmission. **Methods:** In this study, we aimed to access the prevalence and trend of HIV, HBV, HCV and Syphilis over the last 3½ years (January 2008 to June 2011) among the blood donors who came to donate blood at Blood Bank, P.D.U. Medical College & Hospital, Rajkot as well as in various blood donation camps organized by the same blood bank. **Results:** From the total of 30,178 blood donors, 711 (2.35%) had serological evidence of infection with at least one pathogen, either of HIV, HBV, HCV or Syphilis. These included 131 (0.43%) with HIV, 293 (0.97%) with HBV, 124 (0.41%) with HCV and 94 (0.31%) with Syphilis. Moreover, significantly declining trends of HIV, HBV and Syphilis was observed over the study period. **Conclusion:** A substantial percentage of blood donors harbor HIV, HBV, HCV and Syphilis infections. Strict selection of blood donors and comprehensive screening of donors' blood using standard methods are highly recommended to ensure the safety of blood for recipient.

Key Words: Blood donors; HIV; HBV; HCV; Syphilis; Transfusion transmissible infection (TTI).

Introduction:

Everywhere in this world, transfusion of human blood is an essential therapeutic procedure, as there is no genuine substitution. Even though it can save human lives, in some instances it can transmit infectious diseases, which are fatal. Especially with the rapid increase in number of people with transfusion transmissible infections (TTI's) including HIV, Hepatitis B and C, HTLV I & II, Syphilis, CMV, EBV, Brucellosis, Toxoplasmosis, etc. the field of transfusion medicine has encountered a huge problem in providing safe blood and blood products; therefore there is a need to improve testing for transfusion transmissible diseases and the selection of blood donors. The aim of the present study was to know the seroprevalence of transfusion transmissible infections in donors in this area as the incidence of transfusion transmitted HIV & Hepatitis is increasing in India.[1]

Materials and Methods:

The present study was conducted at Blood Bank, P.D.U. Medical College & Hospital, Rajkot. The Blood Bank is located in the Civil Hospital of Rajkot City which is considered to be the capital of Saurashtra region of Gujarat with an annual average donation of 8600 blood bags. Tests are routinely done on every blood unit to exclude HIV, HBV, HCV, Syphilis and Malaria. Data was collected over a period of 3½ years from January 2008 to June 2011. In a 3½ years period 30,178 donors were tested. Donors were selected by the standard criteria for donor fitness. The screening for HIV was done by ELISA (Standard Diagnostics (SD), India), HBsAg was detected by ELISA (Hepalisa, J.Mitra and Co. India), Anti-HCV test was done by ELISA (Standard Diagnostics (SD), India and Qualisa, Tulip Diagnostics, India). Test for Syphilis was done by RPR method (Span Diagnostics, India). All the reactive samples were repeated in duplicate as recommended by NACO (National AIDS Control Organization). Repeat reactive were labeled as ELISA positive for respective infection and were discarded. Further, within the seroreactive group, cases with a combination of ≥2 TTI's were labeled as co-infection. The number, type and distribution of co-infections were noted and the findings were analyzed.

Results:

Yearly distribution of detected seropositivity is given in Table 1. Table 2 gives the details of sex and type of seropositive donors.

Year	Total Units	HIV positive N (%)	HBsAg positive N (%)	Anti-HCV positive N (%)	RPR Positive N (%)
2008	7882	60 (0.76%)	107 (1.36%)	32 (0.40%)	27 (0.34%)
2009	8141	32 (0.39%)	99 (1.22%)	24 (0.29%)	23 (0.28%)
2010	9441	29 (0.31%)	108 (1.14%)	39 (0.41%)	35 (0.37%)
Jan-Jun 2011	4714	10 (0.21%)	48 (1.01%)	29 (0.62%)	09 (0.19%)

The co-infection rate was highest in 2008 with 8 cases, out of which 3 were HIV+HBV; with other 3 of HIV+HCV followed by 1 case each of HIV+Syphilis and HCV+Syphilis. The rate dropped down to 2 cases in year 2009 and 2010 and zero case in 2011 (Jan to June).

Year	Distribution	HIV N (%)	HBV N (%)	HCV N (%)	Syphilis N (%)
2008	Male	58	103	31	27
	Female	02	04	01	00
	Voluntary	19 (31.67%)	31 (28.98%)	12 (37.5%)	14 (51.85%)
	Replacement	41 (68.33%)	76 (71.02%)	20 (62.5%)	13 (48.15%)
2009	Male	31	95	23	23
	Female	01	04	01	00
	Voluntary	11 (34.38%)	43 (43.43%)	10 (41.67%)	09 (39.13%)
	Replacement	21 (65.62%)	56 (56.57%)	14 (58.33%)	14 (60.87%)
2010	Male	29	104	38	34
	Female	00	04	01	01
	Voluntary	08 (27.59%)	43 (39.81%)	15 (38.46%)	15 (42.86%)
	Replacement	21 (72.41%)	65 (60.19%)	24 (61.54%)	20 (57.14%)
January-June 2011	Male	10	43	27	09
	Female	00	05	02	00
	Voluntary	01 (10%)	06 (12.5%)	02 (6.90%)	03 (33.33%)
	Replacement	09 (90%)	42 (87.5%)	27 (93.10%)	06 (66.67%)

Discussion:

Transfusion Transmissible Infections (TTI's) continue to be a threat to safe transfusion practice. With every unit of blood, there is 1% chance of transfusion associated problem including TTI's.[2] Acquisition of HIV disease through blood transfusion is a relatively efficient mode of transmission, with rates approaching 100%.[3] In 15 percent of total patients infected with HIV, blood transfusion has been the responsible mechanism of transmission.[4] Stringent screening of donors for transfusion transmissible infections is crucial to ensure safe supply of blood and blood products. Our study was dominated by replacement donors in whom all infections were found to be more prevalent. The size of voluntary donors was smaller and infections slightly less prevalent. Voluntary donors mainly consisted of students, religious groups and voluntary organizations. Females made a smaller section of the study as they were found to be anemic and did not fulfill the required fitness criteria. The prevalence of all infections was found to be low among females.

In our study, HIV, HBV and Syphilis prevalence among donors shows a downward trend over the period of 3½ years. With the use of newer generation kits and increase in knowledge about these diseases in public (opt for early detection), the hospital data among the patients shows an increasing trend in these diseases over the period. The declining trends in seroprevalence of various TTI's in the blood donors is a good signal for the society as the risk of acquiring infections due to transfusion is decreased. The declining trends may be due to the public awareness created by mass media to encourage voluntary donors to self-deferral if they belong to any of the high risk groups. Also the NACO (National AIDS Control Organization) strives very hard in providing latest generation kits for the detection of TTI's so that the transfusion practice remains nearly 100% safe. Low seropositivity for diseases in our study could be attributed to proper counseling of blood donors and donor selection criteria. As well as GSACS (Gujarat State AIDS Control Society) is making everyone well aware by promoting blood donation activities as well as Blood Banks.

Conclusion:

To conclude, voluntary blood donation should be encouraged for prevention of Transfusion Transmissible Infections (TTI's).

The time and cost involved in screening donated blood can be reduced by an effective donor education and selection program that promotes self exclusion by donors at risk of TTI's. Media in general has reached to public in a way that the donor is well aware of pre and post events as well as care after blood donation at individual level. The seropositivity could be further decreased by introduction of nucleic acid amplification testing (NAT) in minipools for HCV and HIV and introduction of anti HBcAg (IgM) for HBV infection.[5,6] But this may not be possible in near future in developing countries like India due to financial constraints.[7] The present study concluded that motivating voluntary blood donors is the most effective way of ensuring adequate supplies of safe blood on a continuing basis.

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