Volume : 3 | Issue : 1 | January 2014 • ISSN No 2277 - 8179

Research Paper

Medical Science

KEYWORDS :

# Seroprevalence of Transfusion Transmitted Infections in Blood Donors

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## ABSTRACT

*Aims: This study is conducted to evaluate the sero-prevalence of HBV, HCV, HIV and syphilis among blood donors in V.S. General Hospital , Ahmedabad for duration of eight and half years. Total blood donors who came to V.S. General Hospital to donate blood, during 2004 to June 2012 were selected for the study.*

*Materials & Methods: Seroprevalence of HBV, HCV and HIV was studied by ELISA in voluntary and replacement blood donors. RPR was done for screening of syphilis.*

*Results: The seroprevalence of HIV, HBV, HCV and syphilis is found to be 0.18%, 0.97%, 0.1% and 0.18% respectively. Infections are slightly more common among replacement donors compared to voluntary donors.*

*Conclusion: There is a gradual decrease of TTIs in blood donors over the years due to following of stringent blood donor selection criteria.*

## INTRODUCTION

It should be obligatory on those who are involved in transfusion of blood to a patient for saving his life, that the blood transfusion does no harm to the patient.[1] Timely transfusion of blood saves millions of lives, but unsafe transfusion practices put millions of people at risk of transfusion transmissible diseases.[2] Morbidity and mortality resulting from transfusion of infected blood have far reaching consequences, not only for the recipients themselves, but also for their families, their communities and the wider society.[3] Only continuous improvement and implementation of donor selection, sensitive screening tests and effective inactivation procedures can ensure the elimination, or at least reduction of the risk of acquiring TTIs.[4] Globally more than 81 million units of blood are donated each year.[5] More than 18 million units of blood are not screened for transfusion transmissible infections.[6]

## AIMS & OBJECTIVE

1. To study the sero-prevalence of transfusion transmitted infections in V.S. Hospital blood bank.
2. Comparison of voluntary and replacement donors in sero positive cases.
3. Yearly comparison of incidence of HIV, HBV, HCV & Syphilis positive cases.
4. Comparison with similar other studies.

## MATERIALS AND METHODS

Duration of our study was from Jan 2004 to June 2012 for 8 and a half years at blood bank of V.S.General hospital. 110124 Serum Samples from Replacement and Voluntary Donors were collected. Tests performed by 3rd generation ELISA for HIV , HBV, HCV and RPR for SYPHILIS.

Donors were selected by taking history, clinical examination and following strict donor's selection criteria to eliminate professional donors and unfit donors. Voluntary written consent was taken from all the donors. A detailed pre-donation questionnaire was included in donor registration form. Information regarding risk factors like History of surgery, previous illness, hospitalization, blood transfusion, occupation, high risk behaviour and tattoo marks was collected. All the samples were screened for HIV, HBV, HCV and SYPHILIS. Hepatitis B surface antigen (HBsAg ;ELISA 3rd generation),HIV(1and 2;ELISA 3rd generation & 4th generation), Hepatitis C virus (HCV ;ELISA 3rd generation ) by ELISA method using approved commercially available kits. Screening for syphilis was done by Rapid Plasma Reagin method. All the reactive samples were repeat tested before labelling them sero-positive and respective blood units were discarded.

## RESULTS:

**Table 1: Yearly distribution of data**

| Yr. | VOLUNTARY DONOR | | | REPLACEMENT DONOR | | | TOTAL |
|---|---|---|---|---|---|---|---|
| | M | F | TOTAL | M | F | TOTAL | |
| 2004 | 10316 | 264 | 10580 | 1826 | 28 | 1854 | 12434 |
| 2005 | 11651 | 361 | 12012 | 3453 | 43 | 3496 | 15508 |
| 2006 | 11639 | 312 | 11951 | 2930 | 37 | 2967 | 14918 |
| 2007 | 10633 | 292 | 10925 | 2790 | 32 | 2822 | 13747 |
| 2008 | 10100 | 282 | 10382 | 2391 | 33 | 2424 | 12806 |
| 2009 | 8537 | 237 | 8774 | 2839 | 37 | 2876 | 11650 |
| 2010 | 9169 | 261 | 9430 | 1454 | 24 | 1478 | 10908 |
| 2011 | 10726 | 308 | 11034 | 1782 | 26 | 1808 | 12842 |
| 2012 till June | 5116 | 169 | 5285 | 284 | 42 | 326 | 5611 |
| TOTAL | 87887 | 2486 | 90373 | 19749 | 302 | 20051 | 110424 |

Volume : 3 | Issue : 1 | January 2014 • ISSN No 2277 - 8179

Out of 110424 donors from 2004 to June 2012; 90,373 were voluntary donors and 20,051 were replacement donors. This shows voluntary donors 81.84% & replacement donors 18.16%. Total 97.5% were Male donors and 2.5% were Female donors.

**Table 2: Distribution of sero-positive cases**

| INFECTIONS | VOLUNTARY DONOR | REPLACEMENT DONOR | TOTAL |
|---|---|---|---|
| HIV | 152 | 40 | 192 |
| HBV | 821 | 278 | 1099 |
| HCV | 123 | 22 | 145 |
| RPR | 245 | 51 | 296 |
| TOTAL | 1341 | 391 | 1732 |

1341 (1.48%) voluntary donors were found to be sero-positive out of 90,373 voluntary donors. 391 (1.95%) replacement donors were found to be sero-positive out of 20,051 replacement donors.

**Table 3: Comparison Prevalence of Sero-positive cases - Yearly**

| | HBV | SYPHILIS | HCV | HIV |
|---|---|---|---|---|
| 2004 | 1.3% | 0.12% | 0.1% | 0.27% |
| 2005 | 0.92% | 0.13% | 0.09% | 0.13% |
| 2006 | 1.2% | 0.32% | 0.17% | 0.22% |
| 2007 | 0.89% | 0.1% | 0.12% | 0.23% |
| 2008 | 0.89% | 0.1% | 0.12% | 0.23% |
| 2009 | 0.9% | 0.08% | 0.08% | 0.1% |
| 2010 | 0.8% | 0.2% | 0.08% | 0.1% |
| 2011 | 0.85% | 0.42% | 0.06% | 0.12% |
| 2012 UP TO JUNE | 0.97% | 0.18% | 0.1% | 0.18% |

Table 3 shows seroprevalence of Transfusion transmitted infections were declined from earlier years due to strict donor screening criteria and better availability of tests to detect them at earliest.

**Table 4: Comparison of various studies**

| PLACE | HIV | HBV | HCV | SYPHILIS | AUTHOR AND YEARS |
|---|---|---|---|---|---|
| Ludhiana | 0.08% | 0.66% | 1.09% | 0.85% | Gupta N et al 2001-2003[8] |
| Bhopal, M.P. | 0.51% | 2.90% | 0.57% | 0.23% | Nilima sawke et al 2006–2008[9] |
| Vikarabad AP | 0.39% | 1.41% | 0.84% | 0.08% | Bhawani et al 2004-2009[10] |
| Etawah, UP | 0.19% | 2.63% | 0.34% | Not done | Dayal S.et al 2006-jun2011[11] |
| Lucknow,U.P. | 0.23% | 1.96% | 0.85% | 0.01% | Chandra et al 2001–2006[12] |
| Present study | 0.18% | 0.97% | 0.1% | 0.18% | V.S. HOSPITAL 2004-JUNE2012 |

Our study is comparable to other known studies. As shown in the above table prevalence of HIV and HCV seropositivity is comparable to Dayal S. et al , HBV Prevalence to Gupta N.et al, syphilis seroprevalence to Nilima sawke et al.

## DISCUSSION

Incidence of Transfusion Transmissible infections has decreased in V. S. General hospital over last eight and a half years. Awareness of general population about voluntary regular donation should be created to minimize the chances of spreading transfusion transmitted infections. Strict donor selection criteria must be applied. Latest techniques and tests to detect transfusion transmitted infections at the earliest should be applied. Replacement donors carry a relatively higher risk of transfusion transmitted infections due to chances of carrying professional donors. The blood relatives of recipient are preferred for replacement. Professional donors should be discouraged.

## CONCLUSION

Higher Incidence of Transfusion Transmissible infections have been observed among Replacement donors compared to Voluntary donors. Efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum. Motivation and recruitment of potential local blood donor population would lead to an effective voluntary system. Professional blood donors were discouraged in our study as they were unsafe. Our study is comparable to other studies. Transmission of Transfusion Transmissible infections during serologically negative window period still poses a threat to blood donor safety. Therefore strict selection of blood donors and comprehensive screening of donor's blood using standard methods are highly recommended to ensure the safety of blood for recipient.

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