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**Original Research Article**

# PREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS IN BLOOD DONORS WITH SPECIAL REFERENCE TO THE EFFECT OF COUNSELLING AND SELF DEFERRAL/SELF EXCLUSION

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## Abstract

**Background:** Prevalence of Transfusion Transmitted infections are increasing in the community. The Human Immunodeficiency Virus (HIV) in the early 1980s highlighted multiple systemic deficiencies spanning blood donor selection, testing and post-transfusion surveillance. Almost 4 decades later, the enterprise of blood collection, processing and transfusion is vastly different. Reports of Transfusion Transmitted Infections are there even after introduction of screening tests, which can be reduced by self-deferral and self-exclusion of the donors. **Materials and Methods:** 6071 Donors attending the Department of Transfusion Medicine, Govt Medical College, Thiruvananthapuram from Nov 2010 to Jan 2011 were given proper predonation counselling, and a self deferral proforma with questionnaire. They were allowed to conceal their identity while filling the proforma. They were asked not to write their name, age or address on the proforma. Consent was obtained separately. Questionnaire enquired about having high risk behaviours like chronic alcoholism, chain smoking, drug addiction, extra marital sex, homosexuality and premarital sex. **Result:** Of the total 6071 donors, 639 donors revealed high risk behaviour of which 6.9 % were alcoholics, 2.3% were drug addicts, 14.1% had the habit of chain smoking, 8.5% had extra marital sex, 49.8% gave history of homosexuality and 57.3% gave history of premarital sex, of which 605 self-deferred during the period. Prevalence of seropositivity for transfusion transmissible infections among donors for the three years prior to the study was 3.39%, 3.58% and 3.53% respectively. This was consistent with the average seropositivity for transfusion transmitted infection for 3 months immediately prior to study period of 3.51 % which was reduced to 1.76% during the study period after the implementation of proper predonation counselling and self-deferral. **Conclusion:** During the study period there was decrease in seroprevalence of Transfusion Transmitted Infections. This points to the fact that many having high risk behavior might have self-deferred or self-excluded. This shows that Confidential Unit Exclusion, Computer interactive interview providing more privacy, and telephone call back option can further reduce the risk of transmission of infections through transfusion.

## INTRODUCTION

Prevalence of Transfusion Transmitted infections are increasing in the community. The tragedy of human immunodeficiency virus (HIV) in the early 1980s highlighted multiple systemic deficiencies spanning blood donor selection, testing and post-transfusion surveillance.[1] Almost 4 decades later, the enterprise of blood collection, processing and transfusion is vastly different. There are reports of major transfusion transmitted infections (TTIs) even after introduction of screening tests due to window period, chronic carrier state and technical error. Among the three possibilities of risk reducing policies [ie: zero risk, minimal risk and minimal risk at acceptable cost},it is impossible to meet zero risk as blood transfusion involves a biological material collected from human source .

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Transfusion safety study conducted at San Francisco showed transfusion transmitted HIV to rise rapidly from 1978, since its first occurrence to a peak rise of 1.1% in 1982.[2] From 1983 onwards marked and progressive decline in seropositivity of donors was observed which was attributable to awareness of infectious nature of HIV in the community and due to self-deferral and self-exclusion of the donors.[3,4] Self exclusion means excluding themselves if they know or think that their blood may be unsafe as a result of risk behavior or because of the state of their own health. Self-deferral is postponing blood donation if there are temporary reasons for doing so. Behavior deferrals are retained after test deployment as a layer of protection against false negative test results, test errors and erroneous component distribution.

The massive investment in blood safety to restore confidence in the blood supply, has contributed to a different problem: one of imbalance where the public health yield is often vanishingly low, whereby resources may arguably be better directed elsewhere. Blood safety at any cost is not without its own risk, impacting sustainability and capacity to contend with challenges as they arise.[5]

Nonetheless blood transfusion offers another glaring example of health disparity. Specifically, blood transfusion safety and infectious risk is unequally divided between HICs and low- and middle-income countries (LMICs). Every element of the blood safety continuum from donor selection to post-transfusion surveillance is either lacking or absent in low-income countries.[6] Increasing the safety of blood supply by focusing on screening, needs to be shifted strongly to the proper selection, interview, and the medical examination of the prospective donors. Donors who report no behavioral risk factors and whose donations are repeatedly seronegative for infectious agents are considered as safe donors.

Demand for blood transfusion remains high in LMICs, forcing continued reliance on suboptimal practices (e.g., replacement and paid donation, rapid testing, etc.). Further, post-transfusion surveillance is lacking, where a demonstration of transmission and clinical sequela might help to motivate for change.[7]

**Aims and Objectives**

Comparison of seropositivity among blood donors before and after implementation of proper pre donation counselling and an option for self-deferral/self-exclusion.

## MATERIALS AND METHODS

**Study period:** 6 months.
**Study Setting:** Department of Transfusion Medicine, Govt Medical College, Thiruvananthapuram.

6071 Donors attending the Department of Transfusion Medicine, Govt Medical College Thiruvananthapuram from Nov 2010 to Jan 2011 were given proper predonation counselling, and a self deferral proforma with questionnaire. They were allowed to conceal their identity while filling the proforma. They were asked not to write their name, age or address on the proforma. Consent was obtained separately.

Questionnaire enquired about having high risk behaviours like chronic alcoholism, chain smoking, drug addiction, extra marital sex, homosexuality and premarital sex.

They were given directions to fill the proforma, by marking Yes or No against each question. Final question was that whether they considered themselves fit for donation. Blood donors were given instructions to self-defer or self-exclude after writing the reason for self-deferral if they think they belong to the high risk group of donors.

They were asked to drop the questionnaire form in a closed box and leave the place if they thought they were not fit for donation or proceed for medical examination if they considered themselves fit for donation.

By calculating the difference between the number of questionnaires given and the number of donors presenting for medical examination, we could find the number of donors who have self deferred/ self excluded each day.

The prevalence of seropositivity among blood donors during the study period was compared with prevalence during the previous three months, as well as yearly data for the past three years which were taken from available records like registers and donor forms.

Data generated was coded, entered, validated and analysed using statistical package SPSS version 11.

Rationale for the study: To increase the safety of donated blood by reducing the donation of sero positive donors, of which many will be in the window period which forms the main cause of transfusion transmitted infections in recipients.

## RESULTS

Of the total 6071 donors, 639 donors revealed high risk behaviour of which 6.9 % were alcoholics, 2.3% were drug addicts, 14.1% had the habit of chain smoking, 8.5% had extra marital sex, 49.8% gave history of homosexuality and 57.3% gave history of premarital sex, of which 605 self deferred during the period.

**Table 1: Donor details for three months prior to study**

| Month | AUG 2010 | SEPT 2010 | OCT 2010 | Total |
|---|---|---|---|---|
| Number Of Prospective Donors | 1911 | 1867 | 1954 | 5732 |
| Number of Donors Deferred | 104 | 92 | 125 | 321 |
| Total number of Donations | 1807 | 1775 | 1829 | 5411 |

| | | | | |
|---|---|---|---|---|
| Number of seropositive donors | 58 | 67 | 65 | 190 |
| Percentage Of Seropositivity (%) | 3.21 | 3.77 | 3.55 | 3.51 |

**Table 2: Donor details during the study period**

| Month | Nov-2010 | Dec-2010 | Jan-2011 | Total |
|---|---|---|---|---|
| Total Prospective Donors | 1956 | 2041 | 2074 | 6071 |
| Self Deferral | 186 | 205 | 214 | 605 |
| Total Donors Who Underwent Medical Examination | 1770 | 1836 | 1860 | 5466 |
| Deferral After Medical Examination | 97 | 102 | 83 | 282 |
| Total Donors Who Donated | 1673 | 1734 | 1777 | 5184 |
| Total Number Of Seropositive Donors | 35 | 23 | 33 | 91 |
| Percentage Of Seropositivity (%) | 2.09 | 1.33 | 1.86 | 1.76 |

**Table 3: Age wise Donation Prior to Study Period**

| AGE in years | Total No of Donors | Percentage |
|---|---|---|
| 18-30 | 3641 | 67.29 |
| 31-40 | 1526 | 28.20 |
| 41-50 | 222 | 4.10 |
| 51-60 | 22 | 0.41 |
| Total | 5411 | 100 |

**Table 4: Age wise Donation During the Study Period**

| Age in years | No. of Donors | Percentage |
|---|---|---|
| 18-30 | 3213 | 61.98 |
| 31-40 | 1500 | 28.93 |
| 41-50 | 450 | 8.68 |
| 51-60 | 21 | 0.41 |
| Total | 5184 | 100 |

**Table 5: Deferral Details Before Study Period**

| Age in years | Number of deferral | Percentage of deferral |
|---|---|---|
| 18-30 | 189 | 58.88 |
| 31-40 | 99 | 30.84 |
| 41-50 | 31 | 9.66 |
| 51-60 | 2 | 0.62 |
| Total | 321 | 100 |

**Table 6: Deferral details during study period**

| Age in years | Total No of deferred Donors | Percentage of Deferral |
|---|---|---|
| 18-30 | 558 | 62.9 |
| 31-40 | 276 | 31.12 |
| 41-50 | 51 | 5.75 |
| 51-60 | 2 | 0.23 |
| Total | 887 | 100 |

**Table 7: Seropositivity data for 3 years prior to study period**

| Years | Number and % of seropositive donors | Total number of donors who donated blood |
|---|---|---|
| August 2007 to July 2008 | 855 (3.39%) | 25200 |
| August 2008 to July 2009 | 995 (3.58%) | 27825 |
| August 2009 to July 2010 | 751 (3.53%) | 21255 |

Prevalence of seropositivity for transfusion transmissible infections among donors for the three years prior to the study was 3.39%, 3.58% and 3.53% respectively. This was consistent with the average seropositivity for transfusion transmitted infection for 3 months immediately prior to study period of 3.51 % which was reduced to 1.76% during the study period after the implementation of proper pre donation counselling and self deferral.

## DISCUSSION

Need for blood transfusion has increased over the years due to advances in treating disease, improved techniques in separation of components of blood and molecular diagnosis of TTIs which has made blood a safe form of medication. However it should be judiciously used, as most of the TTIs are missed in window period, and is one of the most dreaded complications of blood transfusion [8].The prevalence of TTIs might vary with different regions of same country as many socio-cultural practises influence in maintaining pool of such disease in the community.[9] There is a risk of 1 to 2 per 1000 recipients, to receive contaminated blood with viral, bacterial or parasitic agents. With every unit of blood, there is 1% chance of transfusion associated problems including TTIs.[10] The picture of prevalence is also quite different in developing nations when compared to developed ones as socioeconomic reforms have reduced TTIs burden in developed nations. In the last two decades, the scientific community has given much attention to

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the prevention of TTIs. To address these issues, novel non-serology-based approaches such as viral nucleic acid testing (NAT) have been established. However, blood components with very low viral load can even escape detection by NAT and cannot completely prevent transmission.[11]

Deferring or rejecting potential blood donors often leaves the donor with negative feeling about themselves as well as the blood banking system. However, there are definite advantages of eliminating donors with possible risk of disease because, despite the availability of sensitive screening tests to detect HIV infection, blood donors can be infected, but tests are negative if they have been infected for a period of 6 weeks or less.[12]

In the present study majority of the 639 donors who revealed having high risk behaviour gave the answer Yes for the question whether they considered themselves fit for donation. However the decrease in prevalence of seropositivity points to the fact that many having risk behaviour might have self-deferred or self-excluded inspite of this response. This is in accordance with the study conducted in Sanfrancisco by Bush et al where a decrease in prevalence of HIV was noted following implementation of high risk donor deferral measures.[2]

## CONCLUSION

Self-deferral/self-exclusion of 605 donors during the study period and the subsequent reduction in the seropositivity points to the fact that deferred donors belonged to the high-risk group. This is also a reflection of reduction of donors in the window period. This shows that Confidential Unit Exclusion, Computer interactive interview providing more privacy, and telephone call back option can further reduce the risk of transmission of infections through transfusion.

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