Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

# The Evaluation of Predonation Blood Donor Deferrals in a Tertiary Care Center: A 3-year Study

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## Abstract

**Background:** Blood safety a major issue in the field of transfusion medicine. Persons who are disqualified or rejected from donating blood are known as "deferred" donors. Deferrals lead to loss of precious blood/components available for transfusion. For preventing this, we should be having knowledge of the causes of deferral and their frequency. To make blood transfusion safe for the patients, many safety measures are undertaken and the most important is a selection of the suitable blood donors. Hence, it is important to analyze the reasons and rate for donor deferral and retain the motivated donors.

**Aims:** This study aims to evaluate and analyze the reasons of predonation deferrals.

**Materials and Methods:** In this retrospective study, causes of donor deferral were evaluated retrospectively including both in-hospital donations (and outdoor camp donations) including voluntary and replacement donors from January 2016 to December 2018 in the State of the Art Model blood bank of Dr. B. R. Ambedkar Memorial Hospital and Pt. Jawaharlal Nehru Memorial Medical College, Raipur, Chhattisgarh, India.

**Results:** Among 53,245 donors registered, 1894 (3.56%) were deferred from blood donation. Temporary deferrals were significantly higher than permanent deferral. The most common reasons for temporary deferral were anemia, followed by underweight, recent medication, high blood pressure (BP), and low BP and so on. The common causes for permanent deferral included being overage, diabetes, asthma, heart disease, hepatitis B surface antigen positivity, and epilepsy and so on.

**Conclusion:** Creating public awareness on common causes of donor deferral may help to lower the deferral rates as well as promote the retention of potential donors.

**Key words:** Anemia, Blood donors, Deferral, Predonation

## INTRODUCTION

Blood transfusion service is the vital part of modern health-care system without which efficient medical care is not possible. The main goal of blood transfusion services globally is to ensure the availability of safe and adequate supply of blood and blood products. Availability of safe blood and blood products is a critical component in improving health care.[1] Donor deferral leads to loss of precious blood/blood components and they are less likely to return for future donations.[2] Knowledge of the reasons and rate of donor deferral can guide the recruitment strategy as well as help in retention of potential donors [3] In India, the criteria for donor selection and deferral are laid down by the Governing body of National Blood Transfusion Council (NBTC) on October 2017, with the approval of AS, DG, National AIDS Control Organisation (NACO), and president NBTC.[4] The present study was undertaken to analyze the donor deferral reasons and rate. This will help in retention of potentially motivated donors.

Access this article online

www.ijss-sn.com

Month of Submission : 01-2019
Month of Peer Review : 02-2019
Month of Acceptance : 02-2019
Month of Publishing : 03-2019

## MATERIALS AND METHODS

This retrospective study was carried out by retrieving deferred blood donors data maintained by the department

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over a period of 3 years from January 2016 to December 2018. These included both in-hospital donations and outdoor camp donations including voluntary as well as replacement donors. Criteria laid down by the Governing body of NBTC on October 2017 were used for donor selection and deferral as well by Strategic Information Management System (SIMS), NACO, and Ministry of Health and Family Welfare Government of India in August 2010.

## RESULTS

Of 53,245 donor registrations, 51,351 were successfully donated blood. A total of 1894 (3.56%) donors were deferred. Among the deferred donors, 1190 (62.83%) were male and 704 (37.17%) were female [Table 1]. Majority were outdoor deferral 1401 (73.97%) in compare to indoor 493 (26.03%) [Table 2]. Temporary deferrals ($n$ = 1855, 97.94%) were significantly higher than permanent deferral 39 (2.06%) [Table 3]. The most common reasons for temporary deferral were anemia, followed by underweight, recent medication, high blood pressure (BP), and low BP and so on [Table 4]. The common causes for permanent deferral included being overage, diabetes, asthma, heart disease, hepatitis B surface antigen (HBsAg) positivity, and epilepsy and so on [Table 5]. According to SIMS, the donor deferral criteria were mentioned in Table 6.

## DISCUSSION

Donor selection is the most important steps in improving the safety of blood and blood products. Knowledge and awareness regarding the reasons of donor deferral is important to avoid the loss of the potential donor.

In our study, a total number of donor registered in the past 3 years (January 2016–December 2018) were 53,245, of which 49,688 were male and 3557 were female. The donor deferral rate in our study was 3.56% ($n$ = 1894) which was similar with other studies such as Rathod *et al.*[2] (3.55%), Agravat *et al.*[6] (3.72%), Jethani *et al.*[7] (2.56%), and Rabeya *et al.*[8] (5.6%) in their studies, whereas Di Lorenzo *et al.*[9] have found a much higher deferral rate of 21.6%; Zou *et al.*[10] have reported a deferral rate of 12.8% and Arslan[11] found a higher deferral rate of 14.6% in their study. The difference in donor deferral rate could be due to regional diversity as well as variation in donor selection criteria.

Most of the donors were male (93.32%); women accounted for only 6.68% of the donors. Our study showed that female donors (19.79%) were deferred more frequently than male donors (2.39%) which might be due to wide prevalence of anemia in female donors which was similar to Rehman *et al.*[12]

In our study, temporary deferral rates were significantly higher than permanent deferrals, which are 97.94% for temporary deferral and 2.06% for permanent deferral. This finding was not correlating with other literatures as by Shah *et al.*[13] (87.55% vs. 12.45%) and Sundar *et al.*[14] (84% vs. 16%).

The major cause of temporary deferral in our study was anemia (26.19%), which was similar to the study performed

**Table 1: Demographic profile of deferred donors**

| Gender | Number of deferrals | % donor deferrals | Total number of registration | % donor deferrals of respective registration |
|---|---|---|---|---|
| Male | 1190 | 62.83 | 49,688 | 2.39 |
| Female | 704 | 37.17 | 3557 | 19.79 |
| Total | 1894 | 100 | 53,245 | 3.56 |

**Table 2: Frequency of indoor and outdoor deferrals**

| Type of deferrals | Number of male deferrals | Number of female deferrals | Number of total deferrals | % donor deferrals | Total registration | % donor deferrals of respective registration |
|---|---|---|---|---|---|---|
| Indoor | 404 | 89 | 493 | 26.03 | 32,769 | 1.50 |
| Outdoor | 786 | 615 | 1401 | 73.97 | 20,476 | 6.84 |
| Total | 1190 | 704 | 1894 | 100 | 53,245 | 3.55 |

**Table 3: Frequency of temporary and permanent deferrals**

| Type of deferrals | Number of male deferrals | Number of female deferrals | Number of total deferrals | % donor deferrals | % donor deferrals of total registration |
|---|---|---|---|---|---|
| Temporary | 1160 | 695 | 1855 | 97.94 | 3.49 |
| Permanent | 30 | 09 | 39 | 2.06 | 0.07 |
| Total | 1190 | 704 | 1894 | | |

**Table 4: Reasons for temporary deferral**

| Reasons of deferrals | Number of male deferrals | Number of female deferrals | Number of total deferrals | SIMS: Donor deferral criteria | % donor deferrals |
|---|---|---|---|---|---|
| L Hb | 176 | 320 | 496 | 7a | 26.19 |
| L Wt | 313 | 116 | 429 | 7b | 22.65 |
| Under age | 21 | 7 | 28 | 7b | 1.48 |
| Medication | 162 | 40 | 202 | 7c | 10.89 |
| High BP | 148 | 28 | 176 | 7c | 9.29 |
| Low BP | 87 | 76 | 163 | 7c | 8.60 |
| Thyroid disease | 12 | 9 | 21 | 7c | 1.11 |
| Operation | 20 | 1 | 21 | 7c | 1.11 |
| Fever | 15 | 1 | 16 | 7c | 0.84 |
| Skin problem | 13 | 2 | 15 | 7c | 0.79 |
| Typhoid | 11 | 0 | 11 | 7c | 0.58 |
| Malaria | 6 | 1 | 7 | 7c | 0.37 |
| Allergy | 6 | 0 | 6 | 7c | 0.32 |
| TB | 6 | 0 | 6 | 7c | 0.32 |
| Chicken pox | 5 | 0 | 5 | 7c | 0.26 |
| Accident | 4 | 0 | 4 | 7c | 0.21 |
| Infection | 4 | 0 | 4 | 7c | 0.21 |
| Jaundice | 2 | 0 | 2 | 7c | 0.11 |
| Palpitation | 2 | 0 | 2 | 7c | 0.11 |
| Wound over foot | 2 | 0 | 2 | 7c | 0.11 |
| Abortion | 0 | 1 | 1 | 7c | 0.05 |
| Dacryocystitis | 1 | 0 | 1 | 7c | 0.05 |
| Ear discharge | 1 | 0 | 1 | 7c | 0.05 |
| Eye problem | 1 | 0 | 1 | 7c | 0.05 |
| GB stone | 1 | 0 | 1 | 7c | 0.05 |
| Pancreas | 1 | 0 | 1 | 7c | 0.05 |
| Piles | 1 | 0 | 1 | 7c | 0.05 |
| Sleep disturbances | 1 | 0 | 1 | 7c | 0.05 |
| Tumour | 0 | 1 | 1 | 7c | 0.05 |
| Wart | 1 | 0 | 1 | 7c | 0.05 |
| Menstruation | 0 | 72 | 72 | 7e | 3.8 |
| Blood donation | 49 | 4 | 53 | 7e | 2.8 |
| Alcohol | 25 | 1 | 26 | 7e | 1.37 |
| Tattoo | 16 | 5 | 21 | 7e | 1.11 |
| Fasting | 14 | 0 | 14 | 7e | 0.74 |
| Injection | 10 | 1 | 11 | 7e | 0.58 |
| Vaccination | 10 | 1 | 11 | 7e | 0.58 |
| Fainting | 9 | 2 | 11 | 7e | 0.58 |
| Breastfeeding | 0 | 4 | 4 | 7e | 0.22 |
| Ear piercing | 3 | 0 | 3 | 7e | 0.16 |
| Blood transfusion | 1 | 1 | 2 | 7e | 0.11 |
| Pregnancy | 0 | 1 | 1 | 7e | 0.05 |
| Total | 1160 | 695 | 1855 | | 97.99 |

TB: Tuberculosis, SIMS: Strategic Information Management System, BP: Blood pressure

**Table 5: Reasons for permanent deferral**

| Reasons of deferrals | Number of male deferrals | Number of female deferrals | Number of total deferrals | SIMS: Donor deferral criteria | % donor deferrals |
|---|---|---|---|---|---|
| Above age | 9 | 3 | 12 | 7e | 0.63 |
| Diabetes | 5 | 1 | 6 | 7c | 0.32 |
| Asthma | 2 | 4 | 6 | 7c | 0.32 |
| Heart disease | 5 | 0 | 5 | 7c | 0.27 |
| Hepatitis B | 3 | 1 | 4 | 7d | 0.22 |
| Epilepsy | 4 | 0 | 4 | 7c | 0.22 |
| High-risk sexual relation | 1 | 0 | 1 | 7d | 0.05 |
| Paralysis | 1 | 0 | 1 | 7c | 0.05 |
| Total | 30 | 9 | 39 | | 2.06 |

by Singh *et al.*[15] which showed low hemoglobin as the most common cause in 23.26% of the temporary deferrals. The high prevalence of anemia could be due to poor nutritional status and ill health. These donors should be provided

**Table 6: SIMS donor deferral criteria: Standard report and monitory system[5]**

| SIMS: Donor deferral criteria | Causes | Male | Male in % | Female | Female in % | Total | Total in % |
|---|---|---|---|---|---|---|---|
| 7a | Anemia | 176 | 35.48 | 320 | 64.52 | 496 | 26.19 |
| 7b | Underweight/under age | 334 | 73.09 | 123 | 26.91 | 457 | 24.12 |
| 7c | Medical/surgical causes | 553 | 76.49 | 170 | 23.51 | 723 | 38.17 |
| 7d | High-risk history | 4 | 80 | 1 | 20 | 5 | 0.26 |
| 7e | Others | 123 | 57.75 | 90 | 42.25 | 213 | 11.25 |
| Total | | 1190 | 62.83 | 704 | 37.17 | 1894 | |

SIMS: Strategic Information Management System

the information regarding the treatment of anemia with follow-up. Among other reasons of temporary deferrals were underweight (22.65%), recent medication (10.89%) followed by high BP, low BP, menstrual periods, recent blood donation, alcohol consumption, tattoo, thyroid medications, and recent operation and so on. A proper track regarding management and follow-up of the temporary deferred donors should be there so that these potentially motivated donors can be recruited back for future donation.

In our study, 2.06% of donors were deferred for permanent reasons, which were not in accordance with other studies showing significantly high permanent deferral rate of 10.6% by Custer *et al.*,[16] Arslan[11] (10%), and Wasnik and Bhaskar[17] (32.1%). This low permanent deferral rate could be due to self-exclusion by the donors due to the display of the causes of permanent deferral in the premises of blood bank and also might be because maximum number of donor is in the middle age group and their chances of permanent deferral are low. The most common reason of permanent deferrals was overage followed by diabetes, asthma, heart disease, HBsAg positive status, epilepsy, and single case each of high risk behaviour and paralysis. Collection of blood from high-risk behavior people creates a risk to recipient by transfusion.

According to SIMS[5] and as per the recommendations by NACO, in our study, major blood deferral was under Group 7c: 38.17% (medical and surgical causes), followed by 7a: 26.19% (anemia), 7b: 24.12% (underweight/underage), 7e: 11.25% (others), and 7d: 0.26% (high-risk history).

## CONCLUSION

The present study evaluates the rate and reasons of donor deferral showing that the donor deferral rates were similar in different populations. However, the difference in the rate and causes of donor deferral in other study is due to the difference in the socioeconomic status and also due to donor selection criteria. Proper medical examination and strict deferral system of the blood donors in blood banks reduce the risk of transfusion transmissible infections. The need of eliciting more detailed history while screening, history of tattooing, piercing, drug addiction, high-risk sexual practice, etc., as on rare occasions even a screening test may turn as false negative. The donor deferral rates and reasons for deferral for blood donation are important issues to be highlighted among blood donors, general public, in the blood banks, and hospitals. We can add a significant number of donors by recruiting back for future donation by remotivating them after addressing the reason for deferral and proper follow-up along with management.

## ACKNOWLEDGMENT

I would like to express my special thanks of gratitude to my teacher (Dr. Renuka Gahine and Dr. Vijay Kapse) who gave me the golden opportunity and guided me to complete this article on the topic (Predonation Blood Donor Deferrals in a Tertiary Care Center). Special thanks to my colleague Dr. Vanita Bhaskar and our Counsellor Miss. Bhumika Yadav.

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**How to cite this article:** Kapse V, Agrawal A, Gahine R, Bhaskar V. The Evaluation of Predonation Blood Donor Deferrals in a Tertiary Care Center: A 3-year Study. Int J Sci Stud 2019;6(12):36-40.

**Source of Support:** Nil, **Conflict of Interest:** None declared.