

Retrospective Study on the Blood Donor Deferral Pattern in a Tertiary Care Hospital

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ABSTRACT

Background: Blood is essential for saving lives, particularly in emergency conditions. Therefore, an adequate supply of safe blood is the backbone of the healthcare delivery system of any country. Voluntary blood donation is regarded as a safe practice. However, deferrals due to temporary or permanent reasons lead to a significant loss of blood donors. Therefore, knowledge of the donor profile and deferrals can help in devising strategies to motivate donors and increase retention.

Methods: This retrospective study was conducted from January 2021 to October 2025. A total of 28295 records of donors were included, provided they met the inclusion and exclusion criteria. Only complete records were included. Records of professional or apheresis donors were excluded. Demographic details and relevant histories were noted. Reasons for deferral were recorded and categorized as temporary or permanent deferral as per national guidelines.

Results: There was a male preponderance (93.51%). 65.02% donors belonged to the 18 to 30 years of age. The overall deferral rate was 7.49%, with 79.10% being temporary deferrals. Low hemoglobin was the commonest cause of temporary deferral (25.82%), followed by alcohol intake (15.62%) and medications (14.37%). Rest accounted for less than 10% patients each. Amongst permanent deferrals, cardiac disease (38.60%) and chronic obstructive pulmonary disease (37.25%) were the commonest causes.

Conclusion: The majority of the blood donors are young males. Most of the deferrals are for temporary reasons. Females have high rates of temporary deferrals due to anemia, indicating poor nutritional status.

Key-words: Blood donor, Blood transfusion, Hemoglobin, Permanent deferral, Temporary deferral, Voluntary donor

INTRODUCTION

Blood Transfusion Services are the most vital component of the healthcare delivery system. Blood is a scarce resource often required urgently in life-threatening emergencies ^[1,2]. The indications include acute blood loss, such as in trauma, surgery, pregnancy-related complications, and newborn care. Blood transfusions are also required for the treatment of anemia ^[3-5].

According to the World Health Organization (WHO), the minimum basic national requirement for blood can be met if the blood donation rate is 1% of the total population ^[6].

Maintaining an adequate supply of safe blood and blood products for transfusion remains a challenge. Since the acquired immunodeficiency syndrome (AIDS) pandemic in the 1980s, attention has been focused on blood transfusion as a significant route of transmission, and stringent protocols and testing procedures have been developed by various national and international agencies to avoid any Transfusion Transmitted Infection (TTI) ^[7].

The availability of blood and blood products depends solely on the donors. Blood donors can be of the following types:

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- ❖ Voluntary non-remunerated donors: They donate blood of their own free will and, in turn, receive no payment in cash or kind.
- ❖ Family or replacement donors: They are often asked by the hospital to donate blood for a family member, friend, or relative who is in urgent need of a blood transfusion.
- ❖ Paid or commercial donors: These donors receive some incentive, either in cash or kind, and often may have contracts with blood banks or hospitals.

Voluntary blood donation is often regarded as the safest practice. It is hypothesized that they are motivated by altruism and often do not withhold information about medical conditions or lifestyle, thereby decreasing the risk of TTl. On the other hand, other donors may hide information due to social pressure (family/replacement donors) or incentives and commercialization (paid or commercial donors), thereby increasing the chances of temporary or permanent deferrals [8,9].

Despite having a huge population in the country with 50% to 60% donor eligibility rates, there is a continuous shortage of blood and blood products [10]. It has been reported that during the year 2016-17 in India, a total of 11.1 million units of blood was collected against a target of 13 million units [7]. There is a need for the development of retention strategies for the motivated donors. Deferrals due to either temporary or permanent causes may lead to a loss of a significant proportion of donors. Therefore, the present study was conducted to assess the donor profile and the deferral pattern in the Indian scenario.

MATERIALS AND METHODS

Research Design- This retrospective study was conducted from January 2021 to October 2025 at the Department of Pathology, Indira Gandhi Government Medical College, Maharashtra, India. Data was collected from the records of donors from presenting for blood donation at the blood bank.

Methodology- Data were obtained from the register maintained at the blood bank. A total of 28295 records were included. Baseline demographic characteristics were noted from all the records. Relevant details were noted. In our blood bank, the deferral guidelines according to the Technical Guidelines Transfusion Medicine by Directorate General of Health Services

(DGHS), Government of India (GoI), Second edition, were followed [11]. The reasons for deferral, as per the handbook, were noted and categorized as either temporary or permanent deferral accordingly.

Inclusion criteria

- Records of voluntary donors.
- Records of non-remunerated blood donors.
- Records of donors of either gender.
- Complete records.

Exclusion criteria

- Incomplete records.
- Records of professional donors.
- Records of apheresis donors.

Statistical Analysis- The data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 22.0. All the qualitative data were expressed as numbers and percentages, while for the quantitative data, measures of central tendency, including mean and standard deviation, were applied to summarize the data.

Ethical approval- Since it is a retrospective study, the ethics approval was waived. However, due care was taken not to include any identifying information about the donors in the records.

RESULTS

From January 2021 to October 2025, a total of 28295 blood donors were registered, of which 26459 were males (93.51%), and 1836 were females (6.49%). The majority of the donors belonged to the age group of 18 to 30 years (Table 1).

Table 1: Distribution of donors by age

Parameter	Donors	
	N	%
18 to 30	18397	65.02
31 to 45	7916	27.98
46 to 60	1982	7
Total	28295	100

The overall deferral rate was 7.49%, with males accounting for 79.62% of the deferred cases. When

assessed gender wise, the deferral rates were 6.38% in males and 23.53% in females. The majority of the cases were temporary deferrals (1677; 79.10%) while permanent deferrals accounted for 443 cases (20.90%). When assessed according to reason for temporary deferral, low hemoglobin was the commonest cause,

accounting for 25.82% of the donors, while breastfeeding, vaccination, and typhoid accounted for less than 1% donors (Table 2).

Table 2: Distribution of reasons for temporary deferral according to gender

Parameter	Male		Female		Total	
	N	%	N	%	N	%
Low hemoglobin	320	19.08	113	6.74	433	25.82
Alcohol intake	260	15.50	2	0.12	262	15.62
Medications	193	11.50	48	2.87	241	14.37
Underweight	102	6.08	56	3.34	158	9.42
Tattoo in 1 year	100	5.96	10	0.60	110	6.56
High blood pressure	82	4.89	2	0.12	84	5.01
Inadequate sleep	74	4.41	6	0.36	80	4.77
Low blood pressure	22	1.31	52	3.10	74	4.41
Major/minor surgery	56	3.34	2	0.12	58	3.46
Menstruation	0	0	36	2.15	36	2.15
Jaundice (Hepatitis A and E)	32	1.91	3	0.18	35	2.09
Recent donation (3 months)	26	1.55	5	0.30	31	1.85
Other infections	22	1.31	2	0.12	24	1.43
Tuberculosis	17	1.01	1	0.06	18	1.07
Breast feeding	0	0	16	0.95	16	0.95
Vaccination	9	0.54	3	0.18	12	0.72
Typhoid	1	0.06	4	0.24	5	0.30
Total	1316	78.47	361	21.53	1677	100

When assessed according to reason for permanent deferral, cardiac disease and chronic obstructive pulmonary disease (COPD) were the commonest causes,

accounting for 38.60% and 37.25% patients, respectively (Table 3).

Table 3: Distribution of reasons for permanent deferral according to gender

Parameter	Male		Female		Total	
	N	%	N	%	N	%
Cardiac disease	149	33.63	22	4.97	171	38.60
Chronic obstructive pulmonary disease	132	29.80	33	7.45	165	37.25
High-risk behavior	75	16.93	9	2.03	84	18.96
Epilepsy	16	3.61	7	1.58	23	5.19
Total	372	83.97	71	16.03	443	100

DISCUSSION

In the present study, it was noted that the majority of blood donors were males, with only 6.49% female donors. Young donors were common in the age group of

18 to 30 years (65.02%). Deferral rate was 7.49%. The deferral rates were higher for females (23.53%) than for males (6.38%). 79.10% of the donors were deferred for temporary causes, while only 20.90% were deferred for

permanent causes. Low hemoglobin and alcohol intake were the commonest causes for temporary deferrals. Cardiac disease was the most common cause for permanent deferral (38.60%), while epilepsy was the least common cause (5.19%).

Kandasamy *et al.* ^[12] included 99,680 voluntary donors in their study, with 91.20% males and 8.8% females. They reported a deferral rate of 10.6%. The deferral rate in females was 49.88% as compared to 6.76% in males. Temporary deferral accounted for 98.19% of the deferred cases. Low hemoglobin was the commonest cause of deferral amongst females (70.08%). These findings were similar to our study.

Maheshwari *et al.* ^[13] included a total of 5912 donors during the study period. The majority of the donors belonged to the age group of 21 to 30 years (51.3%). There was a preponderance of male donors (97.1%). The deferral rate in their study was slightly higher (33.6%). Male preponderance was observed in the deferred cases as well (79.56%). The gender wise deferral rate was 29.4% in males and 78.4% on females. Out of the deferred cases, 93.8% were temporary deferrals. Low hemoglobin (34.04%), medications (18.52%), abnormal blood pressure (17.17%), and underweight (15.31%) were the most common causes for temporary deferrals while surgical reasons (1.01%) and prior donation within 3 months (1.05%) were the least common causes. Amongst the reasons for permanent deferrals, high-risk behavior (61.78%) and history of jaundice (Hepatitis B and C) (17.07%) were the most common causes. These findings were similar to our study.

In another study by Sanjana *et al.* ^[14] conducted in Karnataka, they included a total of 3449 donors. The deferral rate was 7.31% with a male preponderance (97.2%). 56.73% of the deferred male donors and 57.14% of the deferred female donors belonged to the age group of 18 to 30 years. 96.03% donors were categorized as temporary deferrals, while 3.97% were permanent deferrals. These findings were almost similar to those of the present study.

Male preponderance amongst voluntary and replacement non-remunerated donors has often been reported by other studies as well ^[15-17]. This may be due to the lower prevalence of deferrals amongst males. A systematic review conducted to assess the factors responsible for motivation amongst male donors reported other probable causes like perceived pressure

from family and friends (especially in case of replacement donors), for incentives or gifts, altruism, or as an opportunity for health check-up ^[18].

The proportion of deferred cases are more amongst the female donors as compared to the male donors, particularly because of poor nutritional status ^[15-17]. Low hemoglobin or anemia is the most commonly reported cause. It has also been reported that deferral due to anemia leads to a low return rate of the donor for potential future donations ^[19]. Furthermore, some reasons for deferral are exclusive to females, like pregnancy and breastfeeding. Nevertheless, higher deferral rates amongst female donors may lead to a lower return rate amongst deferred females, leading to a lower proportion of female donors. The present study was a single-center study and was limited by the attendance of the donors. Therefore, the results may not be generalized.

CONCLUSIONS

This study provides a valuable insight into the donor profile and deferral reasons amongst the Indian donors. While the proportion of female donors for voluntary, non-remunerated donors is lower, the deferral rate is higher in female donors. Low hemoglobin or anemia is the commonest cause of temporary deferral amongst both males and females, indicating an overall poor nutritional status.

Blood is a scarce resource. Therefore, improving the donor rates is imperative for adequate availability of blood for transfusion. Strategies for improvement in the general health status of the population with regular health check-ups may help in decreasing the deferral rates and increasing the motivation for blood donation.

CONTRIBUTION OF AUTHORS

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Research design- Sureshni Pradeep Daiwile, Amit Agrawal

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