



Evaluation of Blood Donor Selection and Deferrals in a Tertiary Care Hospital Blood Centre

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DOI: 10.21276/APALM.3346

Abstract

Background: Blood transfusion is considered an important life-saving treatment in the medical field, saving millions of lives. In blood transfusion practice, blood donor selection is the first and most important step to safeguard the health of both donors and recipients. Donors may be deferred permanently or temporarily due to various reasons during the screening procedure. This study was carried out to understand the reasons for donor deferral and deferral rates at our blood center.

Methods: A retrospective study was conducted at the Blood Center, GMERS Medical College and Hospital, Gotri, Vadodara, Gujarat, for the period of January 2022 to June 2023. Relevant data on total blood donations and donor deferrals were retrieved from the donor registration form and analyzed.

Results: Out of a total of 6054 blood donors, 721 (11.9%) were deferred. Amongst them, 89.74% were temporarily deferred and 10.26% were permanently deferred. The most common cause for temporary deferral was anemia (Hemoglobin < 12.5 gm%), comprising 53.47%, and the most common cause for permanent deferral was RPR positive status, comprising 40.54%.

Conclusion: Donor selection is a crucial step for safe and healthy blood transfusion. Understanding the reasons for donor deferral can greatly aid in blood donor recruitment efforts, especially targeting temporarily deferred young adult donors who can be returned to the donor pool.

Keywords:

Blood donation, Temporary deferred, Permanent deferred, Anemia

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Submitted: 08-Apr-2024

Final Revision: 11-May-2024

Acceptance: 02-Jun-2024

Publication: 11-Jul-2024



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Introduction

Blood transfusion is considered an important life-saving treatment in various medical situations, such as road traffic accidents, postpartum hemorrhage, and major surgeries. It saves millions of lives. The requirement of blood in India is 8 million units every year, but the number of units collected annually is 5.5–6 million units, contributing to a significant shortage of blood units[1]. In blood transfusion practice, blood donor selection is the first and most important step to safeguard the health of both donor and recipient[2]. During donor screening, a donor disqualified from donating blood is called a deferred donor. A donor could be deferred for one or more reasons. Depending on the reason for deferral, a donor could be deferred temporarily for a period of time or permanently, meaning they will never be allowed to donate blood. According to geographical area, rates and reasons for donor

deferral are different[3]. This study was carried out to know the reasons for donor deferral and deferral rates in our blood center. Furthermore, in light of the results, strategies will be developed to mitigate the donor deferral rate and improve donor re-entry in our blood center.

Materials and Methods

A retrospective study was conducted at the Blood Center, GMERS Medical College and Hospital, Gotri, Vadodara, Gujarat, India. The data recorded from donor registration forms and the donor register were compiled and statistically analyzed, and categorized according to the cause of deferral. A total of 6,054 donors were registered during the study period. All whole blood donors, including voluntary and replacement blood donations in the blood bank as well as in blood donation camps from January 2022 to June 2023 (one and a half years), were recorded and the data was analyzed.

The criteria for prospective blood donor selection and deferral in India are provided by the Drugs and Cosmetics Act 1940 & Rules 1945, supplemented by the Standards for Blood Banks and Blood Transfusion Services by the National AIDS Control Organisation (NACO) and the Transfusion Medicine Technical Manual by the Ministry of Health and Family Welfare (MoHFW), Government of India (GOI) [4]. Each donor was evaluated by some questionnaires and a basic medical examination. The requirements included age between 18 to 65 years, body weight ≥ 45 kg (in 350 ml) or > 55 kg (in 450 ml), systolic BP 100-140 mmHg and diastolic BP 60-90 mmHg, pulse 60-100 bpm with regular rhythm, temperature 37°C , hemoglobin (Hb) estimation ≥ 12.5 gm/dl, and transfusion-transmitted infection (TTI) screening tests. Hemoglobin estimation was done by Hemocue, and hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) tests were performed by enzyme-linked immunosorbent assay (ELISA), syphilis by the rapid plasma reagin (RPR) test, and malaria by thick smear examination in Giemsa stain.

All the prospective blood donors were accepted or deferred according to Standard Operating Procedure (SOP) criteria prepared by the above agencies. Deferred donors were categorized as temporary or permanent according to the reasons for deferral. This was done to help in counseling and enabling temporarily deferred donors to become healthy donors in the future. The seropositive blood was disposed of by autoclaving followed by incineration [5].

Ethics: This was a retrospective study. The study was undertaken after the Institutional Ethics Committee gave its approval.

Statistical Analysis: All statistical analysis was performed in Microsoft Excel. In this study, we used descriptive statistical analysis, including percentage, mean, and median.

Results

A total of 6,054 potential blood donors were registered for blood donation during the study period of one and a half years, from January 2022 to June 2023. Out of these, 5,333 (88.1%) were accepted for blood donation, and 721 (11.9%) were deferred due to various reasons (see Table 1). There were a total of 5,713 male registered donors, out of which 5,043 (88.27%) were accepted and 670 (11.73%) were deferred. Out of 341 female donors, 290 (85.04%) were accepted and 51 (14.96%) were deferred (see Table 2 and Fig 1).

Out of the total 721 deferred donors, 647 (89.74%) were deferred temporarily and 74 (10.26%) were deferred permanently (see Fig 2). Among the 647 temporarily deferred donors, 346 (53.47%) were deferred due to anemia, 71 (11%) due to high blood pressure, and 41 (6.34%) due to tattooing (see Table 3). Among the permanently deferred donors, 30 (40.54%) were deferred due

to being RPR positive, 27 (36.49%) due to being Hepatitis B positive, and 5 (6.76%) due to being HIV positive (see Table 4).

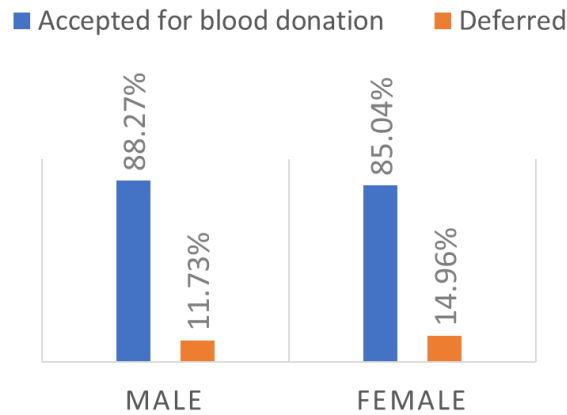


Figure 1: Demographic profile of donors

Table 1: Demographic profile of blood donors

	Number of donors	Percentage
Total registered blood donor	6054	100
Accepted for blood donation	5333	88.1%
Deferred	721	11.9%

Table 2: Gender wise distribution of blood donors

Donor	Male	Female
	Number (%)	Number(%)
Total Registered	5713(100%)	341(100%)
Accepted for blood donation	5043(88.27%)	290(85.04%)
Deferred	670(11.73%)	51(14.96%)

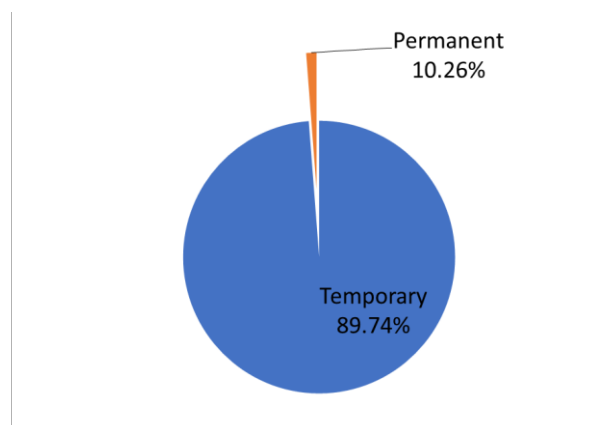


Figure 2: Deferral profile of donors

Table 3: Causes of Temporary donor deferral

Causes	Male	Female	Total	Percentage (Out Of 647)
Anemia (Hemoglobin <12.5gm/dl)	312	34	346	53.47 %
Hypertension	70	1	71	11 %
Tattoo	41	0	41	6.34 %
Skin diseases	34	0	34	5.26 %
On going treatment	27	0	27	4.17 %
Weight <45Kg	22	0	22	3.4 %
High Hb	17	0	17	2.62 %
Hypotension	15	0	15	2.32 %
Alcohol consumption	12	0	12	1.86 %
Dental procedure	10	1	11	1.7 %
Cough & Cold	9	0	9	1.4 %
Minor surgery	7	0	7	1.08 %
Donation within 3 months	7	0	7	1.08 %
Menstruation	0	6	6	0.93 %
Recent vaccination	4	1	5	0.77 %
Dog bite	4	0	4	0.61 %
Fever	3	0	3	0.46 %
In adequate sleep	2	0	2	0.31 %
Thyroid disease	1	1	2	0.31 %
Age <18 years	2	0	2	0.31 %
TB	1	0	1	0.15 %
Typhoid	1	0	1	0.15 %
Major surgery	1	0	1	0.15 %
Recent BT	1	0	1	0.15 %
Total	603	44	647	100%

Discussion

In transfusion medicine services, pre-donation donor counselling and screening based on a questionnaire and basic medical examination, as well as post-donation TTI testing, is important to ensure blood safety for both blood donors and recipients. During the screening process, the donors who were deferred were informed about the reason for deferral.

Out of a total of 6,054 registered blood donors, the donor deferral rate reported in the present study was 11.9%, which is comparable to the study by Awasthi S et al., showing a deferral rate of 10.4% [6]. Different studies done by E. Sabari Priya,

Shrivastava M et al., Shah A et al., Mulla FI et al., and Aneke CJ et al. observed donor deferral rates of 6.5%, 11.5%, 17.39%, 13.02%, and 32.50%, respectively, in their literature from various parts of India as well as internationally [7,8,9,10,11]. The donor deferral rate may vary due to different donor selection criteria in different countries, as well as variations in the prevalence of anaemia and TTIs in the general populations of the different study locations. Our study observed a higher number of deferrals for female donors (14.96%) than male donors (11.73%), similar to other studies done by E. Sabari Priya, Chauhan DN et al., and Patel S et al. [7,12,13].

Table 4: Causes of Permanent donor deferral

CAUSES	MALE	FEMALE	TOTAL	PERCENTAGE%(Out of 74)
RPR Positive	25	05	30	40.54
HBV Positive	25	02	27	36.49
HIV Positive	05	00	05	6.76
HCV Positive	04	00	04	5.41
Uncontrolled diabetes	03	00	03	4.05
K/C/O epilepsy	02	00	02	2.70
Cardiac problem	02	00	02	2.70
Patient on anticancer drugs	01	00	01	1.35
Total	67	07	74	100

Temporary deferrals (89.74%) occupy a major portion of total deferrals compared to permanent deferrals (10.26%) in our study. In a past study from South India, Sundar P et al. also reported about 16% permanent and 84% temporary deferrals [14]. A study done by Arslan et al. [15] also reported similar results, constituting 90% temporary and 10% permanent deferrals. Anemia (Hemoglobin <12.5 gm/dl) was the most common cause for both male and female temporary deferred donors, comprising 53.47%, which is comparable to the study done by Agnihotri N showing 55.8% deferral due to low hemoglobin [16]. Like our study, most other studies done in the past have also shown low hemoglobin as the main reason for deferral of blood donors [17,18,19,20,21]. This indicates a high prevalence of anemia (particularly iron deficiency anemia) in our population. Anemia in females is more likely to be related to physiological causes like menstrual blood loss, pregnancies, lactation, or nutritional deficiencies. However, anemia in male donors may relate to nutritional deficiencies or unrecognized medical illnesses [22]. These donors are advised to take nutritional supplementation and seek medical consultation to rule out any underlying illness.

Other less common reasons for deferral in our study were high blood pressure (11.00%), tattoos (6.3%), skin disease at the local site (5.26%), and ongoing medical treatment (4.17%). To reduce our precious blood donor loss, regular health check-ups, proper management, and follow-up can be carried out so that they can be reverted back to the healthy donor pool. Some of the reasons for deferrals, such as inadequate sleep, alcohol intake, and fasting, are totally avoidable through proper blood donor education and counselling. Jashnani and Patil stated that blood donor deferrals will surely reduce if the blood bank officials provide some information, education, and communication (IEC) material or conduct sessions regarding donor acceptance criteria with the organizing team of the blood donation camps as a routine practice [23].

Permanent deferral observed in our study was 10.26% out of total deferrals. Transfusion transmissible infectious diseases (HIV, HCV, HBsAg, Syphilis) are the leading cause of permanent deferral in our study, which is comparable to the study done by Prajapati D et al. [24]. These donors are properly counseled and advised never to donate blood for the safety of recipients and their own. RPR (Syphilis) positive is the most common cause of permanent deferral, followed by Hepatitis B infection in our study. The public should be educated about routes of transmission, preventive measures, and vaccination for HBV through various modes like the distribution of Information, Education, and Communication pamphlets to reduce the prevalence of infectious diseases. Other than TTI, some other medical reasons for permanent deferral observed in our study were uncontrolled diabetes (4.05%), epilepsy (2.70%), cardiac disease (2.70%), and anticancer treatment (1.55%). These donors were properly counseled to never donate blood for the safety of recipients and their own.

Conclusion

Raising general awareness for blood donation through proper information, education, and communication within the general population regarding blood donation, including pre-donation eligibility criteria and post-donation care, helps increase the number of voluntary donations and reduces the deferral rate. Understanding the reasons for donor deferral and providing proper counseling would greatly aid blood donor recruitment efforts, especially for temporarily deferred young adult donors who can be returned to the donor pool. This approach will also help develop better strategies to minimize the loss of precious blood donors and ensure safe and quality blood products for recipients along with the safety of blood donors.

Funding: None

Competing Interests: The authors declare that they have no conflict of interest.

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