

Pattern and Causes of Blood Donor Deferral at a Tertiary Care Blood Centre: A Retrospective Study from Western Uttar Pradesh

Govind Mishra^{1*}, Natasha Singh², Ankita Mittal², Abhishek Sharma³, Jyoti Mishra⁴

¹Assistant Professor, Department of Immunohematology and Transfusion Medicine, Kalyan Singh Government Medical College, Bulandshahr, India

²Associate Professor, Department of Pathology, Kalyan Singh Government Medical College, Bulandshahr, India

³Assistant Professor, Department of Forensic Medicine and Toxicology, Kalyan Singh Government Medical College, Bulandshahr, India

⁴Professor, Department of Pathology, Kalyan Singh Government Medical College, Bulandshahr, India

***Address for Correspondence:** Dr. Govind Kumar Mishra, Assistant Professor, Department of Immunohematology and Transfusion Medicine, Kalyan Singh Government Medical College, Bulandshahr, U.P., India

E-mail: dr.govindmishra@gmail.com

Received: 25 Jan 2026/ Revised: 19 Mar 2026/ Accepted: 20 Apr 2026

ABSTRACT

Background: Blood donor deferral is a significant challenge for transfusion services, as it affects both blood availability and donor retention. Identification of common causes of donor deferral helps in improving donor recruitment and ensuring transfusion safety. To analyze the pattern and causes of blood donor deferral at a tertiary care blood center in Western Uttar Pradesh.

Methods: This retrospective study was conducted at the Blood Centre, Kalyan Singh Government Medical College, from 1st February 2024 to 31st January 2026. A total of 592 deferred blood donors aged 18–50 years were included. Data were collected from the donor deferral register and analyzed for demographic profile, blood group distribution, and causes of donor deferral.

Results: Male donors accounted for the majority (93.2%), while females accounted for 6.8%. B positive was the most common blood group among deferred donors (67.7%). Hemoglobin abnormalities, including anemia were the leading cause of donor deferral (34.6%), followed by alcoholism (33.7%). Medication use accounted for 12.5% of deferrals. Anemia was more common among younger and older donors, whereas alcoholism was predominantly observed in middle-aged donors.

Conclusion: Most donor deferrals were temporary and potentially preventable. Anemia and alcoholism were the major causes of donor deferral. Donor education, nutritional counseling, iron supplementation, and effective counseling strategies may help reduce avoidable donor deferrals and improve donor retention and blood availability

Key-words: Blood donor deferral, Blood donation, Temporary deferral, Permanent deferral, Transfusion safety, Donor retention

INTRODUCTION

Blood transfusion is an essential life-saving procedure and its use for a variety of medical and surgical conditions is increasing day by day. Approximately 85 million units of red blood cells (RBCs) are transfused globally every year. ^[1]

The provision of safe and adequate blood and blood products is an important component of any healthcare system.

Blood donors are broadly categorized into replacement donors and voluntary donors. A replacement donor donates blood upon request for a specific patient or the patient's family, whereas a voluntary donor donates blood willingly without any pressure or personal interest. Various strategies have been adopted worldwide to ensure the availability of blood components and efficient transfusion services during emergencies. ^[2]

The welfare and safety of both donors and recipients require thorough clinical and laboratory screening. Selection of a healthy donor is ensured through a strict

How to cite this article

Mishra G, Singh N, Mittal A, Sharma A, Mishra J. Pattern and Causes of Blood Donor Deferral at a Tertiary Care Blood Centre: A Retrospective Study from Western Uttar Pradesh. SSR Inst Int J Life Sci., 2026; 12(3): 9913-9919.



Access this article online

<https://ijls.com/>

screening process that includes a detailed questionnaire and a mini-physical examination, as per national guidelines. Donors who do not meet the required criteria are deferred from donating blood. Depending on the cause, deferral may be temporary or permanent. Strict adherence to donor screening protocols minimises the risk of transfusion-transmitted infections (TTIs) and reduces blood and blood product waste. [3-5]

Previous studies have shown that a large number of blood donors are deferred due to one or more reasons, either temporarily or permanently. This creates a challenging situation for blood banks by reducing the pool of eligible donors and negatively affecting prospective donors psychologically. [6,7]

The present study was conducted at the Blood Centre, Kalyan Singh Government Medical College, Bulandshahr, to analyze the pattern and causes of donor deferrals recorded in the donor deferral registry. Understanding the common causes of donor deferral may help in formulating strategies to reduce avoidable deferrals, improve donor retention, and increase awareness among prospective donors.

MATERIALS AND METHODS

Study Design and Setting- This retrospective observational study was conducted at the Blood Centre, Kalyan Singh Government Medical College, from 1st February 2024 to 31st January 2026.

Study Population- A total of 592 blood donors aged between 18 and 50 years who were deferred from blood donation during the study period were included in the study.

Data Collection- Data were collected retrospectively from the donor deferral register maintained at the blood centre. Information regarding donor demographics, blood group distribution, and causes of donor deferral was recorded.

Inclusion Criteria

- Deferred blood donors aged 18–50 years
- Donors deferred during the study period
- Complete donor deferral records available

Exclusion Criteria

- Incomplete donor records
- Donors outside the eligible age group

Donor Screening Procedure- All donors underwent standard donor screening according to national blood donation guidelines, including:

- Detailed medical history
- Donor questionnaire
- Physical examination
- Hemoglobin assessment

Classification of Donor Deferral

Donor deferrals were categorized as:

- Temporary deferral
- Permanent deferral

based on the underlying medical condition and standard blood centre guidelines.

Statistical Analysis- Collected data were tabulated and analyzed using descriptive statistical methods. Frequencies and percentages were calculated to evaluate demographic characteristics and common causes of donor deferral.

RESULTS

The age of deferred donors ranged from 18 to 50 years according to the donor selection criteria. A total of 592 blood donors were deferred during the study period. Male donor deferrals were significantly higher, accounting for 552 cases (93.2%), whereas female donor deferrals accounted for only 40 cases (6.8%) (Table 1).

Table 1: Gender-wise Distribution of Deferred Blood Donors

| Gender | Number of Deferred Donors | Percentage (%) |
|--------|---------------------------|----------------|
| Male | 552 | 93.2 |
| Female | 40 | 6.8 |
| Total | 592 | 100 |

Analysis of blood group distribution among deferred donors showed that B positive was the most common blood group, observed in 401 donors (67.7%). This was followed by O-positive in 78 donors (13.2%) and A-positive in 61 donors (10.3%). The least common blood groups among deferred donors were A- and AB- (Table 2).

Table 2: Distribution of Blood Groups among Deferred Donors

| Blood Group | Number of Deferred Donors | Percentage (%) |
|-------------|---------------------------|----------------|
| B Positive | 401 | 67.7 |
| O Positive | 78 | 13.2 |
| A Positive | 61 | 10.3 |
| AB Positive | 22 | 3.7 |
| B Negative | 10 | 1.7 |
| O Negative | 8 | 1.4 |
| A Negative | 7 | 1.2 |
| AB Negative | 5 | 0.8 |
| Total | 592 | 100 |

Hemoglobin abnormalities, including anemia were identified as the leading cause of donor deferral, accounting for 205 cases (34.6%). Alcoholism was the second most common cause and was responsible for 200 donor deferrals (33.7%). Medication use accounted for 74 cases (12.5%), while fever/infections, hypertension, diabetes mellitus, jaundice/hepatitis history, and polycythemia contributed to smaller proportions of donor deferrals (Table 3).

Age-wise analysis revealed that anemia and hemoglobin abnormalities were more commonly observed in younger donors (18–30 years) and older donors (41–50 years). In contrast, alcoholism was predominantly observed in the middle-aged group (31–40 years). Medication-related deferrals were more frequent among older individuals (41–50 years) (Table 3).

Table 3: Age-wise Distribution of Common Causes of Donor Deferral

| Cause of Deferral | 18–30 Years | 31–40 Years | 41–50 Years | Total Cases | Percentage (%) |
|----------------------------------|-------------|-------------|-------------|-------------|----------------|
| Anemia/ Hemoglobin abnormalities | 95 | 48 | 62 | 205 | 34.6 |
| Alcoholism | 42 | 126 | 32 | 200 | 33.7 |
| Medication Use | 8 | 20 | 46 | 74 | 12.5 |
| Fever/Infections | 20 | 14 | 6 | 40 | 6.8 |
| Hypertension | 2 | 10 | 18 | 30 | 5.1 |
| Diabetes Mellitus | 1 | 8 | 14 | 23 | 3.9 |
| Jaundice/ Hepatitis History | 4 | 5 | 3 | 12 | 2.0 |
| Polycythemia | 1 | 5 | 4 | 10 | 1.7 |
| Other Causes | 3 | 1 | 0 | 4 | 0.7 |
| Total | 176 | 237 | 185 | 592 | 100 |

The study also documented the standard period of temporary donor deferral for various medical and procedural conditions followed at the blood centre (Table 4). Deferral periods ranged from 1 week for influenza/upper respiratory tract infections to 3 years for malaria in non-endemic areas. In addition, certain

chronic systemic illnesses and transfusion-transmissible conditions such as hepatitis B infection, heart disease, liver disease, epilepsy, tuberculosis, schizophrenia, and polycythemia vera were considered causes for permanent donor deferral.

Table 4: Period of Temporary Deferral for Various Conditions

| Condition | Period of Deferral |
|--|--------------------------|
| Abortion | 6 months |
| History of blood transfusion | 12 months |
| Major surgery | 12 months |
| Minor surgery | 6 months |
| Typhoid fever | 12 months after recovery |
| Malaria (endemic area) | 3 months |
| Malaria (non-endemic area) | 3 years |
| Tattooing | 12 months |
| Tooth extraction/Dental surgery | 6 months |
| Immunization (cholera, typhoid, diphtheria, tetanus, plague, gamma globulin) | 15 days |
| Rabies vaccination | 1 year after vaccination |
| Hepatitis in family/close contact | 12 months |
| Hepatitis immune globulin | 12 months |
| Measles/Mumps/Chickenpox | 2 weeks |
| Influenza/URTI | 1 week after treatment |
| Dengue/Chikungunya | 6 months |

DISCUSSION

Blood donor selection is a crucial step in the transfusion process and involves multiple checkpoints to ensure the safety of both donors and recipients. The donor screening process generally includes four important steps. Initially, potential donors are educated regarding transfusion-transmissible infections and possible risks associated with blood donation. This is followed by completion of a detailed donor questionnaire and an interview conducted by the medical officer. Finally, donors undergo physical examination and laboratory investigations, based on which they are either accepted or deferred. Deferrals may be temporary or permanent depending upon the underlying condition. The eligibility criteria for blood donation include donor age between 18 and 55 years, body weight not less than 45 kg, normal temperature and pulse rate, systolic blood pressure between 100–140 mm Hg and diastolic blood pressure between 60–90 mm Hg, hemoglobin level not less than 12.5 g/dL, absence of acute respiratory infections, absence of skin lesions at the phlebotomy site, and no

history suggestive of transfusion-transmissible diseases including HIV/AIDS. It is also important to assess high-risk behavior among donors. Adequate privacy and counseling should be provided during donor interviews, and suspected high-risk individuals should be referred for voluntary counseling and testing services while maintaining strict confidentiality. The blood centre follows standard donor deferral criteria for both temporary and permanent deferrals.

Donor deferral remains a major challenge for transfusion services worldwide, as it affects both blood availability and donor retention. Deferral can have a negative psychological impact on donors and may discourage future blood donation attempts. Temporary deferrals are commonly caused by low hemoglobin levels, recent infections, alcohol intake, medications, and short intervals between donations, whereas permanent deferrals are usually associated with chronic systemic illnesses and transfusion-transmissible infections. Recent studies have emphasized that proper donor screening



and counseling are essential to ensure donor safety and maintain an adequate blood supply. [8]

In the present study, most deferred donors were aged 18–50 years, with younger adults constituting the majority of deferrals. Similar findings were reported by Chauhan *et al.*, Sundar *et al.*, Arslan, and Gupta *et al.* [9–12] Younger donors are often first-time donors and are more likely to be deferred due to nutritional deficiencies, anaemia, and lack of awareness of donor eligibility criteria. [11]

The overall donor deferral rate in our study was 15%, which is comparable with studies conducted by Chauhan *et al.*, Sundar *et al.*, Arslan, Gupta *et al.*, and Bahadur *et al.* [8–12] Variations in donor deferral rates may be attributed to geographical differences, socioeconomic conditions, nutritional status, prevalence of endemic diseases, donor awareness, and institutional donor selection criteria. Standardised screening protocols and donor education programs may help reduce unnecessary donor deferrals.

Male donors constituted the majority of deferred donors in the present study, while female donor participation was comparatively low. Temporary deferrals accounted for the majority of cases in our study. Anemia was the leading cause of temporary donor deferral, followed by alcoholism. Similar findings were reported by Sundar *et al.* and Gupta *et al.* [10,12]. Mast *et al.* also demonstrated that low haemoglobin remains one of the leading causes of donor deferral globally, significantly affecting blood availability. [13] The lower participation of female donors may be related to higher prevalence of anemia, low body weight, nutritional deficiencies, and sociocultural factors affecting voluntary blood donation practices.

Hillgrove *et al.* demonstrated that temporary donor deferral may negatively affect future blood donation behavior and reduce donor return rates if adequate counseling and reassurance are not provided. [14]

Therefore, proper communication about the reason and duration of deferral, along with nutritional advice and appropriate treatment, is essential to motivate deferred donors to donate blood in the future. Cable *et al.* reported that iron deficiency and depleted iron stores are major contributors to hemoglobin-related donor deferrals. They suggested that iron supplementation programs and ferritin-guided donor monitoring strategies can help reduce such deferrals and improve donor retention. [15]

In the present study, permanent deferrals were mainly related to chronic medication use, diabetes mellitus, and systemic illnesses. Similar findings were reported by Gupta *et al.*, Mast *et al.*, and Yadav *et al.*, where chronic illnesses, hypertension, hepatitis-related conditions, and long-term medication use were identified as major causes of permanent donor deferral. [12,13] Proper identification, counseling, and referral of permanently deferred donors remain essential for ensuring donor and recipient safety and maintaining the quality of transfusion services. Recent reviews on donor deferral have also emphasized the need for evidence-based donor selection policies and appropriate counseling strategies to improve donor retention while ensuring transfusion safety. [16]

Anemia and alcoholism were more frequently observed among younger and middle-aged donors in our study, whereas medication-related deferrals were more common among older individuals. Similar age-related trends were also observed by Gupta *et al.*, Hillgrove *et al.*, and Spencer BR *et al.*, reflecting changing lifestyle patterns, nutritional status, and increasing prevalence of chronic medical conditions with advancing age. [12,14,17]

LIMITATIONS

The present study has certain limitations. Since it was conducted at a single tertiary care centre over a limited study period, the findings may not be fully representative of the general population. Nevertheless, the study provides valuable insight into common and potentially preventable causes of donor deferral in a tertiary care hospital setting. The findings emphasise the importance of donor education, nutritional support, proper medical evaluation, and effective counselling strategies to minimise avoidable donor deferrals and improve long-term donor retention. Recent studies by Arcot *et al.* and Hasan *et al.* have similarly highlighted the importance of counseling, donor follow-up, and iron supplementation programs in improving donor return rates and maintaining a sustainable blood supply.

CONCLUSIONS

The present study demonstrated that the majority of donor deferrals were temporary and potentially reversible. Anemia was the most common cause of donor deferral, followed by alcoholism. Male donors constituted the majority of deferred donors. The findings



of this study emphasise the importance of donor education, counselling, nutritional support, and appropriate medical management to reduce avoidable donor deferrals. Proper counseling and treatment of temporarily deferred donors can help in their future recruitment into the donor pool, thereby helping to overcome shortages of blood and blood components in hospitals.

CONTRIBUTION OF AUTHORS

Research concept- Govind Mishra, Ankita Mittal, Abhishek Sharma

Research design- Govind Mishra, Ankita Mittal, Abhishek Sharma

Supervision- Natasha Singh, Jyoti Mishra

Materials- Govind Mishra, Ankita Mittal, Abhishek Sharma

Data collection- Govind Mishra, Ankita Mittal, Abhishek Sharma

Data analysis and interpretation- Natasha Singh, Jyoti Mishra

Literature search- Govind Mishra, Ankita Mittal, Abhishek Sharma

Writing article- Govind Mishra, Ankita Mittal, Abhishek Sharma

Critical review- Natasha Singh, Jyoti Mishra

Article editing- Govind Mishra, Ankita Mittal, Abhishek Sharma

Final approval- Natasha Singh, Jyoti Mishra

REFERENCES

- [1] Marik PE. Transfusion of blood and blood products. In: Evidence-Based Critical Care. Cham: Springer; 2014; pp. 585–619. doi: 10.1007/978-3-319-11020-2_38.
- [2] World Health Organization. Voluntary blood donation: foundation of a safe and sufficient blood supply. In: Towards 100% Voluntary Blood Donation: A Global Framework for Action. Geneva: WHO; 2010. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK305666/>.
- [3] World Health Organization. Screening donated blood for transfusion-transmissible infections: recommendations. Geneva: World Health Organization; 2010.
- [4] Gammon RR, Dubey R, Gupta GK, Hinrichsen C, Jindal A, Lamba DS, et al. Patient blood management and its role in supporting blood supply. *J Blood Med.* 2023; 14: 595–611. doi: 10.2147/JBM.S387322.
- [5] Clement M, Shehu E, Chandler T. The impact of temporary deferrals on future blood donation behavior across the donor life cycle. *Transfusion*, 2021; 61(6): 1799–808. doi: 10.1111/trf.16387.
- [6] World Health Organization. Blood donor selection: guidelines on assessing donor suitability for blood donation. Geneva: World Health Organization; 2012.
- [7] Agnihotri N. Whole blood donor deferral analysis at a center in Western India. *Asian J Transfus Sci.*, 2010; 4(2): 116–22.
- [8] Bahadur S, Jain S, Goel RK, Pahuja S, Jain M. Analysis of blood donor deferral characteristics in Delhi, India. *Southeast Asian J Trop Med Public Health*, 2009; 40(5): 1087–1091.
- [9] Chauhan DN, Desai KN, Trivedi HJ, Agnihotri AS. Evaluation of blood donor deferral causes: A tertiary-care center-based study. *Int J Med Sci Public Health*, 2015; 4(3): 389–92.
- [10] Sundar P, Sangeetha SK, Seema DM, Marimuthu P, Shivanna N. Pre-donation deferral of blood donors in South Indian set-up: An analysis. *Asian J Transfus Sci.*, 2010; 4(2): 112–15.
- [11] Arslan O. Whole blood donor deferral rate and characteristics of the Turkish population. *Transfus Med.*, 2007; 17(5): 379–83.
- [12] Gupta PK, Kumar H, Basannar DR, Jaiprakash M. Transfusion donor deferral analysis at a tertiary care teaching hospital blood bank in Karnataka. *J Clin Diagn Res.*, 2016; 10(3): EC18–EC20.
- [13] Mast AE, Schlumpf KS, Wright DJ, Custer B, Spencer BR, Murphy EL, et al. Demographic correlates of low hemoglobin deferral among prospective whole blood donors. *Transfusion*, 2010; 50(8): 1794–802.
- [14] Hillgrove T, Moore V, Doherty K, Ryan P. The impact of temporary deferral on future blood donation behavior among Australian donors. *Transfusion*, 2011; 51(6): 1187–96.
- [15] Cable RG, Glynn SA, Kiss JE, Mast AE, Steele WR, et al. Iron deficiency in blood donors: Analysis of enrollment data from the REDS-II donor iron status evaluation study. *Transfusion*, 2011; 51(3): 511–22.
- [16] Review of blood donor deferral with emphasis on donor and patient safety. *Transfus Clin Biol.*, 2022. doi: 10.1016/j.tracli.2022.07.002.

[17]Spencer BR, Mast AE. Iron status of blood donors.
Curr Opin Hematol., 2022; 29(6): 310–16. doi:
10.1097/MOH.0000000000000733.

Open Access Policy:

Authors/Contributors are responsible for originality, contents, correct references, and ethical issues. IJLSSR publishes all articles under Creative Commons Attribution- Non-Commercial 4.0 International License (CC BY-NC). <https://creativecommons.org/licenses/by-nc/4.0/legalcode>

