

Original Research Article

Blood Donor Deferral Pattern at Tertiary Care Center

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Abstract

Background and Objectives: It is well known that quite a large number of apparently healthy donors are not able to donate blood successfully because of varied reasons. These donors are deferred temporarily or permanently. The aim of the study was to analyse the incidence of Blood Donor deferral and its various causes and use this information as a guide for promoting voluntary Blood donation. *Materials and Methods:* Present study is a retrospective descriptive study. All the Blood donors reporting at our Blood Bank in last 18 months period were analysed retrospectively. Data of all the donors deferred due to various causes was analysed at our Blood bank. *Results:* There were 10,569 donors, of which 557 donors were deferred. Deferral rate amounting to 5.27%. Most common age group deferred was 26–35 years (38.42%). Temporary deferral were 96.76% (n=539) and permanent deferral were 3.23%. Leading causes of temporary deferral were hypertension, hypotension, alcohol intake, medicine intake, infection and permanent deferral causes were epilepsy, uncontrolled diabetes mellitus, thyroid disorder. *Conclusion:* More studies should be done at state and national level so that enough data can be collected and national policies formulated in deferring donors and moreover analysis of donor deferral pattern will help blood banks to formulate more focused donor screening approach.

Keywords: Blood bank; Blood donors; Donor deferral; Permanent deferral.

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Introduction

The main goal of blood transfusion services is to ensure the availability of safe and adequate supply of blood and blood products. National AIDS control organization (NACO) statistics shows that annual

rate of blood collection in India is about 7.4 million units, as against the requirement of 10 million units¹. The paucity of healthy safe blood donors is always a point of concern for all the blood banks. In the last 50 years most important advancement in blood safety is to prefer voluntary non remunerated donors selection instead of paid professional donors

to reduce transfusion transmitted infections.^{2,3} The blood bank should follow standard operating procedure in donor selection. It should include questionnaire, physical examination, weight measurement, and haemoglobin testing before donation. Those who satisfy all the criteria should qualify for blood donation. These criteria have been laid by the standards for blood bank and blood transfusion services and drugs and cosmetics act, 1940 and rules amended thereafter.^{4,5} Individuals disqualified from donating blood are known as “deferred” donors. Blood donors may be deferred, either on a temporary or permanent basis, on the grounds of their health status, medical or travel history or TTI risk.⁶ Deferring donors often leaves them with negative feelings about themselves as well as the blood donation process. Additionally these donors are less likely to return for blood donation in future. Retention and re-entry of these temporarily deferred donors can be achieved by analysing the reasons of their deferrals and ameliorating the causes wherever possible

A few studies from India in the past have provided different common reasons for deferral of whole blood donation highlighting differing demographic profile in different parts of the country.⁷ The aim of the study is to evaluate and analyse the blood donor deferral pattern, apply these findings to recruit them in future for donation and to compare with previous published studies.

Materials and Methods

The present study is a retrospective descriptive study. Study period included January 2017 to June 2018. Donors were selected in our Blood bank based on standard operating procedure with reference to Drugs and Cosmetic Act 1940 which is supplemented by Guidelines of Directorate General of Health Services guidelines, Ministry of Health & Family Welfare (2003) and National AIDS Control

Organisation (NACO). Predonation screening of the donors were done using donor questionnaire followed by physical examination, haemoglobin estimation and Blood grouping.

Data were collected from the donor deferral forms with respect to age and gender. The causes of deferral were categorized as temporary and permanent. All repeat donations were considered as independent attempts and for simplicity sake, they were not segregated from first time donations. Based on the reason of deferral, three categories of donors have been made: 1) category 1-donors own health might be affected by donation 2) category 2-recipients may get transfusion transmitted infection by potentially infectious blood, 3) category 3-transmissibility is unknown or other conditions, social and physical considerations by which donor is not suitable.

Results

During the study period January 2017 to March 2018 a total of 10,569 blood donors were screened. Out of which 10,012 (94.72%) were accepted for donation and 557 donors were deferred amounting to 5.27% of deferral rate. Among deferred donors 97.66% ($n=544$) were males and 2.33% ($n=13$) were females (Table 2). Commonest age group that was deferred was 26-35 yrs (38.42%) followed by 18-25 yrs (33.03%, Table 3). Out of 557 donors, temporary donors were 96.76% ($n=539$) and permanent donors 3.23% ($n=18$) and category wise distribution is shown in Table 4. Top five leading causes of deferral in male were hypertension, hypotension, alcohol intake, medicine and infection. Top five leading cause of deferral in female were low hemoglobin, menses, low weight, hypertension and surgery (Table 6). Main causes of permanent deferral was epilepsy, generalized skin disease, uncontrolled diabetes, thyroid disorder, psychiatric illness and cancer/Brain tumor (Table 5).

Table 1: Gender wise distribution of accepted and deferred donors

Gender	Accepted	Deferred	Total
Male	98.5% (n=9849)	97.66% (n=544)	98.45% (10393)
Female	1.5% (n=150)	2.33% (n=13)	1.544% (163)
Total	100% (9999)	100% (557)	10556

Table 2: Age wise distribution of deferred donors

Age in years	Number/Percentage of deferred donors (557)
18-25	33.03% (184)
26-35	38.42% (214)
36-45	23.33% (130)

Age in years	Number/Percentage of deferred donors (557)
46-55	4.84% (27)
56-65	0.35% (5)
>65	00

Table 3: Category wise deferral

Category	Total deferral (557)	Temporary Deferral (539)	Permanent deferral (18)
Category I	63.37% (353)	60.14% (335)	100% (18)
Category II	3.23% (18)	3.23% (18)	-
Category III	33.39% (186)	33.39% (186)	-
Total	100% (557)	96.76% (539)	3.23% (18)

Table 4: Category wise temporary deferral causes

Category	Number of donors deferred temporarily and percentage among temporary deferral (539)	Percentage of temporary donors among all deferred donors (557)
Category I		
Hypertension	169 (31.35%)	30.34%
Hypotension	107 (19.85%)	19.21%
Low Hemoglobin	17 (3.15%)	3.05%
Allergy	13 (2.41%)	2.33%
Previous blood donation <3months	9 (1.66%)	1.61%
Weakness/dizziness/Uneasiness	7 (1.29%)	1.25%
Low Body Weight	7 (1.29%)	1.25%
Under age	2 (0.37%)	0.35%
Menses	4 (0.74%)	0.71%
Category II		
Tattooing	11 (2.04%)	1.97%
Malaria	3 (0.55%)	0.53%
Ear piercing	1 (0.18%)	0.17%
Recent Vaccination	2 (0.37%)	0.35%
Jaundice	1 (0.18%)	0.17%
Category III		
Alcohol and smoking	56 (10.38%)	10.05%
Medicine	51 (9.46%)	9.15%
Infection	32 (5.93%)	5.74%
Sleep disturbance	23 (4.26%)	4.12%
Tooth Extraction	11 (2.04%)	1.97%
Surgery	5 (0.92%)	0.89%
No ID card	3 (0.55%)	0.53%
Acne	2 (0.37%)	0.35%
RTA	2 (0.37%)	0.35%
Hand tremors	1 (0.18%)	0.17%

Table 5: Category wise permanently deferred donors

Deferral cause	Number of donors deferred permanently and percentage among permanent donors (n=18)	Percentage of permanent donors among all deferred donors (n=18/557)
Category I		
Epilepsy	5 (27.77%)	0.89%
Generalized skin disease	3 (16.66%)	0.53%
Uncontrolled Diabetes mellitus	5 (27.77%)	0.89%
Brain tumor	1 (5.55%)	0.17%
Psychiatric illness	1 (5.55%)	0.17%
Thyroid disorder	3 (16.66%)	0.53%
Total	18 (100%)	3.23%

Table 6: Leading causes of deferral in male and female

Causes in male	Number /Percentage (415/557)	Causes in female	Number/ Percentage (13/557)
Hypertension	169 (30.34%)	Low Hemoglobin	6 (1.07%)
Hypotension	107 (19.21%)	Menses	4 (0.71%)
Alcohol	56 (10.05%)	Low weight	1(0.17%)
Medicine	51 (9.15%)	Hypertension	1(0.17%)
Infection	32 (5.74%)	Surgery	1(0.17%)

Discussion

An appropriate process of blood donor selection is very important in achieving safety in blood transfusion, as the desired aim is to protect and safeguard the health of both the donor and the recipient of blood and blood components. However, unnecessary deferral of blood donors may result in the loss of potential donors particularly in our society, where the culture of blood donation is still very poor. Various studies have reported different rates of donor deferrals. In our study the deferral rate was 5.27%. This rate is compared with other previous studies as shown in Table 7. With different standards and levels of strictness in selection criteria, there is wide variation in deferral rates worldwide from 5–10% to 20–40%.^{14,15} Strict criteria in donor selection are the reason for higher deferral rate. With these stringent criteria, there are losses of blood donors in this era of shortage of blood. While transfusion transmitted infection has been the focus of ours for years, reasons for deferral has not received much attention. In order to lessen the loss of blood donors and future recruitment of potential temporary blood donors this study was conducted.

Majority of the donors i.e., 97.66% in our study were males and female donors were only 2.33%, Chaudhary *et al.*⁹ and Arslan¹⁶ found similar differences in male and female donation trends which may be due to hesitation in society towards female donation. There is still huge difference between number of males and females turning up for donation. Education and motivation of female donor pool may help to decrease this disparity and improve our donor pool.

Out of total 557 deferred donors, 96.76% (539) were temporary deferral and 3.23% (18) were permanent deferral. Ankur *et al.*¹³ reported 81.11% of temporary deferral and 18.89% of permanent deferral. Custer *et al.*¹¹ and Arslan *et al.*¹⁶ reported 10.6% and 10% permanent deferrals. This varying deferral rate may be due to geographical variation and varied donor selection criteria. In our study top five leading causes of deferral in males were hypertension, hypotension, alcohol intake, history of drug intake and infection (Table 8).

In females leading causes of deferral were low hemoglobin, low weight, hypertension and surgery (Table 9).

Table 7: Deferral rate by different studies

Author	Deferral rate
Zou <i>et al.</i> ⁸	12.8%
Chaudhary <i>et al.</i> ⁹	16.4%
Bahadur <i>et al.</i> ¹⁰	17.9%
Custer <i>et al.</i> ¹¹	13.6%
Lim <i>et al.</i> ¹²	14.4%
Ankur N S <i>et al.</i> ¹³	10.26%
Our study	5.27%

Most of the deferrals were due to temporary causes such as anemia (3.05%), medication (9.15%), alcohol and smoking history (10.05%), previous donation less than three months (1.61%), low body weight (1.29%), uneasiness (1.29%), underage (0.37%), menses (0.74%), acne (0.37%), no ID card (0.55%). Such temporarily deferred donors can be motivated to return back after proper education and therapeutic referral.

Chronic diseases like severe uncontrolled diabetes (0.89%), hypertension (30.34%), cardiac disease, allergy (2.3%), epilepsy (0.53%) etc. are major part of deferral. Hypertension can lead to deferral of a significant percentage of prospective blood donors as evident in our study and another by Bahadur *et al.*¹⁰ However, any blood donor suffering from a marked degree of hypertension has to be bled with care as in such cases the sudden removal of 350 or 450 ml of

blood may precipitate a cerebral catastrophe. This could be tragic for the donor as well as blood center bleeding such donor. Patients with hypertension

and diabetes should not be outrightly rejected but assessed carefully as reduction of deferral in this group can cause large decrease in deferral rates.

Table 8:

Sl. No	Deferral causes	WHO recommendation
1	Hypertension / Hypotension	Accept stable uncomplicated hypertension controlled by medication. Defer if recently started or changed antihypertensive medication until 28 days after blood pressure stabilized. Defer permanently if hypertensive heart or renal disease.
2	Alcohol intake	Regular heavy drinking or use of illicit drugs and other dependence-producing psychoactive substances is a marker for other high-risk behaviours. Accept if no signs of intoxication and defer if displaying signs and symptoms of intoxication.
3	Medicine intake	Aspirin: defer for 5 days, Other NSAIDs: defer for 48 hours, Acitretin: defer for 3 years, Isotretinoin: defer for 28 days, Dutasteride: defer for 6 months, Finasteride: defer for 28 days, Antibiotics for acute infections: defer for 14 days after completion of treatment. Defer permanently individuals treated with human pituitary-derived growth hormone because of case reports of transmission of iatrogenic Creutzfeldt-Jakob disease.
4	Infection	Acute bacterial: Accept 14 days after full recovery and completion of antibiotic treatment. Defer for 28 days following full recovery and completion of treatment if symptoms suggestive of infection with salmonella, campylobacter, streptococcus or staphylococcus.

Donor counseling is an important aspect of blood banking. Deferral is perceived as negative experience by many donors as they feel rejected. Proper counseling alleviates the fear of rejection and motivates donor. Empathetic counselling encourages donors to return after the defined deferral period is over. The National Donor Deferral Registry (NDDR) is a database of permanently deferred source plasma donors in

North America. All donors who test "reactive" for the viral agents for HIV, HBV and HCV are added to the NDDR and are permanently prohibited from donating source plasma at participating licensed and industry certified centers in the U.S. and Canada. So, permanent deferral registry initiative can be helpful in reducing the burden of transfusion transmitted infections.

Table 9:

1	Low Hemoglobin	Accept if past history of iron deficiency anaemia, with a known cause not a contraindication to donation, when treatment completed and fully recovered. Accept vitamin B12 or folate deficiency when fully recovered and on maintenance treatment. Defer if does not meet minimum haemoglobin level for blood donation or under investigation or on treatment for anaemia. Defer permanently if chronic anaemia of unknown cause or associated with systemic disease.
2	Menses	Accept
3	Low weight	Prospective donors of whole blood donations should weigh at least 45 kg to donate 350 ml $\pm 10\%$ and 50 kg to donate 450 ml $\pm 10\%$
4	Surgery	Defer following minor surgery until treatment is complete and successful and normal activity resumed. Defer for 12 months following major surgery. Defer permanently following neurosurgical procedure, dura mater graft or corneal transplant.

Conclusion

Temporary deferral should be actively and aggressively managed so that this donor pool is not lost permanently and after treatment, education and motivation they return back to the donor pool. More studies should be done at state and national level so that enough data can be collected and national policies formulated and western parameters for deferral should not be followed as regional differences cause unnecessary deferrals of already limited donors. Moreover analysis of donor

deferral pattern will help blood banks to formulate more focused donor screening approach.

Ethical Clearance:

Approved from ethical committee SIMS Shimoga.

Source of Funding:

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Conflict of Interest: NIL

References

1. Rajendra N, Prashanth Madapura V. Study of blood donor profile in a blood bank attached to a medical college hospital - a retrospective study. *Pathology Update: Trop J Path Micro* 2017;3(4):406-11. doi:10.17511/jopm.2017.i4.08.
2. Davey RJ. Recruiting blood donors: challenges and opportunities. *Transfusion*. 2004 Apr 1; 44(4):597-600.
3. Domen RE. Paid-versus-volunteer blood donation in the United States: a historical review. *Transfusion medicine reviews*. 1995 Jan 1;9(1):53-9.
4. Drugs and cosmetics act. Available from www.cdsc.co.nic.in/writereaddata/Drugs&CosmeticAct.pdf
5. Standards for blood bank and blood transfusion services. National AIDS control organization. Ministry of health and family welfare, government of india, New delhi. Available from www.naco.gov.in/sites/default/files/Standards%20for%20Blood%20Banks%20and%20Blood%20Transfusion%20Services.pdf.
6. World Health Organization. Centers for Disease Control and Prevention. Blood donor counselling: implementation guidelines. 2014.
7. Sundar P, Sangeetha SK, Seema DM, *et al*. Predonation deferral of blood donors in South Indian set-up: An analysis. *Asian J Transfus Sci*. 2010;4(2):112-115.
8. Zou S, Musavi F, Notari EP, *et al*. Donor deferral and resulting donor loss at the American Red Cross Blood Services, 2001 through 2006. *Transfusion*. 2008 Dec 1;48(12):2531-9.
9. Chaudhary RK, Gupta D, Gupta RK. Analysis of donor deferral pattern in a voluntary blood donor population. *Transfusion Medicine*. 1995 Sep 1;5(3):209-12.
10. Bahadur S, Jain S, Goel RK, *et al*. Analysis of blood donor deferral characteristics in Delhi, India. *Southeast Asian Journal of Tropical Medicine and Public Health*. 2009 Sep 1;40(5):1087.
11. Custer B, Johnson ES, Sullivan SD, *et al*. Quantifying losses to the donated blood supply due to donor deferral and miscollection. *Transfusion*. 2004 Oct 1;
12. Lim JC, Tien SL, Ong YW. Main causes of predonation deferral of prospective blood donors in the Singapore Blood Transfusion Service. *Annals of the Academy of Medicine, Singapore*. 1993 May;22(3):326-31.
13. Ankur NS, Sanjay kumar CC, Baldev HP. Blood Donor Deferral Pattern Analysis in a Tertiary Care Center: A Study of 4902 Subjects. *Indian Journal of pathology: Research and practice*. 2017;6(2):354-59.
14. Tomasulo PA, Anderson AJ, Paluso MB, *et al*. A study of criteria for blood donor deferral. *Transfusion*. 1980 Sep 10;20(5):511-8.
15. Rabeya Y, Rapiaah M, Rosline H, *et al*. Blood predonation deferrals – a teaching hospital experience. *Southeast Asian J Trop Med Public Health*. 2008 May;39(3):571-4.
16. Arslan Ö. Whole blood donor deferral rate and characteristics of the Turkish population. *Transfusion Medicine*. 2007 Oct 1;17(5):379-83.