



Analysis of Rates and Reasons of Whole Blood Donor Deferral at a Tertiary Care Hospital

Authors

Dr Mitali Sharma¹, Dr Ankur Malhotra², Dr Salve Sharma^{3*}

¹Assistant Professor, Department of Transfusion Medicine, GMC Jammu

²MD Medicine

³Senior Resident, Department of Transfusion Medicine, GMC Jammu

*Corresponding Author

Dr Salve Sharma

Senior resident, Department of Transfusion Medicine, GMC Jammu, India

Abstract

Background: Safe blood donors form the backbone of safe blood transfusion services. Donor eligibility policies are a critical layer of blood safety designed to ensure selection of healthy donors and to protect recipients from any harm.

Aim: Analysis of rates and reasons of blood donor deferral at a tertiary care hospital in north India.

Methodology: The present study is a retrospective study done in a tertiary care centre in Jammu region. The data was collected over a period of 2 years from January 2018 to December 2019. The various causes for deferral of the donor from donation were collected from donor deferral register which was recorded using regular questionnaire-based interview in the registration card followed by thorough medical history elicitation and minimal physical examination.

Result: The total number of potential donors screened during the study period were 4728, out of which 532 were deferred because of various reasons. The deferral rate was calculated to be 11.25%. The mean age of deferred donors was 31.2 ± 8.4 years. Most common cause for deferral both among males and females was low Haemoglobin level (less than 12.5gm %) i.e., 28.58%, followed by alcohol intake in last 24 hrs i.e., 11.09%, history of medication (6.2%); medical causes (5.83%); and Jaundice 5.26%. Deferral rate was found to be more among replacement donors (18.98%) than voluntary donors (6.62%). The permanent deferral was 16.65%.

Conclusion: The deferral rate in this study is comparable to the deferral rates in other centres. The data will be very essential and helpful in testing the applicability of donor selection criteria. By identification of the causes for temporary deferrals, appropriate measures can be put in place to motivate and inform these potential donors to return for blood donation at a later date after the underlying cause has been rectified.

Keywords: Blood donor deferral, permanent deferral, temporary deferral.

Introduction

Blood transfusion is a crucial procedure in the current medical practice owing to its life saving ability in various instances such as road accidents,

various surgical procedures, post-partum haemorrhage etc. Therefore, adequate supply of safe blood is essential to meet this surpassing need for blood and blood components.

Safe blood donors form the backbone of safe blood transfusion services¹. Donor eligibility policies are a critical layer of blood safety designed to ensure selection of healthy donors and to protect recipients from any harm². All blood donors should be in enough good health to be able to tolerate a short period of hypotension and bradycardia that occurs due to removal of blood. Donor should also be free of known recurrent diseases so that a coincidental exacerbation of disease cannot be attributed to blood donation.³

A healthy donor is selected by a blood donation screening procedure which is based on questionnaire and mini physical examination set by national guidelines. Those who are not fulfilling the selection criteria, deferred from blood donation. Proper donor screening procedure minimizes the risk of transfusion transmitted infection (TTI) and also wastage of blood and blood products. Most blood banks only collect non-remunerated blood from voluntary donors who are at low risk for transfusion transmittable infection.⁴

Replacement donor is one who gives blood upon request of a specific patient or patient's family, & voluntary donor is the one who donates without any interest or compulsion. Literature have shown that large numbers of blood donors are deferred from donating blood for one or more reasons, either temporarily or permanently, which makes a miserable experience for blood banks and creates a crisis of blood donors who are healthy to donate blood.⁵⁻⁷

Even though donor deferrals lead to decreased availability of invaluable blood and its components, it is necessary to do so, to make process of transfusion free of unsafe blood. Having said that, it is also important to note that unnecessary donor deferrals should be avoided. Hence it is mandatory for us to have the knowledge of various causes for which a donor should be deferred and formulate donor deferral criteria. Analysis of rates and reasons for donor

deferral is beneficial in helping us in refining our donor screening methods and criteria.

Aim

To find out rate and reasons of donor deferral in a tertiary care hospital

Material and methods

The present study is a retrospective study done in a tertiary care centre in Jammu region. The data was collected from 1st January 2018 to 31st December 2019, over a period of 2 years. The blood donors were selected as per norms laid down by the Drug and Cosmetics Act and Directorate General of Health Services, Ministry of Health and Family welfare, Government of India. The acceptable age for blood donation was selected between 18-65yrs. Donors having weight 45kg or more and Hb of 12.5gm% or more were considered eligible for the whole blood donation. Haemoglobin was estimated using Hemocue 301+ (Hemocue AB, Angelholm, Sweden). The deferral period after one whole blood donation was taken as 3 months.

The various causes for deferral of the donor from donation were collected from donor deferral register which was recorded using regular questionnaire-based interview in the registration card followed by thorough medical history elicitation and minimal physical examination.

Statistical analysis was done by estimating frequencies and proportions on SPSS software.

Results

The total number of potential donors screened during the study period were 4728, out of which 4196 made whole blood donation and rest 532 were deferred because of various reasons. The deferral rate was calculated to be 11.25%. The mean age of deferred donors was 31.2±8.4 years.

Out of total number of donors deferred 176 (out of 299 potential female donors) i.e., 58.86% were females and 356 (out of total 4429 potential male donors) i.e., 8.04% were males. The most common

cause for deferral both among males and females was low Haemoglobin level (less than 12.5gm %) i.e., 28.58%, followed by alcohol intake in last 24 hrs i.e., 11.09%, history of medication (6.2%); medical causes (5.83%); and Jaundice 5.26%.

The deferral among voluntary donors (VD) was 142 (6.62%) and among Replacement Donors (RD) was found to be 390 (18.98%) the most common cause for deferral in both the groups was low Hb (VD-30; RD-122). In VDs second reason for deferral was alcohol intake in last 24hrs followed by antibiotics intake in last 2 weeks, other medications, underweight and poor venous access. In RD the common reasons for deferral were alcohol intake; history of jaundice, medical causes and antibiotic intake history.

The total number of temporary deferrals were 445 out of 532 i.e., 83.65% and permanent deferrals were 87 out of 532 i.e., 16.35%. The most

common cause of temporary deferral was low Haemoglobin where as the most common cause of permanent deferral was history of jaundice.

Table 1: Gender distribution of accepted and deferred donors.

	Accepted	Deferred	Total
Males	4073	356	4429
Females	123	176	299
Total	4196	532	4728

Table 2: Accepted and deferred donors among voluntary and replacement donors

	Accepted	Deferred	Total
VOLUNTARY DONORS	2142	142	2284
REPLACEMENT DONORS	2054	390	2444
Total	4196	532	4728

Table 3: Reasons for deferral among whole blood donors.

REASONS FOR DEFERRAL	VOLUNTARY DONORS	REPLACEMENT DONORS	TOTAL	PERCENTAGE
Alcohol	21	38	59	11.09%
Allergy	3	3	6	1.13%
Antibiotics	11	19	30	5.64%
Dental extraction/surgery	0	5	5	0.94%
Dog Bite	1	3	4	0.75%
Fever	0	2	2	0.38%
Fasting	2	7	9	1.69%
High risk behaviour	0	7	7	1.31%
High Hb	6	14	20	3.75%
H/O surgery	1	5	6	1.13%
Hypertension	5	11	16	0.30%
Jaundice	5	26	31	5.82%
Low Hb	30	122	152	28.57%
Medical Causes	3	28	31	5.83%
Menstruation	1	3	4	0.75%
Not willing	0	6	6	1.13%
other medications	12	21	33	6.20%
over age	2	7	9	1.69%
Piercing	4	7	11	2.06%
Poor vein	10	10	20	3.75%
Previous donation less than 3 months	6	12	18	3.38%
Recent Vaccination	2	0	2	0.38%
Skin Disease	1	2	3	0.56%
Typhoid	2	0	2	0.38%
Tattoo	1	8	9	1.69%
URTI	1	12	13	2.44%
Underweight	10	6	16	0.30%
Under Age	2	6	8	1.50%
Total	142	390	532	

Table 4: Reasons of temporary deferral among donors.

REASONS FOR TEMPORARY DEFERRAL	NO OF DEFERRALS
Alcohol	38
Allergy	6
Antibiotics	30
Dental extraction/surgery	5
Dog Bite	4
Fever	2
Fasting	9
High Hb	20
H/O surgery	6
Hypertension	16
Low Hb	152
Medical Causes	12
Menstruation	4
Not willing	6
other medications	24
over age	9
Piercing	11
Poor vein	20
Previous donation less than 3 months	18
Recent Vaccination	2
Skin Disease	3
Typhoid	2
Tattoo	9
URTI	13
Underweight	16
Under Age	8
Total	445

Table 5: Reasons of permanent deferral among donors.

REASONS FOR PERMANENT DEFERRAL	NO OF DEFERRALS
Alcohol	21
Medical Causes	19
other medications	9
High risk behaviour	7
Jaundice	31
Total	87

Discussion

A total of 4728 donors were screened out of which 532 (11.25%) were deferred due to various reasons. Multiple studies have reported varied deferral rate ranging between 5.2- 35.6% .5.20% by Unnikrishnan et al⁸, 5.29% by Attri et al⁹.6% by Sundar et al¹⁰, 5.6% by Rabeya et al¹¹, 7.1% by Sushant kumar et al¹² and 7.55% by Madhuri S Kate et al¹³. Compare to our study higher deferral rate was found in Chaudhary et al

(16.4%)³, Charles et al (35.6%)¹⁴, Lim JC et al. (14.4%)¹⁵, and Layla AM Bashawri (19.2%)¹⁶. The variations in deferral rates may be due to many causes like geographical variation in health problems, socioeconomic status, different donor selection criteria, gender variation etc. Uniform and standardized screening criteria for blood donors will help to keep the proportion of deferrals to an acceptable minimum.

On doing the gender analysis of the total number of donors, it was found that 6.32% were females and 93.68% were males that came to the blood centre for donation. Out of which 58.86% of the total number of females were deferred and 8.03% of the total number of males were deferred due to various reasons. The deferral rate was found to be significantly more in females as compared to males. This is because of false belief about blood donation in society and lack of awareness about blood donation among females. Although, due to physiological factors, women may be more prone to conditions such as anaemia and underweight but a proper pre-donation counselling and improving nutritional status will help to reduce deferral due to physiological factors among female. Present study showed that female donors were deferred more frequently than male donors who might be due to the wide prevalence of anaemia and underweight among female donors.

The most common reason for deferral among both sexes was found to be low Hb levels. Similar results were found in Malhotra S .et al². Anaemia in females is explainable which may be related to physiological conditions as menstrual loss and pregnancies. However, anaemia in male donors may relate to unrecognized medical illnesses, occult gastrointestinal bleed, Vitamin B12 deficiency, and hyperthyroidism.¹⁷

On analysing the voluntary donors and replacement donors separately it was found that deferral was more among replacement donors (18.98%) than voluntary donors (6.62%)

The most common cause for deferral in both the groups was again found to be low Hb (VD-

30;RD-122). In VDs second common reason for deferral was found to be alcohol intake in last 24hrs followed by antibiotics intake in last 2 weeks, other medications, underweight and poor venous access. In RD the other common reasons for deferral were alcohol intake; history of jaundice, medical causes and antibiotic intake history. similar results were found in Malhotra. S et al². They reported a significant difference of deferral in replacement versus voluntary (P = 0.002). Main reasons of deferral in their study were anaemia (28%), medication intake (14%), infections (13%), and medical reasons such as cardiac disease, blood transfusion.

Blood donors were also deferred temporarily (83.35%) and permanently (16.65%) depending upon the reasons for deferral. In other studies, higher number of deferral was found in temporary constituting 83.11% and permanent 16.89% in Basavarajgowda A. et al¹⁸. Custer et al. reported 68.5% temporary and 31.5% permanent deferral.⁷ Overall, most common cause for temporary donor deferral were low Haemoglobin levels (34.16%). In literature also temporary was of deferral was anaemia in range of 32.53%- 46%.¹¹⁻¹⁷. Those with anaemia have to be referred for further evaluation and treatment. Studies by Newman et al show that by lowering haemoglobin standard levels and offering iron treatment for pre-menopausal woman, one could increase female eligibility.¹⁹

The other important causes of temporary deferral in our study included alcohol intake, antibiotic course done in last 2 weeks, history of medication, high haemoglobin levels, hypertension and underweight. Pre-donation awareness through various IEC materials about the common causes of temporary deferrals like smoking and alcohol prior to blood donation, age limit, menstruation, deferrals for hypertension and diabetes, drugs that cannot be consumed prior to donation etc. will decrease temporary deferral rates. Such steps taken by government and local health authorities will help donors to pre-screen themselves and then

come forward for donation. Another major concern with temporary deferred individuals is that they are less likely to return in future for donation thinking that they have been deferred for life time. Zou et al have reported potential donor loss after a deferral²⁰. Therefore, all deferred individuals must be informed about the cause and period of deferral. Proper counselling must be done to help them overcome the problem so that these donors can be recruited back to donor's pool.

The most common cause for permanent deferral was history of jaundice followed by chronic alcohol intake, medical causes, medications and high-risk behaviour. The donors were counselled regarding the cause of their deferral and were advised to not to donate blood in future. Malhotra S et al had similar data on permanent donor deferral causes.

Tomasulo et al., have shown that less stringent donor deferral criteria can be used for donor selection without compromising donor safety and they pointed out that criteria for donor deferral which are intended to exclude donors likely to suffer a "donor reaction" are based partially on untested hypothesis and tradition.²¹ Awareness programs regarding importance of blood donation along with reasons to deferral, misconception about blood donation, pre donation self-screening and IEC activity should be conducted routinely to increase the number of voluntary donations. In the study by Shahshahani et al,²² free pre-donation medical check-ups, free blood investigations could be of great help to motivate people to donate blood and help them clear all misconceptions. Not only awareness drives but also assurance about safety and no risk of contracting any infection due to blood donation will help to increase blood donation among young population.

Conclusion

Blood donor deferrals leads to inadequate blood supply for transfusion. Hence it should not be taken lightly and should be avoided whenever it is

possible. This can be achieved by equipping the blood bank personnel with adequate knowledge and information about the criteria of deferrals. It is likely that many young donors deferred temporarily at initial screening may be lost permanently from the donor pool. Centralized management of the donor pool may be done so that we have the information whether deferred donors have continued donating at other blood centres or not.

Analysis of deferral patterns help to strengthen or improve strategy which will help to increase blood donation. It is also essential for the safety of blood transfusion and guide the donor recruitment efforts to prevent loss of precious blood/ components at local, national and international levels.

Bibliography

1. Birjandi F, Gharehbaghian A, Delavari A, Rezaie N, Maghsudlu M. Blood donor deferral pattern in Iran. *Arch Iran Med* 2013;16:657-60.
2. Malhotra S, Negi G. Analysis of reasons of blood donor deferral at a tertiary care institute in India and its reflections on community health status. *Asian J Transfus Sci* 2023;17:48-52.
3. Chaudhary RK, Gupta D, Gupta RK. Analysis of donor-deferral pattern in a voluntary blood donor population. *Transfus Med*. 1995 Sep;5(3):209-12. doi: 10.1111/j.1365-3148.1995.tb00230.x. PMID: 8593526.
4. Ekwere TA, Ino-Ekanem M, Motilewa OO, Ibang IA. Pattern of Blood Donor Deferral in a Tertiary Hospital, South-south, Nigeria: A three-year study review. *Int J Blood Transfus Immunohematology*. 2014;4:7–13. doi:10.5348/ijbti-2014-14-OA-2.
5. Agnihotri N. Whole blood donor deferral analysis at a center in western India. *Asian J Transfus Sci*. 2010;4(2):116–22. 5.
6. Kazarian L. Causes of discontinuity of blood donation among donors in Shiraz, Iran: a cross-sectional study. *Sao Paulo Med J*. 2010;128(5):272–5. 6.
7. Custer B, Chinn A, Hirschler NV, Busch MP, Murphy EL. The consequences of temporary Deferral on future whole blood donation. *Transfusion*. 2007;47(8):1514–23. Doi:10.1111/j.1537-2995.2007.01292.x)
8. Unnikrishnan B, Kumar N, Ganti S, Prasad R. Profile of blood donors and reasons for Deferral in coastal South India. *Australas Med J*. 2011;4(7):379–85.
9. Attri N, Margam S, A M. A Study of The Reasons for Deferral of Voluntary Blood Donors at A Tertiary Care Hospital. *Ann Pathol Lab Med*. 2019;6(2):84–90.
10. Sundar P, Sangeetha SK, Seema DM, Marimuthu P, Shivanna N. Predonation deferral of blood donors in South Indian setup: An analysis. *Asian J Transfusion Sci*. 2010;4(2):112–5.
11. Rabeya Y, Rapiaah M, Rosline H. Blood pre-donation deferrals-a teaching hospital experience. *Southeast Asian J Trop Med public Health* 2008;39(3):571-4.
12. Meinia S K, Sawhney V. Analysis of Donor Deferral Rate and its Various Causes in Voluntary and Replacement Blood Donors in Jammu, India. *Int J Health Sci Res* 2016;6(1):49- 56
13. Kate MS, Jain P, Patil CK. An audit of deferral of blood donors at a tertiary care hospital. *Res J Pharmaceut Biol Chem Sci* 2013;4(3):1556–63
14. Charles KS, Hughes P, Gadd R, Bodkyn CJ, Rodriguez M. Evaluation of blood donor deferral causes in the Trinidad and Tobago National Blood Transfusion Service. *Transfus Med*. 2010;20(1):11–4. doi:10.1111/j.1365-3148.2009.00968.x.
15. Lim JC, Tien SL, and Ong YW. Main causes of pre-donation deferral of

- prospective blood donors in the Singapore Blood Transfusion Service. *Annals of the Academy of Medicine, Singapore* 1993; 22(3):326-31
16. Bashawri L. A review of predonation blood donor deferrals in a university hospital. *J Fam Community Med* 2005;12(2):79-84.
 17. Mast AE. Low hemoglobin deferral in blood donors. *Transfus Med Rev* 2014;28:18-22.
 18. Basavarajegowda A. Whole blood donor deferral causes in a tertiary care teaching hospital blood bank from South India. *Hematol Transfus Int J.* 2017;5(2):219–222. DOI: 10.15406/htij.2017.05.00116
 19. Newman BH. Adjusting our management of female blood donors: the key to an adequate blood supply. *Transfusion.* 2004;44:591–6.
 20. Zou S, Masavi F, Noyary EP, Rios JA, Trouern-Trend J, Fang CT, et al. Donor deferral and resulting donor loss at the American Red Cross Blood Services. *Transfusion.* 2001;48(12):2531–9. doi:10.1111/j.1537-2995.2008.01903.x.
 21. Tomasulo PA, Anderson AJ, Paluso MB, et al. A study of criteria for blood donor deferral. *Transfusion.* 1980;20(5):511–518.
 22. Shahshahani HJ, Yavari MT, Attar M, Ahmadiyah MH. Knowledge, attitude and practice study about blood donation in the urban population of Yazd. *Transfus Med.* 2006;16(6):403–9. doi:10.1111/j.1365-3148.2006.00699.x.