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Original Research Article

Evaluation of blood donor deferrals in a government teaching hospital

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ABSTRACT

Background: Blood transfusion is a life-saving intervention. Blood should be accepted from non-remunerated and healthy donors. Proper donor screening procedure minimizes the risk of transfusion transmitted Infections and also wastage of blood and blood products and thus screening of donors is a prerequisite for blood donation.
Methods: This is a retrospective study conducted in blood bank center in the Department of Pathology in a Government teaching hospital, Shivamogga from January 2022 to June 2022. All the voluntary and replacement donors were evaluated by the standard questionnaire and medical examination including demographic profile, anthropometry, blood group, vital signs and hemoglobin estimated by cyanmethemoglobin method were collected from the donation requisition forms and online deferred list. The data were represented in the form of percentage, descriptive statistics and analysed.
Results: Out of 3,449 blood donors, 252 were deferred. The deferral rate was 7.31%. Among the ineligible donors, males 245 (97.22%) outnumbered females 7 (2.8%). 242 donors (96.03%) were temporarily rejected among which high blood pressure constituted to 23.02% followed by alcohol consumption (11.11%) whereas 10 donors (3.96%) were deferred permanently. 9 donors (3.57%) had low haemoglobin level.
Conclusions: Temporary deferrals are more than permanent deferrals thus temporarily deferred donors should be instructed to return for blood donation after their period of deferral days to retain the pool of blood donors.

Keywords: Blood donors, Blood transfusion, Hemoglobin

INTRODUCTION

Blood transfusion is an important life-saving treatment in medical field, particularly in medical emergencies.[1] However there are several reasons which disqualify individuals who volunteer to donate blood, these individuals are known as "deferred donors".[2] The process of donor selection based on criteria of subjecting donors to a questionnaire, haemoglobin testing before blood donation and physical examination, only those who meet the requirements qualify as blood donors.[3] Deferral maybe temporary or permanent depending on donating blood due to being suspected or confirmed of having a haematological disease, infectious disease or any other medical condition that will either influence the safety of blood or donors' own health.[4] To minimizes the risk of TTI (Transfusion Transmitted Infections) and to prevent the wastage of blood and blood products proper donor screening procedure is necessary.[5] Although the most of these criteria are applicable widely in all the situations, might vary depending on variables such as anthropometric, cultural, demographic, and endemic disease patterns due to which they have to be improvised and modified locally. Hence there would be varied prevalence in the donor deferral which needs to be investigated.[6] As voluntary non-remunerated blood

donors are the foundation of a safe, sustainable blood supply, so World Health Organization (WHO) envisions the achievement of 100% voluntary non-remunerated blood donation in every country.[7]

It sheds light on the population's health state and aids in t he delivery of effective blood transfusion services.[8] This was a retrospective study designed to delineate the causes for deferrals amongst whole blood donors at a district hospital blood centre. This study aimed to determine the rate of deferral of blood donors in a Government teaching hospital in Shivamogga and to determine the commonest reason for deferral, commonest age group, gender and blood group.

METHODS

The retrospective study conducted in the blood bank centre of the Department of Pathology in a Government teaching hospital (McGann District hospital, Shivamogga institute of medical science), Shivamogga for a period of six months from January 2022 to June 2022 with the samples size of 3,449 donors. All the voluntary donors and replacement donors were evaluated by the standard questionnaire and medical examinations including age, temperature, height, weight, blood pressure, pulse rate, haemoglobin estimation done using cyanmethemoglobin method were collected from donation requisition forms and online deferred list. The criteria for blood donor selection and blood donor deferral was according to National Standards for Blood Centres and Blood Transfusion Services provided by National Blood Transfusion Council (NBTC) and National AIDS Control Organization (NACO) 2022.[9] Age range of 18 to 65 years, weight above 45 kg, blood pressure 140/90 to 100/60mmHg, temperature of 98.4°F etc. are the parameters considered. Blood group determination, screening for hepatitis B, C, HIV, syphilis and malaria were also done.

Non-remunerated, voluntary whole blood donors were included in the study while apheresis donors were excluded from the present study. Ethical clearance has been taken from institution ethical clearance committee. And the results were noted tabulated, and analysed using percentage.

RESULTS

Out of 3,449 blood donors, 252 donors were deferred. The deferral rate was 7.31%. Majority of the deferred donors were males constituting 245 (97.2%) whereas 7 donors (2.8%) were females. The age of these deferred donors ranged from 17 to 53 years. The mean age was 30.30 years. Most of the deferred donors were in their 2nd to 3rd decade of life. There were no donors aged >60 years. Age of one female donor was below the age limit for donating blood, which was the reason for deferral of the same (Table 1).

Table 1: Age and sex distribution of deferred donors.

Age (years)	Sex			
	Male		Female	
	No.	%	No.	%
<18	0	0	1	14.29
18-30	139	56.73	4	57.14
31-40	72	29.39	2	28.57
41-50	29	11.84	0	0
51-60	5	2.04	0	0
>60	0	0	0	0
Total	245	100	7	100

The ABO blood group of the deferred blood donors were in the order B > O > A > AB (Table 2).

Table 2: Blood groups of deferred donors.

Blood groups	No. of donors	Percentage
O positive	81	32.14
O negative	2	0.80
A positive	55	21.82
A negative	1	0.39
B positive	87	34.52
B negative	4	1.60
AB positive	19	7.54
AB negative	3	1.19
Total	252	100

Deferred donors were categorised into pre-donation temporary and pre-donation permanent based on the reason for deferral. Most of them 242 donors (96.03%) were deferred due to temporary reasons and the remaining 10 donors (3.97%) were permanently deferred (Table 3).

Table 3: Deferral type based on the reason for deferral.

Type of deferral	Male	Female	Total
Temporary	236	6	242
Permanent	9	1	10
Total	245	7	252

Among temporary deferrals, 58 donors (23.01%) with high blood pressure, on repeated testing on the day of presentation for donation, were considered ineligible for donating blood followed by 28 donors (11.11%) donors with history of alcohol intake within 72 hours of their arrival for donation followed by 19 donors having low blood pressure were declined for blood donation. Four donors (1.59%) with history of Covid-19 infection in the past 3 months and two donors (0.79%) who received Covid vaccine within 14 days of blood donation were rejected. The least common reason among the temporary deferrals was history of parasitic infestation, polycythemia, irregular menstrual history, epilepsy each constituting to 0.4%. 9 (3.57%) donors had low

haemoglobin level. There were 10 (3.96%) permanently deferred donors who had history of thyroid disorders 4 (1.59%), 2 donors (0.79%) on insulin therapy, 2 donors (0.79%) with history of allergic diseases and one case (0.40%) each of epilepsy and polycythaemia (Table 4).

Table 4: Causes of temporary and permanent deferrals.

Deferral reasons	No. of donors (%)	Type of deferral
High blood pressure	58 (23.01)	Temporary
Alcohol consumption in 72 hours	28 (11.11)	Temporary
Low blood pressure	19 (7.54)	Temporary
Lack of sleep	16 (6.35)	Temporary
Medication (ATT)	15 (5.90)	Temporary
Low body weight	13 (5.16)	Temporary
Tattooing <6 months	13 (5.16)	Temporary
Antibiotic intake < 2 weeks	13 (5.16)	Temporary
Donation interval < 3 months (males), <4 months (females)	12 (4.76)	Temporary
Fever	10 (4)	Temporary
Surgical history	9 (3.56)	Temporary
Low haemoglobin	9 (3.56)	Temporary
Productive cough	6 (2.38)	Temporary
Thyroid disorders	4 (2.0)	Permanent
Migraine/headache/ giddiness	4 (2.0)	Temporary
Covid-19 vaccine	4 (2.0)	Temporary
Dengue infection	3 (1.19)	Temporary
Covid-19 history	2 (0.79)	Temporary
Allergy history	2 (0.79)	Permanent
Diabetic on insulin	2 (0.79)	Permanent
Jaundice history	2 (0.79)	Temporary
Other vaccines (TT, rabies prophylaxis)	2 (0.79)	Temporary
Age	1 (0.40)	Temporary
Malaria infestation	1 (0.40)	Temporary
Epilepsy	1 (0.40)	Permanent
Irregular menstrual history	1 (0.40)	Temporary
Polycythemia	1 (0.40)	Permanent
Laser beam therapy 45 days back	1 (0.40)	Temporary
Total	252	

DISCUSSION

In our study majority of the deferred cases 143 (57.2%) were in the age group of 18 to 30 years which is similar to the study done by Shoba et al, 208(65.20%).[7] There are no donors aged >60yrs in our study, however study by Shoba et al there were two donors (0.62%) (Table 5).[7]

Table 5: Age distribution of deferred donors-comparative study.

Age	Our study (%)	Shoba et al[7](%)
<18	1 (0.4)	32 (10.03)
18-30	143 (57.2)	208 (65.20)
31-40	74 (29.6)	53 (16.61)
41-50	29 (11.6)	20 (6.26)
51-60	5 (2.0)	04 (1.25)
>60	0 (0.0)	02 (0.62)
Total	252	319

In our study male deferred donors 245 (98.0%) are more than female donors 07 (2.8%) which is similar to study done by Joy et al and Okoroiwu et al (Table 6).[2,5]

Table 6: Gender distribution of deferred donors - comparative studies.

Gender	Our study	Joy et al[2] (%)	Okoroiwu et al[5] (%)
Male	245 (98.0)	11 (14.97)	1853 (98.25)
Female	07 (2.8)	63 (85.13)	33 (1.75)
Total	252	74	1886

In our study predominantly deferred blood group was B 91 (36.4%) followed by O 83 (33.2%), A 56 (22.4%) and AB 22 (8.8%), whereas in study done by Okoroiwu et al it was O 1335 (70.78%) followed by A 334 (17.71%), B 209 (11.08%) and AB 8 (0.43%) (Table 7).[5]

Table 7: Blood groups distribution among deferred donors-comparative study.

Blood groups	Our study	Okoroiwu HU et al[5] (%)
O	83 (33.2)	1335 (70.78)
A	56 (22.4)	334 (17.71)
B	91 (36.4)	209 (11.08)
AB	22 (8.8)	8 (0.43)
Total	252	1886

Total number of temporary deferrals 242 (96.8%) were more than permanent deferrals 10 (4.0%) which is similar to study done by Chenna et al and Shoba et al (Table 8).[6,7]

Table 8: Deferral types-comparative studies.

Type of deferral	No. of donors (%)	Chenna et al[6] (%)	Shoba et al[7] (%)
Temporary	242 (96.8)	2878 (98.1)	271 (98.19)
Permanent	10 (4.0)	57 (1.9)	48 (15.04)
Total	252	2935	319

In our study the highest number of deferral reason were donors with high blood pressure 58 (23.01%), whereas in Das et al low haemoglobin is the reason for majority of

deferrals.[1] Also in our study we have one case of polycythemia and history of laser beam therapy, history of fever, productive cough, hypothyroidism, covid vaccination (less than 7 days), recent past history of dengue fever and covid infection which were not seen in other studies (Table 9).

Table 9: Reasons for deferral-comparative studies.

Deferral reasons	Our study (%)	Srivastava et al[3] (%)	Das et al[1] (%)
High blood pressure	58 (23.01)	169 (43.44)	44 (3.65)
Alcohol consumption in 72 hours	28 (11.11)	29 (36.71)	218 (18.06)
Low blood pressure	19 (7.54)	-	-
Medication (ATT, anti-thyroid drugs, insulin)	17 (6.8)	-	2 (0.17)
Lack of sleep	16 (6.35)	-	14 (1.16)
Low body weight	13 (5.16)	254 (11.59)	49 (4.06)
Tattooing <6 months	13 (5.16)	49 (2.74)	27 (2.24)
Antibiotic intake < 2 weeks	13 (5.16)	386 (44.01)	-
Donation internal < 3 months (males), <4 months (females)	12 (4.76)	179 (8.17)	6 (0.50)
Surgical history	9 (3.56)	75 (8.55)	
Low haemoglobin	9 (3.56)	1199 (54.70)	745 (61.72)
Fever	10 (4.0)	-	-
Thyroid disorder	4 (2.0)	-	-
Productive cough	6 (2.38)	-	-
Migraine/headache/giddiness	4 (2.0)	90 (4.11)	
Covid-19 vaccine	4 (2.0)	-	-
Dengue infection	3 (1.19)	-	-
Covid-19 history	2 (0.79)	-	-
Allergy history	2 (0.79)	220 (10.04)	39 (3.23)
Jaundice history	2 (0.79)	1739 (97.26)	-
Underage	1 (0.40)	26 (1.19)	12 (0.99)
Other vaccines (TT, rabies prophylaxis)	2 (0.79)	1(0.11)	12 (0.99)
Malaria infestation	1 (0.4)	484 (67.86)	3 (0.25)
Epilepsy	1 (0.4)	50 (12.85)	-
Irregular menstrual history	1 (0.4)	30 (1.37)	3 (0.25)
Polycythemia	1 (0.4)	-	-
Laser beam therapy 45 days back	1 (0.4)	-	-
Total	252	2192	1207

Deferral rate in our study was 7.31% which was similar to that observed by Kwa et al (7.1%).[10] However, studies by other authors such as Rubeya et al have cited low (5.6%) to high Tomasulo et al having 24% at the beginning of their study and Charles et al with 35.6% deferral incidence in their donor populations, which could be attributed to regional variations and variation in international pre-donation criteria for whole blood donor eligibility (Table 10).[11-15]

Table 10: Blood donor deferral rates-comparative studies.

Various studies	Deferral rates (%)
Our study	7.3
Kwa et al[10]	7.1
Rubeya et al[11]	5.6
Tomasulo et al[12]	24
Charle et al[13]	35.6

This study has some limitations. Since the study was conducted retrospectively, it is possible that selection bias and missing data, which are frequent in these kinds of investigations, were present. Because of the retrospective investigation, post-deferral donor follow-up was not feasible.

CONCLUSION

The determination of rate and causes of blood donor deferral and the effective measures undertaken to reduce these groups of pre-donation temporarily deferred donors serves to recruit and retain the pool of blood donors. Awareness should be created among donors about the criteria for blood donations. Thus knowledge about the donor selection and deferral pattern is an important tool for the safety of the blood donors as well as blood recipients.

As temporary reasons for deferral are more than the permanent reasons, temporarily deferred donors should be requested to return for blood donation after their period of deferral days to help retain the pool of blood donors.

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REFERENCES

1. Das S, Brahma V, Rahman S, Borsaikia K. Analysis of blood donor deferral in a tertiary hospital based blood bank from North East India. Int J Med Sci Diagn Res. 2019;3(7):138-41.
2. Joy S, Shashikala P, Rajashree K. Evaluation of reasons for donor deferral in a voluntary blood donation camp-A Pilot study. RGUHS J Med Sci. 2018;8(2):77-80.
3. Shrivastava M, Shah N, Navaid S, Agarwal K, Sharma G. Blood donor selection and deferral pattern as an important tool for blood safety in a tertiary care hospital. Asain J Trans Sci. 2016;10(2):122-6.
4. Valerian DM, Mauka WI, Kajeguka DC, Mgabo M, Juma A, Baliyima L, et al. Prevalence and causes of blood donor deferrals among clients presenting for blood donation in northern Tanzania. PLoS ONE. 2018;13(10):1-12.
5. Ahmad N, Khan S, Hassan MJ, Jetley S. Analysis of blood donor deferral pattern in a new blood bank of a tertiary care hospital in Delhi region. Int Arch BioMed Clin Res. 2020;6(1):7-11.
6. Chenna D, Shastry S, Murugesan M, Baliga PB. Implication of deferral pattern on the donor pool: study at a tertiary care hospital. J Appl Hematol. 2015;6(3):111-4.
7. Shoba KL, Babu PS. A cross sectional study of the reasons for deferral of voluntary blood donors at a district blood bank attached to a medical college hospital in southern Karnataka. Indian J Pathol Oncol. 2018;5(2):237-41.
8. 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):219-22.
9. National Standards for Blood Centres & Blood Transfusion Services. 2nd ed. New Delhi; 2022.
10. Kwa SB, Ong YW, Gaw YN. Blood donor rejects - a study of the causes and rejection rates. Singapore Med J. 1966;7(1):61-8.
11. Rabeya Y, Rapiaah M, Rosline H, Ahmed SA, Zaidah WA, Roshan TM. Blood pre-donation deferrals-a teaching hospital experience. Southeast Asian J Trop Med Public Health. 2008;39(3):571-4.
12. Tomasulo PA, Anderson AJ, Paluso MB, Gutschenritter MA, Aster RH. A study of criteria for blood donor deferral. Transfu. 2003;20(5):511-18.
13. Charles KS, Hughes P, Gadd R, Bodkyn CJ, Rodriquez M. Evaluation of blood donor deferral causes in the Trinidad and Tobago National Blood Transfusion Service. Transfu Med. 2010;20(1):11-4.
14. Di Lorenzo Oliveira C, Loureiro F, de Bastos MR, Proietti FA, Carneiro-Proietti AB. Blood donor deferral in Minas Gerais State, Brazil: blood centers as sentinels of urban population health. Transfu. 2009;49(5):851-7.
15. Karp JK, King KE. International variation in volunteer whole blood donor eligibility criteria. Transfu. 2010;50(2):507-13.

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