

RETROSPECTIVE ANALYSIS OF BLOOD DONOR DEFERRALS IN TERTIARY MEDICAL CARE HOSPITAL OF WEST UTTAR PRADESH

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DOI: [10.5281/zenodo.10016307](https://doi.org/10.5281/zenodo.10016307)

Abstract

Introduction: Blood transfusion is an essential life-saving procedure. Its use in variety of medical and surgical diseases is increasing day by day. Transfusing safe blood is most important aspect in proper functioning of the blood centres. A healthy donor is selected by a strict blood donation screening procedure. The donors not fulfilling the set criteria are deferred from blood donation. **Materials and Methods:** We at blood centre, Sharda Hospital, School of Medical Sciences and Research, Greater Noida, analysed 592 blood donor deferrals that occurred from 1st January 2022 to 31st December 2022 in order to scrutinize the causes of deferral that would be helpful in providing safe blood to the recipients and also in reducing the loss of temporarily deferred blood donors from the donor pool. **Results:** There were 552 (93.2%) males and 40 (6.7%) females. in the age group of 29-38 years (46.7%). The most common blood group among the deferred blood donors was B+ (n=401, 67.7%). The common causes of blood donor deferrals included haemoglobin abnormalities included anaemias (n=205, 34.6% cases) and alcoholism (n=200, 33.7%). Anaemia was more common in younger and older age groups while alcoholism was commonest in the middle age group. **Conclusion:** The temporary causes of deferral like anemia, medications are commoner than permanent deferrals. Hence, proper donor counselling is imperative to ensure return of donor-to-donor pool once temporary cause has been treated.

Keywords: Donor, Deferral, Blood Centre, Causes, Donor Pool, Temporary Causes, Permanent

INTRODUCTION

Blood transfusion is an essential life-saving procedure. Approximately 85 million units of red blood cells (RBCs) are transfused globally per year. ^[1]

Donors are broadly categorized into replacement donors or voluntary donors. A replacement donor is the one who gives blood upon request of a specific patient or patient's family. A voluntary donor is the one who donates blood without any prior motive. Various strategies and approaches have been adopted worldwide for availability of blood components and transfusion services in hospitals. ^[2] A healthy donor is selected by a strict blood donation screening procedure which is based on standard questionnaire and physical examination. Those not fulfilling the required criteria are deferred from blood donation either temporary or permanently. Strict compliance with the proper donor screening procedure minimizes the risk of

transfusion transmitted infection (TTI) and reduces the wastage of blood, blood products and even consumables.

We at blood bank of School of Medical sciences and Research, analysed the number of deferrals from the deferral registry of the blood centre. This can then help us deciphering the important causes of blood donor deferral and thus reducing the blood donor same and also decreasing the negative impact on the prospective donors.

MATERIALS AND METHODS

This retrospective study was carried out from 1st January 2022 to 30th September 2022, in the Blood Bank of Sharda School of Medical Science and Research, Greater Noida. A total 592 donors were deferred from donation ranging from ages 18 to 50 years. Data was tabulated and analysed from the blood donor deferral register available at the blood centre.

There are some basic set rules determining the eligibility for blood donation ^[1]

- (a) The donor shall be between 18-55 years of age
- (b) He / She shall not be less than 45 kilograms
- (c) Temperature and pulse of the donor shall be normal
- (d) The systolic blood pressure (100-140 mm Hg) and diastolic blood pressure (60-90 mm Hg) with or without medication
- (e) Haemoglobin shall not be less than 12.5 g/dL
- (f) The donor shall be free from acute respiratory diseases
- (g) The donor shall be free from any skin diseases at the site of phlebotomy
- (h) The donor shall be free from any disease transmissible by blood transfusion, in so far as can also be determined by history and examination indicated above signs and symptoms, suggestive of AIDS

The blood bank at Sharda follows strict donor deferral criteria as mentioned below:

Table A The period of deferral for the given conditions:

Conditions	Period of Deferment	Conditions	Period of Deferment
Abortion	6 months	Immunization (Cholera, Typhoid, Diphtheria, Tetanus, Plague, Gamma globulin)	15 days
History of blood transfusion	12 months	Rabies vaccination	1 year after vaccination
Surgery Major Minor	12 months 6 months	Hepatitis in family or close contact	12 months
Typhoid fever	12 months after recovery	Hepatitis Immune globulin	12 months
History of malaria treated	3 months (endemic) 3 year (non endemic area)	History of measles / mumps / Chickenpox	2 weeks
Tattoo	12 months	History of Influenza & URTI	Till 1 week after treatment
Tooth extraction and Dental surgery	6 months	Dengue/Chikungunya	6 months

Table B Defer the donor permanently if suffering from any of the following diseases:

Cancer	Abnormal Bleeding tendencies	Unexplained weight loss	Signs symptoms suggestive of AIDS
Uncontrolled Diabetes on insulin	Hepatitis B infection	Chronic nephritis	Heart Disease
Liver disease	Tuberculosis	Polycythemia vera	Endocrine disorders
Epilepsy	Leprosy	Schizophrenia	Asthma
Syphilis	Gonorrhoea		

RESULTS

The age of the donors ranged from 18 to 50 years as per the donor selection criteria. We had more male donor deferrals as compared to female donor deferrals. (Table 1)

We noted that the most common blood group among the deferred blood donors was B+ (n=401, 67.7%) (Table 2). The common causes of donor deferrals were anaemia (n=205, 34.6% cases), alcoholism (n=200, 33.7%) and medications (n=41, 6.8%). Anaemia was more common in both younger and older age groups while alcoholism was commonest in the middle age group. Medications was the commonest cause of deferral reported in the older age group. (Table 3).

Table 1: Gender wise distribution of donors deferred

Age	Male	Female
18 -28 years	168	26
29-38 years	260	10
39-48 years	96	2
>48 years	28	

Table 2: Blood groups of the donors under study

Blood groups of intended doners	Number
B+	401
A+	77
O+	58
O-	3
AB+	50
AB-	3

Table 3: Degree of anemia in donors deferred due to low hemoglobin

Anemia	Levels of hemoglobin	18-28yrs	29-38yrs	39-48yrs	>48yrs
Severe	<5gm/dl	-	-	-	-
Moderate	5-7gm/dl	19	26	55	70
Mild	8-10gm/dl	03	15	12	05

Table 4: Causes of donor deferrals and causes of deferral as per the age distribution

Cause	18-28yrs	29-38yrs	39-48yrs	>48yrs
Hemoglobin				
Low	22	41	67	75
High	6	2	2	-
Alcohol(>5lts/month)	15	90	55	40
Medication (hormonal, antiplatelets, etc.)	1	2	6	32
Fever	2	3	5	1
Low platelets	1	1	1	7
Infections				
Jaundice	10	5	1	2
Typhoid (up to 3 months)	07	-	-	-
VDRL+	02	-	1	-
Enteric fever	03	-	-	-
Malaria positive (up to 1 month)	-	02	-	-
Tuberculosis on treatment	-	-	-	01
HbsAg positive	01	-	-	-
Asthma	-	-	-	01
Dysentery	-	-	01	-
Vaccination				
Covid vaccine (Covishield-2 days back)	01			
Tetvac vaccine (3 days back)	01			
Diabetes (not controlled)	01	04	06	48
Blood pressure raised (>normal for age)	-	-	-	04
Reduced weight	02	-	-	-
Eosinophilia on CBC	02	-	-	-
Tattoo	02	-	-	01
Phlebotomy failure	-	-	-	-
Veins not clear	-	-	01	-
SDP required however unmatched donor	03	-	-	-
Skin lesions	01	-	-	-
Recently donated blood	01	-	-	-

DISCUSSION

Blood donor selection is a key step in the transfusion process and usually comprises multiple checkpoints to ensure the safety of donors as well as the recipients. Studies show that large numbers of blood donors are deferred from donating blood for one or more reasons, either temporarily or permanently. This makes a difficult situation for blood banks creating a crisis of blood donors who are healthy to donate blood and also for the potential donors.³⁻¹⁰

The donor is evaluated on the basis of laboratory investigations, leading to its acceptance or deferral. The deferral can be temporary or permanent depending upon the underlying condition.

Donor needs to be fully prepared for donations and it is extremely important to confirm proper health and safety of donor to ensure quality blood products which are to be transfused to the recipients. If a donor has history of STDs or is identified while examination then he/she can be referred to VCTC (voluntary counselling and testing centre). Strict confidentiality should be maintained for any such sensitive cases.

There are some set donor deferral criteria followed in our blood bank (**Table A and B**)

Donor deferral is not only frustrating for the donors but also for the healthcare professionals and societies involved in blood collection. The common causes of temporary deferral include low haemoglobin, infections including malaria, and duration of last blood donation less than three months. The donors could be permanently deferred due to underlying chronic conditions¹⁰

In our study common age group of donor deferral ranged from 18 years to 50 years while other showed that most of the deferral were in age group of 18-30years of age. Similar findings was noted by **Hinal Gajjar et al**¹² and **Atti N et al** in their independent studies.¹³ Multiple studies have been in the different regions of the world to find the rates of blood deferral and their common aetiologies.

In our case total deferral percentage was 15%. Other studies have reported deferral rate ranging from 5.2 to 35.6% such as 5.20% by **Unnikrishnan et al**, 5.29% by **Attri et al** and 5.6% by **Rabeya et al**.^{13,14,15} Compared to our study, higher deferral rate was noted in studies by **Chaudhary et al** (16.4%)¹⁶ and **Charles et al** (35.6%).¹⁷ In another study donor deferral was 12.9% while in a study done in Tanzania it was 12.9%^{18,19} This variation in deferral may be due to many reasons like geographical variation in health problems, socioeconomic status, difference in donor selection criteria, gender variation etc. Uniform screening criteria for blood donors will help to keep the proportion of deferrals to an acceptable minimum.

Similar to our study the study by **Agnihotri et al** also reported that males constituted 82.2% of blood donors.²⁰ The number of females volunteering for blood donation were few (17.8%).²¹ In our study females were 40 out of 592 total donors.

In our study the majority of the cases (78.8%) were deferred due to temporary causes like anaemia, alcoholism etc. These findings were in agreement to **Attri N et al**¹³ in which temporary deferral constituted 81.30% and permanent deferral, about 18.69%. In another study 16 donors (65.7%) showed deferral due to temporary reasons while 34.3% due to permanent reasons. Most common cause among temporary deferral was anaemia (52%).²² Latest studies show anaemia as the most common cause of temporary deferral ranging from 32.53%- 46%.²³

Some studies have reported potential donor loss after a deferral. 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 motivated to become donors again.

In our study 20.6% of donors were deferred due to permanent reasons. A study by **Custer et al**²⁴ reported a permanent deferral rate of 10.6%, **Arslan et al**²⁵ in 10%, **Atti N et al**¹³ in 18.6%. The common causes for permanent deferral in our study were medication, diabetes.

A study carried out in Pakistan revealed anaemia as the leading cause of deferral (41%)²⁶. Another study demonstrated anaemia as the common cause of temporary deferral though the incidence was relatively lower. (21.1%)²⁷ Similarly in our study the major cause of donor deferral is anaemia, however, we also saw polycythemia in 10 cases (0.04%). An interesting study carried out in South Pakistan to assess the deferral pattern on the basis of the peripheral blood counts. It still showed anaemia as the leading cause but depicted higher rates of polycythemia (3.3%).²⁸

Similar to our study an extensive study was conducted in the United States to determine the association between the demographics and low hemoglobin in blood donor deferrals. It demonstrated female gender, advanced age in males and African-Americans, being significantly associated factors ²⁹.

In a study 98.6% males in the blood donor deferral group, and the mean age of the sample population was 28.96 years³⁰. Hepatitis C infection was second among the common causes of a donor deferral (19.2%) and first in the list of infections. However in our case though fever and jaundice were common yet we did not get so many hepatitis B or C cases. Other causes indicated by their study included syphilis, active infection, and some rare disorders like thrombocytosis, polycythemia, malaria, and tuberculosis.

In contrast to our study, **Valerian et al** showed syphilis as the second most common cause of temporary deferral, following anaemia. The rates were relatively higher as compared to our study (9.3% versus 8.3%) ³⁰.

Age wise distribution of the blood donor deferral causes revealed that alcoholism and anaemia were common in young to middle age group while medications in the older age group.

This study has some limitations. As this was conducted in a single centre, so the findings cannot be generalized to the entire geographical area. Secondly, duration of the study was limited keeping post COVID period in consideration. However, our study throws light on some important donor deferral causes and also highlights the significance of adding the donors of temporary deferral to the pool later when the cause for the same is rectified.

CONCLUSION

Our study found that the commonest cause of donor deferral was anaemias followed by alcoholism. Males were more deferred donors than females. The findings of our study should bolster tertiary care hospitals to introspect and realize the common temporary and reversible causes of donor deferral. It is also suggested that the proper counselling and medical treatment would facilitate blood donations and counter the dearth of blood components in the hospital.

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