



ANALYSIS OF PREVALENCE AND CAUSES OF BLOOD DONOR DEFERRAL AT JLN MEDICAL COLLEGE & ASSOCIATED GROUP OF HOSPITAL, AJMER

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ABSTRACT

Introduction: A reliable blood transfusion service is essential for effective health care delivery. Blood donor deferral is when a donor doesn't meet selection criteria. Deferral can be temporary or permanent due to health risks or safety concerns. Safe donors are encouraged to donate regularly. Thus, careful assessment of the eligibility of prospective donors is extremely important for ensuring the safety and adequacy of the blood supply and to protect the recipients as well as the donors themselves, without unnecessary deferral of suitable donors.

Objectives: This study investigates the prevalence and causes of blood donor deferral at JLN Medical College, Ajmer, analyzing temporary and permanent causes, demographics, and comparing findings with similar studies, with a goal to convert temporary deferrals to regular donors.

Methodology: This prospective study was conducted over a period of 1½ years, from January 2023 to June 2024, among indoor and outdoor donors at Tertiary Care Hospitals in the Ajmer zone. The study included 1755 deferred donors who presented during the study period and 29052 total registered donors, while non-registered donors who were deferred or self-deferred from blood donation were excluded.

Results: The majority of blood donor deferrals (85.58%) were temporary, affecting 1502 donors, indicating that many donors can potentially be converted to regular donors after addressing the temporary deferral issue. In contrast, permanent deferrals accounted for a relatively smaller proportion (14.42%) of total deferrals, affecting 253 donors, highlighting the importance of identifying and managing underlying health conditions.

Conclusion: The findings highlight the need for targeted strategies to address deferral causes, improve donor retention, and promote blood donation among underrepresented groups, particularly females.

Keywords : Blood donor deferrals, Permanent deferrals, Temporary deferral

INTRODUCTION

A reliable blood transfusion service is essential for effective health care delivery.¹ Blood donor deferral refers to a donor who is not eligible to donate blood based on the criteria for blood donor selection where the donors are selected as per guidelines of Drug and Cosmetic Act 1940 and supplemented by Guidelines issued by NACO². In 2021 blood transfusion services supported by National AIDS Control Organization in India collected a total of approximately 5.83 million blood units. This reflected a decrease from nearly 7.3 million units in previous year³. Those who not fulfilling selection criteria, deferred from blood donation⁴. Safe donors are encouraged to donate at interval while at risk donors are encouraged to self defer from donation.

Deferral may be temporal postponement or a permanent exclusion from donating blood in future due to existing hematological disease, permanent infective state or medical cord that could affect safety of blood or affect donor's own health. Temporarily deferred population is encouraged to donate once deferral period over safe and adequate supply of blood and blood products is a public health priority. According to NACO statistics, annual rate of blood donation is about 7.4 million units against requirement of 10 million units in India. Increasing awareness among people regarding blood transfusion has increased number of voluntary donors over time⁵. Donor deferral is initiated either by the donation centre based on information disclosed by prospective donors or by the donor through self-deferral. These deferrals occur because of the belief that a donor's behavior, exposures, or history may represent an increased risk to safety of the blood supply and as well as to the health of the donors⁶. Presently, per year, ten million units of blood products are required in India against donation of 7.4 million units⁷. In such current situation, donor deferral impacts on day-to-day management of blood bank while providing blood products to hospitals.

All individuals with a history of transfusion-transmissible infection like HIV, Hepatitis B, Hepatitis C, and syphilis are deferred permanently. Donors who are temporarily deferred should be clearly informed of the reason and actively encouraged to return after a suitable interval. Most of the temporarily deferred donation conditions are usually ranged from few days to few months, which make the person eligible to donate blood again⁸. The voluntary blood donation in India is about 55% and even in developing countries number of voluntary donation is reducing due to various reasons. Low hemoglobin remained to main cause of temporary defer in many places. Risk factors related to infections of HIV and hepatitis B reported to lead cause of permanent defer. Understanding causes of blood donor defer important in instituting app. preventive strategies towards conditions identified included approximate referral systems for clinical care⁹.

Donors can be deferred for a variety of reasons including signs and symptoms of relevant transfusion-transmitted infections, social behaviors that increase their risk of exposure to infectious diseases, travel to certain countries where the risk of exposure to a particular infectious disease is of concern, medical procedures, intake of certain medications, and pregnancy¹⁰. Thus, careful assessment of the eligibility of prospective donors is extremely important for ensuring the safety and adequacy of the blood supply and to protect the recipients as well as the donors themselves, without unnecessary deferral of suitable donors.

AIMS AND OBJECTIVES : This study aims to investigate the prevalence and causes of donor deferral at JLN Medical College & Associated Group of Hospital, Ajmer, differentiating between temporary and permanent causes. It also analyzes the age, sex, and demographic characteristics of deferred donors. The findings were compared with similar studies conducted in India and abroad. Furthermore, the study seeks to make effort for how to convert temporary deferral donors to regular blood donor category.

MATERIAL AND METHODS

This prospective study was conducted over a period of 1½ years, from January 2023 to June 2024, among indoor and outdoor donors at Tertiary Care Hospitals in the Ajmer zone. The study included

1755 deferred donors who presented during the study period and 29052 total registered donors, while non-registered donors who were deferred or self- deferred from blood donation were excluded.

Donors underwent Hemocue hemoglobin testing, medical screening, and completed a comprehensive questionnaire capturing demographic information and health history. Laboratory results (including TTI ELISAs for donated blood) were securely stored. Data collection utilized quality controls and specialized forms. The study analyzed demographic profiles, deferral reasons (temporary/permanent), and laboratory results to determine deferral frequency and causes.

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) 2022.¹¹

Temporarily deferred donors received counseling, guidance, and their contact information and deferral period were recorded for future donation reminders. All deferred donors were informed of the reason, advised on healthy lifestyles, and referred as needed. Ethical approval was obtained from the Ethic and Research Committee of the hospital before the commencement of this study. Data were represented in the form of tables and graphs and analyzed statistically. Mean $\pm$ S.D were compared using independent sample t-test and P value < 0.05 was considered significant.

OBSERVATIONS

Analysis reveals a significant gender disparity in blood donation, with males comprising 96.57% (28,055) of total donors, while females account for only 3.43% (997).

TABLE 1 : DISTRIBUTION OF TEMPORARY AND PERMANENT DEFERRALS

	Number of Deferrals	% of Total Deferrals
Temporary Deferral	1502	85.58
Permanent Deferral	253	14.42
Total	1755	100.00

P Value < 0.0001 (Significant)

The analysis of blood donor deferrals reveals that temporary deferrals account for the majority (85.58%) of total deferrals, while permanent deferrals make up a smaller proportion (14.42%). P value is 0.0001 (Significant).

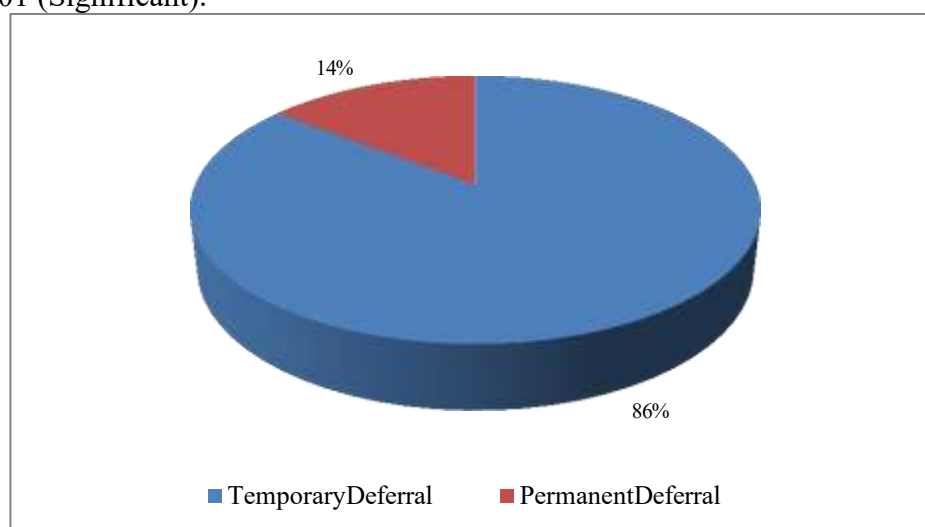


TABLE 2 – A : DEMOGRAPHIC PROFILE OF TEMPORARY DEFERRED DONORS

Gender	Number of Temporary Deferred Donors	Temporary Deferred Donors as a % of Total Donors
Male	1247	83.02
Female	255	16.98
Total	1502	100.00

Among temporary deferred donors, males account for 83.02% of the total, while females comprise 16.98%.

TABLE 2 – B : DEMOGRAPHIC PROFILE OF PERMANENT DEFERRED DONORS

Gender	Number of Permanent Deferred Donors	Permanent Deferred Donors as a % of Total Donors
Male	239	94.47
Female	14	5.53
Total	253	100.00

Among permanent deferred donors, males account for 94.47% of the total, while females comprise only 5.53%.

TABLE – 3 : DISTRIBUTION OF DEFERRED DONORS ACCORDING TO AGE

Age	Male	Female	Total
Less than 20 year	98	24	122
21 to 40	1085	190	1275
41 to 60	294	52	346
Above 60	9	3	12
Total	1486	269	1755

The age distribution of deferred donors reveals that the majority 72.6% fall within the 21-40 year age range, with 1085 males and 190 females. The next largest group is the 41-60 year age range 19.7%, followed by less than 20 years 6.9% and above 60 years 0.7%.

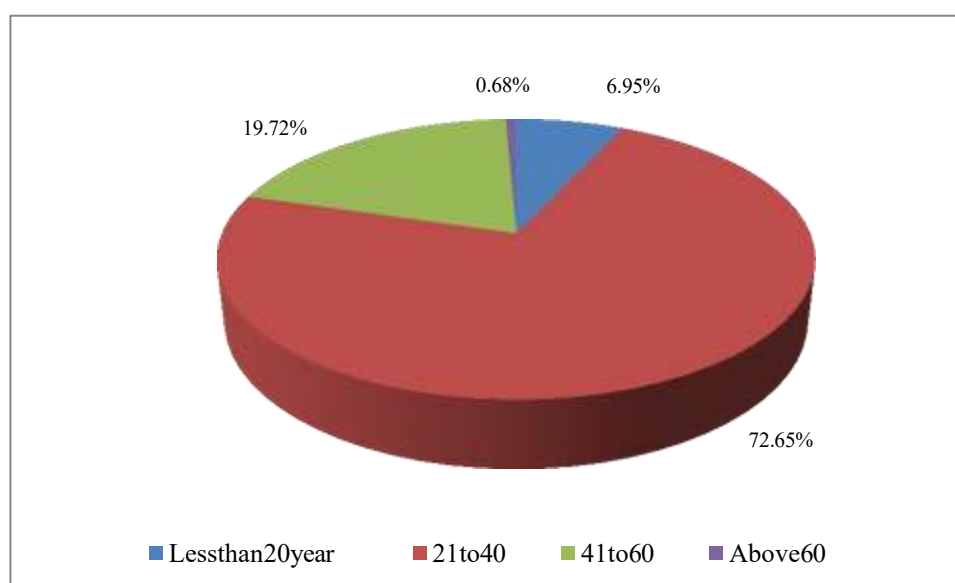


TABLE - 4 - TEMPORARY DEFERRAL REASONS OF TEMPORARY DEFERRAL AND THEIR PROPORTIONS (T)

Reasons of temporary deferral and their proportions	Male	Female	Total	% Temporary Deferral
Low Hb	428	187	615	40.95
Medication	134	9	143	9.52
Tattoo	113	5	118	7.86
Alcohol intake	94	1	95	6.32
Animal Bite / ARV	87	7	94	6.26
Under Weight	62	8	70	4.66
Last Donation < 3 months	63	6	69	4.59
Surgery	44	3	47	3.13
Self Deferred	39	3	42	2.80
Vaccinated	30	2	32	2.13
Not Sleep Properly	23	1	24	1.60
NSA ID	18	1	19	1.26
Anti Allergic Medication	16	0	16	1.07
Under Age	14	1	15	1.00
Jaundice	10	1	11	0.73
Low BP	10	1	11	0.73
Menses	0	10	10	0.67
Narcotic Drug Consumption	9	0	9	0.60
Typhoid	8	1	9	0.60
Piles	8	0	8	0.53
Cold	6	0	6	0.40
Fever	6	0	6	0.40
TB	5	1	6	0.40
Blood Transfusion	5	0	5	0.33
Pregnancy	0	5	5	0.33
Chicken Pox	3	0	3	0.20
Ear Lobe Penetration	3	0	3	0.20
Not Eaten Anything	2	1	3	0.20
Conjunctivitis	2	0	2	0.13
RTA	2	0	2	0.13
Burn Skin on both side of fore arm	1	0	1	0.07
Kidney Stone	0	1	1	0.07
Malaria	1	0	1	0.07
Varicose Vein Treatment	1	0	1	0.07
Total	1247	255	1502	100.00

P Value < 0.0001 (Significant)

The most common reason for temporary deferral is low hemoglobin levels, accounting for 40.95% of all temporary deferrals. Medication and tattoos are other notable reasons for temporary deferral, accounting for 9.52% and 7.86% of cases, respectively.

TABLE - 5 - PERMANENT DEFERRAL REASONS OF PERMANENT DEFERRAL AND THEIR PROPORTIONS (P)

Reasons	Male	Female	Total	% Permanent Deferral
Hypertension	67	5	72	28.46
High Hb	66	1	67	26.48
Skin Problem	31	2	33	13.04
Diabetes	15	1	16	6.32
Thyroid	11	3	14	5.53
Heart Disease	12	0	12	4.74
Asthma	7	2	9	3.56
Epilepsy	9	0	9	3.56
Vertigo	8	0	8	3.16
Over Age	4	0	4	1.58
HBsAg Positive	3	0	3	1.19
Liver Disease	2	0	2	0.79
Bleeding Disorder	1	0	1	0.40
Disturbed Mental State	1	0	1	0.40
Paralysis	1	0	1	0.40
Stroke	1	0	1	0.40
Total	239	14	253	100.00

P Value < 0.0001 (Significant)

Hypertension is the leading cause of permanent deferral, accounting for 28.46% of cases (72 donors). High hemoglobin (Hb) levels are the second most common reason for permanent deferral, affecting 26.48% of donors (67 cases).

DISCUSSION

TEMPORARY AND PERMANENT DEFERRALS

Sivaramakrishnan A et al. (2020)¹² reported blood donor deferral rates: 84.23% temporary and 15.76% permanent, similar to the current study (85.58% temporary and 14.42% permanent). Blood donor deferral studies reported varying rates: Shoba KL et al. (2018)¹³ 84.95% temporary, 15.04% permanent; Kapse V et al. (2019)¹⁴ 97.94% temporary, 2.06% permanent; and present study 96.57% temporary, 3.43% permanent. These results collectively indicate that temporary deferrals account for the majority of blood donor deferrals, ranging from 84.23% to 97.94% across the studies.

DISTRIBUTION OF DEFERRED DONORS ACCORDING TO AGE

The age distribution of deferred donors reveals that the majority (1275, 72.6%) fall within the 21-40 year age range, with 1085 males and 190 females. The next largest group is the 41-60 year age range (346, 19.7%), followed by less than 20 years (122, 6.9%), and above 60 years (12, 0.7%).

Studies on blood donor age distribution revealed varying trends. Gaikwad et al. (2022)⁴ reported 65% of donors fell within the 21-40 years age range. Shoba KL et al. (2018)¹³ found 81.81% of donors were between 21-40 years, 7.52% between 41-60 years, and 0.62% above 60 years. Sivaramakrishnan A et al. (2020)¹² observed 83.14% of donors between 21-40 years and 16.3% between 41-60 years, with no donors above 60 years. The present study found 72.6% of donors between 21-40 years, 19.7% between 41- 60 years, and 0.7% above 60 years. These

results collectively indicate that the majority of blood donors fall within the 21-40 years age range, ranging from 65% to 83.14% across the studies.

TOP 5 REASONS FOR DEFERRAL IN SCREENED MALE AND FEMALE DONORS

Causes of deferral differ by gender. Male donors: low hemoglobin (28.51%, 428), medication (8.93%, 134), tattoo (7.53%, 113), high hemoglobin (25.88%, 66).

Female donors: low hemoglobin (12.45%, 187), menses (0.67%, 10), high blood pressure (1.96%, 5).

The analysis of top deferral reasons in screened male and female donors reveals varying trends. Low hemoglobin was the most common reason, ranging from 18.63% (Malhotra S et al., 2023)¹⁷ to 57.8% (Gaikwad MJ et al., 2022)⁴ in males and 12.45% (present study) to 69.29% (Malhotra S et al., 2023)¹⁷ in females. Medication was another common reason, ranging from 6.6% (Gaikwad MJ et al., 2022)⁴ to 16.34% (Shoba KL et al., 2018)¹³ in males. Alcohol intake also led to deferrals, ranging from 4.5% (Gaikwad MJ et al., 2022)⁴ to 8.69% (Shoba KL et al., 2018)¹³ in males.

Menses and high blood pressure were specific deferral reasons in female donors. Menses ranged from 0.67% (present study) to 15.31% (Shoba KL et al., 2018)¹³. High blood pressure ranged from 1.96% (present study) to 6.1% (Gaikwad MJ et al., 2022)⁴.

These results collectively indicate that low hemoglobin is the most common reason for deferral in both male and female donors, followed by medication, alcohol intake, and menses/high BP in female donors.

CONCLUSION

Blood donor deferral analysis showed males dominated donations (96.57%) and deferrals (83.02% temporary, 94.47% permanent). Temporary deferrals (85.58%) were mainly due to low hemoglobin, medication, tattoo, and alcohol, while permanent deferrals were caused by high blood pressure, high hemoglobin, and skin problems. Most deferred donors (72.6%) were 21-40 years old, with differing primary deferral causes between males and females.

These findings highlight the need for targeted strategies to address deferral causes, improve donor retention, and promote blood donation among underrepresented groups, particularly females.

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