

A RETROSPECTIVE STUDY OF WHOLE BLOOD DONOR DEFERRAL PATTERN IN A TERTIARY CARE HOSPITAL IN SOUTHERN RAJASTHAN

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ABSTRACT

Background: Blood donation is a vital process that helps save countless lives. However, ensuring the safety of both donors and recipients is crucial. Donor deferral is an essential step in maintaining blood safety.

Objective: To analyze the incidence and patterns of deferrals among whole blood donors at a tertiary care hospital in southern Rajasthan.

Materials and Methods: This retrospective study analyzed data from whole blood donations over a 9-month period. Donor deferrals were categorized into temporary and permanent deferrals.

Results: A total of 21,821 donors were registered, with 516 (2.36%) being deferred. Temporary deferrals accounted for 85% of all deferrals, with anemia and underweight being the leading causes. Permanent deferrals accounted for 15% of all deferrals, with systemic hypertension being the most common cause.

Conclusion: This study highlights the importance of donor deferral in maintaining blood safety. Understanding the patterns and causes of deferral can help optimize donor selection and recruitment strategies.

Keywords: *Blood donation, donor deferral, blood safety, donor selection, donor screening, donor education.*

INTRODUCTION:

Donor screening is necessary to ensure safety of both donor as well as patient receiving transfusion. The criteria for these deferrals and their implementation significantly impact the overall quality of the blood supply within a population. As such, each blood center must carefully strike a balance between maintaining acceptable quality standards and ensuring the desired quantity of donations

AIMS AND OBJECTIVES:

To analyze the incidence and patterns of deferrals among blood donors at an Indian blood center, with the aim of evaluating the Centre's policies on donor recruitment and retention.

MATERIALS AND METHODS:

The study was conducted in blood centre, under the department of transfusion medicine, R.N.T. Medical college, Udaipur, a tertiary care teaching hospital in southern Rajasthan. Data were analyzed retrospectively for whole blood donations over a 9 months period from January 1st 2024 to September 30th 2024. The criteria for prospective blood donor selection and deferral in India provided by the Drugs and Cosmetic Act 1940 (and rules thereunder) [1], supplemented by the Technical Manual (Directorate General of Health Services, MOH and FW, Govt. of India) [2], was followed. The reasons for deferral were analyzed after classification into the following categories, namely, replacement-voluntary blood donors, gender-based (male-female) and temporary-permanent deferral.

Causes for deferral were classified into 3 categories.

Category 1	Donors whose own health might be affected by donating
Category 2	Donors at risk of transmitting TTI
Category 3	Others/Unknown Risk

OBSERVATIONS AND RESULTS:

Table: 01. Classification of prospective whole blood donors

	Registered donors	Donated	Deferred	Deferral rate (out of registered)
Voluntary	9012	8816	196	2.17%
Replacement	12809	12489	320	2.49%
Male	20730	20305	425	2.05%
Female	1091	1000	91	8.34%
TOTAL	21821	21305	516	2.36%

Table: 01 depicts that a deferral rate in replacement donors (2.49%) is a bit higher than in voluntary donors (2.17%). Female donors (8.34%) are significantly four times more prone to deferral than male donors (2.05%), which may be attributed to factors such as pregnancy, menstruation, or other gender-specific health conditions.

Table: 02. CAUSES OF TEMPORARY DEFERRAL

CATEGORY: 01 (Donors whose own health might be affected by donating)	Male	female	Total	Percentage
Anaemia	93	36	120	23.25%
Underweight	62	20	82	15.89%
Haemorrhoids/ulcers/ bleeding	7	-	7	1.35%
Last blood donation less than 3 months	18	1	19	3.68%
Menstruation and lactating female	-	10	10	1.93%
Underage	13	-	13	2.5%
TOTAL	193	67	251	48.60%

The table: 02, provides insights into the specific reasons for temporary deferral, which might affect donor's own health if they donate stratified by gender. Total Temporary Deferrals which falls into category: 01, are 251 donors accounting for 48.60% of all deferrals. Anaemia (23.25%) is found to be a top cause in this category. Total 120 donors were deferred due to anaemia, with not much differentiation between males and females. Underweight (15.89%) is a second leading cause in this category with not much differentiation between males and females. Menstruation or lactation is found to be a reason for deferral in 10 females. Underage is also found to be a constraint in 13 donors (2.5%), and all of them are male donors. History of previous donation in less than 3 months is found to be in 3.68% of all deferrals.

Table: 03. CAUSES OF TEMPORARY DEFERRAL

Causes in category: 02 (Donors at risk of transmitting TTI)	Male	female	Total	Percentage
Malaria	2	-	2	0.39%
Typhoid	2	-	2	0.39%
Tattoo made within 1 year	43	5	48	9.30%
TOTAL	47	5	52	10.08%

A total 52 donors were temporarily deferred, accounting for 10.08% of all deferrals, because of known risk of transmitting TTI (table: 03). Among them most commonly, 48 donors (9.30) were deferred due to having a tattoo within the past year, with a higher prevalence among males (43 vs. 5 females).

Table: 04. CAUSES OF TEMPORARY DEFERRAL

Causes in category 3 (Others/Unknown or probable Risk)	Male	Female	Total	Percentage
Medications	45	3	48	9.30%
Infections	14	-	14	2.71%
Surgery/dental procedures	12	1	13	2.51%
Phlebotomy site and venous access	8	7	15	2.90%
Dog bite/ Vaccination history	5	-	5	0.96%
H/o travel to other countries	2	-	2	0.39%
Alcohol intoxication	16	-	16	3.10%
Fever	9	3	12	2.32%
H/o blood transfusion	2	-	2	0.39%
Total	113	14	127	24.58%

A cumulative 127 donors were temporarily deferred because of unknown or probable risk to donor or recipient, accounting for 24.58% of all deferrals (table-04). Among them 48 donors (9.30%) were deferred because they were taking medications for some illness. 14 male (2.71%) donors were deferred due to infections. Recent Surgery/dental procedure was responsible for deferral in 13 donors (2.51%). A significant number of donors (3.10%) were deferred due to alcohol intake. Other less common causes of temporary deferral in this category of unknown/probable risk are phlebotomy site issue or venous access failure, dog bite and vaccination history, history of travel to other countries, fever, history of blood transfusion etc.,

Table: 05. CAUSES OF PERMANENT DEFERRAL

CATEGORY: 01 (Donors whose own health might be affected by donating)	Male	female	Total	Percentage
Systemic hypertension	14	-	14	2.71%
Diabetes mellitus	10	-	10	1.93%
Cardiac diseases	4	-	4	0.77%
Endocrine disorders	7	5	12	2.32%
Respiratory diseases	14	-	14	2.71%
Epilepsy/ psychiatric disorders	7	-	7	2.32%
Overage	4	-	4	0.77%
Rheumatic diseases	6	-	6	1.16%
TOTAL	66	5	71	14.69%

Table-05 analyses causes of permanent deferral of category-01 (Donors whose own health might be affected by donating). Key Observation is 71 donors (males-66>>females-05) were permanently deferred, accounting for 14.69% of all deferrals. Systemic hypertension (2.71%) and respiratory diseases (2.71%) are main reasons of deferral under this category. Endocrine disorders (2.32%) and Epilepsy/ psychiatric disorders (2.32%) are also prominent reasons. Diabetes mellitus (1.93%), Rheumatic diseases (1.16%), Cardiac diseases (0.77%) and Overage (0.77%) are other reasons which hampered prospective donors to donate.

Table: 06. CAUSES OF PERMANENT DEFFERAL

Causes in category: 02 (Donors at risk of transmitting TTI)	MALE	FEMALE	TOTAL	PERCENTAGE
HIGH RISK GROUP (persons engaged in promiscuous relations, drug abusers etc)	5	-	5	0.96%

Five male donors were permanently deferred due to being part of a high-risk group, including those engaged in promiscuous relations or drug abusers, accounting for 0.96% of all deferrals (table-06).

Table: 07. CAUSES OF PERMANENT DEFFERAL

Causes in category 3 (Others/Unknown or probable Risk)	MALE	FEMALE	TOTAL	PERCENTAGE
Professional Donor	1	-	1	0.19%

Table-07 highlights one person was intending to donate blood in lieu of cash incentive from relatives of needy patient. Professional donors are typically individuals who donate blood or plasma for financial compensation, which can lead to safety risks and compromised donor health.

DISCUSSION:

Donor deferral is a critical aspect of blood donation, ensuring the safety of both donors and recipients. Many studies were conducted previously on donor deferral, highlighting the causes, implications, and strategies for improvement. The deferred donors were told about the reason of their deferral and also counseled accordingly in our study.

P. sunder and et al., from south India discovered a rate of deferral 5.04% in their study from three years data (2005-2007) which is somewhat double than in our study 2.36%. The low hemoglobin was the most common cause of temporary deferral in both males and females which is same as in the present study (23.6%). Hypertension and cardiac diseases were major causes of permanent deferral in their study which is also similar in our study. [3]

Manisha shrivastav et al., from Madhya Pradesh, central India found the blood donor deferral rate of 11.5% in their study which is nearly five times higher in contrast to our study (2.36%). Moreover they found jaundice (28.2%) as the most common cause of overall deferral as contrary to our study which highlights anaemia as most important reason of deferral in our study. [4]

Another study by Naveen Agnihotri western India reported low hemoglobin (55.8%) as the most common reason of deferral which is in accordance with our study. He also reported females eight times more prone to deferral which is similar finding in our study. [5]

In a recent cross-sectional retrospective study by Soundarya V. and et al., from south India, data were collected from May 2021 to May 2024. They reported deferral rate of 5.85% which is double of present study. They found most deferrals (76.4%) were temporary, often due to anaemia or recent alcohol intake, which is similar finding in our study. Present study reported 84% deferrals as temporary and most common reason to be anaemia (23.25%). They reported hypertension and diabetes as most common cause of permanent deferral which is also similar to our study. [6]

Bhimani R. and et al., from western India reported deferral rate of 2.50% out of 9180 registered donors. Among the deferred blood donors 66.52% were temporary and 33.48% were permanent. Among temporary deferrals, anemia was the most common cause whereas among permanent deferrals, hypertension was found to be the commonest cause. Thus their findings were almost similar to present study. [7]

Kothari A. and et al., from Vadodara Gujrat collected data from January 2021 to December 2021, and found deferral of 14.38% out of total 2168 persons who came to donate blood. They found 43.09% of deferrals were because of single reason, low hemoglobin. [8]

Kandasamy D. and et al., from Karnataka, South India did a Retrospective analysis of the deferral record of whole blood donors from January 2014 to December 2018. They found a cumulative 10.65% of intended donors got deferred because of various reasons, out of which most common reason was low hemoglobin (52.45%). [9]

CONCLUSION:

Key findings in the present study are:

- 1) Deferral rate of donors at our institute is 2.36%, which is lesser than others as previous studies suggest.
- 2) Females are four times more prone to deferral attributed to their physiological conditions such as pregnancy, menstruation, lactation etc,
- 3) Majority of deferrals are temporary i.e. 84%, which needs to be addressed, properly counseled and motivated to return back to donation after they resume from their temporary illness.
- 4) Most common cause of overall deferrals is anaemia accounting for 23.25% cases which can be eliminated with proper counseling, good dietary habits, lifestyle modification, exercise etc.,
- 5) Second most common cause is underweight accounting for 15.89% probably due to poverty and undernourishment in the tribe majority region. Underweight is also a temporary condition and can be improved with good diet and healthy life style.
- 6) Approximately 16% of deferrals are having permanent reasons. Uncontrolled systemic hypertension, cardiac diseases, epilepsy, psychiatric disorders, respiratory diseases, diabetes, other endocrine disorders etc., are main reasons for permanent deferral. People should be advised to adopt healthy life style and counseled for early diagnosis and adhere to prescribed treatment to mitigate these issues.
- 7) Unique finding in present study is a significant deferral because of history of tattoo within one year and medications both of which accounting for 9.30% of deferrals each separately. Persons with tattoo should be informed about the hazards of tattooing. The higher prevalence of tattoo-related deferrals among males may be attributed to differences in lifestyle or behavior.

RECOMMENDATION:

It is worth to analyze the donor deferral at regular interval so as to maintain adequate supply of blood and its components by formulation of strategies to bring back donors deferred due to temporary causes and minimize loss of blood donors and keep them motivated.

CONFLICTS OF INTEREST: NIL

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