

## Blood Donor Deferral Pattern in a Tertiary Care Hospital of North Eastern India

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### Abstract:

**Background:** Blood safety is a major issue all over the world in transfusion medicine. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. Deferrals lead to loss of precious blood/components available for transfusion. For preventing this, we should be having knowledge of blood donor deferral pattern and the causes of deferral.

**Materials and Methods:** A prospective study was carried out in a tertiary care hospital over a period of 20 months from January 2018 to August 2019. Data were collected from the donor deferral registry with respect to age and gender. The causes of deferral were categorized as temporary and permanent.

**Results:** A total of 23091 registered donors were screened and 2818 (12.2%) were deferred. Overall, men (82.2%; 2315/2818) were deferred more than women (17.8%; 503/2818). However, women had higher deferral rate (20.6%; 503/2440) compared to men (11.2%; 2315/20651). Age group of 18-30 years has higher percentage of deferral (48.4%). Temporary deferral (91.5%) was common than the permanent deferral (8.5%). Alcohol intake was the commonest cause of temporary deferral (14.4%). Past history of jaundice was the commonest cause of permanent deferral (36.3%). One of the major causes of deferral among males was alcohol intake whereas anemia with low hemoglobin was the major cause of deferral among females.

**Conclusion:** The pattern of donor deferral identified is an important tool for blood safety and also provides key areas to focus on a region or policy formulation nationally for donor selection as well ensure donor safety. The deferral rate was 12.2% in this study. Majority of deferrals are temporary and measures such as proper education of donors and raising general awareness for blood donation could help in retaining temporarily deferred donors, thus can be a strategy for long-term retention of motivated blood donors.

**Keywords:** Blood safety, donor deferral, donor selection, permanent deferral, temporary deferral.

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### I. Introduction

Blood transfusion is a life-saving intervention that has an essential role in patient management within health care systems.<sup>[1]</sup> It can be a vital life-saving procedure in current medical and surgical procedures for which adequate and safe blood supply should be maintained. It is a prerequisite that the blood collection process does not harm either the donor or the recipient. This is achieved by following stringent donor selection and deferral criteria and donor counselling which aimed at assessing the suitability of prospective donors.<sup>[2]</sup>

Donor selection is defined as the process of assessing the suitability of an individual to donate blood or blood components against stringent donor selection criteria. The safest blood donors are voluntary non-remunerated blood donors from low-risk population. Donor quality is most important.<sup>[3]</sup> Individuals who are disqualified from donating blood are known as deferred donors. Donor deferral is a painful and sad experience for the blood donor as well as the blood bank screening the donor. This must be handled carefully because it leads to loss of precious whole blood donors and they are less likely to return for blood donation in the future.<sup>[4]</sup>

The criteria for prospective blood donor selection and deferral in India are provided by the Drugs and Cosmetic Act 1940 (and rules thereunder) supplemented by the Technical Manual (Directorate General of Health Services, MOH and FW, Government of India).<sup>[5]</sup> The policies of recruitment and retention of blood donors depend on the deferral pattern in any given area.<sup>[6]</sup>

In today's era, we are far behind in blood donations supply compared with demand. It is said that 1% blood donation of the population is the minimal requirement for blood donation for country's blood requirement. So, by knowledge of the rate and causes of donor deferral, we can improve blood donor recruitment strategies.

The present study was undertaken to analyse the blood donor deferral pattern and causes for deferral of blood donors in a tertiary care hospital blood bank so that temporarily deferred donors are identified and properly counselled to improve their quality so that we can increase the pool of voluntary donors without compromising on the quality of the blood and safety to the donor and the recipient.

## II. Materials And Methods

This prospective study was carried out in a tertiary care hospital over a period of 20 months from January 2018 to August 2019 after getting ethical clearance from the Institutional Ethics Committee. The study involved donors both voluntary and replacement presenting themselves at the hospital blood bank or the outdoor camps during the study period. For collection of whole blood initially, the donor selection Standard Operating Procedure (SOP) based on National AIDS Control Organisation (NACO) guidelines was followed and the donors were subjected to a questionnaire followed by haemoglobin testing, if found suitable, physical examination of donors was performed by Medical Officer. Criteria laid down by Director General Health Services and Drugs Controller of India were strictly followed. Deferred donor data were collected from the donor deferral registry with respect to age and gender. The causes of deferral were categorized as temporary and permanent.

## III. Results

A total of 23,091 registered donors were screened during the study period and 2818 (12.2%) donors were deferred. Among the deferred donors, 2315 were males and 503 were females. Percentage of deferral among a total number of registered males and females were 11.2% (2,315/20,651) and 20.6% (503/2,440) respectively (Table 1)

**Table 1:** Demographic profile of donors

Donors	Registered	Deferred	Selected	Percentage of Deferral
Male	20651	2315	18336	11.2%
Female	2440	503	1937	20.6%
Total	23091	2818	20273	

The age of deferred donors ranged from below 18 years to 65 years. The rate of deferral was the highest in the age group of 18-30 years (48.4%) followed by 31-40 years (33.8%) and then 41-50 years (1.3%) (Table 2)

**Table 2:** Donor deferral profile according to Age and Gender

Age of donors	No. of male donors	No. of female donors	Total no. of donors	Percentage of deferrals(%)
Below 18 years	46	2	48	1.7
18-30 years	1139	226	1365	48.4
31-40 years	769	184	953	33.8
41-50 years	285	81	366	13.0
51-65 years	76	10	86	3.1
Total	2315	503	2818	100

Deferred donors were further categorized as temporary and permanent (Table 3). This was done to facilitate counseling and help temporarily deferred donors to become healthy donors in the future

**Table 3:** Distribution of blood donation deferral by causes

Causes of Deferral	Total no. of donors	Percentage of deferral (%)
Temporary	2578	91.5
Permanent	240	8.5
total	2818	100

Most common cause among temporary deferral was alcohol intake (14.4%), followed by donors on medication (12.5%) (Table 4)

**Table 4: Causes of Temporary Deferral**

Cause	Male	Female	Total No. of donors	Percentage of deferral (%)
Alcohol intake	369	2	371	14.4
On Medication	286	37	323	12.5
Low /high blood pressure	248	57	305	11.8
Lack of sleep	239	52	291	11.3
Low Hb (Hb<12.5g/dl)	127	148	275	10.7
Skin lesions & allergic reactions	171	38	209	8.1
Underweight (<45kg)	121	37	158	6.1
Tattoo	120	2	122	4.7
Surgery	96	16	112	4.4
Fever	102	11	113	4.4
Vaccination	69	9	78	3.0
Previous blood donation < 3 months	61	7	68	2.6
Underage (age<18 years)	52	6	58	2.3
Menstruation	0	57	57	2.2
Dental procedure	21	0	21	0.8
Lactating mother	0	2	2	0.1
Others	15	0	15	0.6
Total	2097	481	2578	100

Past history of jaundice was the most common cause of permanent deferral, followed by donors having suspicious identity (Table 5)

**Table 5: Causes of Permanent Deferral**

Causes	Male	Female	Total No. of donors	Percentage of deferral (%)
Past history of jaundice	81	6	87	36.3
Suspicious identity/high risk group	75	4	79	32.9
Epilepsy /Psychiatric problem	30	5	35	14.6
Chronic liver disease	14	0	14	5.8
Thyroid disorder	9	5	14	5.8
Asthma	7	2	9	3.8
Diabetes	2	0	2	0.8
Total	218	22	240	100

#### IV. Discussion

Donor counselling and screening through questionnaire before donation is an important process not only to ensure blood safety but also to recruit and retain regular voluntary non-remunerated donors. Donor selection process is a most important preliminary step in blood banking and should follow stringent medical and regulatory rules ensuring both donor and recipient safety. A large number of blood donors are not able to donate blood successfully for several reasons, either temporarily or permanently. In this study, various reasons for deferral from blood donation have been studied.

The rate of deferral differs from region to region and sometimes in the same region and one center to another. Donor deferral rate in blood centers in previous studies in India as well as across the world varies from 3.55% to 35.60% leading to huge losses in terms of available units for transfusion every year.<sup>[7,8]</sup>

The overall deferral rate in our study was 12.2% and the deferral rate was higher in females (20.6%) compared with males (11.2%) which was consistent with other reported studies by Rehman et al (12.4%)<sup>[9]</sup>, Zou et al (12.8%)<sup>[10]</sup>, Agnihotri (11.6%)<sup>[11]</sup>. However, few studies by Chenna D et al (5.6%)<sup>[12]</sup>, Sharma et al (5.1%)<sup>[13]</sup>, Krishna MC et al (7.3%)<sup>[4]</sup> reported lower deferral rate. Higher deferral rate reported by Purohit A et al (29.67%)<sup>[14]</sup> and Charles et al (35.6%)<sup>[15]</sup>. Such possible differences in deferral rates could be due to different donor selection criteria used in the different studies.

In this study, most of deferral blood donors belonged to 18-30 years of age group. Studies by Shah et al<sup>[3]</sup> and Ginish et al<sup>[16]</sup> showed similar findings. The probable reason for such finding was most of the donors belonged to this age group.

The causes of deferral were broadly classified into temporary causes and permanent causes. In the present study, more number of deferral was in temporary constituting 91.5% and permanent about 8.5%. Krishna MC et al<sup>[4]</sup> report 93% temporary and 7% permanent deferral. Custer et al<sup>[18]</sup> report 68.5% temporary and 31.5%

permanent deferral. In our study, permanent deferral constituted only 8.5%; this may be due to more number of young donors.

The most common cause among temporary deferral was alcohol intake (14.4%). The other causes of temporary deferral included donors on medication, abnormal blood pressure, lack of sleep, low haemoglobin, underage, underweight and others. One of the major causes of temporary deferral among males was alcohol intake whereas anemia with low haemoglobin was the major cause of deferral among females. Low haemoglobin level (anemia) was the most common cause for temporary deferral in most previous studies conducted elsewhere.<sup>[2,3,4,12,15]</sup>

Under permanent deferral, past history of jaundice was the most common cause of deferral. Similar findings were reported in the studies conducted by Krishna MC et al<sup>[4]</sup> and Chaudhary RK et al<sup>[18]</sup>.

Analysis of donor deferral pattern indicates the impact of knowledge of deferral criteria in blood donors. The deferral rate can be reduced by providing information and education of selection criteria. In present study, alcohol intake and on medications was the common causes of temporary deferral so people should be informed about abstaining from alcohol and medications within 72 hours.

## V. Conclusion

This study showed that the deferral rate was 12.2%. The temporary causes of deferral were more as compared to the permanent causes. The most common cause of temporary deferral was alcohol intake in males and anemia in females. Past history of jaundice was the most common cause for permanent deferral. Majority of deferrals are temporary and measures such as proper education of donors and raising general awareness for blood donation could help in retaining temporarily deferred donors, thus can be a strategy for long-term retention of motivated blood donors.

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