

# A Study of 507 Deferred Blood Donors, for the Evaluation of Causes of Their Deferral, at the Blood Bank of a Tertiary Care Hospital

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## ABSTRACT

**Background:** In order to obtain healthy and proper blood transfusion, donor selection, in addition to the screenings of blood bags for infectious diseases, is essential. Deferrals lead to loss of precious blood and its components available for transfusion. For preventing this, we should know all the causes of Deferral and their frequency. **Methods:** The study was conducted in the Blood Bank of Jaipur National University, Institute for Medical Sciences and Research Centre, Jaipur, India, from January 2016 to December 2019. The aim of our study is to determine the various and most common causes of permanent and temporary Deferral in our region. **Results:** A total of 8209 donors were screened. Out of which, 507 donors were deferred. The total donor deferral rate was 6.17%; the percentages of Deferral being 0.64% for females and 5.53% for males. The postponement is maximum in the age group between 18- 30 years of age. The temporary Deferral was more common than permanent Deferral. The most common reasons in males being Low Hemoglobin (anemia) followed by medications and followed by Alcohol intake in the last 24 hours. Most common reasons documented in females being Low Hemoglobin < 12.5g/dl (anemia) followed by menstrual history within one week and underweight. The most common cause in both males and females, for permanent Deferral, was hypertension. **Conclusion:** The Donor deferral rate of 6.17% was found in our study. Also, the number of females coming forward for blood donation was deficient in comparison to males. The primary cause of Deferral was anemia, followed by Medications.

**Keywords:** Blood Bank, Donor Deferral, Permanent Deferral, Temporary Deferral.

## INTRODUCTION

Introduction of Blood transfusion is a vital lifesaving procedure that needs an adequate blood supply of safe blood from a healthy donor. A Safe and proper amount of blood and blood products is a significant public health issue faced worldwide.<sup>[1]</sup> Many measures have been taken to make the blood transfusion safe by the blood transfusion committee. A voluntary donor is the one who donates without any interest or compulsion, whereas a replacement donor is one who gives blood upon request of a specific patient or patient's family. Large numbers of blood donors are deferred from donating blood for several reasons, either temporarily or permanently, which makes a miserable experience for blood banks and creates a crisis of blood donors who are healthy to donate blood.<sup>[2-9]</sup>

Now it is high time to understand the reasons for Deferral of potential donors, in comparison to temporarily deferred donors and these donors can be

treated if possible for a cause e.g. Iron and Folic Acid tablets can be given to anemic and medicines for fever and high Blood Pressure can be given in order that these donors can donate blood in the future. Our study was done with the motto of finding the various causes of Deferral, provide care to Donors and ensure the supply of safe blood to the patients.

Many studies similar to our study have revealed that different demographic profiles and different parts of our country had slightly different reasons for the Deferral of blood donors.<sup>[10,11]</sup> The aim of our study is to determine the various and most common causes of permanent and temporary Deferral in our region. The study was conducted in the Blood Bank of Jaipur National University, Institute for Medical Sciences and Research Centre, Jaipur, India.

## MATERIALS AND METHODS

Our study is carried out in the blood bank of a tertiary care hospital. Our study includes all deferred donors from our blood bank during the period from January 2016 to December 2019. All data were collected from the records maintained in our Blood Bank. A Donor questionnaire form was used for screening and all details of the deferred donors were obtained from the Deferral register. All deferred

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donors were categorized on the basis of sex, age and cause of Deferral.

All our Donors were screened on the basis of their Past and Present History of Illness, any Medications or Vaccinations, Alcohol intake within 24 hours, sexual behavior and partners, History of Jaundice, surgical history, menstrual history etc.

Physical and Vital examinations were done. Blood pressure and temperature were measured and Hemoglobin was estimated. All deferred blood donors were deferred either temporary or permanent, on the basis of Indian medical association of blood bank guidelines. Data was saved and maintained in the donor register of our blood bank. Hemoglobin was measured by Hemocue and Copper sulfate method. HBsAg screening by HBsAg ELISA Test kit, anti HCV by 3rd Generation Anti-HCV ELISA test, anti-HIV by HIV1/2 ELISA, Malaria by Pf/Pv ELISA, and syphilis by RPR card test.

All donors who were in the age group of 18-60 years, weighed 45 Kg or more, with a standard pulse rate of 60 -100 beats per minute, Blood Pressure of Systolic, between 100-160 mmHg and Diastolic between 50-100 mmHg, Body temperature of 37.2-37.7 degree Celsius, and Hemoglobin of 12.5 gm/dl or more and had no any significant adverse history were selected for blood donation.

All Donors who were not fulfilling these criteria for the selection of Donor were deferred. Donors who had a past history of Jaundice, Typhoid, malaria or tooth extraction or ear piercing or vaccination within 6 months, or Alcohol intake within 24 hours, or tattooing within 1 year, or drug intake within 72 hours, Minor Allergies and Skin diseases or Fever and Infections were deferred temporarily. Those with Hb. Less than 12.5 gm/dl was delayed temporarily and advised medications. And donors having hypertension or Asthma or Diabetes or past history of high- risk sexual behavior or other significant disease were permanently suspended.

### RESULTS

A total of 8209 donors were registered for a donation from 1st January 2016 to 31st December 2019, out of which 7221 were males and 988 were females.

The Total 507 donors were deferred, out of which; 454 were males and 53 were females. The total donor deferral rate was 6.17%; the percentages of Deferral being 5.53% for males and 0.64% for females [Table 1]. A majority (65%) of the deferred donors were aged between 18 years and 30 years. [Table 2]. Analysis of the deferrals showed that the temporary Deferral was more common than permanent Deferral. The reasons for males being anemia, medications, alcohol intake within the last 24 hours, in the same order. The reasons for documented in females being anemia, followed by menstrual history within one week, and underweight in the same proportion [Table 3]. The major reasons for both males and females, for permanent Deferral, was hypertension, followed by Asthma, followed by diabetes [Table 4].

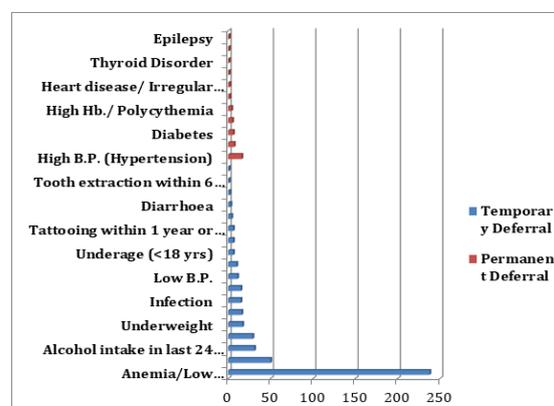


Figure 1: Reasons for Deferral in all Deferred Donors

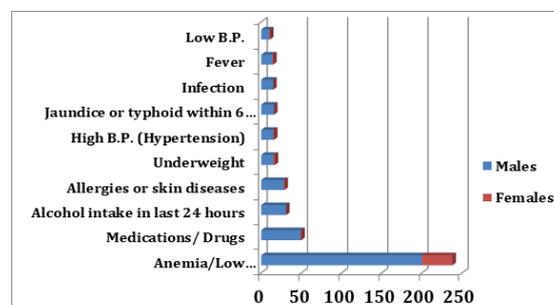


Figure 2: Main reasons of Deferral seen in Males and Females

Table 1: Percentage of Deferrals and Sex of the Donors

	Sex of the Donors	Number of Registered Donors	Number of Deferred Donors	Percentage of Deferrals of the total registered Donors
1	Male	7221	454	5.53%
2	Female	988	53	0.64%
	Total	8209	507	6.17%

Table 2: Age wise distribution of Deferred Donors

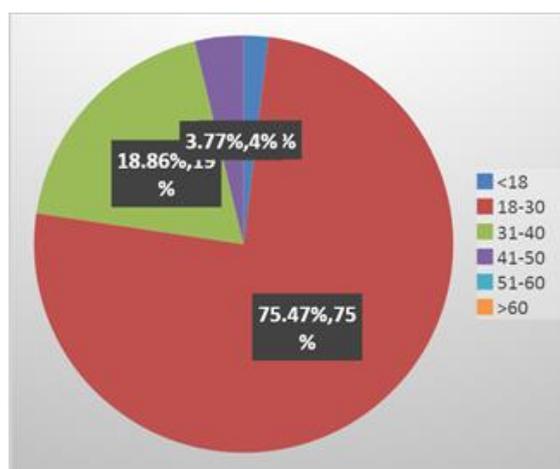
Male (454)				Female (53)		
	Age (years)	No.	Percent	Age (years)	No.	Percent
1	<18	04	0.88%	<18	01	1.9%
2	18-30	290	63.87%	18-30	40	75.47%
3	31-40	117	25.76%	31-40	10	18.86%
4	41-50	35	7.6%	41-50	02	3.77%
5	51-60	08	1.8%	51-60	00	00%
6	>60	00	00%	>60	00	00%
	Total	454	100%	Total	53	100%

**Table 3: Causes of temporary deferrals in both sexes, their number and Percentage**

Reasons for Deferral	Male	Female	Total	Percentage of temporary deferrals	Percentage of total deferrals
Anemia/Low Hemoglobin (<12.5)	200	38	238	51.62%	46.94%
Medications/ Drugs	49	01	50	10.9%	9.87%
Alcohol intake in last 24 hours	31	00	31	6.72%	6.11%
Allergies or skin diseases	28	01	29	6.29%	5.72%
Underweight	15	02	17	3.68%	3.35%
Jaundice or typhoid within 6 m	16	00	16	3.4%	3.16%
Infection	15	00	15	3.25%	2.96%
Fever	14	01	15	3.25%	2.96%
Low B.P.	10	01	11	2.4%	2.17%
Recent Blood donation within 3 months	09	01	10	2.2%	1.97%
Underage (<18 yrs.)	05	01	06	1.3%	1.18%
Recent surgery	06	00	06	1.30%	1.18%
Tattooing within 1 year or Ear piercing within 6 months	05	01	06	1.30%	1.18%
Vaccination within 6 months	04	00	04	0.9%	0.78%
Diarrhea	03	00	03	0.65%	0.6%
Menstrual History within 1 week	00	02	02	0.43%	0.39%
Tooth extraction within 6 months	01	00	01	0.21%	0.19%
Sleep deprivation <4 hrs	01	00	01	0.21%	0.19%
Total	412	49	461	100%	90.9%

**Table 4: Causes of Permanent deferrals with their number in both sexes and Percentage.**

Reason for Deferral	Male	Female	Total	Percentage from Permanent deferrals	Percentage from total deferrals
High B.P. (Hypertension)	15	01	16	34.8%	3.15%
Asthma	06	01	07	15.21	1.38%
Diabetes	05	01	06	13.04%	1.18%
Severe Allergies	05	00	05	10.87%	0.98%
High Hb./ Polycythemia	04	00	04	8.69%	0.78%
Liver disease	02	00	02	4.35%	0.39%
Heart disease/ Irregular pulse	02	00	02	4.35%	0.39%
High sexual risk behavior	01	00	01	2.17%	0.20%
Thyroid Disorder	00	01	01	2.17%	0.20%
Kidney Disease	01	00	01	2.17%	0.20%
Epilepsy	01	00	01	2.17%	0.20%
Total	42	04	46	100%	9.1%



**Figure 3: Distribution of various age groups.**

### DISCUSSION

A total of 8209 donors came for donating blood in our blood bank during this duration of our study. Out of which, 507 cases (6.17) were deferred due to some of the other reasons. Our deferral rate was almost the same as almost all studies like Dr. Attri which was 5.29% and Sundar et al with 6%.<sup>[12,13]</sup>

The Study of Rabeya et al also showed a deferral rate of 5.6%.<sup>[14]</sup> Some studies have even had a higher deferral rate of (11.6%) for Agnihotri et al,<sup>[3]</sup> and Shrivastava et al.<sup>[15]</sup> Even though the deferral rate was found to be similar, the major reasons for Deferral vary, reflecting disparity from various regions to region. The deferral rate differs from region to region and country to country. These varied differences in the rate could be due to different donor selection criteria, which can be made more similar. Male constituted around 87.96% of the donors who came to donate blood. The number of females volunteering for the donation was very less, just 12.04% only. Our study showed that male donors deferred were 6.28% as compared to female donors which were 5.36% with respective sex. Our study showed that male donors were deferred slightly more frequently than female donors, which might be due to the wide use of medications and alcohol intake in males. Though deferral cases were due to anemia were more frequent in females. In addition, in our study 29 (5.7%) deferrals were because of Allergies and Skin diseases (temporary deferrals) which could not be ignored. All causes of Deferral were classified as temporary deferrals or permanent deferrals, depending on the causes. The

Majority i.e. 90.9% of our deferrals, were temporary and only 9.1% were permanent deferrals. Most of the other studies showed the same finding and showed an almost similar Percentage of temporary and permanent deferrals like ours. This study correlates well with other studies. Like most of the other studies done in the past,<sup>[5,10,14,16-18]</sup> the most common reason for Deferral in our blood donor population was low Hemoglobin and nearly 56% of total deferrals were because of this.

In our study also the most common cause of Deferral was anemia (46.94%), similar to Halperin et al.<sup>[18]</sup> and Agnihotri et al.,<sup>[3]</sup> which showed low Hemoglobin as the most common cause in 46% and 55.8% of the total Deferral, respectively. Those with anemia have to be referred for further evaluation and treatment. The other causes of temporary Deferral included medication or drug, alcohol intake in last 24 hours, allergies and skin diseases, underweight, history of jaundice or typhoid, infections and fever, low B.P., etc. We should also explain the Donors about common causes and habits which can lead to temporary deferrals like Alcohol intake in last 24 hours, age less than 18 years or above 60, menstruation, various drugs, women who are breastfeeding, certain diseases etc. According to a study by Zou et al, there is a huge loss in the number of potential donors after being deferred once, with minimal chances of them to come again for donating blood.<sup>[19]</sup> The major problem faced is that most of the deferred donors are less likely to return in the future for donation, thinking they have been deferred for a lifetime or fear of being deferred once again.

Hence all the deferred individuals must be informed about the cause and period of Deferral and proper counseling with treatment must be given to help them overcome the problem so that these donors can donate blood in the future. In our study, 9.1% of donors were deferred for permanent Reasons, similar to comparison in other studies, Custer et al.<sup>[20]</sup> reported a permanent deferral rate of 10.6% and Arslan et al.<sup>[21]</sup> reported a rate of 10%. The leading cause for permanent Deferral in our study was hypertension, followed by Asthma and diabetes and others, which were very few. This supports the study done by Bahadur et al.<sup>[10]</sup> who stated hypertension as the commonest cause of permanent Deferral in their studies [Figure 2]. It may be because of the anxiety of donating blood, first-time blood donation, fear of phlebotomy, white coat hypertension, stress and exercise. In our study, large proportions (65 %) of the deferred donors were aged between 18 years and 30 years, similar to the findings of Hinal Gajjar et al.<sup>[22]</sup> in which (52%) were in this age group. This age group, also incidentally is the major age group to which most of the voluntary blood donors belong to. This indicates the nutritional deficiencies in this age group, which can be corrected by treatment or counseling. Also Donors must be explained that blood donation is a safe procedure and all septic

measures are taken to avoid infection not only to the Donor but also to the person receiving the blood.

## CONCLUSION

Our study showed that out of the total 507 donors deferred, Majority i.e. 454 was males and only 53 were females. This showed that very few females step forward for blood donation. This is mainly because of socio-economic beliefs and poor health in our region. The Total donor deferral rate was 6.17%; the percentages of Deferral being 5.53% for males and 0.64% for females. A majority (65%) of the deferred donors were aged between 18 years and 30 years, as it is the age group that most frequently volunteer for blood donation, being young and healthy.

Analysis of the deferrals showed that the temporary Deferral (90.9%) was more common than permanent Deferral (9.1%). The most common reasons for temporary deferrals in males being anemia, medications and alcohol intake within the last 24 hours, in the same order. And the ideas documented in females being anemia, followed by menstrual history within one week and underweight both in equal proportion. The most common reasons in both males and females, for permanent Deferral, were hypertension. Similar to most other studies, the leading causes of permanent and temporary deferrals were hypertension and anemia, respectively. Hence such deferrals can be controlled by providing proper nutrition, medications and awareness among donors and society. Also, those who were temporarily deferred should be informed about the reason and counseled when to come back for donating blood again. Also, proper standards for Deferral, the adequate and complete history of Donor, appropriate physical examination of the donor and proper and highly reliable results for all tests and investigations are must for sufficient and safe blood banking and blood transfusion.

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