

Patterns of pre-donation deferral in voluntary blood donors with its impact on the donor pool- A study in a tertiary care hospital

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Background: The prime responsibility of a Blood Transfusion Service is to provide a very safe, sufficient and timely supply of blood and its components to those in need. In fulfilling this responsibility, the Blood Transfusion Service should ensure that the act of blood donation is safe and causes no harm to the donor. **Aims and objectives:** To estimate the incidence of pre-donation deferral in a tertiary care institute and to estimate various factors for donor deferral. **Material and methodology:** A retrospective analysis of donors data was collected from January 2019 to December 2019 from the donor deferral registry maintained in the blood bank. In this study, the subjects who visited our blood bank or arrived at a voluntary blood donation camp for purpose of donating blood were screened by donor questionnaire and basic physical examination done with recording vital signs(temperature, blood pressure, pulse rate) followed by hemoglobin estimation and blood grouping. **Results:** In the present study, 456 donors were deferred from donation. The deferral rate was 13.6%. Deferral rate was high among males. The majority of deferrals, were temporary deferrals, 380(83.33%) and 76(16.66%) were permanent deferrals. Anemia was the most common cause among temporary deferrals constituting 56.05% of temporary deferrals and 46.71% of total deferrals. **Conclusion:** Attempts should be made to create awareness among potential donors by conducting health talks, distributing educational pamphlets, counselling donors during donation and encouraging them for future donations.

Keywords: Donor deferral, Temporary, Permanent, Anemia

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Introduction

The prime responsibility of the Blood Transfusion Service is to provide a very safe, sufficient and timely supply of blood and its components to those in need. In fulfilling this responsibility, the Blood Transfusion Service should ensure that the act of blood donation is safe and causes no harm to the donor[1].

Individuals who are disqualified from donating blood are known as deferred donors[2]. Deferrals can be temporary or permanent. All deferral donors are expected to be treated with due respect and care confidentially and should be given a clear explanation of the reason for the deferral and an opportunity to ask questions[3]. This study evaluates the incidence and various reasons for donor deferral.

Aims and Objectives

01. To estimate the incidence of pre-donation deferral in a tertiary care institute.
02. To estimate various factors for donor deferral.

Material and Methodology

The present study involved voluntary donors who wished to donate blood from January 2019 to December 2019. Our blood bank is attached to a tertiary care teaching hospital with facilities for collection, preparation, storage of blood and its components and issue of blood /components to in-patients, out-patients and local hospitals.

We collected blood both from voluntary donors visiting blood bank and from outdoor voluntary blood donation camps. Blood donation camps were conducted in and around the blood bank covering a 150km radius. A retrospective analysis of donors details was collected from January 2019 to December 2019 from the donor deferral registry maintained in the blood bank.

Donors were selected and deferred as per guidelines of Drug and Cosmetic Act 1940 and supplemented by Guidelines of Directorate General of Health Services guidelines, Ministry of Health and Family welfare (2003) and National AIDS Control Organization (NACO).

In this study, the subjects who visited our blood bank or arrived at an outdoor voluntary blood donation camp for purpose of donating blood were considered as "Donors".

Donors were screened by donor questionnaire and basic physical examination done with recording vital signs(temperature, blood pressure, pulse rate) followed by hemoglobin estimation and blood grouping. Hemoglobin estimation was done by the Hemocue method (Hb 301 analyzer) and blood grouping by slide method. Donors fit for blood donation were given pre-donation counselling and requested for donation. Donors who were deferred from donation were counselled and informed of the reason behind deferral and were categorized as temporary deferral and permanent deferral.

Approval for conducting the study was obtained from the Institutional Ethical Committee.

Statistical Analysis: The data were entered in MS Excel 2007 version and further analyzed using Epi Info 7.1. For descriptive analyses, the categorical variables were analyzed by using percentages and the continuous variables analyzed by calculating mean +/- standard deviation.

Inclusion criteria: All blood donors who visited for voluntary blood donation(blood bank/camps) were deferred from donation.

Exclusion criteria: Self deferral donors.

Results

During the study period 3,332 donors registered for donation, 2876 blood donors donated blood and 456 donors were deferred from the donation(Table 1). The deferral rate was 13.6%. Among the donors deferred, 257(56.35%) were males and 199(43.64%) were females. Deferral rate was high among males. The most common age group deferred was between 18-30 years both in males and females followed by 31-40 years (Table 2).

Table 1: Gender wise distribution of selected and deferred donors

Donors	Males	Females	Total
Selected	2735	141	2876
Deferred	257	199	456

Table-2: Age group and gender-wise deferred donors

Age in years	Males		Females	
	Number of deferred donors	Percentage of deferrals	Number of deferred donors	Percentage of deferrals
<18	8	3.11	1	0.50
18-30	204	79.37	193	96.98
31-40	23	8.94	4	2.01
41-50	20	7.78	1	0.50

51-60	1	0.38	0	0
>60	1	0.38	0	0
Total	257	100	199	100

The majority of deferrals were temporary deferrals, 380(83.33%) and 76(16.66%) were permanent deferrals (Table 3).

Table 3: Number and percentage of temporary and permanent deferral

Type	Number of deferral donors	Percentage of deferral
Temporary deferral	380	83.33%
Permanent deferral	76	16.66%

Table 4: Causes of temporary donor deferrals and their percentage

Cause of deferral	Males	Females	Total number	Percentage of temporary deferral	Percentage of total deferral
Age<18	8	1	9	2.36	1.97
Alcohol	24	0	24	6.31	5.26
Allergy	2	1	3	0.78	0.65
Anemia	56	157	213	56.05	46.71
Dental extraction	0	1	1	0.26	0.21
Ear piercing	2	0	2	0.52	0.43
Fever/cough/cold	25	3	28	7.36	6.14
Low weight/Under weight	14	8	22	5.78	4.82
Medications	22	3	25	6.57	5.48
Menstrual history	0	6	6	1.57	1.31
Previous history of donation	5	0	5	1.31	1.09
Smoking	3	0	3	0.78	0.65
Skin rashes	8	1	9	2.36	1.97
Surgery history	6	2	8	2.10	1.75
Tattoo	18	2	20	5.26	4.38
Throat Infections	2	0	2	0.52	0.43
Total	195	185	380	100	83.33

Table 5: Causes of permanent donor deferrals and their percentage

Cause of Permanent deferral	Males	Females	Total number	Percentage of permanent deferral	Percentage of total deferral
Age<65	1	0	1	1.31	0.21
Asthma	2	0	2	2.63	0.43
Epilepsy	0	1	1	1.31	0.21
High Blood pressure	36	2	38	50.00	8.33
Low Blood pressure	18	9	27	35.52	5.92
Thyroid disorders	3	2	5	6.57	1.09
Tuberculosis history	2	0	2	2.63	0.43
Total	62	14	76	100	16.66

The various causes for temporary and permanent deferrals and their relative proportions are shown in Table 4 and Table 5.

Anemia was the most common cause among temporary deferrals constituting 56.05% of temporary deferrals and 46.71% of total deferrals. Anaemia was the commonest cause in both males and females followed by fever /cough/cold in males and low weight/underweight in females. Hypertension was the commonest cause among permanent deferrals in males followed by low blood pressure, which constituted 50% of permanent deferrals and 8.33% among total deferrals.

Low blood pressure was the commonest cause of permanent deferral in females followed by hypertension and thyroid disorders on treatment.

Discussion

Selecting a correct donor by strict adherence to the guidelines is mandatory for safe transfusion practice. In the current study, the overall deferral rate was 13.6 %. A comparison of deferral rate in different studies is shown in Table 6.

Table 6: Comparison of donor deferral percentage in different studies

Author name	Study period	Total deferral percentage
Taneja K et al.	1 year	17.1%
Okoroiwu H U et al	1 year	8.69%
Kulkarni N	1 year	4.27%
Kumar S H et al.	3 years	13.1%
Vimal M et al.	4 years	14.87%
Present study	1 year	13.6%

Among the deferrals most of them were in the age group of 18-30 years(96.98%). In similar studies done by Kulkarni N *et al.* most of the deferred donors were in the age group of 18-38 years(74.33%) and a study done by Singh P *et al.* majority of donors were between 21-29 years.

In the present study, the deferral rate was high in males when compared to females with a ratio of 1.29:1. Similar study done by Taneja *et al.* most deferred donors were males(66.6%) compared to females(33.3%). Among the deferrals, temporary causes of deferrals constituted 83.33% and permanent causes for deferrals constituted 16.66%.

Anemia was the most common cause in both males and females constituting 56.05% in our study. In a study done by Kumar S H *et al.*, Singh P *et al.* and Chenna D *et al.* anemia was the most common cause constituting 54.6%,27.0% and 48.7% respectively. The minimal haemoglobin cutoff is set at 12.5 gm%, which is done to ensure both donor safety and appropriate haemoglobin content in the donated unit. A large majority of the donor population in a developing country, like India, is deferred due to temporary causes.

The causes of anemia could be due to nutritional deficiency, blood loss, anemia of chronic disease, and so on. Anemia due to nutritional deficiency is a worldwide problem with the highest prevalence in developing countries like India. The most common cause of nutritional deficiency is iron deficiency. Iron deficiency could be due to inadequate intake or poor bioavailability of dietary iron (only 5%-10% is absorbed) or due to excessive loss of iron from the body (malaria/hookworm infestation)[9].

Apart from anemia, the other most common causes among temporary deferrals were fever/cough/cold(7.36%) followed by medication(6.57%) and alcohol consumption in less than 72 hours(6.31%). A study done by Kumar S H *et al.* medications(10.7%), infections(7.6%) and miscellaneous causes were (5.1%)and a study done by Chauhan C *et al.* alcohol consumption within the last 24 hours (17.68%) was a second common cause.

Increasing awareness before the conduction of voluntary blood donation camps and regular talks in the community can reduce the deferrals due to alcohol consumption.

Analysis of permanent deferral donors showed hypertension as the commonest cause constituting 50 % followed by low blood pressure(35.52%). Results compared to a study done by Shariff M H *et al.* and Vimal M *et al.* also reported hypertension as the most common cause. In a study done by Hao J *et al.* 11.3% of respondents were in the hypertensive range and it was concluded that hypertension awareness can be created during blood donation.

Additionally, our findings indicate that an educational pamphlet at the time of donation is valuable to donors to increase awareness among the community. Overall, these findings suggest that increasing hypertension awareness as part of a blood donation screening is not only needed but also useful as a public health measure.

Conclusion

The cause for deferral varies from region to region. The majority of the donors are deferred due to temporary causes. Hence attempts should be made to create awareness among potential donors by conducting health talks, distributing educational pamphlets, counselling donors during donation and encouraging them for future donations.

What does the study add to the existing knowledge?

Regular health camps can be conducted and proper measures can be given so that temporary deferrals can be brought back to the potential donor pool.

Author's contributions

Dr. Reshma Anegundi: Concept, study design

Dr. Divyashree B N: Manuscript preparation

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