

Pre-Donation Deferral of Blood Donors: A Retrospective Analysis in a Tertiary Care Hospital

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Abstract: ***Background:** Blood donor selection is important for the safety of donors and recipients as well as for maintaining adequate blood supply. The aim of this study was to identify the reasons for pre-donation deferral at the Blood bank of a tertiary care hospital in Delhi. Knowing the reasons for donor deferral can help in formulating more efficient donor selection criteria. **Materials and Methods:** This retrospective study was conducted on all donors who presented for blood donation between 1st January 2018 and 30th June 2018, at the Blood bank of Safdarjung Hospital, New Delhi. The donation and deferral data were analyzed to determine the frequency analysis of accepted and deferred donors. **Results:** Among 18,586 donors presenting to the blood bank during the study period, 17,297 (93.06%) were accepted for donation, and 1289 (6.94%) were deferred. Out of 1289 deferral, 1220 (94.65%) were males and rest 69 (5.35%) were females. Among the deferred, 1132 (87.81%) were deferred for temporary reasons and 157 (12.19%) for permanent reasons. Main reasons for temporary deferral were low weight (15.59%), anaemia (12.49%) and history of recent animal bite/administration of anti-rabies vaccination (11.02%) while neurological disorders in the form of Seizures & other neuropsychological disorders (9.31%), multiple prick marks over phlebotomy site (2.17%) and thyroid disorders (0.31%) were the main reasons for permanent deferrals. **Conclusion:** The deferral rate among blood donors in blood bank of Safdarjung hospital is relatively low as compared to the world-wide data. However, some studies from India show similar rate. Strategies to reduce deferral and improve blood donor retention are required to ensure adequate blood supply.*

Keywords: Blood donation, donor deferral, temporary deferral, permanent deferral

1. Introduction

Appropriate blood donor screening and selection is of utmost importance to ensure safe blood supply.^{[1], [2]} The demand for blood is increasing due to the increase in population. This requires recruiting safe donors and preventing high-risk donors from donation. The criteria for blood donor selection and deferral in India are provided by the Drugs and Cosmetic Act and rules (1940).^{[3], [4]} However, donor selection processes might have negative impacts on the blood supply at the same time, as many deferred donors might not return to donate again.^{[5], [6]} Thus an evidence-based donor selection process is needed so as to avoid unnecessary deferral of donors especially voluntary donors.^{[7], [8]}

The aim of the study is to describe the reasons and frequency of donor deferral in the blood bank of a tertiary care hospital in Delhi and thereby helping in planning efficient recruitment strategies and maintaining continuous and safe blood supply.

2. Materials and Methods

This retrospective study was conducted on voluntary as well as replacement donors who presented for blood donation in Vardhman Mahavir Medical college and Safdarjung Hospital between 1st January 2018 and 30th June 2018. The

data was retrieved from the records of Safdarjung hospital blood bank. The WHO has enumerated various donor selection criteria like age, body weight, haemoglobin level, blood pressure and various other temporary and permanent deferral criteria. This information is obtained using a questionnaire proforma mentioning donor details including past medical history, high-risk behaviour etc, physical examination details and using laboratory test for haemoglobin level (measured using finger prick sample). Each blood donor was interviewed face-to-face and was either declared fit to donate blood or deferred from blood donation based on the questionnaire (mentioning donor details), physical examination (blood pressure, temperature, pulse other general and systemic examination including examination for generalized lymphadenopathy) and haemoglobin testing. This study excluded individuals who self deferred themselves after counselling. The data was recorded and presented in the form of tables. Chi-square test was used for statistical analysis with p value < 0.05 as significant limit.

3. Results

During the study period, a total of 18,586 individuals presented for blood donation at the Blood bank Safdarjung hospital. The majority of prospective donors were within the age group of 21–40 years. Of these, 18,369 (98.9%) were males and 217 (1.1%) were females. The demographic characteristics of donors are described in Table 1.

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Out of these 18,586 donors, 17,297 (93.06%) were accepted for donation, and 1289 (6.94%) were deferred. Among the deferred, 1132 (87.81%) were deferred for temporary reasons and 157 (12.19%) for permanent reasons. Out of 1289 deferral, 1220 (94.65%) were males and rest 69 (5.35%) were females.

Out of 18369 males registered for donation 1220 (6.64%) were deferred while out of 217 females registered for donation 69 (31.79%) females were deferred (Table 2). If we compare this deferral data with total donors registering for blood donation, 6.56% males and 0.37% females were deferred (Table 1). Thus, overall males were deferred more than females, but if we consider the female donors only, females had more deferral rates.

The most common reasons for temporary deferral among the blood donors were, low weight (15.59%), anaemia (12.49%) and recent animal bite/administration of anti-rabies vaccination (11.02%) (Table 3). Donors with high levels of haemoglobin (>18gm/dl) were included in the temporary deferrals and were referred to the hematology clinic to rule out Polycythemia. Of the total temporary deferrals, 1.24% was classified as "miscellaneous," which indicates that the reason for deferral did not fit in any of the deferral categories used in our study. The deferral proportions were almost similar across the Nation. Deferrals due to low haemoglobin levels were more frequent in females than males. In addition, males were deferred due to medical diagnosis and medication more often than females. The reasons for permanent deferrals were neurological disorders in the form of Seizures & other neuropsychological disorders (9.31%), Multiple prick marks over phlebotomy site (2.17%) and thyroid disorders (0.31%). (Table 4). Donors with multiple prick marks over phlebotomy site were considered as professional donors and so were put in the permanent deferrals.

4. Discussion

Blood and blood products safety is the main concern of any blood bank. Blood donors should meet eligibility criteria before donation to ensure this safety. However, proper donor evaluation is important without affecting blood safety and decreasing unnecessary donor deferrals. In a country like India with limited resources it is important to recruit as many donors as possible to meet the increasing blood demand in the population. For this a proper knowledge regarding causes of temporary and permanent deferral is important so that measures can be taken to correct temporary causes of deferral and thereby recruiting more donors to meet the blood demand. Safdarjung hospital is among the largest hospitals in Delhi which represents population from not only Delhi but also from other states, so information regarding causes and frequency of deferral represents a wide range of population.

In this study, we report causes and frequency of deferred donors in blood bank of Safdarjung hospital to add in the epidemiologic information regarding deferral in the Delhi and nearby region. The study showed an overall deferral rate of 6.94%. In other similar studies conducted in various parts of the country this rate varies 4% to 6.99%^{[5], [9], [10]} while it

varies 6.2% to 30.9% in different parts of the world like, United states (12.8-15.6%), Europe (6.2-10.8%), Turkey (14.6%), Singapore (14.4%), Iran (30.9%)^{[2], [11], [12], [13], [14], [15], [16], [17]} (Table 5). Thus our study showed a rate which is similar to Indian scenario while a bit lower compared to many other countries. This difference in the deferral rates suggest the differences in the donor population or donor selection criteria and thus requires further improvement to the donor selection process to avoid negative impacts on blood availability. Out of total deferrals 87.81% accounted for temporary deferrals, the most common reason being low weight followed by anaemia, this rate is lower than a study by Lawson Ayayi et al (91.3%)^[14] while many of the studies^{[15], [18]} show a low rate for temporary deferrals than the present study. Reasons for permanent deferral were seizures and other neuropsychological disorders (9.31%), Multiple prick marks over phlebotomy site (2.17%) and thyroid disorders (0.31%).

If we considered sex wise frequency of deferral, we found that although more number of male donors were deferred in the present study, the deferral rates were higher in females reporting for donation which is similar to data from worldwide including USA and Saudi Arabia^{[15], [19]}

The study also reveals high rates of donor loss due to low weight and low haemoglobin especially in females, indicating nutritional problems in the population. In one study by Khurram et al^[20] iron deficiency accounted for 6% of public health burden. This indicates need for nutritional programmes to correct anaemia and malnutrition in the population resulting in more donor recruitment.

The current study shows that majority of donor deferrals are due to some correctable temporary causes. So, donors should be properly evaluated and counselled to come back for donation after the current cause is corrected. This will not only improve our resources but also will encourage donors. Apart from this authorities involved in blood bank should also look into various causes of deferral and should keep on modifying guidelines from time to time according to the need of blood and blood products.

The shortcoming in this study was that less number of females were reporting to the blood bank for donation so it appeared that the deferral rate was higher in females and also the study period was only six months. So, more donors need to be studied for an extended period of time to represent the wide-range of population and to modify donor selection criteria accordingly.

5. Conclusion

Proper assessment of the donors at the time of donor selection is important to ensure safe blood supply. However, in doing so we should avoid unnecessary deferral of donors. The donors should be properly informed about the reason for deferral so that they do not have negative feelings about deferral preventing them from future donation. Corrective actions should be taken to minimize loss of blood donors without compromising the safety of blood.

Table 1: Demographic representation of the donors

	Total registrations	Total donations	Total deferrals	% deferral of total registrations	% of sex-wise deferral out of total deferrals
Male	18369	17149	1220	6.56	94.65
Female	217	148	69	0.37	5.35
Total	18586	17297	1289	6.93	100

Table 2: Deferral among male and female donors

	Total registrations	Total deferrals	% of sex-wise deferral amongst total registrations
Male	18369	1220	6.64
Female	217	69	31.79

Table 3: Causes of Temporary deferral & their proportion

Causes	Number	% of temporary deferrals	% of total deferrals
Weight < 45Kg	201	17.76	15.59
Anaemia (Hb < 12.5%)	161	14.22	12.49
H/o Animal bite (dog, monkey etc.) or anti-rabies vaccine in last 1yr	142	12.54	11.02
H/o Jaundice	139	12.28	10.78
Hypertension /Hypotension	79	6.98	6.13
Recent Alcohol intake	62	5.48	4.81
Recent donation <3 months	52	4.59	4.03
H/o TB with incomplete treatment	43	3.80	3.34
Unsuitable vein	42	3.71	3.26
Tattoo/ear piercing in last 1yr	34	3.00	2.64
On antibiotics or other medication	33	2.92	2.56
High Hb >18%	28	2.47	2.17
Typhoid in last 1yr	27	2.39	2.09
Recent infections (URTI,UTI, Fungal, Conjunctivitis, Chicken pox), Fever	25	2.21	1.94
Pregnant/Lactating/ menstruating females	15	1.33	1.16
Dengue in < 6months	15	1.33	1.16
Age < 18yrs or Age > 65yrs	09	0.79	0.70
Malaria in last 3 months	09	0.79	0.70
Miscellaneous	16	1.41	1.24
Total	1132	100	87.81

Note: H/o- History of, Hb- Haemoglobin, etc.- Et cetera, TB- Tuberculosis, URTI- Upper Respiratory Tract Infection, UTI- Urinary Tract Infection

Table 4: Causes of Permanent deferral & their proportion

Causes	Number	% of permanent deferrals	% of total deferrals
Seizures & other neuropsychological disorders	120	76.43	9.31
Multiple prick marks over phlebotomy site	28	17.83	2.17
Thyroid disorders	04	2.55	0.31
H/o Myocardial infarction/Angina	02	1.27	0.16
ITP	01	0.64	0.08
Leprosy	01	0.64	0.08
Diabetics on Insulin	01	0.64	0.08
Total	157	100	12.19

Note: ITP-Immune Thrombocytopenic Purpura

Table 5: Comparison of deferral rates of present study with other studies

Serial number	Study	Deferral rate
1	Present study	6.94%
2	Singapore 1993 ¹⁶	14.4 %
3	United States 2004 ²	13.6 %
4	Turkey 2007 ²¹	14.6 %
5	Iran 2009 ¹¹	30.90 %
6	Nigeria 2014 ²²	16 %
7	India 2012 ²³	12.40 %
8	India 2014 ²⁴	11.6 %
9	India 2016 ²⁵	6.99 %

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