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IP Journal of Diagnostic Pathology and Oncology

Journal homepage: <https://www.jdpo.org/>

Original Research Article

Understanding deferral rate and reason among voluntary blood donors at a tertiary care center

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ARTICLE INFO

Article history:

Received 03-12-2021

Accepted 29-01-2022

Available online 28-02-2022

Keywords:

Blood donation

Criteria

Deferral

Donor Screening

ABSTRACT

Background: Healthy Donor selection is necessary for procurement of safe blood in addition to the screenings of blood bags for infectious diseases. Deferrals lead to loss of precious blood/components available for transfusion in emergency situation. To avoid such problems, we should be aware about its reasons and frequency.

Aim: To find the incidence of donors who were deferred from donating blood and to determine the causes for same.

Materials and Methods: The study was conducted in the blood bank of tertiary health care center, from January 2015 to December 2017 to find the incidence of deferral and reason behind it. Criteria for deferral was decided as per guidelines given by national health authority.

Results: A total of 10,000 donors were screened of which 99% were voluntary donors (VD). The total 598 donors were deferred among 10000 registered during study period. The total donor deferral rate was 6%. The percentage of deferral amongst males was 5.7% and females 7.4%. A majority (65%) of the deferred donors were between 18 to 30 years. The major causes of deferral were anemia and hypertension.

Analysis of the deferrals showed that the proportion of temporary deferral was more common than the permanent deferral.

Conclusion: Conducting pre-donation camp awareness session can reduce the deferral rate. Temporarily deferred individuals must be informed and followed up to encourage donation in future.

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1. Introduction

Vital lifesaving procedure that needs an adequate supply of safe blood from a healthy donor is blood transfusion. A Safe and adequate quantity of blood and blood products is a significant public health issue faced globally by all countries.¹ Various strategies and approaches have been adopted worldwide to make the blood transfusion services be available in emergency requirements by the blood transfusion committee.¹

A healthy donor is selected by a blood donation screening procedure which is based on questionnaire and

mini physical examination set by national guidelines. Those who are not fulfilling the selection criteria, deferred from blood donation. Proper donor screening procedure minimizes the risk of transfusion transmitted infection (TTI) and also wastage of blood and blood products. Most blood banks only collect non-remunerated blood from voluntary donors who are at low risk for transfusion transmittable infection.²

Replacement donor is one who gives blood upon request of a specific patient or patient's family, & voluntary donor is the one who donates without any interest or compulsion. Literature have shown that large numbers of blood donors are deferred from donating blood for one or more reasons,

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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.³⁻¹⁰

In the scarcity of available blood stock at blood banks and increased demand of blood transfusion requirements it's time to understand the reasons for deferral of potential donors, in a temporarily deferred donors and these donors can be treated if possible, for a cause e.g., Iron and Folic Acid tablets to anemic, medicines for minor infections and high Blood Pressure in order that these donors can donate blood in the future.

Our study was carried out with aim of finding the various reasons for deferral, provide care to donors and ensure the supply of safe blood to the patients. The objective of our study is to determine the various and most common causes of permanent and temporary deferral in study are.

2. Materials and Methods

Present study was conducted in a blood bank of a tertiary care hospital over the period of January 2015 to December 2017. Data collected from the records maintained in Blood Bank. Donors who have donated blood at outdoor voluntary blood donation camps and at the blood bank were included in the present study.

A Donor questionnaire form was used for screening and all details of the deferred donors were obtained from the Deferral register. All deferred donors were categorized on the basis of age, gender and cause of Deferral.

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.

Before blood collections Physical and Vital examinations were done. Blood pressure was measured using sphygmomanometer by both palpatory and auscultatory methods, axillary temperature was measured using mercury thermometer and Hemoglobin was estimated using Hemocue and Copper sulfate method.

All deferred blood donors were classified either temporary or permanent, on the basis of Indian medical association (IMA) blood bank guidelines. Data was saved and maintained in the donor register of blood bank.

Screening of transfusion transmitted diseases i.e., 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.

Donors who were in the age group of 18-65 years, weighed 45 Kg or more, with a standard pulse rate of 60-100 beats per minute, Blood Pressure of Systolic, 100-160 mmHg and Diastolic 60-100 mmHg, Body temperature of 37.2-37.7 degree Celsius, and Hemoglobin of 12.5 gm/dl or more and no any significant adverse history were selected

for blood donation. Donors who were not fulfilling these criteria for the selection of Donor were deferred. A part from above mentioned criteria 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, Hb less than 12.5 gm/dl were deferred temporarily.

Donors having hypertension or Asthma or Diabetes or past history of high- risk sexual behaviour or other significant diseases were permanently suspended.

Data extracted from blood bank record was entered in Microsoft excel and data analysis was done using Epi-Info software. Descriptive statistical measures i.e. frequency and percentage were utilized to present the data.

3. Results

From 1st January 2015 to 31st December 2017, a total of 10000 donors were registered for a donation, out of which 8224 were males and 1776 were females. Voluntary donors (VD) were (99%) and replacement donors (RD) were (1%).

The total 598 donors were deferred among 10000 registered during study period, out of which; 467 were males and 131 were females. The total donor deferral rate was 6%; the percentages of deferral being males was 5.7% and females 7.4% [Table 1].

A majority (65%) of the deferred donors were aged between 18 years to 30 years. [Table 2]. The proportion of temporary deferral was more common than the permanent deferrals showed in analysis.

The reasons for males being anemia, medications, alcohol intake within the last 24 hours, in the same order. The reasons for females being anemia, followed by menstrual history within one week, and underweight in the same proportion.

The major reasons for both males and females, for permanent Deferral, were hypertension (8%), followed by diabetes (7%) and chronic diseases like epilepsy, cardiac dysfunction, recent surgery, kidney dysfunction recent hepatitis or hep B Vaccination in last 6 month (3%) [Table 3].

4. Discussion

Total of 10,000 donors who came forward for blood donation, of which about 598 cases; 6% were deferred due various reasons. Several studies have reported varied deferral rate (5.2- 35.6%) 5.20% by Unnikrishnan et al,³ 5.29% by Attri et al¹¹ 6% by Sundar et al,¹² and 5.6% by Rabeya et al.¹³ Compare to our study higher deferral rate was found in Chaudhary et al (16.4%)¹⁴ and Charles et al (35.6%).¹⁵ This variation in deferral may be due to many reasons like geographical variation in health problems, socioeconomic status, different donor selection criteria,

Table 1: Distribution of deferral as per gender

Gender	Total No	Deferrals	%	Deferral rate
Male	8224	467	5.7	4.7
Female	1776	131	7.4	1.3
Total	10000	598	6.0	6.0

Table 2: Distribution of deferral as per age

Age group	n	Percentage
18-30yrs	389	65
31-45yrs	137	23
46-60yrs	54	9
>60yrs	18	3
Total	598	100

Table 3: Deferral cause distribution across gender

Deferral Cause	Male		Female		Total	
	n	%	n	%	N	%
Temporary						
Low Hb	270	57.8	69	52.7	339	52
low weight	15	3.2	21	16.0	36	6
on medication for any reason	31	6.6	4	3.1	35	6
Alcohol last 24 hours	21	4.5	3	2.3	24	4
H/o Typhoid Malaria or dengue	18	3.9	5	3.8	23	4
Donated in last 3 months	10	2.1	2	1.5	12	2
Current menstrual history	0	0.0	6	4.6	6	1
Permanent						
Hypertension	39	8.4	8	6.1	47	8
Diabetes	38	8.1	3	2.3	41	7
Chronic diseases like epilepsy, cardiac dysfunction, recent surgery, kidney dysfunction recent hepatitis or hep B	12	2.6	5	3.8	17	3
Vaccination in last 6 month						
Body tattoo	4	0.9	2	1.5	6	1
High risk behaviour	6	1.3	0	0.0	6	1
Unknown skin infection	3	0.6	3	2.3	6	1
Total	467	100.0	131	100.0	598	100

gender variation etc. Uniform screening criteria for blood donors will help to keep the proportion of deferrals to an acceptable minimum.

On analyzing gender distribution of blood donor, it was found that majority of them were male. Male constituted around 82.2% of the donors who came to donate blood. The number of females volunteering for the donation were very few i.e. 17.8% only. Present study showed that female donors deferred were 7.4% as compared to male donors which were 5.4%. This is because of false belief about blood donation in society and lack of awareness about blood donation among females. Our study findings are matching with study by Attri N et al.¹¹ Although, due to physiological factors, women may be more prone to conditions such as anemia and underweight but a proper predonation counselling and improving nutritional status will help to reduce deferral due to physiological factors among female. Present study showed that female donors were deferred more frequently than male donors which might be due to the

wide prevalence of anemia and underweight among female donors.

To understand in a better way reason behind deferral, causes of deferral were broadly classified as temporary and permanent causes. More number of deferrals were temporary (475/598 constituting about 79.4% and permanent deferral, about 20.6%. In a study by Attri N et al.¹¹ temporary deferral constituting about 81.30% and permanent deferral, about 18.69%. Another study by E Sabri Priya¹⁶ showed deferred due to temporary reasons was 65.7% and permanent reasons 34.3%.

Overall, the most common cause among temporary deferral was anemia (52%). In literature also temporary was of deferral was anemia in range of 32.53%- 46%.^{11,15-21} Those with anemia have to be referred for further evaluation and treatment. Physiologically there is different cut-off for male and female so similar criteria should be followed during screening of male and female for donation so that rate of deferral due to anemia will decrease among

female. Studies by Newman et al²² show that by lowering hemoglobin standard levels and offering iron treatment for pre-menopausal woman, one could increase female eligibility.

The other causes of temporary deferral included alcohol intake, underweight, history of malaria, dengue or typhoid within 6 months, menstrual history within one week in females. Pre camp and at blood bank also awareness through various IEC activity about the common causes of temporary deferrals like smoking and alcohol prior to blood donation, age limit, menstruation, breastfeeding women, drugs that cannot be consumed prior to donation etc. will help to reduce temporary deferral. Such steps by government and local health authority will help donors to pre-screen themselves and come for donation. Another major concern is that most of the temporary deferred donors are less likely to return in future for donation thinking that they have been deferred for life time. Zou et al²³ have reported potential donor loss after a deferral. Therefore, all deferred individuals must be informed about the cause and period of deferral and proper counselling must be done to help them overcome the problem so that these donors can be recruited back to donors' pool.

In our study 20.6% of donors were deferred for permanent reasons. On comparison in other studies, Custer, et al.²⁴ reported a permanent deferral rate of 10.6% and Arslan et al²⁵ reported a rate of 10% and Atti N et al¹¹ reported a permanent deferral rate of 18.6%. The leading cause for permanent deferral in our study was hypertension, diabetes and followed by high-risk behavior among donors with multiple sexual partners. This correlated with the study done by Attri N et al¹¹ and Bahadur et al.²⁶ who stated hypertension as the commonest cause of permanent deferral in their studies. The probable reason could be sight of blood, first time blood donation, fear of phlebotomy, white coat hypertension, stress and exercise. Hypertension often goes undetected and is mostly the incidental finding while screening donors.

Age of deferral analysis showed that most of the deferral were in age group of 18-30years of age. Similar to the findings in a study done by Hinal Gajjar et al.²⁰ and Atti N et al¹¹ a large proportion of the deferred donors were aged between 18 years and 30 years (52%) which also incidentally is the major age group to which most of the voluntary blood donors belong to. This points towards the food fad and body imaging among youth landing them into undernutrition and low micronutrient, which when improved will significantly reduce deferrals due to temporary reasons like anemia and undernutrition.²⁰

A large number of awareness programs regarding importance of blood donation along with reasons to deferral, misconception about blood donation, pre donation self-screening and IEC activity to be conducted to increase the number of voluntary donors. In the study by Shahshahani

et al,²⁷ free pre-donation medical check-ups, free blood investigations could also help motivate people to donate blood and help them clear all misconceptions.

Apart from awareness drive assurance about safety and no risk of contracting any infection due to blood donation will help to increase blood donation among young population. Along with this youth should be conveyed that body replaces the lost fluids within 24 hours of blood donation and the lost red blood cells in a few weeks.

5. Conclusion

Our study showed that donor deferral rates were very much similar in different populations, with varied reason in different study.

The Leading causes of permanent deferral was hypertension and temporary deferral was anemia. Both are generally undetected due to lack of regular screening programme in community.

Conducting pre-donation camp awareness session, IEC display and removing myths and misconception will help donor to pre- screen them self and reduce temporary deferral. Temporarily deferred individuals must be informed and followed up to encourage donation in future.

Analysis of deferral patterns help to strengthen or improve strategy which will help to increase blood donation. It is also essential for the safety of blood transfusion and guide the donor recruitment efforts to prevent loss of precious blood/components at local, national and international levels.

6. Conflict of Interest

The authors declare that there is no conflict of interest.

7. Source of Funding

None.


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Cite this article: Gaikwad MJ, Rathod KB, Chaudhari A, Nakate LA. Understanding deferral rate and reason among voluntary blood donors at a tertiary care center. *IP J Diagn Pathol Oncol* 2022;7(1):1-5.