Original Article

Blood Donor Deferral Analysis: A Tertiary Care Centre Experience

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ABSTRACT

Background: Blood donor selection is important to ensure the safety of both donors and recipients. There is a paucity of data on reasons for blood donor deferral in Punjab. The aim of this study was to identify the reasons for predonation deferral at a blood collection site at a blood bank of a tertiary care teaching hospital.

Method: The investigators conducted retrospectively of data pertaining to donor deferral for blood donors from January 1, 2014 to December 31, 2014.

Results: Among 8523 donors reporting to our blood bank during the one year period, 91 % were males. Of these, 7927 (93%) attempted donation, while 596 (6.9%) were deferred. Among the deferred, 342 (57.4%) were deferred for temporary reasons and 254 (42.6%) for permanent or semi-permanent reasons. Main reasons for temporary deferral were low hemoglobin (17.25%), alcohol abuse (13.15%) and tattooing (12.18%). A positive history of cardiac abnormalities with high blood pressure (37.4%) followed by age disparity (age , 18 years or > 65 years)- 25.98 % and practicing unsafe sex or drug abuse (13.77%) were the main reasons for permanent/semi-permanent deferrals.

Statistically it was noted that the overall proportion of deferral was higher in males (5.3% vs 1.1%, $p < 0.0001$), and first-time donors (4.97% vs 2.01%, $p < 0.0001$)

Conclusion: First time donors are more frequently deferred than repeat donors, especially because of interview decisions and presence of high risk behaviour. The study suggests the importance of recruiting repeated blood donors for better hemovigilance and blood safety practices.

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Introduction

Appropriate donor selection is an important step in ensuring safe supply of blood and blood products. Availability of safe blood is the main goal of blood transfusion center. The aim of Blood Transfusion Services (BTS) should be to provide effective blood and blood products, which are as safe as possible and adequate to meet patients need.[1] In this context the donor screening process is very critical to ensure the safety of the blood supply.[2,3]

Screening, usually of two types: temporary or permanent deferral, is a double edged sword because on one hand where it is necessary for safe blood while on the other hand it can itself lead to relatively lower donation rates and in Indian scenario can add onto already existing blood shortage.

Another problem associated with a rigorous screening/ deferral program is change in donor behavior as it has been noted that there was less chance of first time donors who were once temporarily deferred to return for subsequent donation than those who donated successfully.[4] This deferral can also have a bearing on an overall cost benefit ratio of a blood bank.[5]

Thus knowledge of the rate and reasons for donor deferral is quite essential as this can guide future donor recruitment strategy. The objectives of the present study were to determine the proportion and reasons of donor deferral in a blood bank of a tertiary care teaching hospital. This in turn helps ensure a more informed process of donor recruitment and selection and forestall unnecessary donor deferrals.

Materials and Methods

The retrospective data was retrieved from the records of Sri Guru Ram Das Institute of medical Sciences and Research, Amritsar (Punjab) during the period from 1st January – 31st December 2014.

The donor selection criteria enumerated by WHO are based on age, body weight, blood pressure, and hemoglobin level according to sex. Other factors include status of the donor i.e., first-time donor (never donated or donated whole blood once more than five years previously), repeat donor (donors who donated whole blood at least twice in the previous 12 months), and sporadic donors (donors who donated whole blood at least twice in an interval greater than 12 months and less than five years). Some of the things, which complete the donor selection, are enquiry against number of whole blood donations, past medical history, history of high-risk occupations and behavior. Additional laboratory test hemoglobin with cyanmethemoglobin method was utilized wherever the pallor was noted clinically or in case of doubt.

Data of all blood donors and pre donation deferrals over the stated period were obtained using a pre tested structure questionnaire designed for the study. The data was presented as simple descriptive studies by means of tables. Donor deferral rates were compared using chi-square test with $p < 0.5$ being considered as significant.

Results

Among 8523 donors reporting to our blood bank during one year period, 91 % were males. Of these, 7927 (93%) attempted donation, while 596 (6.9%) were deferred (TABLE 1). The overall average age was 35 years, ranging from 18 to 55 years. Most of the prospective donors were replacement (69.3%) and were first time donors (24%).

Among the deferred, 342 (57.4%) were deferred for temporary reasons and 254 (42.6%) for permanent or semi-permanent reasons. Main reasons for temporary deferral were low hemoglobin (17.25%), alcohol abuse (13.15%) and tattooing (12.18%) (TABLE 2).

A positive history of cardiac abnormalities with high blood pressure (37.4%) followed by age disparity (age , 18 years or > 65 years)- 25.98 % and practicing unsafe sex or drug abuse (13.77%) were the main reasons for permanent/ semi-permanent deferrals (TABLE 3).

Statistically it was noted that the overall proportion of deferral was higher in males (5.3% vs 1.1%, $p < 0.0001$), and first-time donors (4.97% vs 2.01%, $p < 0.0001$) (TABLE 4).

Table 1: Demographic characteristics of donors- successful donation and deferral.

	Total	Donated	Deferred
Sex			
Male	8125	7625	500
Female	398	302	96
Donor Status			
Repeat	6052	5628	172
First Timer	2471	2299	424

Table 2: Causes of Temporary Deferral with their relative proportions.

Cause	Numbers	Percentage of temporary deferral
Low hemoglobin	59	17.25%
Alcohol	45	13.15%
Tattoo & needle pricking	42	12.28%
Tuberculosis	25	7.30%
Dog bite	26	7.60%
Fever	25	7.30%
Jaundice	21	6.14%
Low weight	20	5.84%
Medication	18	4.38%
Malaria	15	4.38%
Previous Surgery	12	3.50%
Previous blood donation	12	3.50%
Typhoid	08	2.33%
Miscellaneous	15	4.38%

Table 3: Causes of Permanent Deferral with their relative proportions.

Causes	Number	Percentage of deferrals
High Blood pressure and other cardiac problems	95	19.6%
AGE >65 yr < 18 yrs	66	25.97%
High risk behavior	35	13.77%
Thyroid dysfunction	33	12.99%
Epilepsy	20	7.87%

Table 4: Comparison of deferral rates and most common reasons for deferral in our study with other studies.

Study	Deferral rate	Most common reason for deferral
Present study	6.99%	Age<65 and <18 yrs, High blood pressure Low Hb
Shiraz Blood Transfusion Center, Iran 2009[18]	30.90%	Having risk factors that may be related to HIV or hepatitis infections (43.60%) Underlying diseases (31.90%) Non-eligible general conditions (13.50%)
Nigeria 2014 [19]	16%	Low Hb 39% Hypertension 30% Weight < 45 2.4%
India 2014 [20]	11.6%	Low Hb 33.5% Hypertension 11% Alcohol intake 10.8%
Turkey 2007 [11]	14.6%	Low hematocrit (20.07%) Common cold (17.70%) High-risk sexual activity (16.70%)
Singapore 1993 [12]	14.4%	Drug consumption Influenza Low hemoglobin
United States 2004 [9]	13.6%	Low hemoglobin (60%) Emigration from an area with malaria (59%) Tattoo or needle exposure (29%)

Discussion

Donor selection is the most important step in improving the safety of blood and blood products in donor selection. Insight into the reasons of deferral is very important to avoid any permanent loss of the donor as donor donation program. In view of blood unit scarcity owing due to shortage of safe blood donors in our country, which mirrors the situation prevalent in many of the resource-challenged countries of Asia and Africa, it is important to understand the reasons for deferral. Identification of reasons for deferral can lead to changes in blood safety programs and can lead to informed and well-directed intervention. There have been few publications describing the reasons for deferral in northern part of India, specifically for state of Punjab. Our study evaluated reasons for deferral in a population of voluntary and non-remunerated donors reporting to a blood bank of a tertiary care teaching hospital.

In this study, the deferral rate was 6.99%. The deferral rate in other Indian and international studies have a reportable range of 4 % to 16.4%.[6,7,8] These have been compared in Table 4. The deferral rate in our center was much lower than other studies conducted elsewhere such as in United states, Europe, Turkey, Singapore where these have been reported as 12.8%, 10.8%, 14.6% & 14.4% respectively.[9,10,11,12]

Temporary deferrals accounted for 57.28% of all deferrals in our study. This is in accordance with the studies done by Custer et al [4] and Shaz et al [13] who have a reported range of short-term deferral similar to us as 68.5% and 68%. However, in a study by Lawson Ayayi et al in France the temporary deferral rate was unusually very high as 91.3 % of all deferrals.[10]

The current study had a higher percentage of male donors compared with some of the other Asian studies.[14]

In the study conducted the rate of temporary deferrals varied according to the sex of the donor and type of donor ($p < 0.05$). Deferral rates-stratified by donor sex-differed for both temporary and permanent deferral. The literature published shows studies differ according to a particular geographical area, with Custer et al [4] having concluded that the rates of deferral do vary by sex and Lawson-Ayayi [10] having reported that permanent deferral was not sex related.

The study also concluded that deferral rates in first time donors was higher as compared to the repeat donors and this relationship was statistically significant. The finding of more chances of deferral in first time donors in comparison to repeat donors is explained by the fact that the repeat donors have greater awareness about blood donation criteria.[5] Hence, it is logical for any successful blood donation program that regular/ repeat donors encouraged or felicitated by some means and increased community based health education and information programs be initiated to encourage and educate the general population regarding the eligibility criteria for blood donation.[15]

The most common cause of temporary deferral overall in our study was low hemoglobin (16.08%), alcohol abuse(13.15%) and needle exposure (acupuncture) / tattooing (12.25%). These findings are often different in different centers due to cultural and socio- economic indicators. This is illustrated by the fact that while the most common reasons of temporary deferral were low hemoglobin (46%), common cold (19%) elevated temperature (10%) in work done by Halperin D et al [16] ; yet in another study by Lim et al [12], the most frequent reasons for deferral were drug consumption followed by influenza, low hemoglobin, hypertension and recent high risk sexual activity. The observations such as these are illustrated by the fact that while in most of the studies low hemoglobin (low Hct) was the most common cause of temporary deferral but the next common cause varies according to the various geographical areas ; for example study by Custer et al recorded emigration from an area with malaria & tattoo / needle exposure as next common reason of deferral [4] and another study on Turkish population shows the main reasons for short term deferral were common cold in men and low hematocrit in women , while low hematocrit was the most common reason overall (20.07) followed by common cold (17.7%) , high risk sexual activity (16.7%) , hypertension (5.6%) and polycythemia (2.8%).[11]

In the present study 42.6 % donors were deferred for permanent reasons and most common reason for permanent deferral was cardiac causes most notably hypertension followed by age related deferrals (>65 years and < 18 years). Arsalan et al [11] reported permanent deferral rate of around 10.0 % long term and 1.5 % permanent deferrals and Custer et al [4] reported a rate of 10.5% in their study. In accordance with the study conducted even Di Lorenzo Oliveria et al also found hypertension as the most common cause of permanent donor deferral. [17]

Donor deferral is a noteworthy problem in the setting of blood banks as it may discourage potential/ first time donors as it has been noted that the temporary deferral due to any reason genuine or trivial often do not return to blood bank in future for further donations. Many researchers especially, Zou et al [9] and Halparin et al have documented a negative impact of temporary deferral on the donor return rates.[16]

All the potential donors deferred due to temporary reasons should be informed at the time of deferral. These donors

should be appropriately counseled and managed to improve the efficiency of the donor program. Health authorities should also implement policies for the preventive measures to decrease the incidences of common deferral causes as this reflects the health status of the society.

Conclusion

First-time donors are more frequently deferred than repeat donors, especially because of interview decisions and presence of high risk behavior (recreational drug abuse/ multiple partners/ unprotected sexual intercourse).

In this study (in similarity with many of the national and global blood bank based deferral studies), the most common reason for deferral among first-time donors was the high risk behavior that might be related to HIV or hepatitis infection. This often was not the case with repeat donors. Thus the study emphatically emphasizes the importance of recruiting repeated blood donors for better hemovigilance and blood safety practices.

Apart from not only the shrinkage of the donor pool the deferrals also inflicts an expenditure so called cost implication for blood collection organizations.

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