


Original Research Article

# Evaluation of causes of deferral of blood donors in blood bank - A study of 2 years at tertiary care hospital blood bank

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## Abstract

**Background:** Millions of patients who are in need of blood transfusion do not have timely access to safe blood. Donor selection is important to ensure safe blood supply. Blood transfusion services (BTS) have the responsibility to collect blood only from donors who are at low risk for any infection that could be transmitted through transfusion and who are unlikely to jeopardize their own health by blood donation. A rigorous process to assess the suitability of prospective donors is therefore essential to protect the safety and sufficiency of the blood supply, and safeguard the health of recipients of transfusion and blood donors themselves, while ensuring that suitable donors are not deferred unnecessarily.

**Aim:** To study the incidence and causes for deferral of both voluntary and replacement Donors in Blood Bank.

**Materials and methods:** The study was conducted over a period of 2 years from 2015 January to 2017 January at Gandhi Hospital Blood Bank, under Gandhi Hospital; which is a tertiary care referral Hospital.

**Results:** A total of 2510 donors of both voluntary and replacement category were deferred, among which males were 1790 were males and 720 were females. The commonest cause of deferral among males was alcohol intake within 24 hours, followed by underweight and hypertension. The commonest cause among female donors was anemia followed by menstrual history within one week.

**Conclusion:** Analysis and evaluation of deferral in blood donors helps us to understand the causes of deferral and deferral rate. This helps us in providing safe blood to the recipients by promoting blood donation by healthy donors. There is a need to motivate more voluntary non remunerable donors to ensure safe blood to all by conducting educational and motivational programs.

## Key words

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Blood donors, Blood bank, Deferral.

## Introduction

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Blood transfusion is a vital lifesaving procedure which requires adequate blood supply of safe blood from a healthy donor. Safe and adequate supply of blood and blood products is a major public health issue faced globally [1]. Many measures have been taken to make the blood transfusion safe by the blood transfusion committee. The most important is the selection of blood donors by donor selection criteria. A large number of blood donors are not able to donate blood successfully for several reasons, either temporarily or permanently. Individuals disqualified from donating blood are known as 'deferred' donors. Blood donor deferral is a painful and sad experience for the blood donor as well as the blood center screening the donor [3]. These World Health Organization (WHO) guidelines, Blood donor selection: guidelines on assessing donor suitability for blood donation have been developed to assist blood transfusion services in countries that are establishing or strengthening national systems for the selection of blood donors. They are designed for use by policy makers in national blood programs in ministries of health, national advisory bodies such as national blood commissions or councils, and blood transfusion services [2]. According to the figures of World Health Organization (WHO), over 81 million units of blood are collected annually worldwide, but only 39% are collected in developing countries, which have 82% of world's population [4]. In India, the annual rate of blood donation is 7.4 million units against the requirement of 10 million units, according to National AIDS Control Organization's statistics [5]. Safe transfusion practice, a symbol of good blood banking means transfusion practice which is safe for the patient and the donor and this is achieved by having donor deferral criteria [4] and stringent screening of collected blood for possible transfusion transmissible infections (TTI's) [6]. Deferrals are divided into permanent and temporary. Few

studies done in India in the past have provided different common reasons for deferral of whole blood donors, highlighting differing demographic profile in different parts of the country [7, 8]. The aim of our study is to know the profile of the blood donors and causes of the permanent and temporary deferral and their frequency.

## Materials and methods

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The study was conducted at Gandhi Hospital Blood Bank, a government run blood bank under Gandhi Hospital, Secunderabad; which is a tertiary care referral Centre. The donors, of both voluntary and replacement categories, were evaluated on the basis of elaborate clinical history including age, high risk behavior with multiple sexual partners, history of jaundice, tattoos, history of intake of alcohol within 24 hours, history of any medication, herbal medication intake, vaccination history etc. for women additional history of menstrual cycle within one week, any abortions etc. was taken. Physical examination, Hb estimation, blood pressure, and temperature recording were performed. NACO guidelines were used for deferral of blood donors. Data was recorded and maintained by the blood bank in donor register. Hemoglobin was measured by Sahli's Hemoglobinometer. Blood samples of these donors were screened for HBsAg 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 VDRL ELISA or RPR card test. The criteria for deferral were minimum age of 18 years, weight of 45 kg, and hemoglobin of 12 gm%. Donors with past history of typhoid or malaria or tooth extraction within past 6 months, past history of high risk sexual behavior, tattooing, drug intake within 72 hours, alcohol intake within 24 hours, history of intravenous drug abuse, diabetes, patients with hypertension were deferred. Patients with hemoglobin less than 12 were temporarily deferred as well as females with

history of abortion within 1 month. Temporarily deferred patients were asked to come back after a suitable period of time.

## Results

A total of 22599 donors were registered out of which 20339 were males and 2260 were females. 2510 donors were deferred; out of which; 720 were females and 1790 were males. As such, the total donor deferral rate was 11.1%. It was noticed that the deferral rate was more for females among the female donors than the male donors; the percentages of deferral being 31.87%

for females and 8.8% for males. Analysis of the deferrals showed that the temporary deferral was more common than permanent deferral; the reasons in males being alcohol intake, underweight, and anemia in that order. The reasons documented in females being anemia, menstrual history within one week, followed by underweight. The reasons in both males and females, for permanent deferral were hypertension, diabetes, high risk behavior with multiple partners and donors who were diagnosed with positive TTI results (Table – 1 to 4).

**Table – 1:** Distribution of deferral percentage according to sex.

Sex	No. of donors	No. of deferrals	% of deferrals
Male	20339	1790	8.8%
Female	2260	720	31.8%

**Table – 2:** Demographic profile of the donors.

Sex of the Donor	No. of Registrations	No. of Deferrals	% of Deferrals of total registrations
Males	20339	1790	7.9%
Females	2260	720	3.2%
Total	22599	2510	11.08%

**Table – 3:** Causes of Temporary Deferrals with their Relative Proportions.

Cause of Temporary Deferral	Number of Donors Deferred	Total Percentage
Anemia (Hb<12.5 gm%)	500	19.9%
Under weight	400	15.93%
Alcohol Intake within 24 hours	400	15.93%
Sleep Deprivation (<4 hours)	400	15.93%
Tattooing within 6 mo.	150	5.97%
Menstrual History within 1 week	100	3.98%
Jaundice or typhoid within 6 mo.	50	1.99%
Tooth Extraction within 6 months	30	1.19%
Lactation/Abortions within 6 mo.	20	0.79%
Vaccination within 6 mo.	10	0.39%
<b>Total</b>	<b>2060</b>	<b>82.15%</b>

## Discussion

Donor selection has vital importance in blood banking and transfusion medicine. The preamble

of our study was to device a protocol which could prevent the loss of whole blood/component and be safe for the donors and recipients [9]. Most of the donors were males (90.2%); women

accounted for only 10% of the donors. Present study showed that female donors (31.8%) were deferred more frequently than male donors (8.8%) which might be due to wide prevalence of anemia and underweight factors in female donors. Donor deferral (11.08%) in the study was very much similar to various American, European and Asian studies. Zou, et al. [8] reported a deferral rate of 12.8% in their 6 years study of American Red Cross blood service and Custer, et al. [10] showed a deferral rate of 13.6%. In a European study conducted by Lawson-Ayayi and Salmi [11], 10.8% of donors were deferred. Arslan [12] reported a donor deferral rate of 14.6% in Turkish donors. Lim, et al. [13] reported a deferral rate of 14.4% in Singapore (Asia) and Bahadur, et al. [6] reported 9% in Delhi (India). Rabeya, et al. [14] found a very low deferral rate in their study (5.6%) which

could be due to different donor selection criteria. The most common cause among temporary deferral was anemia (19.9%) as compared to Halperin, et al. [15] which showed low hemoglobin as the most common cause in 46% of the temporary deferral. The study done by Arslan [12] in Turkish donors showed low hemoglobin as the most common cause of deferral in 20.7% of overall deferral. The findings in our study were very much similar to these studies. The other causes of temporary deferral included alcohol intake, underweight, anemia, drug intake, history of jaundice, malaria or typhoid, tooth extraction within 6 months, menstrual history within one week in females. A proper track for follow up of temporarily deferred donors regarding their management should be made by the blood bank so that these donors can be recruited back to donors' pool.

**Table – 4:** Causes of Permanent Deferrals with their Relative Proportions.

Cause of Permanent Deferral	Number of Donors Deferred	Total Percentage
Hypertension	200	7.9%
Diabetes on insulin	100	3.98%
High Risk Behavior/ +ve TTI test	100	3.98%
Thyroid Disorder	50	1.99%
<b>Total</b>	<b>450</b>	<b>17.85%</b>

In our study 17.85% of donors were deferred for permanent reasons. Our findings (17.85%) were higher than that of Custer, et al. [10] who reported a permanent deferral rate of 10.6% and Arslan [12] who reported a rate of 10%. This high frequency was due to the inclusion of transfusion transmissible infection in our study. The most common cause for permanent deferral in our study was hypertension, followed by diabetes, and high risk behavior among donors who had multiple sexual partners. This correlated with the study done by Bahadur et al<sup>6</sup>, who stated hypertension as most common cause of permanent deferral in their studies.

### **Conclusion**

Our study showed that although donor deferral rates were very much similar in different

populations, the reasons for deferral differ, reflecting difference in socioeconomic status and environment. However, some studies showed that different deferral rate could be due to different donor selection criteria. Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening, especially of those who are having higher occurrence e.g., Anemia, and transfusion transmitted infection. Temporary deferred donors require proper follow up and management so that it does not lead to a diminished supply of future donors. Government needs to take a more pro-active role in decreasing anemia, by providing quality nutrition to all and also by undertaking more educational programs towards elimination of TTI's. Finally, to improve the safety of blood and blood products and to

decrease loss of precious blood/ components, four steps must be included: (1) detail history based on NACO/ WHO guidelines, (2) physical examination, (3) laboratory tests including ELISA for anti HIV, anti HCV and HBsAg and other tests for malaria and syphilis and (4) public awareness, educational and motivational programs.

So to conclude, it is important to determine the rate and causes of blood donor deferral for the safety of blood/components transfusion and also to guide the donor recruitment efforts to prevent loss of precious blood/components at local, national and international levels.

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