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# An Audit of Deferral of Blood Donors at a Tertiary Care Hospital

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## ABSTRACT

Blood donor selection contributes to the safety of both the donor and the recipient. The objective of this study was to identify the number and causes of blood pre-donation deferrals at the ESIC Model Hospital and PGIMSR, Andheri, Mumbai, India. Methods and materials: A retrospective study was carried out to retrieve data regarding deferred blood donors at our Blood bank over a period of two years from January 2011 to December 2012. Results: A total of 2172 blood donors donated blood at our Blood bank, of whom 163 were deferred or rejected as donors. The percentage of deferred donors was 7.55%. The main reason for deferral was low haemoglobin (49.69%), females constituting the majority of those deferred. This was followed by high blood pressure (9.20%) and male donors were predominant in this group. Recent malarial infection caused 6.13% of donor deferrals. Conclusion: Increased public education on common causes of donor deferral may also lower deferral rates by allowing prospective donors to "pre-screen" themselves. Thus the blood donor deferrals can be prevented by proper health care education and awareness.

**Keywords:** Blood donor; Deferral; Low Haemoglobin; Temporary Deferral

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## INTRODUCTION

The need for blood is growing day by day as a result of advancement of medical sciences. Blood transfusions thus form an important and irreplaceable part in management of many diseases. Availability of safe blood and blood products is a critical component in improving health care. It is well known that quite a large number of apparently healthy donors are not able to donate blood successfully because of varied reasons. Blood donor suitability criteria are based on science, informed medical opinion, and regulatory rules. [1] Blood donors are deferred for various reasons. Individuals disqualified from donating blood are known as "deferred" donors. A large number of blood donors are deferred each year and many of the temporarily deferred donors do not return to donate blood. The collection of blood only from voluntary, non-renumerated blood donors from low risk populations ensures the safety, quality, availability and accessibility of blood transfusion.

To make blood transfusion safe for the patients many safety measures are undertaken by the blood transfusion community [2] of the many safety measures, the most important is selection of blood donors. The rate and reasons of deferral differs from region to region and one centre to the other. To protect blood donors and recipients, stringent donor screening criteria are necessary. [3] Deferrals for whatever reason represent loss of time and effort for both potential donors and blood bank staff. This study was therefore conducted to analyze the rate and various reasons for donor deferral and find means to enhance voluntary, non-renumerated and safe blood donation.

## METHODS AND MATERIALS

The study included donors both voluntary and replacement who have donated blood for our hospital and voluntary donors from outdoor camps and mobile vans over a period of two years from January 2011 to December 2012. Each donor was selected by a blood transfusion officer based on detailed medical history and brief physical examination of donors with regard to haemoglobin, blood pressure, temperature, and pulse regularity and rate. Haemoglobin standard level for donor acceptance was 12.5gm/dl.(3) Detailed information on the donor deferral including the cause of deferral was recorded from the donor forms. Donors deferred were differentiated according to sex, age group, and whether deferral was temporary or permanent basis. Criteria laid down by Director General Health services and Drug's controller of India were strictly followed.

A retrospective analysis of records of the donors during this period was done, in order to find out the rate and causes of deferral in four categories of age groups, both in male and female, in our blood bank. The quantity of blood collected was 350 ml from donors who weighed above 45kg. Presenting blood donors were screened to ensure both their safety and that of the recipients of blood products. Donors with identified risks were deferred from donating blood either temporarily or permanently.

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## RESULTS

In this study, there were 2172 donors who came to donate blood, of which 163 donors were deferred (7.55%) for various reasons. Of the 2172 donors registered, 1985 (91.4%) were males and 187(8.6%) females. The deferral rate was about six times more for female (33.15%) compared to male (5.09%). Table 1 shows the total number of donors, number deferred, and percentage deferred both in male and female.

**Table 1. Distribution of blood donor deferral and sex**

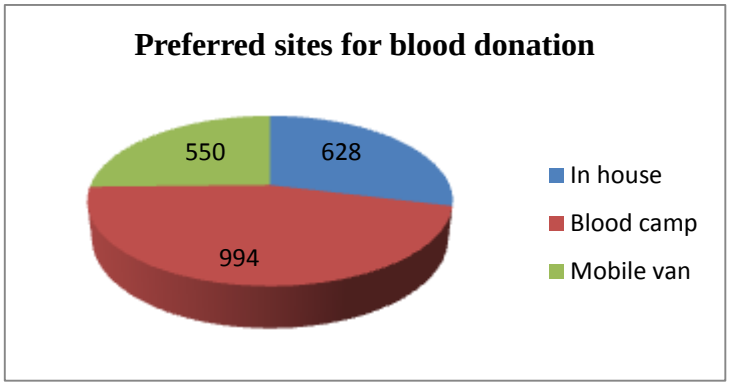
| Distribution of donor deferral and sex | | | |
|---|---|---|---|
| | Male | Female | Total |
| Number of donors | 1985(91.4%) | 187(8.6%) | 2172 |
| Number of deferred | 101 | 62 | 163 |
| % Deferred | 5.09% | 33.15% | 7.55% |

We studied the preferred sites for blood donation among the donors. This is shown in following Table 2 and Figure 1.

**Table 2. Preferred sites for blood donation among the donors**

| Distribution of blood donation site | | | | | |
|---|---|---|---|---|---|
| In house( blood bank) | | | Blood Camp | Mobile van | Total |
| Voluntary | | Replacement | | | |
| Number of donors | 548(87.26%) | 80(12.74%) | 994 | 550 | 2172 |
| | Total- 628 | | | | |

**Figure 1. Preferred sites for blood donation among the donors**




There were majority of donors from blood camps followed by indoor blood camp donation. Out of the 628 in-house donation, majority blood donation was voluntary 548(87.26%) with only 12.74% being replacement donation as seen in Figure 2.

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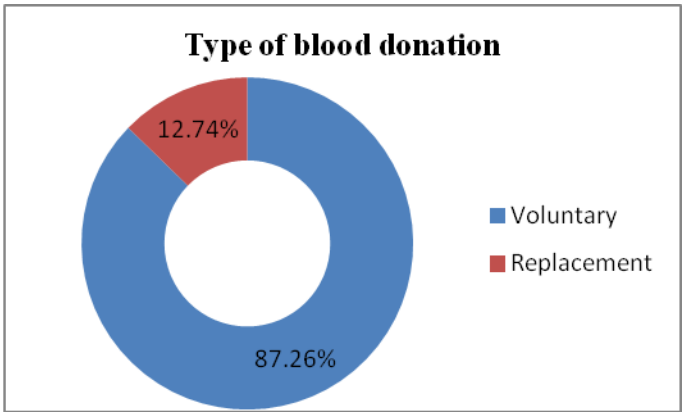
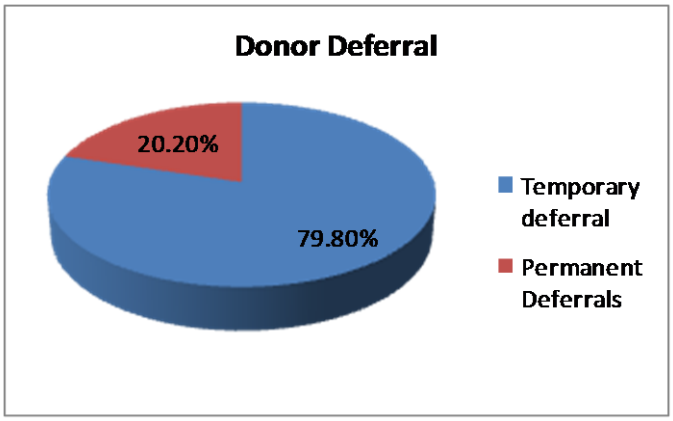
**Figure 2. Type of in-house blood donation**




As per the records the reasons for deferral are many as listed below. They are broadly differentiated into permanent and temporary. There were 130 (79.8%) temporary and 33 (20.2%) permanent deferrals out of 163 donors. This is shown in figure 3.

**Figure 3. Showing percentage of temporary and permanent donors**




It was observed that, the three most common reasons for deferral were low haemoglobin levels, hypertension and malaria. Due to high prevalence of anaemia in the female population, the leading reason for rejecting both the male and the female donors is low haemoglobin (Hb) levels (49.69%of all deferrals). High blood pressure (BP) is the second most common cause (9.20%) for rejecting the male donors followed by the history of malaria in recent past. The deferral rate was higher in the age group of 18-25 years and most common cause was low haemoglobin level.

We have also subdivided the age group into four categories, for both male and female, to find out which category of age donated blood more and in which age group the deferral rate is high. The reasons for rejecting the blood donors shown in table 3 by different age groups.

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**Table 3. Distribution of reasons for rejecting blood donors by sex and age**

| Distribution of deferral by age and sex | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Causes | 18-30 years | | 31-40years | | 41-50years | | 51-60 years | | Total | | Grand total |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | |
| Anaemia | 13 | 29 | 9 | 16 | 6 | 3 | 4 | 1 | 32 | 49 | 81(49.69%) |
| Hypertension | 0 | 0 | 5 | 0 | 6 | 1 | 3 | 0 | 14 | 1 | 15(9.20%) |
| History of Malaria | 7 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 8 | 2 | 10(6.13%) |
| History of drug intake | 4 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 6 | 2 | 8(4.9%) |
| Diabetes mellitus | 0 | 0 | 1 | 0 | 3 | 1 | 2 | 1 | 6 | 2 | 8(4.9%) |
| History of alcohol consumption | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7(4.29%) |
| Hepatitis | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 6(3.68%) |
| History of surgery | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5(3.06%) |
| Hypotension | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 (3.06%) |
| History of sexual exposure | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4(2.45%) |
| History of Fever | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 4(2.45%) |
| Underweight | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2(1.22%) |
| Others | 3 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 6 | 2 | 8(4.9%) |
| Total | 43 | 37 | 31 | 18 | 17 | 5 | 10 | 2 | 101 | 62 | 163 |

## DISCUSSION

Deferring or rejecting potential blood donors often leaves the person with negative feeling about themselves as well as loss to the blood bank inventory. In our study, there were 2172 donors who came to donate whole blood, of which 7.55% donors were deferred for various reasons. Such higher donor deferral rate (7-15%) was reported by Chaudhry, [4] Ranveet[5] and Blumberg. [6] The lowest reported rate of rejection was by Talonu T (4%) in Papua New Guinea.[7] Thus the deferral rate in our study and in several studies available in the literature is the same.

Causes of deferral were many and were broadly classified into temporary and permanent. There were more number of temporary deferral, constituting about 79.2% and permanent about 20.8%. Custer et al, reported 68.5% temporary and 31.5% permanent deferral. [8] Most blood donor deferrals are temporary and short-term. The most common causes for temporary and short-term deferral (STTD) in female were low haemoglobin level, low body weight, and hypotension and in males, it was low haemoglobin level. In a study by Halperin et al, the three most common STTD are low haemoglobin level, colds and/or sore throats, and elevated temperature, [9] whereas that by Ranveet et al, under-weight, under-age,

and low haemoglobin levels. [5] Hence, studies on donor deferral indicate that in each regions there would be unique sets of reasons.

Analysis of the deferrals showed that the top ten defined causes were: low haemoglobin level; raised blood pressure; history of malaria, recent ingestion of medication; being underweight; Hepatitis; recent history of measles, infections; tattoos or ear-piercing in the preceding six months and recent sexual exposure in high-risk activity. Low haemoglobin (49.69%) was commonest cause of deferral in both the male and the female donors. It has been reported that 97% of female deferrals were due to low haemoglobin. This is similar to the study done by Ranveet, [5] Halperin et al [9] and Rabeya Y et al. [10] Thus, the most common cause of deferral in our study and in these studies is also similar. It has also been suggested that haemoglobin standard be lowered to increase female eligibility and to offer iron treatment for premenopausal woman who want to donate or who are frequent donors. [10]

The second most common cause of predonation deferral was high Blood pressure (in about 9.20% donors), especially in males. High BP in some was diagnosed for first time, while rest were the cases of uncontrolled hypertension on medication. The systolic blood pressure should be between 100and180mm Hg and the diastolic pressure between 50 to 100mm Hg. [3] Prospective donors on regular antihypertensive therapy can get their BP checked by their family physician few days prior to the donation camp if they are aware of uncontrolled BP being a cause of temporary deferral. In our study, 3.06% donors were deferred due to low BP (Systolic blood pressure <100mm Hg).

India being an endemic area for malaria, many donors were rejected due to the history of malaria in recent past (6.13%). Intake of medication (4.9%) by donors was fourth cause. This included analgesics and antibiotics for which donor is deferred for few days, to drugs like anti-Koch's treatment for which donor is deferred for few years. [3]

Both drug ingestion and alcohol intake within last 24 hours, which lead to 4.9% and 4.29% of donor rejections in our study respectively, can also be easily avoidable. If a practice is made by the concerned blood bank to educate the main organizer or the organizing team of the blood camp as regards to some of the causes of the temporary deferrals, few days prior to the date of donation camp, we are sure the number of deferrals would definitely reduce. Donors suffering from cold, cough, and fever at the time of donation was a cause of deferral in 2.45% cases. This may be simple viral infection, which requires deferral of few days, or the cough may be of long duration and suggestive of tuberculosis (which is common in our country) requiring the donor to take medical advice, which leads to temporary deferral. [3] Such donors can be counselled to donate blood after treatment. This would be beneficial to both the blood donor as well to the blood bank inventory.

Under permanent deferral, hypertension was the most common cause of deferral (9.20%), followed by diabetes mellitus (4.9%) and hepatitis (3.68%). Two Indian studies report that history of jaundice was the most common cause of deferral in Lucknow [4] and Chandigarh [5]. It, being a permanent cause of deferral, can lead to tremendous loss in future blood

donation. It is important to provide donors with a clear message on their deferral status. Deferrals for whatever reason represent loss of time and effort for both potential donors and blood bank staff.

However, there are definite advantages of eliminating donors with possible risk of disease because despite the availability of sensitive screening tests to detect HIV infection, blood donors can be infected but test negative if they have been infected for a period of 6 weeks or less. [11] Deferring donors also protects the donors from possible adverse reactions and avoid consequent negative impact on the donor motivation. In USA blood centre approximately 83% of blood donors successfully donate, but 13% are rejected because of donor suitability issue. One percent is rejected for the positive test, which is often nonspecific or false positive and 2% to 4% of the phlebotomies are not successful. [12]

## CONCLUSION

In our study, the most common cause of temporary deferral in female donors is low haemoglobin levels followed by raised blood pressure; history of malaria, recent ingestion of medication; Hepatitis; recent history of alcohol intake, being underweight and infections. The information regarding selection criteria for blood donation if made available to prospective blood donors prior to the day of donation may help reduce deferrals. Also the deferred donors should be helped to overcome their problems so that they move out from the category of Non-donors to permanent donors. It is important to provide donors with a clear message on their deferral status. Increased public education on common causes of donor deferral may also lower deferral rates by allowing prospective donors to "pre-screen" themselves. By developing strategies to identify and rationalize donor selection criteria, the blood transfusion services should be able to decrease unnecessary deferrals. However, one-to-one medical screening and appropriate counselling are still the best means for accepting or deferring blood donors in our setting.

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