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# Study of Voluntary Blood Donors and Deferred Blood Donors- A Brief Review at the State of the Art Model Blood Bank, Guwahati, Assam

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**Abstract:** ***Blood donation is a very important life saving measure in current medical practice. At the same time, it also brings about a host of other complications like Transfusion Transmitted Infections, transfusion reactions, adverse donor reaction etc. In order to minimize such unwanted effects as well as to maintain blood safety in modern transfusion practice, it is important that donors and the collected blood or its products have to be screened thoroughly. It is simply when a prospective person is found to be unfit during first phase of counseling and medical examination is termed as deferral. It is important to know the pattern of deferral in a particular donor community so that donor screening can be more focused. The present study was carried out in State Of The Art Model Blood Bank, Gauhati Medical College and Hospital, (SOTAMBB, GMCH) , Guwahati, from 1st January 2015 till 31st December 2015, with the main aim of investigating the deferral rate and the main causes of deferral. Out of 29773 donors 3393 were deferred. The most common causes were low hemoglobin (<12.5gm/dl) high BP, alcohol intake within last 72hours, under weight (<45kgs.), under age (<18years), jaundice, recent blood donation etc.***

**Keywords:** blood donation, donor deferral

## 1. Introduction

Blood donation is a life saving procedure for many patients in current medical practise. The **"Ideal blood donor"** is a voluntary, regular, non remunerated, repeated donor— as this type of donor will have the lowest risk of having any infection that may be transmitted through transfusion of blood or blood products.[1]

However an important role of the blood bank is to ensure safe supply of blood and blood products in awesome manner which should be safe, effective, continuous, effortless, and timely as well as hassles free.

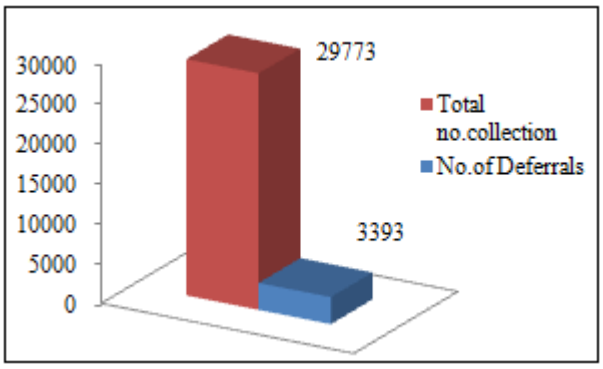
While it is important to ensure that there is an adequate supply of blood, it is also essential that the blood collection process does not harm either the donor or the recipient. This is achieved by having donor deferral criteria [2] and stringent screening of collected blood for possible Transfusion Transmissible Infections (TTIs) [3]

Blood donors are deferred for various reasons. Individuals disqualified from donating blood are known as **"deferred"** donors. To make blood transfusion safe for the patients many safety measures are undertaken by the blood transfusion community. Of the many safety measures, the most important is selection of blood donors. Thus it is important to select voluntary non- remunerated blood donors by adhering to strict criteria of donor deferral. Few studies have been undertaken to analyse the deferral pattern among blood donors in various parts of the country.[4,5,6.]

The present study is a retrospective study carried out in the State Of The Art Model Blood Bank, Gauhati Medical College and Hospital, Guwahati for a period of one year from 1st January 2015 till 31st December 2015 to analyze the pattern of deferral among blood donors attending our institution.

## 2. Materials and Methods

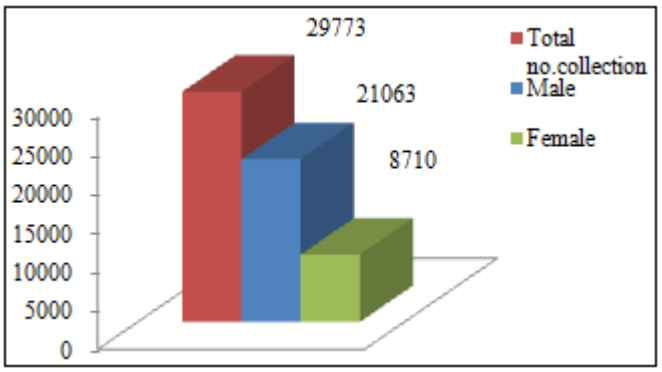
This study has been carried out in State Of The Art Model Blood Bank, Gauhati Medical College and Hospital, (SOTAMBB, GMCH) , Guwahati . This study embraces the total VNRDs (Voluntary, non remunerated, repeated donors), relative donors, familial donors as well as enthusiastic **"Pure voluntary blood donors"** who have been motivated by our donor motivation workshops or seminars or elsewhere recently. The period of study was 1st January 2015 till 31st December 2015. Total number of donors also included outdoor voluntary blood donor (VBD) camps organized at different socio-cultural organizations, local colleges, banks, insurance companies, Red Cross and other self help groups in the city in the urban and rural areas of Greater Guwahati. The population of Guwahati,(approx. 15 lakhs) by virtue of its nature, is a mixture of different socio-cultural, ethnic and diverse populated area where unity is still seen among diversity specially in case of voluntary blood donors.



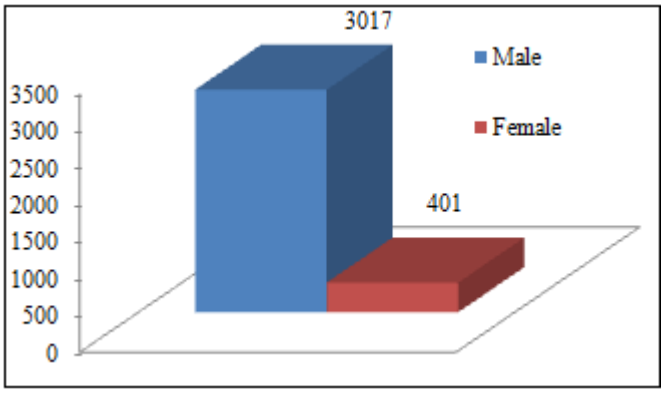

From the above Bar it can be clearly seen that deferrals was very small amount 3393 due to different reasons. Each donor was selected by a councillor then by a medical officer based on detailed medical history and brief physical examination of donors with regard to hemoglobin, blood pressure, temperature, and pulse regularity and rate as per guidelines and the SOP's; Standard operating procedure as described). Detailed information on the donor deferral including the cause of deferral was recorded in deferral register. 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 (DGHI) and Drug's Controller of India were strictly followed.

## 3. Results

The data of prospective donors registered in our blood centre and various blood donation camps were analyzed from the period January 2015 till December 2015. Out of a total of 29,773 blood donors, 21063 were males and 8710 were females. Males constituted 70.74% and females 29.26%.




Showing total collected male and female no. donors. And total deferrals were notice as 3393 no. which can be represented by bar as follows.




From the above tables it is clearly seen that Male (3017) was a dominating factor in general public for many reason deferrals. While a small no.401of females was deferred due various causes.(Other donor like family donor, relative donors were excluded here.)

| NO. OF DEFERRALS 2015 | | | | | |
|---|---|---|---|---|---|
| Month | no of deferral | Male | Female | R D | F D & V D |
| January | 236 | 210 | 36 | 152 | 84 |
| February | 233 | 221 | 12 | 160 | 73 |
| March | 87 | 81 | 6 | 66 | 21 |
| April | 179 | 154 | 25 | 110 | 69 |
| May | 231 | 155 | 81 | 170 | 61 |
| June | 278 | 258 | 20 | 190 | 88 |
| July | 403 | 366 | 37 | 320 | 83 |
| August | 437 | 391 | 46 | 340 | 97 |
| September | 407 | 363 | 44 | 310 | 97 |
| October | 250 | 221 | 29 | 160 | 90 |
| November | 420 | 375 | 45 | 320 | 100 |
| December | 232 | 222 | 20 | 180 | 52 |
| Total | 3393 | 3017 | 401 | 2478 | 915 |

Here RD –Relative donors, FD-Family Donors, VD-Voluntary donors.

Majority of the deferred donors were in the age range of 24 to 29 years as depicted in the table below.

| MONTH | AGE WISE DISTRIBUTION: | Range | Range | Range | Range | Range | Range | Range | Range |
|---|---|---|---|---|---|---|---|---|---|
| | <18 | 18-23 | 24-29 | 30-35 | 36-41 | 42-47 | 48-53 | 53-60 | >60 |
| JAN | 3 | 29 | 66 | 60 | 32 | 24 | 18 | 4 | |
| FEB | 1 | 22 | 58 | 51 | 46 | 26 | 22 | 5 | 2 |
| MAR | 1 | 19 | 28 | 23 | 8 | 3 | 2 | 3 | |
| APR | 4 | 25 | 45 | 32 | 22 | 22 | 15 | 12 | 2 |
| MAY | 3 | 27 | 67 | 59 | 25 | 26 | 19 | 5 | |
| JUN | 0 | 16 | 78 | 72 | 58 | 24 | 19 | 11 | 0 |
| JUL | 0 | 33 | 96 | 85 | 79 | 58 | 36 | 16 | |
| AUG | 1 | 40 | 109 | 92 | 75 | 61 | 37 | 21 | 1 |
| SEPT | 5 | 31 | 99 | 85 | 80 | 58 | 45 | 4 | |
| OCT | 0 | 17 | 76 | 56 | 55 | 32 | 12 | 2 | |
| NOV | 4 | 24 | 98 | 92 | 88 | 74 | 27 | 11 | 2 |
| DEC | 0 | 23 | 57 | 45 | 39 | 28 | 22 | 18 | 0 |
| TOTAL | 22 | 306 | 877 | 752 | 607 | 436 | 274 | 112 | 7 |

Out of the total no.of deferred donors (3393) a temporary male donors was 2599. Among them 580 no.were permanently deferred due to various reasons.

Out of total no.of female donor (794) a small group of 188 was permanently deferred while 606 no. temporary deferrals.
Family replacement donors constitute huge no.of the entire donor population; the remainders were voluntary non-remunerated donors.

Within the period under review, 3393 donors representing a temporary deferrals no.of donor which is just over $1/10^{th}$ of the entire donor population were deferred from donation for various reasons.

The total number of male donors and female donors who were deferred was (including family and relative donors) so total no. 2599 (76.5%) and 794 (23.4%) respectively. Overall donor deferral rate was 11.39%.

| Sex wise deferral: | Total | Total |
|---|---|---|
| Month | Male | Female |
| January | 151 | 85 |
| February | 140 | 93 |
| March | 68 | 19 |
| April | 136 | 43 |
| May | 189 | 42 |
| June | 201 | 77 |
| July | 365 | 38 |
| August | 379 | 58 |
| September | 296 | 111 |
| October | 165 | 85 |
| November | 321 | 99 |
| December | 188 | 44 |
| 3393 | 2599 | 794 |

Analysis of the deferrals showed that the temporary deferral was more common than permanent deferral. As per records, the reasons for deferrals are many as listed below. They are broadly differentiated into permanent and temporary. There were more numbers of permanent deferrals in case of male donors as compared to female donors. It was also clearly observed in most of the cases that females were particularly deferred due to anemia.

Anemia is still a public health problem in the north east. According to the NHFS 3 report there are 72.6% anemic women in Assam alone[7].

Next common cause of deferral is low BP in case of female donors, followed by low body weight as well as different chronic medical and gynaecological health problems under treatment. Other causes for deferral which were encountered during our study are uncontrolled hypertension, respiratory problems, URTI, bronchitis etc.

It was observed that in our hospital setup, low Hemoglobin and anemia is the single most important cause of deferral in female donors. In comparison most of the males were rejected due to high blood pressure (with or without medication) followed by alcohol intake within last 72 hours, the latter being more common during festive season.

Less common causes included menstrual irregularity, icteric donor with or without organomegaly, donors with previous history of surgery, Diabetic donors on insulin or OHAs, History of recent blood transfusion, history of bronchial asthma, skin problems like psoriasis, fungal infection, endocrinal and renal problems.

Another important and common cause of deferral in both sexes was low body weight with respect to standard age and sex of the individual. Generalized malnourishment was also a common cause of deferral.

We also encountered few cases of deferred donors due to chronic allergic rhinitis with sinusitis and donors with previous history of hemoglobinopathy.

Reasons for deferral are depicted in the tables.

| Causes of Deferrals | High BP | Low BP | Alcohol intake | Low Hb | Skin infection | Under Age | Over Age | ↓Wt | Allergy | Donation within 3 months |
|---|---|---|---|---|---|---|---|---|---|---|
| Jan/15 | 73 | 34 | 54 | 29 | 12 | 3 | | 8 | 10 | |
| Feb/15 | 71 | 46 | 53 | 13 | 9 | 1 | 2 | 15 | 3 | |
| Mar/15 | 24 | 14 | 22 | 9 | 4 | 1 | | 4 | 1 | |
| Apr/15 | 45 | 32 | 65 | 10 | 11 | 4 | 2 | 5 | 0 | |
| May/15 | 66 | 46 | 52 | 15 | 9 | 3 | | 10 | 7 | |
| June/15 | 85 | 39 | 64 | 12 | 15 | 0 | 0 | 23 | 16 | |
| July/15 | 112 | 87 | 98 | 23 | 15 | 0 | 0 | 14 | 10 | |
| Aug/15 | 106 | 88 | 98 | 21 | 18 | 1 | 1 | 28 | 32 | |
| Sep/15 | 121 | 82 | 130 | 27 | 15 | 5 | 0 | 8 | 5 | |
| Oct/15 | 63 | 46 | 75 | 12 | 10 | 0 | 0 | 10 | 15 | |
| Nov/15 | 108 | 83 | 110 | 41 | 21 | 4 | 2 | 16 | 10 | |
| Dec/15 | 54 | 45 | 68 | 10 | 15 | 0 | 0 | 10 | 7 | |
| Total | 928 | 642 | 889 | 222 | 154 | 22 | 7 | 151 | 116 | |

## 4. Discussion

Various types of reasons were observed while rejecting/ deferring donors in outdoor VBD camps and in house collection. Donor deferral is an appropriate solution for potential future donors because it avoids the unwanted physical mental dilemma and adverse donor reactions which might have happened, had they not been deferred. It also avoids non compliance to repeated voluntary donation in

such donors. Also it has an added benefit of saving precious resources and manpower.

Definite advantage of eliminating donors with possible risk of disease lies in the fact that despite availability of very sensitive and specific screening laboratory tests to detect various TTIs like HIV, even test negative donors can infect the recipient of such blood units if they have been infected for a period of six weeks or less.[8.]

Donor deferral rate (11.39%) in our study was similar to various American, European and Asian studies. Zou et al. [9] 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. [14] reported 9% in Delhi (India). Rabeya et al. [15] found a very low deferral rate in their study (5.6%) which could be due to different donor selection criteria.

## 5. Conclusion

The most common cause of female temporary deferral s were low Hb% and anemia. It is popular belief that male are not anemic however in our setting it was seen that males also suffer from anemia due to various causes. Among males the most common cause of deferral was high blood pressure followed by alcohol intake within 72 hours as a close second. Temporary deferrals were more common than permanent deferrals. Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening especially of those who are having higher frequency.

Rationalizing the donor selection criteria has had a positive impact on reducing potential transmission of infection. Proper counseling is now full swing and standard procedure of NBTC/DGHS, New Delhi is carried out in all NACO supported blood banks all throughout the state of Assam. E-Blood Banking is a recent Endeavour by the Assam State AIDS Control Society, which has been introduced in our state recently.

Deferred donors should be motivated to overcome negative mental and psychological trauma and encouraged to become future well prepared healthy donors. We follow standard counseling and training procedures and reassure temporary donors about safety of blood donation so that they may be willing to be future healthy repeat donor. Good correspondence and communication is maintained with the deferred donors so as to maintain the donor pool for the State of the art model blood bank as and when necessary.

Permanently deferred donors are provided with proper counseling and the family and relatives of the patient are also counseled regarding possible risks of unsafe blood donation and benefit of seeking another voluntary donor.

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

**Conflict of interest:** None

## 6. Author Declaration

It is to be declared that the study was conducted in GMCH, Guwahati and all liabilities pertaining to claims relating to the content of the article will be borne by the author

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