|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
*Index Copernicus Value 2018: 75.71*
Original Research Article
Volume 3, Issue 8; August: 2019; Page No. 41-46

# TO ANALYSE THE DEFERRAL INCIDENCE AND ITS PATTERN AMONG THE BLOOD DONORS IN A TERTIARY CARE CENTRE IN NORTH INDIA.

**Dr. Surbhi Jain[1], Dr. Parveen Rana[2], Dr. Kulwant Singh[2], Dr. Swaran Kaur[3], Mr. Vaibhav Kundu[4], Dr. Sanjay Verma[5]**

[1]Post Graduate 3rd year, Department of Pathology, BPSGMC for Women, Khanpur Kalan, Dist.Sonipat, Haryana
[2]MD Pathology, Associate Professor, Department of Pathology, BPSGMC for Women, Khanpur Kalan, Dist. Sonipat, Haryana
[3]Professor & Head, Department of Pathology, BPSGMC for Women, Khanpur Kalan, Dist. Sonipat, Haryana, PIN-
[4]B.Tech Nano Technology
[5]Medical Officer, Blood Bank, Sonipat, Haryana

**Article Info:** Received 28 June 2019; Accepted 30 July. 2019
**DOI: https://doi.org/10.32553/ijmbs.v3i8.445**
**Address for Correspondence**: Dr. Parveen Rana, Associate Professor, Department of Pathology, Bhagat Phool Singh, G.M.C. For Women, Khanpur Kalan, Sonepat, Haryana- 124305
**Conflict of interest:** No conflict of interest.

**Abstract**

Background: Blood donor programme is vital to any transfusion service. This process of blood donation involves voluntary and non remunerated blood donors. The objective of donor screening is to minimize the chances of transmitting infectious agents to recipients.

Material and Method: The study was conducted during one year duration from 2017-2018. A total of 700 donors are deferred against 9556 blood donors recruited on the basis of clinical history and brief medical examination in blood bank and voluntary blood donation camps. Donors were deferred temporarily or permanently.

Result: Out of 700 deferred donors; 546 were voluntary and 154 were replacement blood donors. Male (601) outnumbered female (99). There were 682 temporary and 18 permanent deferral. Most common age group for deferral was 17-30 yrs (490). Common causes included anemia(142), on medication(108), underweight(83) and high blood pressure(72).

Conclusion: Donor selection process is a most important preliminary step in blood banking and should follow stringent medical and regulatory rules. Studying and analysing the profile of blood donors will help to identify sections of the population which could be targeted to increase the pool of voluntary blood donors. Every attempt should be made to decrease the donor deferral keeping in view the safety of both donor and recipients.

**Keywords:** Blood donor, Deferral, Voluntary, Temporary, Permanent.

## Introduction:

Blood donor programme is vital to any transfusion service.[1] This process of blood donation involves voluntary and non remunerated blood donors. The objective of donor screening is to minimize the chances of transmitting infectious agents to recipients.

Types of Blood Donor[2]

- Voluntary non-remunerated blood donor
- Family/replacement blood donor
- .Professional/Paid donor
- Autologous donor

Individuals disqualified from donating blood are known as “deferred” donors. A prospective donor may be deferred at any point during collection and testing process. Whether or not a person is deferred, temporarily or permanently, will depend on the specific reason for disqualification. Blood donors can be deferred temporarily and permanently.

Temporary donor deferral is used to protect recipients of blood from possible infectious disease exposure or is used to protect donors, if health parameters such as haematocrit or haemoglobin, blood pressure, pulse, temperature are not within acceptable values. Temporary deferral is known to be non-specific, the majority of donors who receive

temporary deferrals are unlikely to pose a threat to the safety of transfusion.[3]

Permanent deferral of donors can be done in cases with history of chronic diseases like hypertension with heart disease, diabetes mellitus on Insulin, epilepsy, thyroid and renal diseases. Other causes can be jaundice with suspected hepatitis B and C infection, high risk sexual behaviour.[4]

Nodal agencies like the National AIDS Control Organization (NACO) and the State Blood Transfusion Councils (SBTCs) do not actively collect data on donor deferrals. Their formats for data collection are more inclined toward "quantity" of supply and deferrals due solely to infectious marker positivity in donated units. As a result, most of the efforts at government, community, and individual level are focused at recruiting more and more new donors while ignoring the retention and re-entry of those recruited but deferred due to various causes. This can be achieved by analysing the reason of these deferrals amongst blood donors, addressing the issue and ameliorating the cause if possible.[5]

Nonetheless criteria for these deferrals and their implementation strongly influence the quality of blood supply in a population. Thus proper selection and screening of donors plays a major role in safe blood transfusion.[6]

Therefore, the main objective of the study is to identify the main causes of pre-donation deferral and to novitiate healthy volunteer donors.

**MATERIAL AND METHOD:**

Study was conducted on blood donors (voluntary/ replacement/autologus), came for donating blood at our blood bank and voluntary blood donation camps organized by Bhagat Phool Singh Government Medical College (women), Khanpur Kalan, Sonepat, during year 2017-2018. The donor selection was done by pre-donation screening tests like, health-related questionnaire followed by general physical examination and haemoglobin estimation. The cut off for haemoglobin was set as 12.5g/dl for females and 13.5g/dl for males.[2] Systolic blood pressure between 100 and 140 mmHg and diastolic blood pressure between 60 and 90 mmHg alone was accepted for blood donation.[2] A normal pulse rate of 60–100 per minute and a regular rhythm were indicators of good health.[2] The body temperature of donor should be 37.6°C.[2] After the screening, deferred cases were recorded in the blood donor deferral proforma and analysed according to age, sex, residence, type of donor and causes for deferral which were also categorised into permanent and temporary causes based on the curability of the condition.

**RESULTS:**

Out of total 9556 registered blood donors 700 were deferred. During one year study period total 9340 male and 216 female donors turned up in our institute and blood camps, out of which 601 males and 99 females were deferred, constituting a deferral rate of 6.43% and 45.88% respectively which clearly indicates that female donors (45.88%) were deferred more frequently than male donors (6.43%)[Table-1]. Age category was divided into 4 groups; 18-30, 31-40, 41-50 and 51-60 years. Deferred donor age group ranged from 17 to 58 years with a mean age of 27.3 ± 9.36 years. Deferral rate was highest among 18-30 years age group 490 cases (70.00%) followed by 31-40 years 125 cases (17.86%), 41-50 years 71 cases (10.14%) and 51-60 years 14 cases (2.00%). In our study, voluntary donation was significantly higher than the replacement donation (78% vs. 22%) and none of the autologous donor was reported at the centre [Table-2]. As our institute caters mainly rural population, therefore we compared the donors coming from rural and urban areas of state. There was not much difference, but urban donors were deferred more than rural donors (52.86% vs. 47.14%). However, there was no other study that did this comparison[Table-3].

A temporary deferral rate of 682 cases (97.43%) and permanent deferral rate of 18 cases (2.57%) was recorded. The predominant causes of temporary deferral in present study were the presence of low haemoglobin concentration, in 142 cases (20.82%) followed by donors on medication 108 cases (15.84%), underweight 83 cases (12.17%) and hypertension 72 cases (10.56%), respectively.[Table-4] Out of total 18 permanently deferred donors maximum were having Heart Disease/ Renal Disease/Thyroid Disease (61.11%), followed by HIV/HBsAg/HCV positive(16.66%) [Table-5]

**Table 1: SEX- WISE DISTRIBUTION OF TYPE OF DEFERRED CASES**

| | | Type of deferral | | Total no. of cases (*n*=700) |
|---|---|---|---|---|
| | | Permanent (%) | Temporary (%) | |
| SEX | Female | 1 (1.01%) | 98 (98.99%) | 99 (100.00%) |
| | Male | 17 (2.83%) | 584 (97.17%) | 601 (100.00%) |
| Total no. of cases (*n*=700) | | 18 (2.57%) | 682 (97.43%) | 700 (100.00%) |

Out of 700 cases 97.17% males were deferred temporarily and 2.83% were deferred permanently. Only 1% females were deferred permanently.

**Table 2: AGE GROUP WISE DISTRIBUTION OF DIFFERENT TYPES OF DONORS**

| Age Group | Type of donors | | |
|---|---|---|---|
| | Voluntary(%) | Replacement(%) | Autologous(%) |
| 17-30 years | 455 (83.33%) | 35 (22.72%) | 0 (0.0%) |
| 31-40 years | 73 (13.36%) | 52 (33.76%) | 0 (0.0%) |
| 41-50 years | 15 (2.74%) | 56 (36.36%) | 0 (0.0%) |
| 51-60 years | 3 (0.54%) | 11 (7.14%) | 0 (0.0%) |
| Total | 546 (100.00%) | 154 (100.00%) | 0 (0.0%) |

Out of total 700 deferred donors maximum voluntary donors were of age group 17-30 yrs (83.33%) and maximum replacement donors were of age group 41-50 yrs(36.36%).

**Table 3: RESIDENCE- WISE DISTRIBUTION OF CASES**

| Residence | No. of cases (*n*=700) | Percentage(%) |
|---|---|---|
| Rural | 330 | 47.14% |
| Urban | 370 | 52.86% |
| Total | 700 | 100.00% |

There was not much of difference in rural and urban deferred donors. However, urban outnumbered rural with 52.86%.

**Table 4: CAUSES OF TEMPORARY DEFERRAL**

| Causes | No. of cases (*n*=682) | Percentage(%) |
|---|---|---|
| Anemia | 142 | 20.82% |
| Underage | 39 | 5.72% |
| Underweight | 83 | 12.17% |
| Early donation | 20 | 2.93% |
| Alcohol Intake | 40 | 5.87% |
| On medication | 108 | 15.84% |
| Fever and Infections | 24 | 3.52% |
| Typhoid | 10 | 1.47% |
| Dengue | 24 | 3.52% |
| Hypertension | 72 | 10.56% |
| Malaria | 8 | 1.17% |
| Chickenpox | 4 | 0.59% |
| Minor Surgery | 6 | 0.88% |
| Major surgery | 8 | 1.17% |
| Miscellaneous | 94 | 13.78% |
| Total | 682 | 100.00% |

Out of 682 temporarily deferred cases maximum cases were anemic(20.82%) followed by those on medication(15.84%) and hypertension(10.52%). This was further followed by underweight donors, those taking alcohol and having dengue and other infections.

**Table 5: CAUSES OF PERMANENT DEFERRAL**

| Causes | No. of cases (*n*=18) | Percentage(%) |
|---|---|---|
| HIV/HBsAg/HCV | 3 | 16.66% |
| Heart Disease/ Renal Disease/Thyroid Disease. | 11 | 61.11% |
| CNS diseases | 1 | 5.55% |
| Varicose Veins | 2 | 11.11% |
| Organ Transplant | 1 | 5.55% |
| Total | 18 | 100.00% |

Out of total 18 permanently deferred donors maximum were having Heart Disease/ Renal Disease/Thyroid Disease (61.11%), followed by HIV/HBsAg/HCV positive(16.66%).

**DISCUSSION:**

The theme of world blood donor day for the year 2015 is "Thank you for saving my life." World Blood Donor Day is celebrated every year on 14th of June as it is birth anniversary of Sir Karl Landsteiner born in 1868. This event celebration was first started in the year 2004 aiming to raise the public awareness about the need for safe blood donation. National and International efforts are on to ensure safe blood supply through screening education.

The overall deferral rate in our study was 7.3% which was slightly higher in comparison to other reported Indian studies by Sundar et al[7] (5.84%), Unnikrishnan et al[8] (5.2%), Sharma et al[9] (5.1%), and Malaysian study by Rabeya et al[10] (5.6%). Jethani et al[11] reported voluntary donation of 83.68%, whereas Kulkarni109 reported voluntary donation of 83%. In our study, voluntary donation was significantly higher than the replacement donation (78% vs. 22%).

Most of the deferred donors (70.00%) were in age group of 18-30 years which was less compared to studies done by Bahadur et al[12] (89.7%) and Kulkarni et al[13] (74.33%), but much higher than Kumari et al[14] (59.7 %) and Kumar et al[15] (37.64%). This highlights the fact that a sizeable proportion of youth in this part of the world are malnourished, reflecting the impact of low-socioeconomic status on the health of Indian youth.

During one year study period total 9340 male and 216 female donors turned up in our institute and blood camps, out of which 601 males and 99 females were deferred, constituting a deferral rate of 6.43% and 45.88% respectively which clearly indicates that female donors (45.88%) were deferred more frequently than male donors (6.43%). This report was consistent with other Indian studies like Chauhan et al[16] which showed that women donors (63.15%) had deferred more frequently than men donors (3.41%) and Gaajre et al[17] in which percentage of deferral among a total number of registered males and females were 6.14 % (613/9981) and 16.0 % (225/1405) respectively. So significantly higher percentage of females were deferred as compared to males.

As our institute caters mainly rural population, therefore we compared the donors coming from rural and urban areas of state. There was not much difference, but urban donors were deferred more than rural donors (52.86% vs. 47.14%). However, there was no other study that did this comparison.

This study recorded a temporary deferral rate of 97.43%; which is exactly same as reported by Taneja et al[18] but much higher than that of Aneke et al[19] (29.24%) in India and Kagu et al[20] (17.7%) in Nigeria. The predominant predictors of temporary deferral in present study were the presence of low haemoglobin concentration (20.82%) followed by donors on medication (15.84%), underweight (12.17%) and hypertension (10.56%), respectively. Also, according to our study low haemoglobin levels were highest in young age group of 18-30 years which include 115/142(23.47%). Several studies indicating this finding are Birjandi et al[21] (21.4%), Chauhan et al[16] (24.11%). Chenna et al[22] reported highest of all with 48.7%. Next commonest reasons for temporary deferral was donors on medication (15.84%), underweight (12.17%) and hypertension (10.56%). These findings are completely in sync with other

Asian studies. Chauhan et al[16] reported 16.31% of deferral due to medication which was equal to our study. Birjandi et al[21] reported 23.3%, Gaajre et al[17] reported 13.6% but Chenna et al[22] reported 4.1% and Girish C J et al[23] reported 5.91% which was much lower than our study.

Permanent deferral occurred at the rate of 2.57% in this study; this is lower than reported among Indian prospective donors. Taneja et al[18] reported 3.55% and Aneke et al[19] reported 3.26% of permanent deferral, both are slightly higher than our study. According to our study the predominant reason for deferral was heart/renal/thyroid disease (61.11%) followed by HIV/HBsAg/HCV positivity (16.66%). Bahadur et al[12] and Jethani et al[11] (70%) also reported hypertension as the commonest cause. However, Taneja et al and Aneke et al reported HIV/HBsAg/HCV positivity as their commonest reason for permanent deferral with 51.9% and 90.0% respectively, followed by hypertension, epilepsy and syphilis. Single patient of epilepsy and organ transplant each, was recorded in our study.

**CONCLUSION:**

It is seen that the deferral data is not generally recorded and reported to policy makers. If collected and studied in a systematic way it will definitely improve the quality and quantity of blood collection from prospective blood donors. Different causes of deferral seen in different sex, age group and locality are of great significance. Among temporary causes for deferral, anaemia and low weight emerges as the two most common reasons in both sexes, and this can be easily improved by counselling and providing them a proper amount of nutritious supplement. The older blood donors show the high tendency for hypertension and diabetes mellitus, so they must be screened stringently before blood donation and must be followed-up thereafter.

Hence studying and analysing the profile of blood donors will help to identify sections of the population which could be targeted to increase the pool of voluntary blood donors. This can provide the essential database for framing and modulating policies which will enhance modern blood transfusion service and programme implementation.

**REFERENCES:**


1. Lauren BL, Harold CS and Michael AS. HIV and the Blood Supply: An Analysis of Crisis Decision making: Editors, National Academy Press 2101 Constitution Avenue, N.W. Washington, D.C. 20418; 1995: 1-2.
2. Blood donor selection: WHO guidelines on assessing donor suitability for blood donation, 2012: 16-7, 42-4, 53-4, 56, 58-9, 91.
3. Custer B, Schlumpf KS, Wright D, Simon T, Wilkinson S, Ness P. Donor Return Following Temporary Deferral. Transfusion. 2011; 51(6):1188-96.
4. Vasudev R, Kaur S, Kumar A, Singh B, Paul N, Rampal U et al. Pre-Donation Deferral a Single Centre Experience. J Blood Disord Transfus. 2016; 7: 356.
5. Agnihotri N. Whole blood donor deferral analysis at a centre in Western India. Asian J Transfus Sci. 2010; 4:116–22.
6. Ikram N and Hassan K. Transfusion practices-Pakistani Scenario. Int J Pathology 2004; 291: 1-4.
7. Sundar P, Sangeetha SK, Seema DM, Marimuthu P, Shivanna N. Pre-donation deferral of blood donors in South Indian set-up: An analysis. Asian J Transfus Sci. 2010; 4:112– 5.
8. Unnikrishnan B, Rao P, Kumar N, Ganti S, Prasad R, Amarnath A, et al. Profile of blood donors and reasons for deferral in coastal South India. Australas Med J 2011; 4:379-85.
9. Sharma T, Singh B, Bhatt GC. Profile of deferral of blood donors in regional blood transfusion center in North India. Asian J Transfus Sci. 2013; 7:163–4.
10. Rabeya Y, Rapiaah M, Rosline H, Ahmed SA, Zaidah WA, Roshan TM. Blood predonation deferrals-a teaching hospital experience. Southeast Asian J Trop Med Public Health. 2008; 39(3):571–4.
11. Jethani N, Goyal V, Pachori G, Agrawal S, Kasliwal N, Ali G. Analysis of predonation blood donor deferral characteristics in Ajmer (Rajasthan) region. Int J Med Sci Public Health. 2016; 5:2435-42.
12. Bahadur S, Jain S, Goel RK, Pahuja S, Jain M. Analysis of blood donor deferral characteristics in Delhi, India. Southeast Asian J Trop Med Public Health. 2009; 40(5):1087– 91
13. Kulkarni N. Analysis of donor deferral in blood donors. J Evol Med Dental Sci. 2012; 1(6):1081–7.
14. Kumari S. Retrospective analysis of reasons for pre donation deferral – a successful key to modify blood donor recruitment strategies. Int J Cur Res Rev. 2015; 7(10):25-34.
15. Kumar A, Prajapati S, Sharma SM, Ingole NS, Gangane N. Impact of counselling on temporarily deferred blood donor. Int J Med Sci Public Health. 2014; 4(4).
16. Chauhan DN, Desai KN, Trivedi HJ, Agnihotri AS. Evaluation of blood donor deferral causes: a tertiary-care center-based study. Int J Med Sci Public Health. 2015;4(3)
17. Gaajre AV, Khatib Y, Patel R, Oraon AP. Evaluation of The Causes of Deferral Among Blood Donors: A Retrospective Study. Ann Natl Acad Med Sci. 2016; 245-8.

**18.** Taneja K, Bhardwaj K, Arora S, Agarwal A. Analysis of the reasons for deferral of prospective blood donors in a Tertiary Care Hospital in North India. J Appl Hematol 2015; 6:154-6.

**19.** Aneke CJ, Ezeh UT, Nwosu AG, Anumba EC. Retrospective evaluation of prospective blood donor deferral in a tertiary hospital-based blood bank in South-East Nigeria. J Med Trop. 2016; 18:103-7.

**20.** Kagu MB, Ahmed SG, Bashir MA, et al. Deferral patterns of voluntary blood donors at the National Blood Transfusion Service, North East Zonal Centre, Maiduguri. Afr J Med Med Sci. 2010; 39:119–25.

**21.** Birjandi F, Gharehbaghian A, Delavari A, Rezaie N, Maghsudlu M. Blood donor deferral pattern in Iran. Arch Iran Med. 2013; 16(11): 657 – 60.

**22.** Chenna D, Shastry S, Murugesan M, Baliga PB. Implication of deferral pattern on the donor pool: Study at a Tertiary Care Hospital. J Appl Hematol. 2015; 6:111-4.

**23.** Girish CJ, ChandrasheKhar TN, Ramesh BK, KanTiKar SM. Pre-Donation Deferral of Whole Blood Donors in District Transfusion Centre. Journal of Clinical and Diagnostic Research (JCDR). 2012; 6(1):47-50.