# PROFILE OF BLOOD DONOR DEFERRALS IN A TERTIARY CARE CENTRE- OUR INSTITUTIONAL EXPERIENCE


## ABSTRACT

**BACKGROUND:** It is the prime duty of transfusion services to provide safe, adequate and timely need of blood and the blood products. Understanding the reasons for donor deferral can help in planning more efficient recruitment strategies and educate and motivate temporarily deferred donors in order to maintain a safe and adequate supply of blood products. **AIMS OF THE STUDY:** To evaluate and analyze the blood donor deferral pattern in a tertiary care hospital blood bank and to review its influence on blood safety. **METHODOLOGY:** This retrospective study was conducted in the blood bank, CHRI from the year January 2015 to December 2018. Data like demographic data, clinical history, physical examination, haematological examination, stored in the blood bank was retrived. The donors will be deferred based on standard WHO guidelines. The collected deferral data was analyzed using SPSS software 2011version 20. **RESULTS:** During the study period there were 7010 registered blood donors. The deferral rate was 5.19%. Among the donor deferrals, females were more commonly deferred ie 31.66%. The deferral rate among voluntary and replacement donors are 4.71% and 11.62% respectively. The rate of permanent deferral (17.86%) was less compared to temporary deferral (82.14%). Among temporary deferral anaemia is the most common cause (27.75%). Seropositive for Hepatitis B is the most common cause for permenant deferral (52.30%). **CONCLUSION:** In our study temporary deferral is higher this necessities the need of education, motivation of these donors for future donation to maintain a healthy and safe donor pool.



***KEYWORDS:*** *Blood donors, deferral, temporary, permanent*


**INTRODUCTION**: The National AIDS Control Organization's (NACO) figures reveal that in India approximately 7.4 million units are donated annually, but the requirement is more than10 million units [1]. This portrays the blood requirement in our country and more important is to have a safe supply of blood at a reasonable cost. For this purpose it is essential to maintain a healthy pool of voluntary donors. WHO Global Database reveals approximately 1.6 million units were redundant due to variable reasons. Not only this around 13 million blood donors were deferred due to high risk behavior, anemia or a preexisting medical disease [2]. Of the 88.2 million blood donations, 83.3% were donated by voluntary non-remunerated donors, 16.4% by replacement donors, and only by 0.3% as paid donors [3]. The deferral rates varied extensively among countries, ranging from less than 1% to 37% and the median rate of deferral was 12% [3]. Blood donor selection procedure is the cornerstone for safety transfusion practices it perceives to safeguard ~~of~~ the health of not only the recipients but also the donors [4]. All the deferred donors are anticipated to be treated with due respect, care and confidentiality. They should be given a proper and crystal clear explanation for the deferral reason and their doubts should be cleared appropriately. By doing this we are educating and motivating the temporarily deferred donors so that they donate in future.

**AIMS AND OBJECTIVE:** To evaluate and analyze the blood donor deferral pattern and its causes among blood donors in a tertiary care hospital blood bank and to review its influence on blood safety.

**MATERIALS AND METHODS:** The present study was a retrospective study conducted in the blood bank of Chettinad hospital & research institute. All the recorded data about the blood donors from January 2015- December 2018 for a period of 3 years were retrieved. Details about donors like demographic data, clinical history, physical examination, hematological examination, vitals were retrieved from the data stored in the blood bank. Institutional ethical clearance was obtained before the commencement of the study (745/IHEC/12-19). In our institute, we follow WHO guidelines for donor deferral. Blood donors were grouped as either fit or unfit donors. Predonation and postdonation deferral data were collected and analyzed. Predonation deferral was based on a standard questionnaire and physical examination including weight, pulse rate, blood pressure, and measurement of hemoglobulin concentration. In our blood bank, hemoglobulin estimation was by specific gravity method. In terms of blood pressure systolic pressure ranging from 100-140mm of Hg and diastolic pressure ranging from 60-90mm of Hg were considered fit for blood donation. Postdonation deferral was based on screening testing of blood for TTI. ELISA was done for HIV, HBV and HCV. VDRL was done for testing Syphilis. Card test was done for Malaria. The donors were explained the process of blood donation by our staff clearly and adequately before the donation process. The statistics were done using SPSS software 2011 version 20. The values were expressed as frequency and percentage

**RESULTS:** During the 3 year study period there were 7010 registered blood donors. Among them 6701 (95.59%) donated blood. Predonation deferral was 309 (4.41%) and postdonation deferral was 55. Totally 364 were deferred (5.19%) [Table1]. Male donors were more common ie 99.13% ~~were male donors~~. Voluntary donors were more common accounting for 89.59% [Table2]. Among the donor deferrals, females were more commonly deferred in our study ie 31.66%. The deferral rate among voluntary and replacement donors is 4.71% and 11.62% respectively [Table3]. The rate of permanent deferral (17.86%) was less compared to temporary deferral (82.14%). Among temporary deferral Anemia is the most common cause (27.75%) [Table5]. Seropositive for Hepatitis B is the most common cause for permanent deferral (52.30%) [Table 4].

**DISCUSSION:** Blood transfusion service is an essential part of the health care system. As per WHO, the minimum requirement to meet a nation's essential blood requirements is taken generally as donation of blood by 1% of its population. But usually the requirements are much higher in countries which have advanced health care systems [5]. According to Siromani et al our nation's blood requirement is calculated as 8.5 to10 million units/year, but the supply is only 7.4 million units/year [6]. Individuals who approach blood banks intending to donate blood believe them as fit and healthy donors but it is the sole duty of the blood bank to screen them completely and if needed to defer them either temporarily or permanently. This not only aids us to maintain a healthy and safe donor pool but also to safeguard the health of both donors and recipients. To sustain safe, adequate blood at a reasonable cost we have to educate and motivate temporarily deferred donors for future blood donation. ~~This study is aimed to study the deferral causes and patterns in a tertiary teaching hospital.~~ The present study is a retrospective study conducted in the blood bank of Chettinad hospital & research institute. All the recorded data about the blood donation from January 2015- December 2018 for a period of 3 years were retrieved. During the 3 year study period there were 7010 registered blood donors. Among them 6701 (95.59%) donated blood. The rate of deferral in our study is 5.19% and it is lower than most other studies. Most of the Indian and international studies have reported deferral rate ranging from 5% to 24% [7]. In Tufail et al (Pakistan) study the rate is much higher 13.58% [8]. In Henshaw et al (Nigeria) study the deferral rate is 8.69% [9]. Laila et al in their study (Dubai) had a higher deferral rate ie 19.4% [10]. In Singh P et al study (Uttar Pradesh) the deferral rate is 16.4% [11]. The deferral rate in Chauhan et al study (Uttarpradesh) is

comparable to our study which is 5.56% [12]. In Harjot Kaur et al study (Punjab) the deferral rate is 6.99% [13]. A similar deferral rate is seen in Chenna et al study (Karnataka) 5.6% [14]. Vimal et al study (South India) show the deferral rate as 14.87% which is very much higher than our study [15]. In Nagarekha study (Karnataka) the deferral rate is only 4.27% [16]. In Unnikrishnan et al (Mangalore) the deferral rate is 5.2% [17]. The difference in deferral could be attributed due to difference in socioeconomic status, culture and the deferral criteria prevailing in various areas. In our study males were more common registered donors but the deferral rate is much higher in females. This is similar to most other studies [10,12,15]. In contrast to our study Nagarekha in her study showed males were more commonly deferred than females [16]. Anemia is more prevalent in females and this could be the cause. Females are needed to be more educated and motivated for blood donation. Permanent deferral (17.86%) is less common than temporary deferral (82.14%) in our study. This is comparable with many other studies [8,12]. Some studies show a low rate of temporary deferral [13]. Henshaw et al in their study revealed permenant deferral is more common [9]**.** Among permanent deferral high risk behavior particularly seropositive for hepatitis B is the most common cause (52.30%). The seropositive rate in our study is 0.82%. 0ut of 6701cases only 55 were serology positive. All the serology positive cases were males and all were replacement donors in our study. This emphasises the need for recruitment of voluntary donors. It is comparable to Unnikrishnan et al study (1.58%) This is followed by HCV and medications. This is in line with other studies [9, 10, 13, 15]. But in Nagarekha and Chauhan et al study accounted hypertension as the most common cause of permanent deferral [16]. In Tufail et al study Hepatitis C positivity is the most common cause for permanent deferral [8].

Among temporary deferral Anemia is the most common cause (27.75%) followed by hypertension. This is on par with other studies [8, 9, 10, 12, 13, 15]. This reflects the socioeconomic status of this region and people's ignorance about their health. In our country prevalence of both clinical and subclinical anemia is high. This indicates the importance of implementation of awareness and screening programs of anemia so that the health of the donor is guarded and we can maintain a healthy and safe donor pool. Most of the donors who were deferred due to anemia had Hemoglobulin concentration around 11 to 12 gm. By reducing the Hemoglobulin cut-off value by 1gm we can pave a way to get some more donors and this will enable us to meet our country's rising demand for blood [18]. Repeated donors are at risk of iron depletion hence it is essential to supplement them with iron to maintain their iron reserve [19]. Hypertension could be due to anxiety, fear of phlebotomy and white coat hypertension. These individuals should be handled with care and helped to become more comfortable and relaxed by describing the donation in a detail and simpler manner. Hypotension was the third most common cause of temporary deferral in our study since syncope is more commonly anticipated in them due to vasovagal attacks [20].

The other major causes of temporary deferral in decreasing order of frequency include vaccination, medication, intake of alcohol, tooth extraction and tattooing. These temporarily deferred individuals should be educated and motivated so that they return for donation after the period of deferral. The deferral rate among voluntary and replacement donors is 4.71% and 11.62% respectively. In accordance with NACO we don't entertain professional donors in our institute and recruit more voluntary donors by organizing camps [21]. Rehman and Jawaid from their study revealed voluntary blood donors are safer than replacement donors [22]. Unnikrishnan et al also showed a similar pattern [17] but Nagarekha in her study revealed voluntary donor deferral was more common than replacement donor deferral [16]. Henshaw et al study showed a higher rate of deferral for commercial and replacement donors [9]. By analyzing the donor deferral pattern we can understand that the knowledge about donor selection criteria is inadequate in common people. By educating them we can get a better acceptable rate and individuals with more tendencies to return for a future donation and less bitter feeling towards rejection.

**CONCLUSION:** The deferral rate in our study was 5.19%. Females should be educated and motivated for blood donation. As anemia is more common in them there should be more national programs to manage it more effectively. As temporary deferral was more common this necessities the education, motivation and follow up of temporary deferred donors so they could return for future donation

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Table1 Audit of blood donors for 3 years

| Year | Number of registered donors | Number donated | Number of deferral | Number of post donation deferral |
|---|---|---|---|---|
| 2017 | 2294 | 2181 (95.07%) | 113 (4.93%) | 14 |
| 2018 | 2346 | 2246 (95.74%) | 100 (4.26%) | 24 |
| 2019 | 2370 | 2274(95.94%) | 96(4.06%) | 17 |
| Total | 7010 | 6701 | 309 | 55 |

Table2 Frequency Of Registered Donors

| Year | Male | Female | Voluntary | Replacement |
|---|---|---|---|---|
| 2017 | 2167 (99.35%) | 14(0.65%) | 1939 (88.90%) | 242 (11.10%) |
| 2018 | 2227 (99.15%) | 19(0.85%) | 2034(90.56%) | 212(9.44%) |
| 2019 | 2247 (98.81%) | 27(1.19%) | 2031(89.31%) | 243(10.69%) |
| Total | 6641 | 60 | 6004 | 697 |

Table3 Frequency of Deferral Donors

| Year | Frequency of donor deferral | Male | Female | Voluntary | Replacement |
|---|---|---|---|---|---|
| 2017 | 127 (5.53%) | 116(91.34%) | 11 | 98 (77.17%) | 29 |
| 2018 | 124 (5.28%) | 121(97.58%) | 3 | 95(76.61%) | 29 |
| 2019 | 113 (4.76%) | 108(95.58%) | 5 | 90(79.65%) | 23 |
| Total | 364 | 345 | 19 | 283 | 81 |

Table4 Causes for Permenant deferral

| Causes for permanent deferral | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|
| Hbs ag | 8 | 15 | 11 | 34(52.31%) |
| HCV | 4 | 8 | 5 | 17(26.15%) |
| HIV | 2 | 1 | 0 | 3(4.62%) |
| VDRL | 0 | 0 | 1 | 1(1.54%) |
| Medications | 1 | 6 | 2 | 9(13.85%) |
| Hemo dialysis | 0 | 0 | 1 | 1(1.54%) |
| | 15 | 30 | 20 | 65 |

Table5: Causes for Temporay deferral

| Causes for temporay deferral | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|
| Hypotension | 15 | 14 | 16 | 45(15.05%) |
| Hypertension | 20 | 18 | 13 | 51(17.06) |
| Low Hb | 31 | 25 | 27 | 83(27.76%) |
| High Hb | 2 | 4 | 5 | 11(3.68%) |
| Vaccination | 15 | 11 | 9 | 35(11.71%) |
| Taken antibiotics | 7 | 4 | 6 | 17(5.69%) |
| Dental extraction | 4 | 2 | 3 | 9(3.01%) |
| Intake of alcohal | 4 | 3 | 3 | 10(3.34%) |
| Major and minor surgery | 2 | 2 | 2 | 6(2%) |
| Typhoid fever | 1 | 1 | 1 | 3(1%) |
| Chicken pox | 1 | 2 | 0 | 3(1%) |
| Tattooing | 2 | 3 | 3 | 8(2.68%) |
| Asthma | 1 | 0 | 1 | 2(0.67%) |
| Skin allergy | 1 | 3 | 1 | 5(1.67%) |
| Previous donation not complete 3 months | 1 | 1 | 1 | 3(1%) |
| Under weight below 45 | 1 | 1 | 0 | 2(0.67%) |
| Thin vein | 1 | 0 | 1 | 2(0.67%) |
| Menstruation | 1 | 0 | 0 | 1(0.33%) |
| Dengue | 1 | 0 | 0 | 1(0.33%) |
| Ear piercing | 1 | 0 | 0 | 1(0.33%) |
| Jaundice | 0 | 0 | 1 | 1(0.33%) |
|  | 112 | 94 | 93 | 299 |