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Profile of Blood Donors and Deferral Reasons in a Tertiary Care Centre in South India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aim: To assess the demographic profile of blood donors and determine the frequency and causes for deferral.
Study Design: Retrospective cross-sectional study.
Place and Duration of Study: Department of Pathology, Blood Centre at Dr. SMCSI medical college, Karakonam, Trivandrum. January 2018 to September 2022.
Methodology: This study was done to analyze the various causes of deferral and the profile of donors. 8064 donors from the study period were analyzed and their demographic profile was recorded. The deferred donors were analyzed according to their age, sex, type of donor, type of deferral and reasons for deferral.
Results: 8064 donors came to our center for donation of which 7682 (95.3%) were males and 382 (4.7%) were females. Majority of blood donors belonged to age group 18-25 years (50.6%). Replacement donors accounted for 6596 donors (81.8%). Voluntary donors were only 940 (11.7%). 1541 (19.1%) donors were deferred from donating. Out of these, 1186(77%) were replacement donors, 198(12.8%) were voluntary donors and 160(10.2%) were family donors. The most frequent causes of temporary deferrals: Hypertension 314(20.2%), Hypotension 82(5.3%), low hemoglobin 110(7.1%), On medication 104(6.7%), Tattoo/ ear piercing/smoking/pan chewing 154(10%), previous recent illness/surgery 190(12.3%) and alcoholism 46(3%). Permanent deferrals were done for only 68 donors (0.7%). They included 21 high risk donors and 47 donors who were serology positive.

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Conclusion: Deferral pattern analysis can help the medical personnel in knowing the common causes of deferral and be more focused in screening. Determination of cause and rate donor deferral can help in preventing loss of precious blood and components.

Keywords: Donors; deferral; blood donation; hypertension.

1. INTRODUCTION

Blood transfusion services are a very crucial component of the health care system without which essential medical care is impossible. Considering the health of both donors and recipients, many measures are taken to make the process of blood transfusion safe. A very strict process of donor selection is one of the main measures undertaken to achieve this [1].

The state of Kerala reported an annual blood collection of 483,539 of which 82.6% were voluntary donation and rest were replacement donation [2]. Voluntary blood donation is donation of whole blood or plasma voluntarily. Replacement donation is donation done specifically upon request of a patient or patient's family intended to be used for the patient's treatment [3].

The donor selection is based on criteria of subjecting donors to a questionnaire and physical examination. Only those who meet the requirements are qualified as blood donors. Deferral of blood donors is done for various reasons. Donor deferrals should be handled carefully as they may never return for blood donation in the future which leads to the loss of precious whole blood [4]. The rate of deferral also varies from region to region and also from centre to centre. The criteria for blood donor selection and deferral in India, are provided by the Drugs and Cosmetic Act 1940 (NACO guidelines), supplemented by the Technical Manual (Directorate General of Health Services, MOH and FW, Govt. of India) [5,6]. There are past studies which highlight different reasons for deferral. The present study is to analyze the cause and incidence of donor deferral at a blood centre in South Kerala.

1.1 Aim and Objectives

The study was undertaken to assess the demographic profile of blood donors and determine the frequency and causes for deferral.

2. MATERIALS AND METHODS

This is a retrospective hospital-based study. The data was collected from stored record in Blood Centre at Dr. SMCSI medical college, Karakonam, Trivandrum. The study period was from January 2018 to September 2022 and data was collected for the same. There were no commercial donors in this study population. Deferral reasons were analyzed among all donors. Data was analyzed using Microsoft excel.

3. RESULTS

A total of 8064 donors were registered for donation in the blood bank record during the study period. Out of the total donors, 7682 (95.3%) were males and the remaining 382 (4.7%) were females. Majority of blood donors belonged to age group 18-25 years (50.6%), followed by 2729 donors in age group 26-35 years (33.8%), 972(12.1%) in 36-45 years and 283(3.5%) above age 45. More than half donors in this group were replacement donors which accounted for 6596 donors (81.8%). Voluntary donors accounted were only 940 (11.7%). Rest 528(6.5%) were family donors.

Of the total 8064 donors, 1541 (19.1%) were deferred from donating. Out of these 1541 deferred donors, 1186(77%) were replacement donors, 198(12.8%) were voluntary donors and 160(10.2%) were family donors. The causes of deferral were divided into a) those deferred during history taking b) those deferred during examination. Blood which was rejected after collection because of positive serology was also included.

Among all the donors in the study period, the following were the most frequent causes of temporary deferrals: Hypertension 314(20.2%), Hypotension 82(5.3%), low hemoglobin 110(7.1%), On medication 104(6.7%), Tattoo/ ear piercing/smoking/pan chewing 154(10%), previous recent illness/surgery 190(12.3%) and alcoholism 46(3%). Major cause of temporary donor deferral at our Centre was due to Hypertension. 290 donors (18.8%) who came to blood bank as replacement donors and for donating to family members were rejected as the blood group was not matching. This was not a deferral reason but all these donors were not accepted at our Centre for donation.

Table 1. Demographic profile of donors

Variable	Total registered donors (%) n=8064	Selected donors (%) n=6523	Rejected donors (%) n=1541
Gender			
Male	7682 (95.3%)	6314 (96.8%)	1368 (88.7%)
Female	382 (4.7%)	209 (3.2%)	173 (9.3%)
Age group			
<18 years	4		4 (0.3%)
18-25 years	4076 (50.5%)	3354 (51.5%)	722 (46.9%)
26-35 years	2729 (33.8%)	2266 (34.7%)	463 (30%)
36-45 years	972 (12.1%)	724 (11.1%)	248 (16.1%)
>45 years	283 (3.5%)	179 (2.7%)	104 (6.7%)
Type of donation			
Voluntary	940 (11.7%)	742 (11.4%)	198 (12.8%)
Family	528 (6.5%)	371 (5.7%)	157 (10.2%)
Replacement	6596 (81.8%)	5410 (82.9%)	1186 (77%)
First time donor	2258 (28%)	1577 (24.2%)	681 (44.1%)
Repeat donor	5806 (72%)	4946 (75.8%)	860 (55.9%)

Table 2. Deferrals after history

Deferral reason	No. of deferred donors	Percentage of deferred donors
Alcoholism	46	3%
On medication	104	6.7%
Vaccines	72	4.7%
Past donation within 3 months	19	1.2%
Hormonal imbalance	4	0.3%
Previous illness/surgery	190	12.3%
Allergy	5	0.3%
High risk activity	21	1.4%
Tattoo/ear piercing/Smoking	154	10%

Table 3. Deferral after physical examination

Deferral reason	No. of deferred donors	Percentage of deferred donors
Hypertension	314	20.2%
Hypotension	82	5.3%
Anemia	110	7.1%
Body weight <45 kg	7	0.5%

Table 4. Transfusion transmitted infections among donors

Parameters	Male	Female	Total	Overall prevalence
	n=7682	n=382		
HIV	3	0	3	0.04%
HbsAg	24	2	26	0.32%
HCV	13	0	13	0.16%
Syphilis	5	0	5	0.06%

Permanent deferrals were done for only 68 donors (0.7%). They included 21 high risk donors and 47 donors who were serology positive. Of the serology positive donors, 20 were found to be positive after the blood donation process was over. They included 26(0.32%), 3(0.04%), 13(0.16%) and 5(0.06%) of all donors, on account of seropositivity for HBV, HIV, HCV and syphilis respectively.

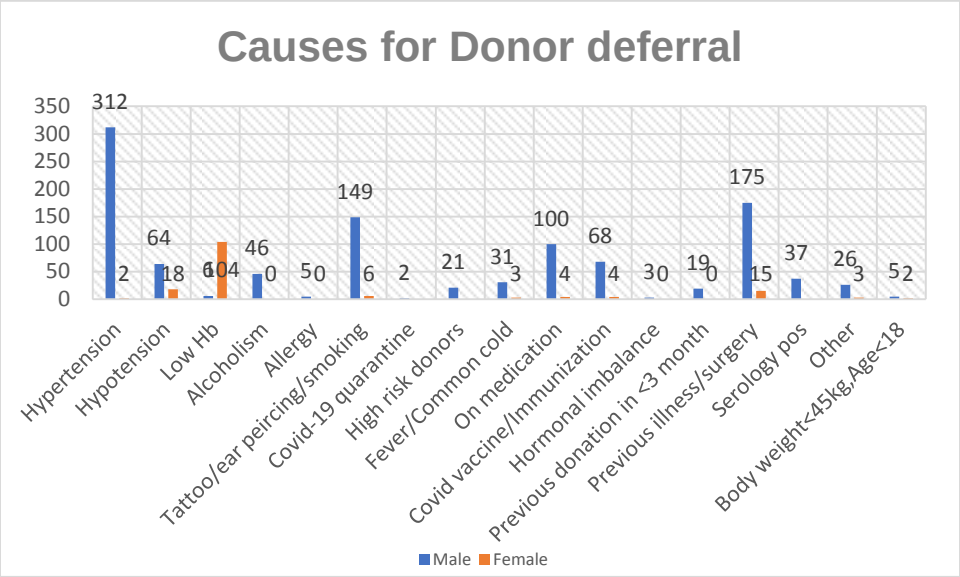

Fig. 1. Causes for donor deferral

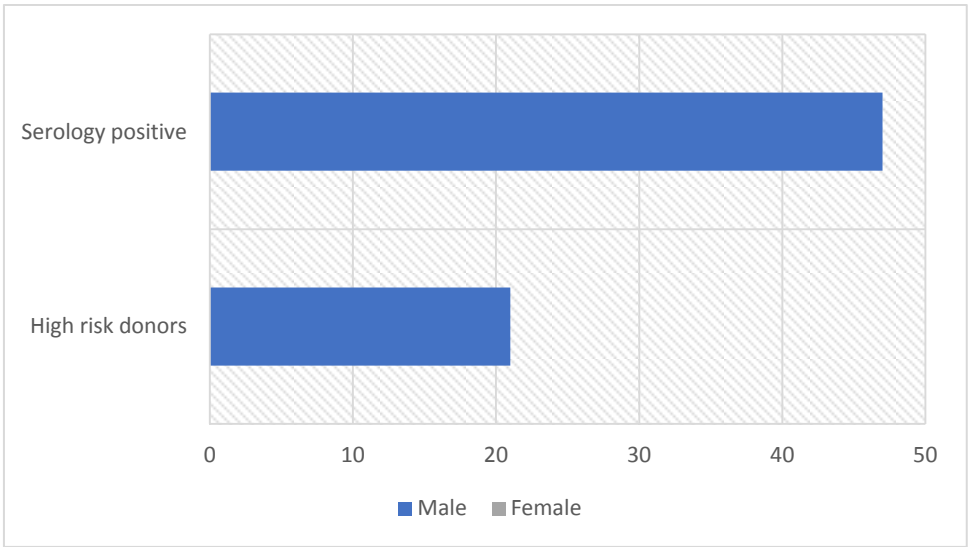

Fig. 2. Causes of permanent deferrals

Majority of the females deferred in this study was for low hemoglobin. Overall, the most common deferral reason among males was hypertension and females were low hemoglobin.

4. DISCUSSION

Blood should always be adequately supplied but it should not be at the cost of either donor or recipient safety. The deferral patterns which are used are based on science, regulatory rules and informed medical opinions [7]. Deferring donors from donating can lead to a feeling of rejection and insight into the causes of deferral is of particular importance [8,9]. The deferred donors are informed about the cause and counselling for the same is given. Knowledge about the deferral patterns and causes can help in increasing the efficiency of screening processes used in our Blood Centre.

50.5% of donors in this study are belonging to age group between 18 to 25 years. Most of the donors in this study were males (95.3%); women accounted for only 4.7% of total donors. Female contribution to the donor pool is very less and this can be due to lack of motivation, fear and sociocultural factors which prevents the donation. Women donors in the study were deferred more frequently (45.3%) compared to male donors

(17.8%). This might be due to the increased prevalence of anemia in women. This was comparable to study done by Chauhan et al. [5]. Anemia among women is very much prevalent in a developing country like India [10]. To retain these donors and getting them to donate at a later date, the donors with anemia should be referred to their treating physicians for management of anemia.

Among the deferrals, majority of them were in the age group of 18-25 years (46.9%). This was similar to studies done by Anegundi et al. [11].

Replacement donors were significantly higher in this study population compared to voluntary and family donors (81.8% vs 18.2%). This finding was not agreeing with many other Indian studies by Jethani et al. [12] and Kulkarni [13]. It is much lesser than the national average of 39.3% [14]. Less number of voluntary donations in this community can be due to lack of awareness or a smaller number of donor camps. This is an area of focus where much improvement is needed to increase non remunerated voluntary donors.

First time donors constituted only 28% in the study. Majority were repeat donors (72%). At a global level first time donors were only 15-25% [4] which is comparable to this study.

Donor deferral rates in various previous studied ranged from 5-28%. A comparison of deferral rate in various studies is shown in (Table 5).

Donor deferral rate in our study was 19.1% which was higher than many other studies from India. A study done by Haque et al. [18] from Bangladesh had comparable deferral rates. The variation in deferral rate can be attributed to many causes like variation in donor selection criteria and type of donors. Temporary deferrals were significantly more than permanent deferrals. (95.6% vs 4.4%). This was similar to many other studies done by Anegundi et al. [11] (83.3%), Shah et al [21] (87.6%) Koju et al. [20] (92.6%). This denotes that most of the donors can be recruited back to the donor pool with proper counselling and management.

Hypertension was the major cause of donor deferral in this study (20.2%). Many other studies have also shown Hypertension as the major cause of deferral [11,12,20,22]. Hypertension was seen to be cause of permanent deferral in previous studies. But at our Centre, hypertension was not a reason for permanent deferral. The probable reasons for hypertension can be fear of the donation procedure or fear of blood and needles [14]. Deferral due to covid quarantine and vaccination was done in 3 donors. But these donors can be recruited back as it was not a reason for permanent deferral.

High risk activity among the donors was a cause of permanent deferral. A study by Gulen et al. [19] had reported 13.8% donors with suspicious sexual interaction which had led to their deferral. 7 donors were known to be positive for serology even before donation, so blood collection was not done from them. 30 donors with positive serological test were identified only after donation and when blood was checked. This has led to loss of collected blood. Proper education and screening of the donors can prevent this up to a level.

Table 5. Comparison of donor deferral percentage in various studies

Author Name	Study period	Deferral rate (%)
Shastry et al. [15]	13 years	5.6%
Sundar et al. [16]	3 years	6%
Shrivastava et al. [1]	12 years	11.5%
Agnihotri [17]	1.5 years	11.6%
R K Chaudary et al. [9]	2 years	16.4%
Bahadur et al. [6]	2 years	9%
Anegundi R. et al. [11]	1 year	13.6%
Haque et al. [18]	6 months	20%
H Gulen et al. [19]	6 months	27.6%
Koju et al. [20]	4 years	9.5%
Present study	4.5 years	19.1%

18.8% of donors who came to the blood Centre as replacement donors and family donors were not accepted whenever the replaced group did not match the blood which was supplied or if adequate blood of the same group was available. One study by Haque et al. [18] has deferred 4.26% donors due to wrong Blood group which is much lower than our study. These individuals were also included in the donor pool and they were added as a deferred donors. This has contributed to an increase in donor deferral rate at our Centre which caters to a group of people of low socioeconomic status from rural background. Even though there no guidelines, it was found that a significant number of donors were rejected from donating in this way. This formed the second highest cause of rejection in our study which validates that further analysis and studies are needed especially from rural tertiary care centers to find the importance of this, mainly to prevent it.

Infectious disease markers causing permanent deferral was seen in 0.6% of the donor population. It is found to be 3.9% in study by Gulen et al. [19] and 3.75% in study done by Jethani et al. [12]. The major infections seen were Hepatitis B (0.32%) followed by HCV (0.16%). Unnikrishnan et al. [14] reported that Hepatitis B and HCV were 0.87% and 0.36%.; Kaur et al. [23] found 1.7% and 0.8% for Hepatitis B and C respectively. The national prevalence of hepatitis B and C were 1-5% and 1% [24] respectively and our findings were lower than this.

5. CONCLUSION

This study showed that most of the donors were young which is encouraging as they can be motivated for regular voluntary donation. Voluntary donations were very less in this study. Advertising, blood donation campaigns are essential to increase the awareness of voluntary blood donation. The number female donors were very less in the present study. Rejection was high among women donors (2.5 times higher than male donors) especially due to anemia among them. Awareness and treatment of anemia is needed among the women to prevent this. The main cause of deferral was hypertension. The criteria for donor selection and deferral in India are partially on scientific facts and partially based on tradition. The tradition of not accepting donors whenever the replaced whole blood was not matching is high at this Centre which needs to be addressed and effective measures should be taken to prevent the loss of present and future blood units.

So, on concluding, determination of the rate and causes of deferral is important for safety of blood transfusion processes and thus preventing loss of precious blood.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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