

Analysis of blood donor deferrals characteristics in a teaching hospital of south India

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Abstract

Context: The health industry today, faces the challenge of safe blood donation. This can be achieved by obtaining blood from voluntary non-remunerated blood donors (VNRD). The rate of deferral has differed from region to region and sometimes in the same region and one centre to another. **Aims:** 1) To ascertain the chief reasons for blood donation deferral among the blood donors. 2) To study the donor deferral rate and its relation with age and gender. **Settings and Design:** Descriptive study. **Methods and Material:** A retrospective study was conducted involving both voluntary and replacement donors who have donated blood to our centre from June 2013 to May 2016. Each donor was selected by a medical officer based on detailed medical history and brief physical examination. Deferral reasons were analysed amongst different categories viz. Gender based (male-female) and various age group categories. **Statistical analysis used:** Chi square test with significance limit set at 0.05. **Results:** The total number of donors accepted for blood donation were 1157, out of which 721 were Voluntary donors (62.7%) and 436 were replacement donors (37.3%). Of the total donors who were willing for blood donation, 81 (6.5%) donors were deferred. The donor deferral rate was significantly higher for those above 40 years. Temporary deferrals were commoner among which anaemia was a leading cause. Among permanent deferrals hypertension and jaundice (due to Hepatitis B and Hepatitis C infection) were the common causes. **Conclusions:** Donor deferral leads to loss of many people from the donation pool to ensure the safety of blood for recipients. Education, motivation, and treatment of these deferred donors due to anemia or other temporary deferrals are important aspects in blood banking, so that these donors may be recruited again.

Key-words: Deferral, Temporary deferral, Permanent deferral, Blood Donor Safety, Anaemia in Blood Donors, Hypertension in Blood Donors, Jaundice in Blood Donors

Introduction

The health industry today, faces the challenge of safe blood donation. To achieve this, blood for transfusion must be obtained from voluntary non-remunerated blood donors (VNRD) [1]. The National AIDS Control Organization's (NACO) statistics show that the annual rate of blood donation in India is about 7.4 million units, against the requirement of 10 million units [2, 3].

A stringent process of donor selection aimed at assessing the suitability of prospective donors is essential in ensuring the safety and sufficiency of blood supply, safeguard the health of the recipients of

transfusion as well as that of the donors, and at the same time ensures that suitable donors are not unnecessarily deferred [4]. The Food and Drug Administration's Code of Federal Regulations and the AABB Standards for Blood Banks and Transfusion Services define the donor eligibility criteria which are designed to protect both the donor and the recipient [5, 6].

Although the majority of these suggested criteria are applicable widely in all the situations, they might be highly dependent on the variables such as demographic, cultural, anthropometric, and endemic disease patterns due to which they have to be locally improvised and modified [7]. Deferring or rejecting potential blood donors often leaves the person with negative feeling

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about themselves as well as the blood banking system. But 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 [8]. The rate of deferral differs from region to region and sometimes in the same region and one centre to another. [9]. The study was performed with the intention of analysing the donor deferral characteristics in our blood bank. The main purpose of this study was to look for the deferred donor demographics in terms of age, gender, occupation and whether they were voluntary or replacement which could help us in future donor recruitment strategies.

Materials and Methods

A retrospective study was conducted involving both voluntary donors (VD) and replacement donors (RD) who have donated blood to our centre from June 2013

to May 2016. The study was approved by the Institutional Ethics Committee. Each donor was selected by a medical officer based on detailed medical history and brief physical examination of donors with regard to haemoglobin, blood pressure, temperature, and pulse regularity and rate.

Repeat donors were not segregated and for the sake of simplicity of analysis, all repeat presentations were considered as independent attempts for blood donation.

The quantity of blood collected is 350 ml as our blood bank is licensed for whole blood. Deferral reasons were analysed amongst different categories viz. Gender based (male-female) and various age group categories. Detailed information on the donor deferral including the cause of deferral was recorded in deferral register.

Statistics employed: Chi square test was employed and a p-value less than was 0.05 taken as significant.

Results

The total number of donors accepted for blood donation were 1157, out of which 721 were voluntary donors (62.7%) and 436 were replacement donors (37.3%). Male donors were 1149 (99.2%) and female donors were 8 (0.8%) as shown in Table 1.

Table-1: Demographic profile of donor population.

Donor category	Male (%)	Female (%)	Total (%)
Replacement	430 (37.1 %)	2 (0.2%)	436 (37.3 %)
Voluntary	719 (62.1%)	6 (0.6%)	721 (62.7%)
Total	1149 (99.2%)	8 (0.8%)	1157 (110%)

The chi-square statistic is 0.5241. The p-value is .469088. This result is *not* significant at $p < .05$.

Of the total donors who were willing for blood donation, 81 (6.5%) donors were deferred out of which 47 (58%) were VD while 34 (42%) were RD as shown in Table 2. The donor deferral rate was 6% for VD and 7% for RD as shown in Figure 1.

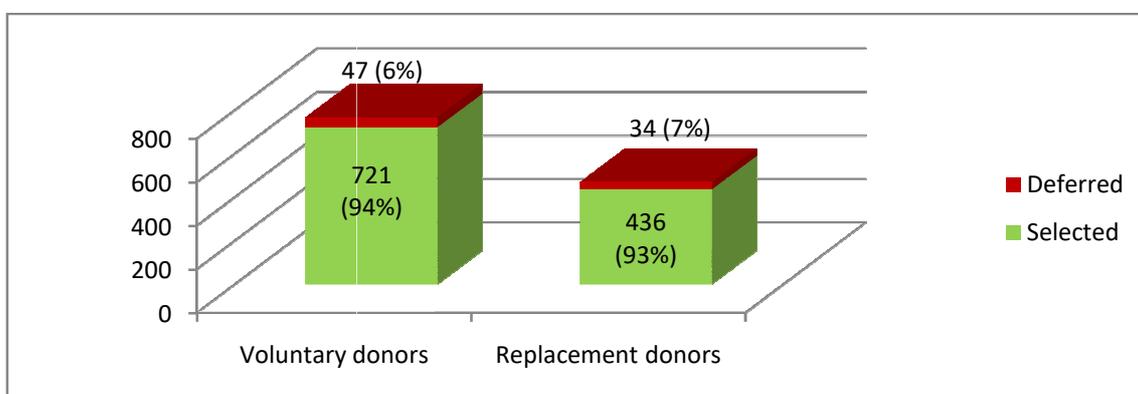


Figure-1: Percentage Deferral in Voluntary and Replacement Donors

In the present study the donor deferral rate was highest for those above 40 years as seen in Figure 2 and it was significant statistically (χ^2 is 6.2543. The p -value is .01239. This result is significant at $p < .05$).

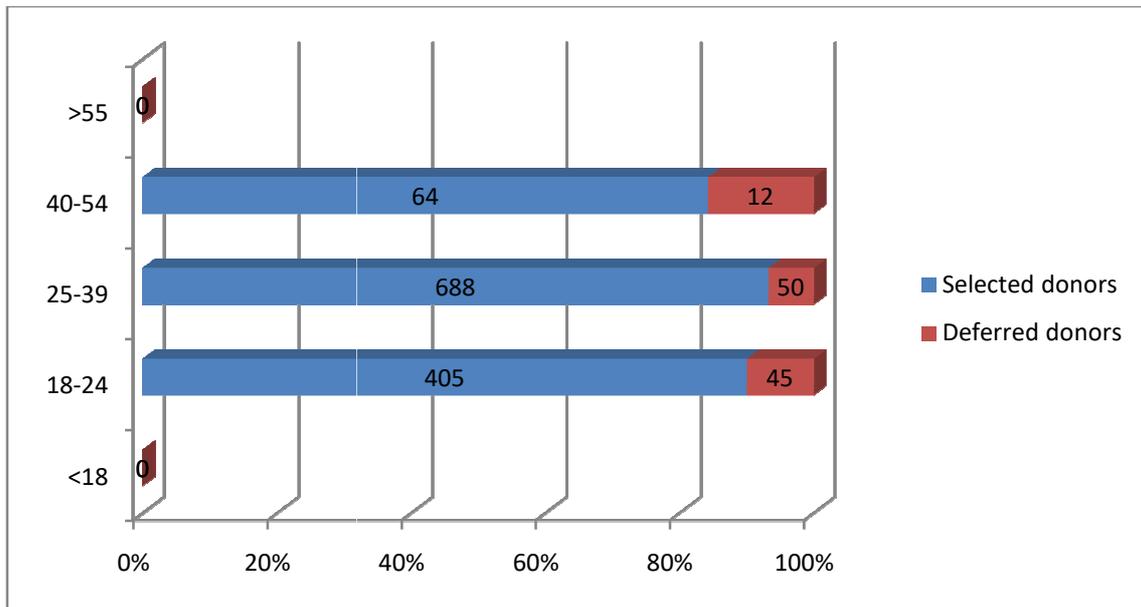


Figure-2: Donor deferral according to age group

Among the deferred donors males were 79 (97.5%) donors while there were 2 females (2.5%) as seen in Table 2. The deferral rate among females (20%) was higher than males (6.4%). However the results were not significant statistically (χ^2 is 2.9858. The p -value is .084. This result is not significant at $p < .05$).

Table-2: Demographic profile of deferred donor

Donor category	Male (%)	Female (%)	Total (%)
Replacement	33	1	34
Voluntary	46	1	47
Total	79	2	81

The chi-square statistic is 0.0542. The p -value is .815881. This result is *not* significant at $p < .05$.

The most common occupation among deferred were skilled (45%) followed by labour (23%) as shown in Table 3.

Table-3: Occupation of the Deferred Donors

Occupation	Number (%)
Skilled	36 (45)
Labour	19 (23)
Student	13 (16)
Business	9 (11)
Professional	4 (5)
Total	81 (100)

Donor deferrals were tabulated into temporary and permanent as shown in Table-4.

Table-4: Deferral reasons in Blood Donors.

Type of deferral	Deferral reason	% of Total Deferred Donors (n= 81)
Temporary Deferrals	Total	61
	Low Hemoglobin	10
	Underweight	4
	Antibiotics	5
	H/o alcohol	5
	H/o fever	6
	H/o common cold	4
	H/o headache	3
	H/o tattooing within six months	6
	H/o dental extraction	7.5
	Allergy	6
	Typhoid	4
	Permanent Deferrals	Total
High Blood Pressure		15
Surgical Causes		0
Asthma		4
Tuberculosis		1
H/o STD		04
	H/o Jaundice associated with HBsAg / HCV positivity	15

Table-5: Deferral reason comparison in different age group blood donors.

Deferral reason	% (n) of Deferred Donors			
	18-24 yrs	25-39 yrs	40-54 yrs	> 55 yrs
Low Haemoglobin	6.8 (2)	12 (5)		
Underweight	3.3 (1)	4.9 (2)		
Antibiotics	6.8 (2)	2.5 (1)	10 (1)	
H/o alcohol	3.3 (1)	7.3 (3)		
H/o fever	6.8 (2)	4.9 (2)		
H/o common cold	10 (3)	4.9 (2)		
H/o headache	3.3 (1)	2.5 (1)		
Lack of sleep last night	3.3 (1)	2.5 (1)		
H/o tattooing within six months	13.2 (4)	2.5 (1)		
H/o dental extraction	3.3 (1)	7.3 (3)	20 (2)	
Allergy	6.8 (2)	7.3 (3)		
Typhoid	3.3 (1)	2.5 (1)	10(1)	
High Blood Pressure	16.5 (5)	9.6 (4)	20 (2)	
Asthma	3.3 (1)	2.4 (1)	10 (1)	
Tuberculosis	3.3 (1)			
H/o STD		4.9 (2)	10 (1)	
H/o Jaundice associated with Known HBsAg / HCV positivity	3.3 (1)	22(9)	20 (2)	
Total	100 (30)	100 (41)	100 (10)	0

Temporary deferrals were 50 (61%) and permanent deferrals were 31 (39%). Within the temporary deferrals (61%), the most common causes were anaemia (14%), antibiotic usage (12%) and undergoing dental extraction (12%). With the permanent deferrals (39%), the most common causes were hypertension (15%) and H/o jaundice (15%). Two female donors were deferred out of which one was anaemic while the other has previous HBsAg positivity.

The occurrence of Hypertension was highest (20%) in those above 40 years as shown while jaundice was a common cause of deferral in the age group of 25-39 years (22%).

Interestingly tattooing and dental extraction together accounted for 13.5% of all deferrals in the present study. Similarly H/o fever, common cold, headache and antibiotic usage lead to 18% of all deferrals in the present study.

A majority of donor deferrals were detected by interviewing meticulously (74%) while physical examinations lead to the remaining (26%).

Discussion

Ensuring adequate supply of blood is as important as ensuring that the collection process does not harm the either the donor or the recipient. This is achieved by donor selection criteria [10]. Blood donor suitability criteria based on science, informed medical opinion, and regulatory rules influence donor demographics and lead to specific deferral patterns [11].

Low donor deferral incidence was observed by Alok et al (2.5%), Talonu T et al (4%) and Kulkarni (4.27%) [12,13,14].

The donor deferral rate in the present study (6.5%) was comparable to Unikrishnan B et al (5.2%) and Sundar P et al (6%) [15, 16]. Higher Donor deferral rates have been observed by Agnihotri (11.6%), Zou et al (12.8%) and Chaudhary et al (16.4%) [11,17,18].

The most common occupation group among deferred donors were skilled (45%) unlike the study by Kulkarni where in students constituted the largest group (31%).

Though the majority of the deferred donors were in the age group of 25-39 years (41%), the deferral percentage when analysed for each group was found to be highest for the age group of 40-54 years (13.5%). Similar findings were observed in the study by Agnihotri [11]. William Riley and Colleagues showed that there can be an overestimation of eligible donor prevalence by approximately 29 percent if age alone was used as the criteria [19].

Garry et al conducted a study on the iron reserves of elderly individuals who donated regular and advised them to limit donations to less than five per year and also to take iron supplement regularly [20].

In our study, the donor deferrals were segregated into temporary and permanent deferrals. The temporary deferrals outnumbered the permanent deferrals similar to the study by Kulkarni and Custer et al [14, 21].

Many donor deferral studies in the past have cited anaemia as the most common cause of temporary deferral similar to the present study [11,14,22]. The other key reasons for temporary deferral were H/o fever, undergoing tattooing within six months, undergoing minor procedures such as dental extractions, antibiotic usage within past three days and alcohol intake.

In the study by Kulkarni the three most common causes of temporary deferrals in females were anaemia, underweight and hypotension. In males underweight, anaemia and alcohol intake were the three most common causes [14]. In the present study among the permanent deferrals, Hypertension along with Jaundice were the most common causes among males. Similarly Kulkarni and Sundar P et al observed hypertension to be a common cause of permanent deferral in males [14, 16]. A blood donor suffering from a marked degree of hypertension has to be bled with care as in such cases the sudden removal of 350 or 450 ml of blood may precipitate a cerebral catastrophe [23].

In two other studies by Chaudhary and Ranveer Kaur et al., history of jaundice was the common cause of donor deferral [18,24].

In the present study the deferral rate among replacement donors (7.7%) was more as compared to voluntary donors (6.5%). This may be due to knowledge about the possibility of deferral and awareness of deferral criteria.

Research Article

Our findings are in contrast to the study by Kulkarni and Zou et al wherein the deferral rate was more among the voluntary donors [14,17].

In the study done by Charles et al, in Trinidad and Tobago, [25] the difference in rate of deferral amongst voluntary and replacement donors was not significant.

The occurrence of Hypertension (20%) was highest in the age group above 40 years similar to the study by Agnihotri reinforcing the need to take into consideration the high deferral rates in elderly donors especially when camps are planned at places with higher proportion of donors above 40 years of age [11].

Conclusions

Donor deferral leads to loss of many people from the donation pool to ensure the safety of blood for recipients. Temporary deferrals accounted for majority of the donor deferrals among which Anaemia is a leading cause. Among permanent deferrals hypertension and jaundice (due to Hepatitis B and Hepatitis C infection) are leading causes. Blood donors above 40 years had a high rate of deferral due to conditions like hypertension. Education, motivation, and treatment of deferred donors due to anemia or other temporary deferrals are important aspects in blood banking, so that these donors may be recruited again. The present study facilitated in identifying the rates and reasons of donor deferral which will help in planning and future recruitment strategies from the real eligible donor pool.

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