

ANALYSIS OF BLOOD DONOR DEFERRAL CHARACTERISTICS IN DELHI, INDIA

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Abstract. Blood donors are deferred from donating blood for several reasons, either permanently or temporarily. Losses related to disease marker rates are well established. Donor and donation losses for other reasons, however, have not been extensively quantified. This study quantified the rate of and reasons for donor deferral among Delhi donors. A retrospective study was conducted by reviewing the deferral donor records from 1 January 2007 to 31 December 2008. The percentage of deferred donors was 9% with majority of them (91.0%) being deferred for temporary reasons. Anemia was the most frequent cause for donor rejection (32.8%). Permanent deferral accounted for 9.1% with hypertension being the most common cause (29.4%) in this category.

INTRODUCTION

The paucity of healthy, safe blood donors has always been a serious problem for blood banks worldwide. The donors are deferred for several reasons related to the safety of the donor and the potential threat to the recipient. In order to quantify the losses due to deferred donors and to understand the health problems of the donor population, a retrospective study was conducted encompassing 2 years (January 2007 to December 2008) to analyze various causes for deferral and their relative frequencies.

MATERIALS AND METHODS

This study was conducted at the Blood Bank, Lady Hardinge Medical College and

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associated Shrimati Sucheta Kriplani Hospital and Kalawati Saran Children's Hospital, a tertiary care center and teaching hospital, New Delhi. Data was collected by reviewing the deferred donor records from 1 January 2007 to 31 December 2008. The donors were deferred according to the guidelines given by the Delhi State Aids Control Society (Saran, 2003).

RESULTS

From 1 January 2007 to 31 December 2008, 16,694 potential donors were screened at the studied blood bank, out of which 15,191(91%) were deemed eligible for donation. Their demographic profiles are given in Table 1.

One thousand three donors (9%) were found unfit to donate for various reasons, the majority (91.0%, $n = 1,365$) were deferred for temporary reasons, and a smaller subset (9.0%, $n = 136$) were permanently deferred. The causes of deferrals in the temporary and permanent subsets are shown in Table 2.

Table 1
Demographic profile of the donors.

	No. of donations	% Total donations		No. of donations	% Total donations
Voluntary	88	0.6	Male	15,036	99.0
Replacement	15,103	99.4	Female	155	1.0
Total	15,191	100.0	Total	15,191	100.0

Of the rejected donors, 1,364 (90.8%) were male and 139 (9.2%) were female. The five leading causes of deferral for both sexes are shown in Table 3.

Anemia (Hb<12.5) was the leading cause of donor rejection (32.9%), closely followed by under-weight (26.6%) donors; the two accounted for more than half the deferrals (59.4%). The demographics of the under-weight and anemic donors is given in Table 4. In the permanently deferred category, uncontrolled hypertension was the most common cause, constituting 29.4% of all the permanently rejected potential donors.

DISCUSSION

While losses resulting from consequences of rigorous screening for transfusion transmitted infections have been the focus of our attention for more than a decade, reasons for donor deferral have not received as much attention. In this study, we analyzed donor deferral patterns in an attempt to provide insight into the reasons for donor deferral in a country where blood donors are usually just relatives of patients admitted to the hospital. Most of the donors were males (98.2%), women accounted for only 1.8% of the donors.

Nine percent of the donors were deferred for multiple reasons in our study. Arslan (2007) reported a donor deferral rate of 14.6% in Turkish donors. Rabeya *et al* (2008) found

a donor deferral rate of 5.6% among 4,138 donors. In a study of American Red Cross blood services spanning 6 years, a deferral rate of 12.8% was reported (Zou *et al*, 2008). In a European study conducted by Lawson-Ayayi *et al* (1999) 10.8% of donors were deferred. Lim *et al* (1993) reported a 14.4% deferral rate and Custer *et al* (2004) reported a deferral rate of 13.6%.

This similarity among studies shows the rate of deferral may not change whether donors are regular volunteers, as reported in other studies, or replacement donors as in our study. The socioeconomic profile of the donor population does not appear to effect the results although the reasons for deferral may vary.

The most common cause for deferral was low hemoglobin (32.9%) similar to that reported in Turkish donors by Arslan (2007) (20.7%) and Custer *et al* (2004) (60% of temporary deferrals) and Halperin *et al* (1998) (46%). The second most common cause of deferral was low weight, which accounted for 59.4% of total deferrals. Hemoglobin and low weight combined accounted for 65.3% of total deferred similar to the findings by Chaudhary *et al* (2008). Most of these deferred donors (89.7%) were age 18-40 years old. 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.

Table 2
Causes of temporary and permanent deferrals with their relative proportions.

Causes - number	% Temporary deferral	%Total deferral
Temporary deferrals		
Hb - 494	36.1	32.9
Wt - 399	29.2	26.6
Jaundice/Hepatitis - 121	8.9	8.1
Alcohol - 105	7.7	7.0
TB - 54	4.0	3.6
Previous donation - 51	3.7	3.4
Malaria - 7	0.5	0.5
Fever/dyspnea - 35	2.6	2.3
Surgery - 5	0.4	0.3
Medic - 28	2.0	1.9
Accident - 5	0.4	0.3
Typhoid - 8	0.6	0.5
Dog bite - 7	0.5	0.5
Anti rabies vaccine - 3	0.2	0.2
Skin lesions - 5	0.4	0.3
Lactation - 9	0.7	0.6
Tattoo - 7	0.5	0.5
Menstruation - 2	0.1	0.1
Dental extraction - 3	0.2	0.2
Allergy - 1	0.1	0.1
Liver abscess - 1	0.1	0.1
Stroke - 1	0.1	0.1
Miscellaneous - 16	1.2	1.0
Total (1,367)	100.0	91.0
Permanent deferrals		
HTN - 40	29.4	2.7
Age - 25	18.4	1.7
Epilepsy - 23	16.9	1.5
Asthma - 22	16.2	1.5
Diabetes mellitus - 14	10.3	0.9
Heart - 7	5.1	0.5
Cirrhosis - 3	2.2	0.2
HIV - 2	1.5	0.1
Total - 136	100.0	9.1

Females constituted 1.0% ($n=155$) of fit donors and 9.3% ($n=139$) of the deferred subset. A staggering 74% ($n=103$) of unfit females were anemic. Some male donors were either anemic (28.7%, $n=391$) or un-

derweight (27.8%, $n=379$). Since both these conditions are easily curable, a large number of temporarily deferred donors can be recruited back into the donor pool if managed properly.

Table 3
The five leading causes of deferral in male and female donors.

Males (n=1,364)			Females (n=139)		
Causes	n	% Total deferrals	Causes	n	% deferrals
Low Hb	391	28.7	Low Hb	103	74.1
Weight	379	27.8	Weight	20	14.4
Jaundice	121	8.9	Lactating	9	6.5
Alcohol	105	7.7	Menstruation	2	1.4
TB	54	4.0	Fever, cough	2	1.4
Total	1,050	77.0	Total	136	97.8

Table 4
Demographic profile of anemic and underweight donors.

Age group (yr)	Anemic donors			Underweight donors		
	Number	% Anemic	% All anemic donors	Number	% Underweight	% All underweight donor
Males						
18-30	229	58.6	46.4	246	64.9	61.7
31-40	128	32.8	25.9	101	30.1	28.6
41-50	26	6.7	5.3	17	4.5	4.3
51-60	8	2.1	1.6	2	0.5	0.5
Total	391	100.0	79.2	379	100.0	95.0
Female						
18-30	47	45.6	9.5	13	65.0	3.3
31-40	39	37.9	7.9	5	25.0	1.3
41-50	15	14.6	3.0	2	10.0	0.5
51-60	2	1.9	0.4	-	-	-
Total	103	100.0	20.9	20	100.0	5.0

Another important observation regarding the donor population was that 3.6% of donors were deferred due to past history or present treatment of tuberculosis. This percentage is higher than that reported in other studies, possibly reflecting the higher prevalence of this infection in the Indian population. This prevalence is seen in spite of all the resources utilized in terms of money and manpower spent on the T.B. (tuberculosis) control program which was launched in 1997 (Park, 2007).

In our study 9.1% of donors were deferred for permanent reasons. Custer *et al* (2004) reported a permanent deferral rate of 10.6% and Arslan (2007) reported a rate of 10%. Our data is in concordance with previously reported literature. The most common cause of permanent deferral was hypertension (29.4%) similar to a study by De Lorenzo Oliveria *et al* (2009).

Our study shows that although donor rejection rates are similar in different populations, the reasons for deferral differ, reflect-

ing disparities in socioeconomic status. Analysis of rejection patterns may help medical personnel to be more focused in donor screening. This will not only help in improving donor and recipient safety but also in maintaining a healthy donor pool in the long run, provided the potential donors are appropriately counseled and managed to improve the efficiency of the donor program. Temporary donor deferrals need to be actively and aggressively managed so as not to lead to a diminished supply of future donors.

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