

Blood Donor Deferral Pattern Analysis in a Tertiary Care Center: A Study of 4902 Subjects

Ankur N. Sarvaiya*, Sanjaykumar C. Chauhan**, Baldev H. Patel*

*Assistant Professor **Associate Professor, Department of Pathology, GMERS Medical College and Hospital, Himmatnagar, Gujarat.

Abstract

Introduction: Blood safety is always remaining a point of concern. In blood bank all the procedures are starting with donor selection. Individuals disqualified from donating blood are known as “deferred” donors. *Aim:* The aim of the study is to evaluate and analyze the blood donor deferral pattern, apply these findings to recruit them in future for donation and to compare with previous published studies. *Materials and Methods:* Retrospective study of blood donors was done of four years from January 2013 to December 2016 at tertiary care center. Donor deferral data was analyzed from indoor and outdoor donor forms and registers. *Results:* Total 4902 potential blood donors were screened at our institute and our outdoor voluntary blood donation camps. 4399 (89.74%) were accepted for blood donation and 503 (10.26%) were deferred. Total number of temporary deferral was 408 and permanent deferral was 95. *Discussion:* In our study the deferral rate was 10.26%. In order to lessen the loss of blood donors and future recruitment of potential temporary blood donors this study was conducted. Low hemoglobin was the commonest cause (53.20%) of temporary deferral. The commonest age group of deferral is 18-25 years age group. *Conclusion:* A donor directory should be made and a special mention in it should be there of temporary deferral donors for future recruitment of them. Analysis of deferral pattern helps in formulating a policy for deferral that helps to prevent loss of blood unit by future recruitment of temporary deferred donors and to ensure safe transfusion by forming a permanent deferral registry.

Keywords: Blood Safety; Screening; Donor Deferral.

Introduction

Blood safety is always remaining a point of concern. In the last 50 years most important advancement in blood safety is to prefer voluntary non remunerated donors selection instead of paid professional donors to reduce transfusion transmitted infections [1,2]. In blood bank all the procedures are starting with donor selection. The blood bank should follow standard operating procedure in donor selection. It should include questionnaire, physical examination, weight measurement, and hemoglobin testing before

donation. Those who satisfy all the criteria should qualify for blood donation. These criteria have been laid by the standards for blood bank and blood transfusion services and drugs and cosmetics act, 1940 and rules amended thereafter [3,4]. Individuals disqualified from donating blood are known as “deferred” donors. Blood donors may be deferred, either on a temporary or permanent basis, on the grounds of their health status, medical or travel history, or TTI risk [5]. Deferral of donor is painful and sad to him/her as well for blood banks in the present scenario of scarcity of blood. Additionally these donors are less likely to return in future for blood donation [6]. Temporarily deferred donors should be encouraged to return after the defined deferral period is over [5]. The rate and causes of deferral can guide the recruitment strategy for blood donors [6,7]. Different previous studies have found different rates and socio demographic profile of

Corresponding Author: Ankur N. Sarvaiya, Momai Krupa, Jalaram Nagar 2, Hanuman Para Road, Amreli 365601.
E-mail: ankur.sarvaiya@gmail.com

(Received on 17.03.2017, Accepted on 24.03.2017)

donors.

The aim of the study is to evaluate and analyze the blood donor deferral pattern, apply these findings to recruit them in future for donation and to compare with previous published studies.

Materials and Methods

Retrospective study of blood donors was done of four years from January 2013 to December 2016 at tertiary care center in himmatnagar, Gujarat. Indoor and outdoor(camp) blood donors were included. Standard operating procedure was followed for donor selection. Standard operating procedures (SOP) have been prepared according to FDA guidelines and WHO module. Donor screening and examination was done by a set of questionnaire, weighing measurement, physical examination and hemoglobin level testing by specific gravity method(copper sulphate).

Specific gravity is set for the cut off range of hemoglobin 12.5 gm/dl. Donor deferral data was analyzed from donor forms and registers. Based on the reason of deferral, three categories of donors have been made: 1) category 1- donors own health might be affected by donation 2) category 2 - recipients may get transfusion transmitted infection by potentially infectious blood, 3) category 3- transmissibility is

unknown or other conditions, social and physical considerations by which donor is not suitable.

Results

Total 4902 potential blood donors were screened at our institute and our outdoor voluntary blood donation camps. Of the total 4902 screened, 4399 (89.74%) were accepted for blood donation and 503 (10.26%) were deferred either for temporary duration or permanently. Of total 4902, 4689 were males and 213 were females (Table 1).

Total number of temporary deferral was 408 and permanent deferral was 95. Category wise total, temporary and permanent deferral number and percentage have been shown in Table 2.

The most common cause for deferral was low hemoglobin followed by low body weight. Different category wise causes of temporary and permanent deferral have been shown in Table 3 and 4.

The donors with suspicious identity were deferred permanently. They may be paid professional donors in disguise.

Top five causes of deferral in males and females are shown in Table 5.

18-25 years is the commonest age group in both

Table 1: Gender distribution of all accepted and deferred donors

Donors	Accepted	Deferred	Total
Male	4260(96.84%)	429(85.29%)	4689
Female	139(3.16%)	74(14.71%)	213
Total	4399(100%)	503(100%)	4902

Table 2: Category wise deferral

Category	Total deferral	Percentage (out of total 4902)	Temporary deferral numbers	Percentage temporary deferral	Permanent deferral numbers	Percentage permanent deferral
Category 1	387	7.89	319	63.42	68	13.52
Category 2	41	0.84	24	4.77	17	3.38
Category 3	75	1.53	65	12.92	10	1.99
Total	503	10.26	408/503	81.11%	95/503	18.89%

Table 3: Temporary deferral causes

	Total number of donors deferred	Percentage (out of total category causes)	Percentage of total temporary deferral (408)	Percentage of all deferral (503)
Category 1 causes				
Low hemoglobin	199	62.38	48.77	39.56
Low body weight	44	13.79	10.78	8.75
Menstrual periods	14	4.39	3.43	2.78
Weakness/dizziness	17	5.33	4.17	3.38
Typhoid	06	1.88	1.47	1.19
Allergy	03	0.94	0.73	0.60
Blood donation in last 3	17	5.33	4.17	3.38

months				
Under age	15	4.70	3.68	2.98
History of blood transfusion	04	1.25	0.98	0.79
Total	319			
Category 2				
Jaundice	12	50	2.94	2.39
Malaria	05	20.83	1.22	0.99
Razor mark	02	8.33	0.49	0.40
Tattooing	03	12.5	0.73	0.60
Dog bite/vaccination	02	8.33	0.49	0.40
Total	24			
Category 3				
Medicine	21	32.31	5.15	4.17
Infection	24	36.92	5.88	4.77
Surgery	06	9.23	1.47	1.19
Alcohol	12	18.46	2.94	2.39
Phlebotomy site not clear	02	3.08	0.49	0.40
Total	65			

Table 4: Permanent deferral causes

	Total number of donors deferred	Percentage (out of total category causes)	Percentage of total permanent deferral (95)	Percentage of all deferral (503)
Category 1 causes				
high blood pressure	29	42.65	30.53	5.76
Lung disease/tuberculosis	07	10.29	7.37	1.39
Epilepsy/psychiatric problem	02	2.94	2.10	0.40
Diabetes	08	11.76	8.42	1.59
Heart disease	07	10.29	7.37	1.39
Cancer	01	1.47	1.05	0.20
Endocrine diseases	01	1.47	1.05	0.20
Kidney diseases	01	1.47	1.05	0.20
Overage	07	10.29	7.37	1.39
Previous blood donor reaction history	03	4.41	3.16	0.60
Thyroid disorders	02	2.94	2.10	0.40
Total	68			
Category 2 causes				
Jaundice	05	29.41	5.26	0.99
High risk behavior	12	70.59	12.63	2.39
Total	17			
Category 3				
Suspicious identity	10	100	10.53	1.99
Total	10			

Table 5: Five leading causes of deferral in males and females

Causes	Males (n=429)		Causes	Females (n=74)	
	Numbers	Percentage		Numbers	Percentage
Low hemoglobin	173	40.33	Low hemoglobin	26	35.13
Low weight	21	4.89	Low weight	23	31.08
High BP	21	4.89	Menses	14	18.92
Infection	21	4.89	Infection	03	4.05
Medicine	20	4.66	Medicine	01	1.35

Table 6: Age and sex wise distribution of deferred donors

Age in years	Males (n=429)		Age in years	Females (n=74)	
	Number of donors	Percentage		Number of donors	Percentage
Less than 18	15	3.50	Less than 18	00	00
18-25	219	51.05	18-25	38	51.35
26-35	79	18.41	26-35	22	29.73
36-45	51	11.89	36-45	11	14.86

46-55	53	12.35	46-55	03	4.05
56-65	09	2.10	56-65	00	00
>65	03	0.70	>65	00	00
Total	429	100	Total	74	100

Table 7: Sex distribution of donor deferral

	Temporary	Temporary deferral percentage of males and females	Permanent	Permanent deferral percentage of males and females	Total
Male	338	78.79%	91	21.21%	429
Male percentage of temporary and permanent deferral	82.84%	-	95.79%	-	-
Female	70	94.60%	04	5.40%	74
Female percentage of temporary and permanent deferral	17.16%	-	4.21%	-	-
Total	408(81.11%)	-	95(18.89%)	-	503

Table 8: Deferral rates

Author	Percentage
Zou et al ¹⁵	12.8%
Chaudhary et al ¹⁶	16.4%
Bahadur et al ¹⁷	9%
Custer et al ¹⁸	13.6%
Lawson ayayi et al ¹⁹	10.8%
Lim et al ⁶	14.4%
Our study	10.26%

males and females for deferral (Table 6).

Different percentages of temporary and permanent deferral of males, females and vice versa have been shown in Table 7.

Discussion

For transfusion services to be safe, safe donor is the first step [7]. In our study the deferral rate was 10.26%. This rate is compared with other previous studies as shown in table 8. Strict criteria in donor selection are the reason for higher deferral rate. With different standards and levels of strictness in selection criteria, there is wide variation in deferral rates worldwide from 5-10% to 20-40% [8-14].

With these stringent criteria, there are losses of blood donors in this era of shortage of blood. While transfusion transmitted infection has been the focus of ours for years, reasons for deferral has not received much attention [7]. In order to lessen the loss of blood donors and future recruitment of potential temporary blood donors this study was conducted.

Deferral rate of female donors was higher in

comparison to male donors. Commonest reason in them was low hemoglobin followed by menstruation period and low body weight.

Low hemoglobin was the commonest cause (53.20%) of temporary deferral. Low hemoglobin is a reason in 60% and 40% of all temporary deferral causes in a study conducted by Custer et al [18] and Halperin et al [20]. Second most common cause of temporary deferral was low body weight (11.76%). Low hemoglobin and low body weight in combination were 64.96% out of all temporary deferral as comparable with 59.5% by Bahadur et al [17].

The commonest age group of deferral was 18-25 years age group. Younger age group is the commonest age group for donation as they are motivated by peers and also by their academic institute. Low hemoglobin as the commonest cause highlights the situation of malnourishment in them especially in females. Underlying cause for anemia in them should be sought. They were referred to physicians at our hospital OPD to find out the causes and management of anemia.

The commonest cause for permanent deferral was high blood pressure. Bahadur S [17] and Sunder P [21] have similar findings.

Out of total 503 deferral, 408(81.11%) were temporary deferral and 95(18.89%) were permanent deferrals. Custer et al [18] and arslan et al [22] have 10.6 and 10% permanent deferrals.

Donor counseling is an important aspect of blood banking. Deferral is perceived as negative experience by many donors as they feel rejected. Proper counseling alleviates the fear of rejection and motivates donor. Empathetic counselling encourages donors to return after the defined deferral period is over. The National Donor Deferral Registry (NDDR) is a database of permanently deferred source plasma donors in North America. All donors who test "reactive" for the viral agents for HIV, HBV and HCV are added to the NDDR and are permanently prohibited from donating source plasma at participating licensed and industry-certified centers in the U.S. and Canada. So, permanent deferral registry initiative can be helpful in reducing the burden of transfusion transmitted infections.

Conclusion

A healthy voluntary young donor is a raw material for blood banks. A donor directory should be made and a special mention in it should be there of temporary deferral donors for future recruitment of them. A measure like National Donor Deferral Registry should also be started in India to ensure blood safety. Analysis of deferral pattern helps in formulating a policy for deferral that helps to prevent loss of blood unit by future recruitment of temporary deferred donors and to ensure safe transfusion by forming a permanent deferral registry. Current various channels in data collection of blood banks in India can be restructured on this direction.

References

1. Davey RJ. Recruiting blood donors: challenges and opportunities. *Transfusion*. 2004 Apr 1; 44(4):597-600.
2. Domen RE. Paid-versus-volunteer blood donation in the United States: a historical review. *Transfusion medicine reviews*. 1995 Jan 1; 9(1):53-9.
3. Drugs and cosmetics act. Available from www.cdsc.nic.in/writereaddata/Drugs&CosmeticAct.pdf
4. Standards for blood bank and blood transfusion services. National AIDS control organization. Ministry of health and family welfare, government of india, New delhi. Available from www.naco.gov.in/sites/default/files/Standards%20for%20Blood%20Banks%20and%20Blood%20Transfusion%20Services.pdf.
5. World Health Organization, Centers for Disease Control and Prevention. Blood donor counselling: implementation guidelines. 2014.
6. Lim JC, Tien SL, Ong YW. Main causes of pre-donation deferral of prospective blood donors in the Singapore Blood Transfusion Service. *Annals of the Academy of Medicine, Singapore*. 1993 May; 22(3): 326-31.
7. Agnihotri N. Whole blood donor deferral analysis at a center in Western India. *Asian J Transfus Sci* 2010; 4:116-22.
8. Tomasulo PA, Anderson AJ, Paluso MB, Gutschenritter MA, Aster RH. A study of criteria for blood donor deferral. *Transfusion*. 1980 Sep 10; 20(5):511-8.
9. Rabeya Y, Rapiaah M, Rosline H, Ahmed SA, Zaidah WA, Roshan TM. Blood pre-donation deferrals – a teaching hospital experience.
10. Kwa SB, Ong YW, Gaw YN. A study of the causes and rejection rates. *Singapore medical journal*. 1966; 7(1):61-8.
11. Charles KS, Hughes P, Gadd R, Bodkyn CJ, Rodriguez M. Evaluation of blood donor deferral causes in the Trinidad and Tobago National Blood Transfusion Service. *Transfusion Medicine*. 2010 Feb 1; 20(1):11-4.
12. Madan N, Qadiri J, Akhtar F. Study of blood donor profile at a tertiary care teaching hospital. *Journal of the Academy of Hospital Administration*. 2005; 17(2):31-4.
13. Di Lorenzo Oliveira C, Loureiro F, De Bastos MR, Proietti FA, Carneiro Proietti AB. Blood donor deferral in Minas Gerais State, Brazil: blood centers as sentinels of urban population health. *Transfusion*. 2009 May 1; 49(5):851-7.
14. Karp JK, King KE. International variation in volunteer whole blood donor eligibility criteria. *Transfusion*. 2010 Feb 1; 50(2):507-13.
15. Zou S, Musavi F, Notari EP, Rios JA, Trouern Trend J, Fang CT. Donor deferral and resulting donor loss at the American Red Cross Blood Services, 2001 through 2006. *Transfusion*. 2008 Dec 1; 48(12):2531-9.
16. Chaudhary RK, Gupta D, Gupta RK. Analysis of donor deferral pattern in a voluntary blood donor population. *Transfusion Medicine*. 1995 Sep 1; 5(3): 209-12.
17. Bahadur S, Jain S, Goel RK, Pahuja S, Jain M. Analysis of blood donor deferral characteristics in Delhi, India. *Southeast Asian Journal of Tropical Medicine and Public Health*. 2009 Sep 1; 40(5):1087.
18. Custer B, Johnson ES, Sullivan SD, Hazlet TK, Ramsey SD, Hirschler NV, Murphy EL, Busch MP. Quantifying losses to the donated blood supply due to donor deferral and miscollection. *Transfusion*. 2004 Oct 1;

- 44(10):1417-26.
19. Lawson-Ayayi S, Salmi LR. Epidemiology of blood collection in France. *European journal of epidemiology*. 1999 Mar 1; 15(3):285-92.
 20. Halperin D, Baetens J, Newman B. The effect of short term, temporary deferral on future blood donation. *Transfusion*. 1998 Feb 1; 38(2):181-3.
 21. Sundar P, Sangeetha SK, Seema DM, Marimuthu P, Shivanna N. Pre-donation deferral of blood donors in South Indian set-up: An analysis. *Asian journal of transfusion science*. 2010 Jul 1; 4(2):112.
 22. Arslan Ö. Whole blood donor deferral rate and characteristics of the Turkish population. *Transfusion Medicine*. 2007 Oct 1; 17(5):379-83.
-

Red Flower Publication Pvt. Ltd.

Presents its Book Publications for sale

- | | |
|--|---------------------|
| 1. Breast Cancer: Biology, Prevention and Treatment | Rs.395/\$100 |
| 2. Child Intelligence | Rs.150/\$50 |
| 3. Pediatric Companion | Rs.250/\$50 |

Order from

Red Flower Publication Pvt. Ltd.

48/41-42, DSIDC, Pocket-II

Mayur Vihar Phase-I

Delhi - 110 091(India)

Phone: Phone: 91-11-45796900, 22754205, 22756995, Fax: 91-11-22754205

E-mail: sales@rfppl.co.in