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Comparative evaluation and interpretation of deferral data of voluntary non remunerated blood donors: An original research study of 3054 donors

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Abstract
Introduction: Blood safety is important thing to consider in blood banks. Donor selection is very important part of blood banking.
Aim: The aim of the study is evaluation and interpretation of deferral data of voluntary non remunerated blood donors and to apply these data for recruitment of temporary deferral and to reduce hazard by making registry of permanent donors as well compare these data with previous studies.
Materials and methods: Retrospective study of blood donors was done at GMERS himmatnagar for one year from January 2018 to December 2018. Donor deferral data was analyzed from indoor and outdoor donor forms and registers.
Results: Total 3054 potential blood donors were screened. Of the total 3054 screened, 2762 (90.43%) were accepted for blood donation and 292 (9.56%) were deferred. Total number of temporary deferral was 252 and permanent deferral was 40.
Discussion: In our study the deferral rate was 9.56%.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 of temporary deferral. The commonest age group of deferral is 18-25 years age group.
Conclusion: Deferral is a burden and stress upon young donors. Temporary donor should be encouraged for donation after period of deferral is over. Donor registry should also be made for identifying reason of deferral in future.

Keywords: Blood safety, screening, donor deferral

Introduction
Blood safety is important thing to consider in blood banks. 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] donor selection is very important part of blood banking. Questionnaire, history, physical examination, and hemoglobin determination are steps in selecting blood donors. 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] Those who fails the criteria are deferred from blood donation. There are temorrary deferral and permanent deferral. 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]. Temporary deferred donors are encouraged to donate after the period of temporary deferral is over.
The aim of the study is evaluation and interpretation of deferral data of voluntary non remunerated blood donors and to apply these data for recruitment of temporary deferral and to reduce hazard by making registry of permanent donors as well compare these data with previous studies.

Materials and methods
Retrospective study of blood donors was done at GMERS himmatnagar for one year from January 2018 to December 2018. Outdoor and indoor voluntary non remunerated blood donors were included in this study. Standard Questionnaire was put for donor selection. Hemoglobin examination was bu copper sulphate method (specific gravity). Three different category was made based on reason for deferral 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 3054 potential blood donors were screened at our institute and our outdoor voluntary blood donation camps. Of the total 3054 screened, 2762 (90.43%) were accepted for blood donation and 292 (9.56%) were deferred either for temporary duration or permanently. Of total 3054, 2982 were males and 72 were females. (Table 1)

Table 1: Gender distribution of all accepted and deferred donors

Donors	Accepted	Deferred	Total
Male	2705	277	2982
Female	57	15	72
Total	2762	292	3054

Total number of temporary deferral was 252 and permanent deferral was 40. Category wise total, temporary and permanent deferral number and percentage have been shown in table 2.

Table 2: Category wise deferral

Category	Total deferral	Percentage (out of total 3054)	Temporary deferral numbers	Percentage temporary deferral	Permanent deferral numbers	Percentage permanent deferral
Category 1	205	6.71	182	62.32	23	7.53
Category 2	33	1.08	22	7.53	11	3.76
Category 3	54	1.76	48	16.44	06	2.05
Total	292	10.26	252/292	86.29%	40/292	13.34%

Table 3: Five leading causes of deferral in males and females

Males (n=277)			Females (n=15)		
Causes	Numbers	Percentage	Causes	Numbers	Percentage
Low hemoglobin	151	54.51	Low hemoglobin	06	40
Low weight	15	5.41	Low weight	05	33.33
High BP	11	3.97	Menses	02	13.33
Infection	08	2.89	Infection	01	6.66
Medicine	07	2.53	Medicine	00	00

18-25 years is the commonest age group in both males and females for deferral. (table 3)

Table 4: Age and sex wise distribution of deferred donors

Males (n=277)			Females (n=15)		
Age in years	Number of donors	Percentage	Age in years	Number of donors	Percentage
Less than 18	02	0.72	Less than 18	00	00
18-25	154	55.59	18-25	09	60
26-35	51	18.41	26-35	03	20
36-45	26	9.39	36-45	02	13.33
46-55	20	7.22	46-55	01	6.66
56-65	22	7.94	56-65	00	00
>65	02	0.72	>65	00	00
Total	277	100	Total	15	100

Different percentages of temporary and permanent deferral of males, females and vice versa have been shown in table 4.

Table 5: Sex distribution of donor deferral

	Temporary	Temporary deferral percentage of males and females	Permanent	Permanent deferral percentage of males females	Total
Male	238	85.92%	39	14.07%	277
Male percentage of temporary and permanent deferral	94.44%	-	97.5%	-	-
Female	14	93.33%	01	6.66%	15
Female percentage of temporary and permanent deferral	5.55%	-	2.5%	-	-
Total	252(86.30%)	-	40(13.70%)	-	292

Discussion

For transfusion services to be safe, safe donor is the first step. [7] In our study the deferral rate was 9.56%. This rate is compared with other previous studies as shown in table 5. 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, 9, 10, 11, 12, 13, 14]

Table 6: 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	9.56%

Stringent criteria may impart losses in total donation. While transfusion transmitted infection has been the focus of ours for years, reasons for deferral has not received much attention. [7] to prevent losses in donation rates, future recruitment of donors is necessary.

Female donors are deferred more than male donors. Commonest reason in them was low hemoglobin followed by menstruation period and low body weight.

Low hemoglobin was the commonest cause 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. 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.* [21].

18-25 years age group was the most common age group deferred. Younger individuals are motivated and more often doing blood donation compared to older ones. Low hemoglobin is common cause for deferral in males and females. Nutritional deficiency needs to be corrected im them, they are referred to physicians.

High blood pressure was the commonest cause of permanent deferral. Bahadur S [17] and Sunder P [21] have similar findings.

252(86.30%) were temporary deferral and 40(13.70%) were permanent deferrals out of total 292. Custer *et al.* [18] and arslan *et al.* [22] have 10.6 and 10% permanent deferrals.

Conclusion

A healthy voluntary non remunerate d blood donor is a key and source of operating any blood bank. Deferral is a burden and stress upon young donors. Temporary donor should be encouraged for donation after period of deferral is over. Providing moral support and couselling of deferred donors is must. The National Donor Deferral Registry (NDDR) is a database of permanently deferred source plasma donors in North America. Such registry is the neeed of a time in our country also. This registry helps identifying permanently deferred donors. These permanenty deferred donors are threst to blood recipients if their blood is infected. Motivation of those donors is also important. Professional paid donors in lieu of money are also a threat to safe blood donation.

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