



Original Research Article

Evaluation of blood donor pre-donation deferral causes in ESIC Medical College Hospital, Chennai, Tamilnadu

Sivaramakrishnan A¹, Meenakshisundaram K², Rajeswari T^{2,*}¹Dept. of Haematology and Blood Bank, ESIC Medical College & PGIMSR, Chennai, Tamil Nadu, India²Dept. of Pathology, ESIC Medical College & PGIMSR, Chennai, Tamil Nadu, India

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ABSTRACT

Purpose: Systematic analysis of pre-donation deferral reasons guides the transfusion society to undertake necessary steps towards the retention and re-entry of the temporary deferrals. Aim of our centre's study is to find out the causes for deferral in detail and to reduce the pre-donation deferrals to an extent that give appreciable results.

Materials and Methods: One year donor details from January 2019 to December 2019, collected from the properly maintained registers, grouped and studied with respect to age, gender and reason for deferral.

Results: Deferred donors were 184 out of 2083 registered volunteers. The number of males deferred were higher (139/184; 75.54%) than females (45/184; 24.46%), but the deferral rate was higher in females (45/109; 41.28%). Temporary deferral (84.23%) accounted more than 4/5 of the total deferrals.

Conclusion: As our study, most of the studies in literature indicate higher percentage of donor deferrals due to temporary causes. Suitable temporary deferrals can be brought back into the donor pool after completion of the treatment by giving proper counselling about the reason and period of deferral.

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1. Introduction

Transfusion of blood is one of the crucial life saving procedures, based upon the adequacy of safe blood. National AIDS Control Organization (NACO) states that only 7.4 million units of blood are available in India against the calculated requirement of 10 million units of blood annually.¹ World Health Organization (WHO) also denotes that the 82% of world's population in developing countries, contributes only one third (39%) of the safe blood, though 81 million units of blood are collected annually in the world.²

Blood bank provides safe blood to the recipients as and when required. Healthy, responsive and motivated voluntary blood donors are the back-bone of blood transfusion services. Donor recruitment and retention process is one of the most difficult tasks for each and every blood bank

in spite of the improving socio-economic, environmental and educational awareness of the society with the available advanced communication facilities and improved medical technologies.

Blood transfusion team undertake many measures to ensure the availability of adequate and safe blood to the recipients by following stringent donor selection criteria.^{3–5} Blood donors rejected for various reasons are known as “deferred” donors.³ Deferred donors feel little or more negatively on their own and about the system of blood donation and highly hesitant to come for future blood donations. Deferral definitely reduces the blood units and donors needed for transfusion, when accounting the already existing negative balance in the requirements. Retention and re-entry of temporarily deferred donors can be achieved by analyzing the reasons of their deferrals and ameliorating the causes whenever and wherever possible with strong overall positive influence.⁶

* Corresponding author.

E-mail address: rajee96path@gmail.com (Rajeswari T).

2. Materials and Methods

Volunteers who came for donating their blood to the blood bank of ESIC Medical College Hospital, Chennai, Tamilnadu, India from 1st January 2019 to 31st December 2019, were accounted in this retrospective and prospective study. Data were collected from the donor deferral register. All the donors were examined physically and a detailed history was recorded as per the criteria laid down by the Drugs and Cosmetic Act 1940 (and rules there under) supplemented by the Technical Manual (Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India) and the departmental Standard Operating Procedures (SOPs). Details grouped under age, males, females and reasons for deferral whether temporary or permanent.

3. Results

Total registered subjects who came for blood donation were 2083. All were voluntary donors. Out of 2083 donors, 1974 (94.76%) were males and 109 (5.23%) were females (Table 1).

Table 1: Gender distribution of registered, selected and deferred donors

Donors	Males	Females	Total
Registered	1974	109	2083 (100%)
Selected	1835	64	1899 (91.17%)
Deferred	139	45	184 (8.83%)

Of the total donors willing for blood donation, 184 persons (8.83%) were deferred. The deferral rate observed among male population was 7.04% (139/1974) and in females was 41.28% (45/109).

Mean age of the deferred was 30.94 years and the group started at 17 years and ended at 55 years. 32 years was the age wise average for the male deferrals and 26.57 years was for females. 21-30 years age range was in the top of the deferral list (75, 40.76%). 31-40 years (53, 28.80%) was placed as second. The subsequent descending order was 41-50 years (26, 14.13%), 18-20 years (25, 13.58%). 51-60 years (4, 2.17%) had a minimal deferral rate. One, 17 years male (0.54%) who came for blood donation was also deferred.

Age range of 18-30 years in both males (68/139, 48.92%) and females (32/45, 71.11%) had the higher deferral numbers (Table 2).

Reasons for rejection were listed out and grouped under temporary and permanent headings (Table 3). Temporary causes occupied more than 4/5 (155/184, 84.23%) of the account. People who lost the chance of future blood donation and thus placed in the permanent deferral group were 15.76% (29/184).

112 males (112/155, 72.25%) and 43 females (43/155, 27.74%), temporarily lost their turn of inclusion in the blood

donors list. The common causes of deferrals in males were high blood pressure (19.64%), tattooing (16.07%) and drug intake (9.82%). In females, anaemia (79.06%), menstrual disorders (11.62%) and upper respiratory tract infections (URTI) (04.65%) were the predominant causes (Table 4).

27 males (93.10%) and 2 females (6.89%) were in the group of permanent deferrals (29, 15.76%). Major causes among males were history of unknown hepatitis (10, 37.03%) followed by high haemoglobin levels (7, 25.92%), hypothyroidism (3, 11.11%) and hypertensive heart disease (3, 11.11%). In females, asthmatics on steroids and hypothyroidism caused for the permanent deferrals (Table 5).

4. Discussion

Recruitment of safe donors is a challenging task. Necessary steps should be taken to sensitize our people to realize the fact that blood donation is the responsibility of each and every citizen of the nation. Blood transfusion dependent health care services definitely need healthy voluntary donors as its central axis and support from blood donor organisations too.⁷

Recruiting more and more new donors to the donors list is mainly concentrated by various activities at various levels by government and also by nongovernmental sectors. At this juncture, it becomes very essential to stress regarding actions to be taken on temporary deferrals, the one which unfortunately goes unnoticed at most of the times. Deferral is a painful and sad experience not only for the blood donor but also for the entire blood bank team and it necessitates additional efforts towards new recruitments.⁸

The study of deferral data in a systematic way definitely provide insights about the areas to be concentrated upon and corrected, leading to the retention and re-entry of suitable deferred donors.

Considering the category of blood donors in our study, as per national guidelines, we proudly achieved 100% voluntary blood donations. This high lights the level of blood safety in our centre.

The proportion of female donor was very low in the present study (64/1899, 3.37%). Bahadur et al, Sundar et al and Unnikrishnan et al also had similar results.^{2,3,9} Health factors, educational status, social reasons, not knowing the importance unfortunately may all be the major reasons. Additional points to be stressed are lack of self motivation and also lack of encouraging persons to alleviate the fear related to blood donation. Strong measures should be taken to find out all possible factors and the causes to remove those barriers to encourage women to participate in the noble act of blood donation. Ensuring them as regular donors definitely guarantees an adequate supply of blood in our country.

Donor deferral rate in our institute was 8.83%. When analysing the literature, we found variations in the deferral

Table 2: Age group of deferred donors and their percentage

Age in years	Number of male deferrals	Number of female deferrals	Total number of deferrals	Percentage of deferrals
<18	1	0	1	0.54
18 - 30	68	32	100	54.34
31 - 40	44	9	53	28.80
41 - 50	22	4	26	14.13
51 - 60	4	0	4	2.17
Total	139	45	184	100

Table 3: Frequency of temporary and permanent deferrals

Type of deferrals	Number of male deferrals	Number of female deferrals	Number of total deferrals	% of donor deferrals	% of donor deferrals of total registration
Temporary	112	43	155	84.23	7.44
Permanent	27	2	29	15.76	1.39
Total	139	45	184		

Table 4: Leading causes of temporary deferrals among donors

Deferred males		Deferred females	
Cause	Number	Cause	Number
High blood pressure	22	Anaemia	34
Tattooing	18	Menstrual disorders	5
Drug intake	11	URTI	2
URTI	9	Low blood pressure	1
Rabies vaccine	6	Under weight	1

Table 5: Causes of permanent deferrals among donors

Cause	Males	Females	Total numbers
Unknown hepatitis	10		10
High Haemoglobin	7		7
Hypothyroidism	3	1	4
Hypertensive heart disease	3		3
Asthmatics on steroids	1	1	2
High risk for HIV infection	1		1
Bleeding disorders	1		1
Chronic liver disease	1		1
Total	27	2	29

incidence. In American Red Cross blood service, Zou et al. noted 12.8% deferral rate in their 6 years study.¹⁰ Deferral rate of 13.6% was observed by Custer et al.¹¹ Lawson-Ayayi and Salmi of Europe concluded 10.8% as deferral incidence.¹² 14.6% was the donor deferral rate in Turkish donors, observed by Arslan.¹³ Lim et al. reported a deferral rate of 14.4% in Singapore. Bahadur et al. noted 9% in a Delhi based study.⁹ Rabeya et al. study noted a very low deferral rate of 5.6%.¹⁴ These variations may be due to the regional diversity, socioeconomic factors and marked difference in whole blood donor selection criteria.

In this present study, volunteers in the age group of 18-30 years (100/184, 54.34%) showed highest deferral. Lawson et al. (50%) and Radhiga et al. (59%) also reported similar results.^{12,15} This could be by the fact that this age group is the predominant group among the total donor pool in every

blood donation centre. But Arslan et al. noted more deferrals in 50-60 age groups.¹³ In our study the deferral rate in 50-60 age groups is 2.17% which is similar to Mourougessine et al. (2.59%) study.¹⁶

In this study, females had a higher deferral rate (41.28%) compared to males (7.04%). Similar deferral figures were reported by Kasraian et al., Newman et al., Arslan et al. and Shaz et al.^{13,17-19}

Parting deferrals either as temporary or permanent, gives us hope and make us to work towards the conversion of temporary deferrals to eligible regular donors. When the number of temporary deferrals is more, that conversion definitely increases the blood donors and blood availability. In our blood bank study, 84.23% (155/184) deferrals were temporary deferrals. Remaining 15.76% (29/184) belongs to permanent deferral group. Similar percentage (83.11%)

was obtained by Basavarajegowda et al.²⁰ Other studies by Custer et al. (68.5%), Shaz et al. (65%) Lawson et al. (91.3%) and Kasraian et al. (95.5%) also showed higher rate of temporary deferrals when compared to permanent deferrals.^{11,12,17,19}

Gender wise analysis revealed, high blood pressure (19.64%), tattooing (16.07%) and drug intake (9.82%) were the predominant major temporary deferral causes in males. Taneja et al. reported anaemia (32.7%), medication (26.1%) and high blood pressure (9.8%) as leading temporary deferral conditions in males.²¹ Mourougessine et al. noted anaemia (23.51%), alcohol intake (23.51%) and low blood pressure (13.52%) as major temporary deferral reasons in male gender.¹⁶

In our study, high blood pressure (19.64%) remained the most common cause of temporary deferral in males. Ignorance towards the significance of periodic health checkups in middle aged men is the underlying factor. Girish et al reported highest hypertensive donor deferrals (39.95%) and Gajjar et al, Bahadur et al, Sundar et al also came with similar findings.^{3,9,22,23} Creating individual awareness towards the participation in community level screening programmes will diagnose this silent killer much earlier. This will surely minimize hypertensive temporary deferrals.

We deferred 16.07% of our male donors with recent history of tattooing, which was much higher when compared with Taneja et al. (1.92%), Vijay et al. (1%) and Mourougessine et al. (1%) reports.^{16,21,24} In India, the deferral period for Tattooing is 1 year. Higher risk of transfusion transmissible infections in connection with tattooing should not be ignored.²⁵ The habit of tattooing can be easily modified by the way of proper education and creating awareness amongst the youngsters. This strategy will greatly reduce temporary deferral rate and will increase the number eligible donors as the young adults form the major donor pool.

Taking medicines either for an acute or chronic illness is one of the reasons for significant proportion of deferrals in many studies. In our study, it was the third most common reason for deferral in males (9.82%). The study of literature showed 7 to 15%.^{2,8,22} This could be due the lack of awareness regarding the eligibility criteria for donor selection, particularly for abstaining from alcohol, smoking and taking medicines for various illnesses. People need to be guided in an understandable manner in this regard. Donors, who were deferred due to medications, need to be educated on things not to be done and when they should come to blood bank for reassessment.

Other causes for temporary deferral in males were URTI, vaccination for rabies, skin diseases, recent major surgery, recent alcohol intake, infections including tuberculosis, typhoid, malaria, wheezing disorders, hypotension, recent blood donation and lack of adequate sleep. Remaining

causes which constituted minor percentage were under age, cardiac diseases, sleep apnoea, renal stones and diarrheal illness.

Statistical analysis of temporary deferral causes in females, showed anaemia (79.06%), menstrual disorders (11.62%), and URTI (4.65%) as leading causes. In concordance with our finding, anaemia was the commonest cause for temporary deferral in females in most of the studies from India.^{21,23} This finding emphasizes the fact that in developing countries like India, the prevalence of clinical and subclinical anaemia is very high. The probable reasons for this scenario are malnutrition, worm infestation, menstrual disorders, multiparity and incomplete treatment in young and middle aged females. But anaemia in males and post-menopausal females signifies underlying medical illness particularly hidden malignancies and warrants proper evaluation and treatment.²⁶ Implementation of screening programmes and treatment for anaemia at community health centres will reduce the burden of low haemoglobin deferrals and can produce more healthy donors.^{27–29}

We reported an overall permanent deferral rate of 15.76%, with male predominance (Males – 93.10%, Females – 6.89%). The permanent deferral rate in various other studies were - Rehman et al – 36.3%, Custer et al. – 10.6% and Arslan et al. – 10%.^{11,13,30} The leading permanent deferral causes in males were history of unknown hepatitis (37.03%), high haemoglobin levels (25.92%), hypertensive heart disease (11.11%) and hypothyroidism (11.11%). Mourougessine et al. observed, hypertension (77.66%), asthma (6.87%) and high risk behaviour (4.46%) as major permanent deferral causes in males.¹⁶

Asthmatics on steroids and hypothyroidism were the permanent deferral reasons in females in our study. In contrast, Mourougessine et al. observed heart diseases (36.36%), hypertension (27.27%) and seizure disorders (18.18%) as causes.¹⁶

Donor deferral rate of our study is similar to that of other studies, but the individual causes and their proportions remained diverse. This is because of the variation in the demographic profile of the donors and varying donor selection criteria among different countries. Study about analysis of donor deferral pattern indicates the impact of knowledge of deferral criteria in blood donors. The donor deferral rate can be reduced by educating the donors and providing information about the selection criteria. This results in better acceptability and there by less negative feeling about rejection of blood donation and more chance of future return for successful blood donations.

5. Conclusion

Donor deferral rate was 8.83% with the temporary deferrals of 84.23% in the present study. As our study, most of the studies in literature indicated higher percentage of donor deferrals due to temporary causes. Proper guidance, regular

follow up and efficient management of suitable temporary deferred donors might help them to overcome the deferral condition before the next visit as they are already motivated for blood donation and far better than un-sensitized people.

6. Source of Funding

None.

7. Conflict of Interest

None.

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Author biography

Sivaramakrishnan A, Assistant Professor

Meenakshisundaram K, Professor and Head

Rajeswari T, Assistant Professor

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