Original Article

Evaluation of The Causes of Deferral Among Blood Donors: A Retrospective Study

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ABSTRACT

Background: Blood transfusion is an essential part of patients care. It is well known that large number of apparently healthy donors are unable to donate blood successfully because of varied reasons. The aim of this study was to evaluate and analyze the rate and causes of deferral among donors

Methods: The present retrospective study was carried out in the department of pathology, Dr.R.N. Cooper Hospital, Mumbai. The retrospective data was retrived from the institutional database over a period of five years from 2011-2015. Based on the history and physical examination findings all blood donors were classified into fit for donation or deferred donors.

Results: Of the 11,386 subjects who presented to our department during the study period, a total of 838 (7.36%) subjects were deferred. The rate of deferral was the highest in the age group of 36-45 years (35.6%) followed by 26-35 years (29.1%) and then 18–25 years (20.4%) . Percentage of deferral among a total number of registered males and females were 6.14 % (613/9981) and 16.0 % (225/1405), respectively. The main reason for deferral was low hemoglobin (Hb) (44.9%), followed by high blood pressure 17.7%), on medication (13.6%) and alcohol consumption within 72 hours (9.5%).

Conclusion: By knowing the causes of deferral, proper strategies can be devised whereby people in the community can be educated regarding the causes of deferral and importance of blood donation.

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Introduction

Blood is life. Blood transfusion has been used since 1930s for various indications. Transfusion therapy is a well established treatment in various medical and surgical procedures.[1] However, it requires an adequate supply of safe blood. Stringent donor screening criteria are designed to protect both the blood donor and recipient from harm [2]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[3]. Criteria for whole blood donor selection and deferral in India are based partially on scientific facts borrowed from developed countries and partially on tradition.[4] It is well known that quite a large number of apparently healthy donors are not able to donate blood successfully because of varied reasons , either permanently or temporarily.Temporarily deferred donors require proper follow-up and management so as not to lead to a diminished supply of future donors[5]. Proper education and screening could help in improving donor as well as recipient safety [6].

Very few studies done in India in the past have provided different common reasons for deferral of whole blood donors, highlighting differing demographic profile in different parts of the country.[4,7,8] But more studies are required regarding various aspects of deferral which can help to format the strategies to increase the pool of voluntary donors without compromising on the quality of the blood and safety to the donor and the recipient. The present study was undertaken to evaluate and analyse the rate and causes of deferral among donors.

Materials and Methods

The present retrospective study was conducted in the department of pathology, Dr. R. N. Cooper Hospital, Mumbai. The retrospective data was retrieved from the institutional database of our hospital over a period of five years from 2011-2015.

All the donors who visited over this period, of all age groups and both sexes, were included. The blood donations were carried out from the donors at outdoor blood donation camps and in-house blood bank in our hospital. The donors were voluntary or replacement donors who included relatives or friends of the patients. The donors were first required to fill up a registration form, which carried all the information like personal details, demographic details, occupation details and medical history regarding risk factors like history of previous surgery, hospitalisation, blood transfusion. The donors were then screened and a brief physical examination of the donors was performed with regards to haemoglobin, blood pressure, temperature and pulse rate & regularity, as per recommendations of Directorate General of Health Sciences, Government of India[9]. The subjects who fulfilled the following criteria of physical examination such as pulse rate- 80-100 beats/min, systolic blood pressure-100-180 mm Hg, diastolic blood pressure- 50-100 mmHg, haemoglobin >12.5 gm% were considered fit for donation and the rest were deferred. Detailed information on donor deferral including the cause of deferral was recorded in separate deferral register. The data thus collected was further analysed by observational and descriptive statistics.

Result

Of the total 11,386 subjects who presented to our department during the study period, a total of 10548 (92.6 %) subjects were selected for donation, of whom 9792(92.8 %) were males, and the rest were females 756 (7.2 %) (Table No.1). Majority (34.6%) of the donors presenting for the donation were between 18 and 25 years of age, followed by age group of 26-35 years (33.9%) (Table No.2). Total 838 (7.36%) individuals were deferred from donation because of various reasons. The age of deferred donors ranged from 17 to 65 years. The rate of deferral was the highest in the age group of 36-45 years (35.6%) followed by 26-35 years (29.1%) and then 18–25 years (20.4%) (Table No.2). Of the total donors who presented for blood donation, 12.3% were females (n=1405), however many of them were deferred so that they contributed only 7.2% of selected donors.Percentage of deferral among a total number of registered males and females were 6.14 % (613/9981) and 16.0 % (225/1405), respectively. So significantly higher percentage of females were deferred as compared to males.

The most common cause for deferral was anemia (low haemoglobin) both in male and female donors, accounting for 44.9% of deferral in our study. The other leading causes in order of frequency were high blood pressure(17.7%), on medication (13.6%) and alcohol consumption within 72 hours(9.5%). The remaining causes for deferral were age<18 years (2.1%), history of jaundice (3%), recent infection/fever (3.1%), history of thyroid disease(1.2%) and other miscellaneous causes. Anaemia (low haemoglobin) was most commonly observed in the age group of 36-45 years (16.1%) followed by 26-35 years of age (13.4%) (Table No.3). Majority of the females(63%) were deferred because of low haemoglobin (Table No 4).High blood pressure was also commonly seen the age group of 36-45 years as a cause of deferral in our study.(Table No.4).

Table 1: Demographic Profile of Donors

Gender	Total Donors	No Of Deferred Donors	No Of Selected Donors	% Of Deferred Donors
Male	9981 (87.7%)	613 (73.2%)	9792 (92.8%)	6.14%
Female	1405 (12.3%)	225 (26.8%)	756 (7.2%)	16.01%
Total	**11386 (100%)**	**838 (100%)**	**10548 (100%)**	**7.36%**

Table 2: Donor Distribution According to The Age

Age Group	Selected Donors	Deferred Donors	Total Donors	Deferral % in respective age category
1. < 18	0 (0)	18 (2.1%)	18 (0.2%)	100%
2. 18 - 25	3765 (35.7%)	171 (20.4%)	3936 (34.6%)	4.34%
3. 26 - 35	3620 (34.3%)	244 (29.1 %)	3864 (33.9%)	6.31%
4. 36 -45	2273 (21.5%)	299 (35.6%)	2572 (22.6%)	11.63%
5. 46 -60	890 (8.4%)	102 (12.1%)	992(8.7%)	10.28%
6. > 60	0 (0)	4 (0.4%)	4 (0.03%)	100%
Total	**10548 (100%)**	**838 (100%)**	**11386 (100%)**	**7.36%**

Table 3: Causes of deferral among different age groups.

Cause of deferral	18 – 25 years	26 - 35 years	36 -45 years	46 -60 years	N.A	Total
High BP	33(3.9%)	36(4.3%)	54(6.3%)	25(3%)	0(0%)	148 (17.7%)
Low HB	9.8(9.8%)	112(13.4%)	135(16.1%)	47(5.6%)	0(0%)	376 (44.9%)
On Medication	13(1.6%)	39(4.6%)	52(6.2%)	10(1.2%)	0(0%)	114 (13.6%)
Alcohol	9(1%)	25(3%)	30(3.6%)	16(1.9%)	0(0%)	80 (9.5%)
Low BP	8(1%)	6(0.7%)	6(0.7%)	1(0.1%)	0(0%)	21 (2.5%)
Infection/fever)	11(1.3%)	8(1.1%)	6(0.7%)	1(0.1%)	0(0%)	26 (3.1%)
H-Tattoo	2(0.25%)	2(0.25%)	0(0%)	0(0%)	0(0%)	4 (0.5%)
H-Jaundice	5(0.6%)	14(1.6%)	6(0.7%)	0(0%)	0(0%)	25 (3.0%)
H-Thyroid	5(0.6%)	0(0%)	5(0.6%)	0(0%)	0(0%)	10 (1.2%)
Age<18	0(0%)	0(0%)	0(0%)	0(0%)	18(2.1%)	18 (2.1%)
Others	3(0.35%)	2(0.25%)	5(0.6%)	2(0.25%)	4(0.5%)	16 (1.9%)
Total	**171(20.4%)**	**244(29.1%)**	**299(35.7%)**	**102(12.2%)**	**22(2.6%)**	**838 (100%)**

Table No.4-Causes of deferral in male and female donors.

Causes of deferral	Male	Female	Total
High BP	108 (17.6%)	40 (17.7%)	148 (17.7%)
Low HB	234 (38.2%)	142 (63.0%)	376 (44.9%)
On Medication	103 (16.8%)	11 (4.9%)	114 (13.6%)
Alcohol	80 (13.1%)	0 (0%)	80 (9.5%)
Low BP	15 (2.5%)	6 (2.5%)	21 (2.5%)
H-infectious ds %)	19 (3.1%)	7 (3.1%)	26 (3.1%)
H-Tattoo	3(0.5%)	1 (0.5%)	4 (0.5%)
H-Jaundice	18 (3.0%)	7 (3.0%)	25 (3.0%)
H-Thyroid	7 (1.2%)	3 (1.2%)	10 (1.2%)
Age<18	13 (2.1%)	5 (2.2%)	18 (2.1%)
Others	12 (1.9%)	4 (1.9%)	16 (1.9%)
Total	**613 (100%)**	**225 (100%)**	**838 (100%)**

Discussion

Paucity of healthy safe donors has always been a serious problem for blood banks all over the world. An adequate supply of blood is required but not at the cost of either donor or recipient safety[8]. Criteria for whole blood donor selection and deferral in India are based partially on scientific facts borrowed from developed countries and partially on tradition. However, sufficient in-house data and its scientific validation are still required to test the applicability of these criteria in our blood donors[4]. Deferral of the donors creates negative feelings about blood donation.

Of the total 11,386 subjects who presented to our department during the study period 92.8 % were males and only 7.2% were females which clearly shows male predominance regarding blood donation. Many studies [4,6,7] showed that female donor population was very low similar to our study and the reason may be due to more incidence of anemia, fear and lack of awareness among females.

The rate of deferral differs from region to region and sometimes in the same region from one centre to another. The overall incidence of deferral in our study was 7.36% which was consistent with the other reported Indian studies by Sundar et al [7], Chenna et al [8], Bobati et al[10], Unnikrishnan *et al*. (5.2%)[11]. But higher rates of deferral were also observed by some authors in their studies. Taneja K et al observed 17.1% of deferral [6],Mangwan (17.88%)[12] while Agnihotri N[4] reported the deferral incidence of 11.6%. Charles *et al*. reported a very high deferral rate of 35.6% in Trinidad and Tobago[13]. Such possible differences in deferral rates could be due to different donor selection criteria followed or various prevailing medical and endemic conditions[8].

The most common cause for deferral in our study was anemia (low haemoglobin) which was similar to previous studies conducted elsewhere[4,6,8,10,13]. Anemia accounted for 38.2% deferrals in males and 63% deferrals in females, implying that deferral in female donors due to anemia is nearly twice than in male donors. With such a high incidence of anemia, it may be useful to setup an anemia clinic along with blood donation camps so as to treat, counsel and maintain follow-up of temporarily deferred donors due to anemia. Kumar et al [14] stated in their study that education, motivation, and treatment of these deferred donors due to anemia are important aspects in blood banking, so that these donors can be recruited again as seen in our study.

However, Unnikrishnan et al[11] reported medication in the past 72 hours as most common cause of deferral and Charles *et al*. reported high deferral rate of 35.6% due to high-risk sexual activity, replacement system which pressures unsuitable relatives and friends into donation and α and β thalassemia traits which are prevalent in Trinidad and Tobago[13].

Many studies[4,6,7,15] showed that female donor population was very low similar to our study and the reason may be due to more incidence of anemia, fear and lack of awareness among females.

As reported by many other studies in India [4,6,7,8] high blood pressure was found to be the second most common cause of deferral in our study contributing to 17.7% deferral. But Bobati et al [10] reported alcohol consumption as second common cause of deferral. Majority of the donors who were deferred because of high blood pressure were in the age group of 36-45 years with nearly equal incidence in males and in females. (Table No. 3 & Table No.4). Hypertension often goes undiagnosed and is usually an incidental finding in rural area. This signifies hypertension as the common undiagnosed epidemic in rural health sectors [11].

13.6% deferral were due to donors on medication in our study, as observed by Agnihotri N in his study [4] History of alcohol consumption within 72 h was another leading cause in the present study exclusively seen in males, with high percentage in the age group of 36-45 years (Table No.3) Alcohol consumption was the second leading cause of deferral in a study conducted by Bobati et al[10]. This needs attention and can be resolved by counseling the donors and educating them about the adverse effects of alcohol.

History of jaundice was responsible for only 3% deferral in our study. The remaining causes of deferral were history of recent infection/fever, low blood pressure at the time of examination, age< 18 years, history of thyroid diseases, tattoo and miscellaneous causes. It is important to determine the incidence and causes of deferral among donors to guide the recruitment and retention efforts at local, regional and national level.

Conclusion

To conclude, incidence of donor deferral in our study was 7.36% with anemia being the most common cause of deferral both in males and females followed by high blood pressure.These deferred donors should be helped to overcome their problems, so that they can be prevented from being permanently deferred and encouraged to become regular donors. By knowing the causes of deferral, proper strategies can be devised whereby people in the community can be educated regarding the causes of deferral and importance of blood donation.

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