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To Determine the Blood Donor Deferral Pattern and Its Causes Among Blood Donors in Tertiary Care Hospital

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ABSTRACT

Objectives: Deferrals lead to loss of precious whole blood donors and blood units available for transfusion purposes. Knowledge of rate and causes of donor deferral can guide the recruitment strategy for whole blood donors. With this background the present study was planned to determine the rate and major reasons of blood donor deferral.
Methods: A cross sectional study was carried out for a period of 1 year from January 2020 to December 2020 in tertiary care hospital. A total number of 22652 potential blood donors were registered for blood donation, out of which 22134 (97.7%) were accepted for blood donation 518 (2.3%) were deferred for various reasons. Criteria for deferral were decided as per guidelines given by National Health Authority. Donors who were deferral were analyzed according to age, sex, occupation, education, marital status and reasons for deferral.
Results: Majority of the study subjects belonged to the age groups of 18-40 years and were married and followed Hindu religion. Among deferred donor males outnumbered the females (73.7% vs. 26.3%). The majority of deferrals were temporary deferrals 429 (82.8%) and it was seen that with increase in age, number of deferrals decreases.
Conclusions: Anaemia (32.6%) was the most common reason of temporary deferral followed by medications (21%). While the most common cause of permanent deferral was high blood pressure (40%) followed by Hepatitis C Virus (11.2%) and epilepsy (7.9%).

Keywords: Blood Donor, Donor Deferral, Temporary Deferrals, Permanent Deferrals.

INTRODUCTION

The primary responsibility of a blood transfusion service is to provide a safe, sufficient and timely supply of blood and blood products. In fulfilling this responsibility, the blood transfusion services should ensure that the act of blood donation is safe and causes no harm to the donor.[1] Only 62 countries have sufficient supplies based on closed to 100% voluntary, non-remunerated blood donation.

The World Health Organization guidelines, on assessing donor suitability for blood donation have been developed to assist blood transfusion services in countries that are establishing or strengthening national systems for the selection of blood donors.[2] Information provided by 164 countries to the WHO Global Database on Blood Safety indicates that, worldwide, more than 92 million blood donations are collected annually. Of these, an estimated 1.6 million units are discarded due to the presence of

infectious markers for Transfusion Transmitted Infections; 13 million prospective donors are deferred from donating blood due to anemia, existing medical conditions or the risk of infections that could be transmitted through transfusion. [3]

In India, the Blood Transfusion Services are guided by the donor deferral criteria laid down by the Transfusion Medicine Technical Manual (director General Health Services, Minister of Health and Family Welfare, Government of India.[4]

A deferral study in the blood donor may shed light on the health status of the general population. Knowledge of rate and causes of donor deferral can guide the recruitment strategy. With this background the present study was planned to determine the pattern of deferral among blood donors and to find out reasons of deferral in a community.

MATERIALS & METHODS

The present study is a cross-sectional study carried out for a period of one year from January to December 2020. All blood donors were screened as per guidelines of the National AIDS Control Organization (NACO) provided in Standards for Blood Banks and Blood Transfusion Services under the Drugs and Cosmetic Act 1940.A total number of 22652 potential blood donors were registered for blood donation in both blood centre and outdoor camps collection.

Each donor was selected by Medical Officer based on detailed medical history and brief physical examinations of donors with regard to hemoglobin, blood pressure, temperature and pulse regularity and rate. Donor haemoglobin (Hb) was checked using the HemoCue Hb201^{+} (HemoCue AB, Angelholm, Sweden). The cut-off point for Hb was 12.5 g/dl.Donors who did not meet the selection criteria were deferred. The deferred donors were informed about the reason of deferral and counseled accordingly. Deferred donors were categorized into temporary and permanent deferral. Temporarily deferred donors are the individuals who are not able to donate for a certain period of time. Permanent deferral are the donors who never return to the donor pool and are deferred permanently. Autologous, Directed and Apheresis donors were excluded from the study. Deferred donor data were analyzed with respect to age, gender, education, occupation and causes of deferral. Due approval was taken from Institutional Ethics Committee.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. The study sample was presented using numbers and percentages. Chi-square (two-sided) test was used to test the association for categorical variables, and odds ratios (ORs) are presented with 95% CI. All predictor variables significant at $P < 0.05$ in univariate analysis were included in multiple logistic regression analysis.

RESULT

A total number of 22652 potential blood donors were registered for blood donation, out of which 22134 (97.7%) were accepted for blood donation and 518 (2.3%) were deferred for various reasons. Majority of donors deferral, 429 (82.8%) were on temporary basis and, 89 (17.2%) were permanently deferred. Mean age and standard deviation (SD) of the subjects was 32.2 ± 10.4 years. A significant proportion of the subjects were male population (73.7%). Majority of the study subjects belonged to the age groups of 18-40 years and were married and followed Hindu religion (45.2%). More than half of study subjects were metric passed (52.5%) followed by higher education (42.1%) and were self-employed. Most of study subjects were from Punjab (95.9%) and nearly two third of study subjects (62.4%) were from urban locality.

Table 1: Socio demographics characteristics of study subjects and relation with type of deferral (n=518)

Table 1 shows the sociodemographic characteristics of study subjects and association with type of donor deferrals. The donor deferral rate was 2.3%. Out of 518 deferrals, majority of donor deferral (82.8%) were due to temporary reasons. It was seen that the proportion of deferrals due to temporary reasons decreased with increase in age and it was statistically significant (*P* = 0.001). It was seen that temporary deferral were more in married study subject as compare to unmarried and this difference was statistically significant (P=0.001). Also, it was seen that deferrals due to temporary reasons were more in males as compare to females. However, this difference was statistically non-significant (p=0.051). It was seen deferrals due to temporary reasons were more in self-employed subjects and students as compared to those who were homemaker and employed and this difference was found to be statistically significant (p=0.002). No significant association was found between years of education, religion, locality and type of deferral. The variables significant in univariate analysis were included in the binary logistic regression analysis. The results showed that age, gender and occupation were independent predictors of deferrals among donors.

Maximum donor deferral rate was due to anemia (32.6%), followed by those who were on certain medications (21.0%), physiological status of women (9.3%) donor refusal (8.4%), tattooing (7.0%) or their blood donation interval less than 3 months (6.1%) (Figure 1)

The most common cause of permanent deferral was high blood pressure (40%) followed by those having Hepatitis C positive (11.2%), epilepsy (7.9%) and uncontrolled diabetes mellitus (6.7%) (figure 2).

Figure 1

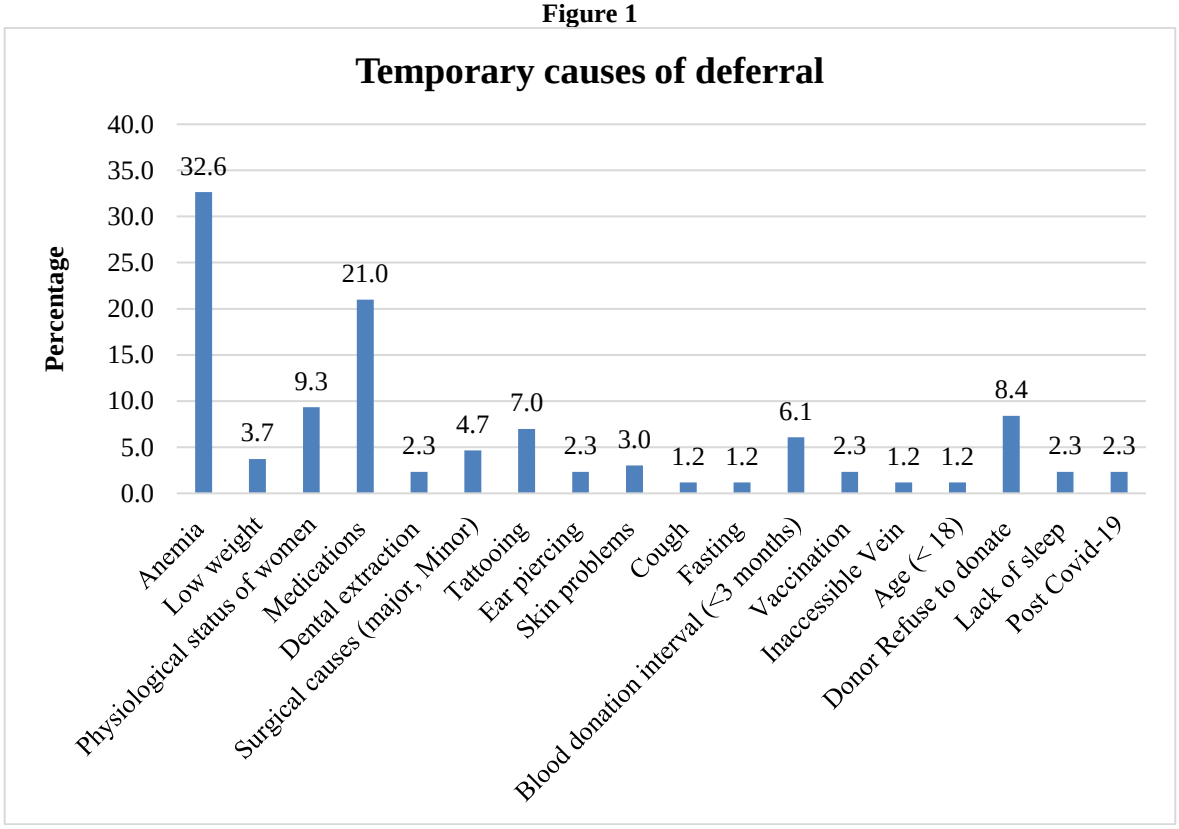

Figure 2

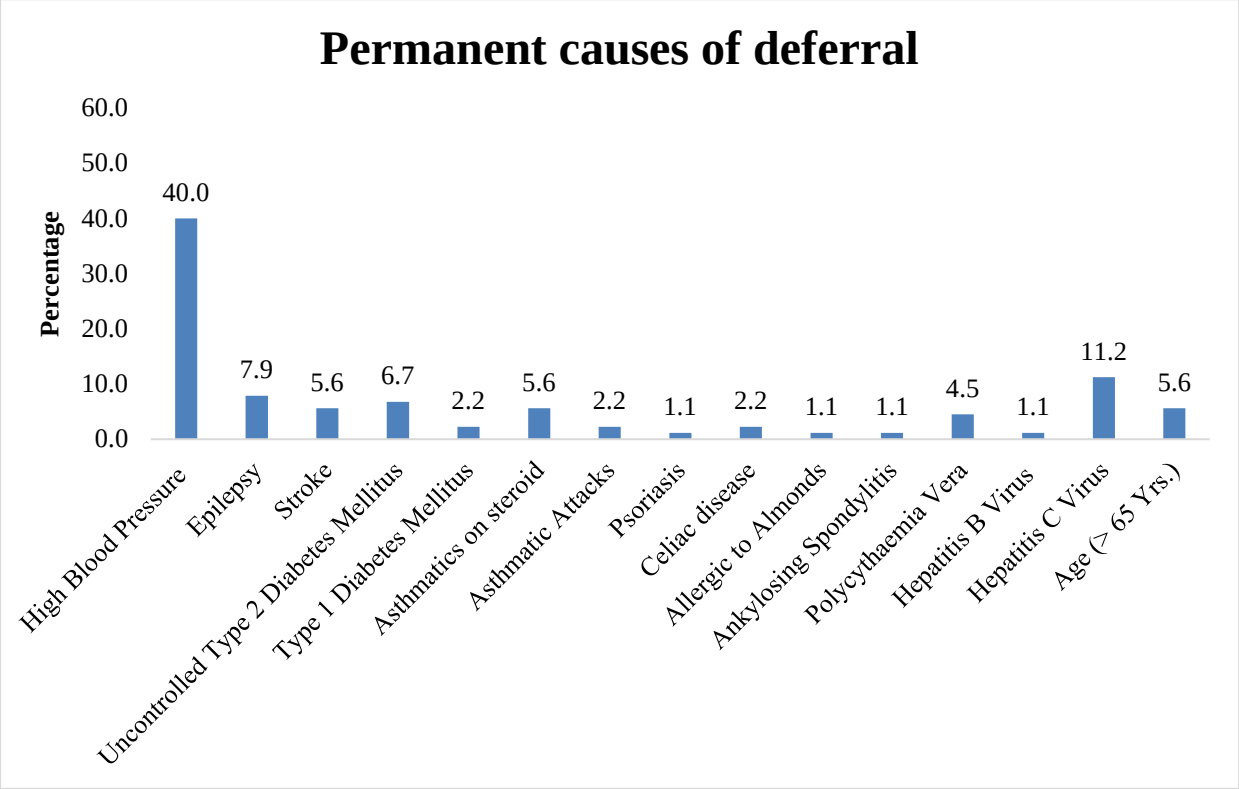

Table 1: Socio demographics characteristics of study subjects and relation with type of deferral (n=518)

Variable	Type of deferrals		Pearson's Chi-Square (p value)	OR (95% CI)	AOR (95% CI)
	Permanent (n=89)	Temporary (n=429)			
Age					
18-30 (n=268)	23 (25.8)	245 (57.1)	37 (0.001)	.121(.053-.274)	6.325(2.04-19.54)
31-40 (n=141)	32 (36.0)	109 (25.4)		0.377(.169-.842)	2.509 (1.11-5.67)
41-50 (n=77)	20 (22.5)	57 (13.3)		.45(.190-1.07)	2.16(0.9050-5.20)
>50 (n=32) ®	14 (15.7)	18 (4.2)		-	-
Marital Status					
Married (n=286) ®	69 (77.5)	217 (50.6)	21.6 (0.001)	3.37(1.98-5.74)	-
Unmarried(n=232)	20 (22.5)	212 (49.4)			1.028(0.3826-2.76)
Gender					
Male® (n=382)	73 (82.0)	309 (72.0)	3.8 (0.051)	0.564 (0.316-1.01)	
Female (n=136)	16 (18.0)	120 (28.0)			4.66(1.37-15.77)
Years of Education					
Below metric ® (n=28)	8 (9.0)	20 (4.7)	2.7 (0.259)	-	
Metric and above (n=272)	45 (50.6)	227 (52.9)		.49 (.206-1.19)	
Professional (n=218)	36 (40.4)	182 (42.4)		.49 (.202-1.21)	
Occupation					
Student (n=120)	8 (9.0)	112 (26.1)	14.5 (0.002)	.192(.073-.502)	5.52(1.156-26.38)
Homemaker(n=48) ®	13 (14.6)	35 (8.2)		-	-
Self	48 (53.9)	185 (43.1)		.698(.343-	5.053(1.239-20.6)

employed(n=233)				1.42)	
Govt. Employees(n=117)	20 (22.5)	97 (22.6)		.555(0.25-1.23)	5.024(1.21-20.82)
Religion					
Hindu® (n=234)	45 (50.6)	189 (44.1)		-	
Muslim (n=22)	3 (3.4)	19 (4.4)	(0.543) Fishers	.663(.188-2.34)	
Sikh (n=262)	41 (46.1)	221 (51.5)		.779(.489-1.24)	
State					
Haryana® (n=4)	1 (1.1)	3 (0.7)	(0.771) Fishers	-	
Jammu & Kashmir (n=17)	3 (3.4)	14 (3.3)		.642(.048-8.52)	
Punjab (n=497)	85 (95.5)	412 (96.0)		.618(.063-6.02)	
Locality					
Rural (n=195)	36 (40.4)	159 (37.1)	0.36 (0.548)	1.15 (0.723-1.84)	
Urban (n=323)	53 (59.6)	270 (62.9)			

***AOR=adjusted odds ratio, CI=confidence interval, OR=odds ratio**

DISCUSSION

Blood donor suitability criteria based on science, informed medical opinion and regulatory rules influence donor demographics and lead to specific deferral pattern.[5]

The deferral rate in present study was 2.3%. It was comparable with study conducted by Jethani et al [6] in Rajasthan who reported 2.56% as deferral rate. High deferral incidence was shown in studies like Zou et al [7] (12.8%), Chaudhary et al [8] (16.4%), Bahadur and colleagues [9] (9%). Custer et al [10] (13.6%). Reason for low deferral rate in present study could be because donors were relatives of admitted patients who had come to arrange blood. Attempts were made to impart knowledge about myths and benefits about blood donations. This helped in decreasing the deferral rate.

In the present study, it was seen that with increase in age, number of deferrals decreases. Maximum deferrals were seen in age group 18-30 years (51.7%). Similar findings were reported by Girish et al (51.4%), [11] and Gaikwad et al[12] (65%).

In the present study, the numbers of deferred males (73.7 vs. 26.3) were higher than the females. Similar results were in shown in study by Sundar P et al [13] (61.6 vs. 38.3).

In the present study, temporary deferrals were more than the permanent deferral (82.8% vs. 17.2%). This was in consonance to studies done by Shah et al. [14] (87.55% vs. 12.45%), Sundar et al. [13] (84% vs. 16%) and Attri N et al [15] (81.30% vs. 18.69%). Temporary deferred donors can be recruited back to the donor pool if they are properly counselled and managed regarding their cause of deferral.

Most common reason for temporary deferral in the present study was anaemia (32.6%). The major cause of anaemia was iron deficiency anaemia. The donors deferred should be advised proper diet, iron supplements with awareness health programmes at the community levels. This finding was in consonance with the finding with the study done by Bahadur et al [9] (32.8%) and Priya et al [16] (37.8%). The second most common cause of temporary deferral among donors was due to medications (21%) they were taking like Absorica, Propecia, Avodart, Asprin, Plavix, Feldene. The subjects taking above medicines were deferred as these medications have anti platelet action and it decreases the viability of the platelets. [17]

This finding was similar to the study conducted by Anchinmane VT et al [18] at Arunachal Pradesh who reported 26.9% subjects were deferred due to medications. Another study conducted by Bashawri LA et al [19] at King Fahd Hospital of the

University (KFHU) Al-Khoba reported 26% subjects were deferred.

In present study donors were deferred due to tattoo (7%) in less than 6 months prior to donation, shown in a similar study done by Priya et al[16] (3.29%). This tattoo culture is popular in our state as it is a way of asserting one's personality and as a marker of their identity.

The most common cause of permanent deferral in our study was high blood pressure (40%). It was seen that in many donors it was an incidental finding. Similar finding was reported by studies conducted by Priya et al [16] (27.63%) and Ramesh S Patil et al (56.2%). [20] This shows that hypertension is the common day epidemic in health sector. Such donors should be counseled and guided to change their lifestyle. The second most common cause of permanent deferral due to hepatitis C virus positive (11.2%). Similar studies were done by Iqbal H et al [21] reported 19.2%.

Other cause of permanent deferral was epilepsy (7.9%) and this finding was similar to the study conducted by Gajender et al [22] who reported 11% donors were deferred due to epilepsy. The blood donor deferred because of any reason leads to loss of time and efforts of blood donors and blood bank staff. Blood donors deferred temporarily had distressing experience and psychological effects. Hence, counseling and encouragement is needed for such temporary deferrals.

CONCLUSION

The deferral rate in present study was 2.3%. It was seen that temporary deferrals were more than the permanent deferral. Maximum donor deferral rate was due to anaemia, followed by those who were on certain medications or have tattoo on their body parts. It is necessary that every blood bank as well as health professional should analyse pattern of donor deferral and health status in their own region so that unnecessary deferral especially due to temporary reasons can be avoided. Donor deferral can be reduced with health awareness and intensive health education.

Declaration by Authors

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