Original Article

Blood Donor Deferral Pattern in Iran

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Abstract

Background: Donor selection is still being emphasized, even in the era of sensitive laboratory screening. Therefore, a number of volunteers are deferred from blood donation. This study evaluated the deferral rate in Iran, as well as the frequency of each reason in order to monitor the impact of donor selection process on donor loss.

Method: This study was carried out on data of all volunteers who were deferred from blood donation in Isfahan Blood Transfusion Services between the years 2007 – 2008. The deferral reasons were then classified into "donor safety" and "recipient safety". The total deferral rates within sociodemographic variables and donor status were compared. Then, the rates of various specific deferral reasons were calculated.

Results: Out of 197,757 blood donor volunteers, 50,727 (25.6 %) were deferred from donation; 88.6 % were temporarily deferred whereas 11.4 % were permanently deferred. The deferral rate for females and males was 54.6 % and 24.3 %, respectively. Forty-three percent of the first-time donors, 9 % of the lapsed donors, and 11.9 % of the regular donors were deferred. Sixty-one percent of all deferrals were due to donors' safety while 31 % were deferred due to recipients' safety.

Conclusion: Blood donors' deferral rate in Iran was significantly higher than other countries. This may be due to special attention to donor selection procedures. However, revision of the national criteria of donor selection and rigorous adherence to these criteria should be considered. Also, it is emphasized to improve the blood donor retention strategies to boost the regular blood donors' pool.

Keywords: Blood donation, blood donor deferral, blood safety

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Introduction

The main goal of the blood transfusion centers is ensuring the availability of safe blood. Therefore, laboratory screening of all blood donations is performed for HIV-1/-2, hepatitis B, hepatitis C, and syphilis. Even with the use of sensitive laboratory screening for several transfusion transmitted infections (TTIs), donor selection is emphasized since it is the only way to prevent transmission of infection from blood transfusion in case of window period and infectious agents for which screening tests are unavailable.[1]

Iranian Blood Transfusion Organization (IBTO) is a national centralized organization with its 31 provincial blood centers affiliated to the central headquarters within the scope of laws, regulations, and guidelines. Isfahan Blood Transfusion Center with three fixed blood collection sites is one of the provincial blood centers that collect about 6 % of the annual blood collection in the country. Isfahan Blood Transfusion Center is responsible to ensure blood and components for all hospitals in the province.

At all blood collection centers of IBTO, presenting donors are selected through a national and standard health history questionnaire and a mini-physical examination by a trained physician. This donor selection includes some issues to ensure either donor safety or recipient safety such as potential exposure to infectious agents. If a donor does not meet the criteria, based on the reason, he / she will be either temporarily or permanently deferred. The record of the donor's general health, medical history, and TTI risk factor are kept in an electronic database capable of generating reports.

The donor selection process requires continuous monitoring to ensure that it achieves its objectives of ensuring donor and recipient safety and providing a sufficient supply of blood and blood components.[2] This study analyzed the deferral data from Isfahan Blood Transfusion Services and their reasons in order to assess each deferral criteria.

Materials and Methods

Data collection

This retrospective study was carried out on all data of blood donors who presented to Isfahan Blood Transfusion Services between March 20, 2007 and March 19, 2008, and were deferred from blood donation according to national criteria of donor selection.

The sociodemographic characteristics of deferral volunteers such as age and sex, history of donation (first-time, lapsed, and regular), as well as deferral reasons were extracted from IBTO national database. Only allogenic whole blood donation both from mobile and fixed collection sites were considered in this study.

The deferral reasons were then classified into "blood donor safety" and "blood recipient safety" as follows:

Blood donor safety: Abnormal blood pressure, medical disease, low or high Hb level, medication, inappropriate blood donation interval, and inappropriate weight.

Blood recipient safety: High-risk behavior, malaria, tattoo or bloodletting, dental procedure, vaccination, history of infectious disease or contact with an infected person, history of transfusion, travel to endemic regions of malaria, leishmaniasis, or other countries that have a deferral period, and self-deferral.

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Table 1. Comparison of the deferral rate based on sex and history of blood donation

Category		Presentation	Deferral number	Deferral rate (%)	P-value
Sex	Male	188,977	45,929	24.3	**0.007**
	Female	8,780	4,798	54.6	
Donor status	First-time	90,225	38,830	43	**0.021**
	Lapsed	33,662	3,049	9	
	Regular	73,840	8,848	11.9	

Table 2. The rate of specific deferral reasons

Category	Deferral reasons	Number	Rate (per 1000 presentation)	Reasons	Number	Rate (per 1000 presentation)
Blood donor safety reasons	Abnormal blood pressure	7226	36.5	Renal diseases	184	0.8
	High Hb level	4755	24	Pregnancy/post-delivery	1	0.8
	Medication	4625	23.3	Low weight	164	0.7
	Low Hb level	4238	21.4	Gastrointestinal and hepatic disorders	147	0.7
	Endocrine disorders	2601	13.1	Blood donation interval of 3 months	137	0.6
	Common cold	2382	12	Reaction after donation	129	0.6
	Heart diseases	1243	6.3	Nervous system disorders	122	0.5
	Allergy	810	4	Autoimmune diseases	89	0.3
	Skin problem	701	3.5	Trauma	54	0.2
	Unappropriate age	406	2	Malignancy	38	0.1
	Respiratory diseases	346	1.7	Occupational limitation	24	0.0
	Surgical procedure	318	1.6	Menstruation	7	0.0
	Unappropriate vein	204	1	Thrombosis	6	0.0
Blood recipient safety reasons	Travel	3930	19.8	Likely carrier of HBV,HCV	162	0.8
	Bloodletting	3891	19.7	Psychological disorders	93	0.5
	High- risk behavior	3761	19.1	Infectious diseases	75	0.4
	History of repeatedly reactive test	1465	7.4	self-deferral	64	0.3
	Dental procedure	445	2.2	Prison history	63	0.3
	Tattooing, acupuncture, or ear piercing	371	1.9	Malaria	58	0.3
	Hepatitis history	320	1.6	Self-exclusion	51	0.3
	Intravenous drug users	318	1.6	Transfusion	25	0.1
	Vaccination	248	1.3	STD	16	0.0
	Contact with hepatitis patient	162	0.8	Others	405	2
Others	Others	3807	19.2	- - -	- - -	- - -

Blood donor questionnaire

The blood donor questionnaire was designed by the headquarter of IBTO and approved by the High Council of IBTO as the main policy maker of the organization which is chaired by the Minister of Health.

The accepted age for blood donation is 18 – 65 years. The current eligibility of minimum weight is 50 kg in considering the use of 450 mL blood bags in IBTO. The minimum acceptable Hb level at the period of study was considered 12.5g/dL for both males and females. Donor's Hb was assessed using a capillary finger stick sample that was analyzed by portable hemoglobinometer. The minimum interval of 56 days between donations are mandatory. Donors' systolic blood pressure should be between 90 to 180 mmHg and their diastolic blood pressure should be between 50 and 100 mmHg.

Definitions

The terms of first-time, lapsed, and regular donors were defined by IBTO as below:

- First-time donor is a donor who succeeds in donating blood for the first time.
- Lapsed donor is a donor who has donated blood in the past but not in the preceding 12 months.
- Regular donor is a donor who has donated twice or more within a period of 12 months.

Statistical analysis

The frequencies of sociodemographic variables were described. Then, chi-square test was used to compare deferral rates within sociodemographic variables and donor status. The rates of various specific deferral reasons were calculated. All statistical analyses were carried out with SPSS software (SPSS, Inc., Chicago, IL, USA).

Results

Data of 197,757 volunteers who presented to Isfahan Blood Transfusion Services between March 20, 2007 and March 19, 2008 were studied, of whom 8,780 (4.4 %) were females and 188,977 (95.6 %) were males; 90,255 (45.6 %) were first-time donors, 33,662 (17 %) were lapsed donors, and 73,840 (37.4 %) were regular donors.

Of those, 147,030 (74.4 %) were approved and 50,727 (25.6 %) were deferred from blood donation. Among the deferred volunteers, 4,798 (9.5 %) were females and 45,929 (90.5 %) were males; 44,920 (88.6 %) were temporarily deferred while 5,807 (11.4 %) were permanently deferred; and 38,830 cases (76.5 %) were first-time, while 8,848 (17.5 %) were regular and 3,049 (61 %) were lapsed donors. The mean age of the deferred donors was 34.29 years; 29.4 % were in age group 25 years or less, 51.3 % were in group 26 – 45 years, and 19.3 % were in age group 46 years or more.

Table 1 shows comparison of deferral rates based on sex and history of blood donation. As it can be seen 24.3 % of males and 54.6 % of females were deferred. Also, 43 % of the first-time donors, 9 % of the lapsed donors, and 11.9 % of the regular donors were deferred.

Table 2 shows the frequency of each reason of deferral with classification in donor safety and recipient safety. As can be seen the rate of specific deferral reasons varied from 36.5 per 1000 to less than 0.1 per 1000 and the top causes included: abnormal blood pressure, high Hb level, medication, low Hb level, travel, bloodletting, and high-risk behavior. The most common cause of deferred from blood donation within male donors was abnormal blood pressure (15.3 %) while the most common cause in female donors was low Hb level (42.3 %).

Totally, 30,905 (61 %) of all deferrals were due to blood donor safety while 15,697 (31 %) were due to recipient safety. The remaining 8 %, who were deferred either due to self deferral or lack of information about the reason, were not included in the above two groups.

The most common causes of deferral for donor safety reasons were abnormal blood pressure with 36.5 per 1000 followed by high Hb level (24 per 1000), medication (23.3 per 1000), and low Hb level (21.4 per 1000). The most common causes of deferral for recipient safety were international travel (19.8 per 1000) followed by bloodletting, high-risk behavior, and history of repeatedly reactive to screening test.

Discussion

In this study, the deferral rate was 25.6 % while other countries have reported different figures. American Red Cross Blood Services have reported a deferral rate of 12.8 %, Brazil 21.6 %, Singapore 14.4 %, India 9%, Trinidad and Tobago 35.6%, and Malaysia 5.6 %.[3,4,5,6,7,8] Also, in studies performed in Tehran Blood Transfusion Services the deferral rate was between 19.7 % and 22.5 %.[9,10] Although there is no practical way for confirmation of deferred or accuracy of accepted donors, this deferral rate is rather high in consideration of the another country deferral rate. This may be due to rigorous adherence to the donor selection procedures in IBTO. However, with respect to lower return rate of deferred donors, deferral management should be considered in order to avoid unnecessary deferrals.

This study showed that the deferral rate was much higher in first-time donors, in comparison to regular donors (43 % vs. 9 %, respectively), which is in agreement with those of other authors. This finding confirms the importance of retaining safe donors as regular donors.

In this study, the most deferral rate was seen in age group 26 – 45 years. On the contrary, the most deferral rate was reported in age group less than 25 years in other studies.[5,9,11]

It may be due to the difference in the deferral reasons between the countries; 61 % of deferrals in IBTO were due to blood donors' safety such as abnormal blood pressure and use of medication that is more frequent in older age groups. Whereas the donor selection questions significantly tend to protect recipients.[12]

This study showed that the deferral rate was significantly higher in female than male volunteers (54.6 % vs. 24.3 %, respectively) which is consistent with studies in other countries.[4,13] The main reason for deferral in females was low Hb level. This was expected due to higher prevalence of iron deficiency in females, and was consistent with studies performed in other countries.[7,8,13] Among deferred women, 95 % were due to donor's safety, and only 5 % were due to recipient's safety reasons. According to the results, the high-risk behavior is significantly lower in females than males and more actions should be taken to recruit more female donors. The need for iron supplements and limitation of the frequency of blood donation to prevent iron deficiency in menstruating female blood donors is being considered in IBTO.

The results of this study indicate that the main reason for deferral in Isfahan Blood Transfusion Centers was abnormal blood pressure that is consistent with the data of deferral in the country.[14] This can be caused by lack of calibrated equipment, or not to follow the current standard operational procedure. This reason was not reported as the main reason for deferral in any study from other countries.

High Hb level was the second reason for deferral (24 per 1000); that is much higher in comparison to previous studies in Iran. This shows an increasing trend in deferral for this particular reason. Low Hb level and unsafe sexual contact were the main reasons reported by others.

Also, medication was the third most common cause of deferral (23.3 per 1000), which is less than the rate reported in previous studies in Iran (12.3 %).[14] This may be a sign of moderation in drug consumption among the donors due to proper information given to the public with respect to blood donation criteria.

In this study, 61 % of deferrals were due to blood donor's safety and 31 % were due to blood recipient's safety, and the remaining 8 % for other reasons not mentioned in these two groups. Although this is consistent with what was reported in the United States,[3] the driving force for donor selection should involve screening for TTIs.

In conclusion, blood donors' deferral rate in one of the main provinces of Iran was significantly higher than other countries. However, several studies emphasized that a significant number of blood donors who were deferred had not returned again. So, elimination of unnecessary deferrals through revision of the national criteria of donor selection and rigorous adherence to the standard operational procedures by the blood donor's physicians should be considered. Also, it is emphasized to improve the blood donor retention strategies to boost the regular blood donors' pool.

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