

Original Research Article

Retrospective analysis of the most common cause of rejection of donors for blood donation

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ABSTRACT

Background: A significant imbalance in access to safe blood is seen between the developing and developed countries. Donor selection has a pivotal role in preventing transfusion related complications and provide safety to the recipients. In this study, we aimed to find out rate and causes of blood donor rejection in our hospital.

Methods: A retrospective study conducted in a tertiary care hospital involving both the voluntary and replacement donors during the period September 2017 to December 2018. We included all those donors who were considered unfit for blood donation. All those who came for blood donation at our hospital were asked to fill up an enrolment form for a blood donor. A general and systemic examination were done. We calculated the rejection rate, listed the reasons for donor rejection, and analyzed the data.

Results: Among 150 rejected blood donors, most were males [129 (86%)], and the rest were females [21 (14%)]. The rejection rate in our study was 3.29%. We found that the rejection rate of donors was different among voluntary and replacement donors. It showed that the most common reason for the temporary rejection of blood donation was low hemoglobin level, followed by abnormal blood pressure.

Conclusions: A vast majority of donors were rejected temporarily [132 (88%)], while the rest of them were rejected permanently [18 (12%)]. Low Hb in females and abnormal blood pressure in males were the commonest causes of blood donor rejection. Many factors affect the similarities and variations between the most typical causes of blood donor rejection, such as geographical area, cultural, socio-economic, and educational factors.

Keywords: Blood donor, Rejection, Low haemoglobin, Blood pressure, Eligibility criteria

INTRODUCTION

Blood donation is the lifesaving practice in a medical emergency, and as the need for blood is universal, many patients do not have timely access to safe blood. A significant imbalance in access to safe blood is seen between the developing and developed countries. Blood donors are the cornerstone for blood provision.^{1,2}

WHO recommends coordinating all the activities related to collecting, testing, processing, storage, and distribution

at the national level through an effective organization.³ According to a 2013 report provided by 150 countries on discarded blood donations, the median total discard rate in low-income countries, lower-middle-income countries, upper-middle-income countries, and high-income countries was 9.0%, 10.9%, 6.7%, 5.7%, respectively.⁴

Donor selection has a pivotal role in preventing transfusion related complications and provide safety to the recipients as the presence of infections such as hepatitis B and C, Herpes, HIV, and syphilis is the indication to discard the

blood units. Eligibility of blood donor is decided by medical interview, based on national guidelines for selection of the donor. "Donor questionnaire" becomes a key tool for donor selection, assesses the health and well-being of the donor, and helps to identify at-risk donors. This checks the transmission of any infections to the recipients and helps screen the donors.⁵⁻⁷

Many studies around the world are done concerning the causes of blood donor rejection. In our study, we aimed to find out rate and causes of blood donor rejection in Dr R.N Cooper hospital.

METHODS

A retrospective study conducted in a tertiary care hospital involving both the voluntary and replacement donors during the period from September 2017 to December 2018. We recorded all the required details for blood donation eligibility in a standard format that included relevant history, physical examination, and hemoglobin estimation. We included all those donors who were considered unfit for blood donation. Donors eligible for blood donation were excluded from our study.

All those who came for blood donation at our hospital were asked to fill up an enrolment form for a blood donor. The form included all the required details such as identification details, age, sex, weight, height, blood group (if known), history of previous blood donation, etc. Relevant medical history such as diabetes mellitus, hypertension, allergy, asthma, epilepsy, ischemic heart disease, past history of TB, chronic kidney disease, chronic liver disease was collected. Recent history of any infections, jaundice, drug/medicine intake, history of blood transfusion, alcohol consumption in the past 24 hours, major surgeries in the past were also recorded in the form. Transfusion transmissible infections, e.g., HIV, Hepatitis B and C, Malaria, and Syphilis, were more emphasized in history taking.

Pallor, icterus, clubbing, pedal edema, and lymphadenopathy were examined with vital signs-temperature, pulse, respiratory rate, and blood pressure. A systemic examination of the cardiovascular system, respiratory system, nervous system, and abdomen was done.

Then, the assessment of hemoglobin was done by a specific gravity method using the CuSO₄ solution. The donor's consent for blood donation was taken with a declaration of the trustworthiness of the details. We calculated the rejection rate, listed the reasons for donor rejection, and analyzed the data.

RESULTS

The total number of subjects came to blood banks who willing to donate blood but rejected due to any reason were 150. Among them, most were males [129 (86%)], and the

rest were females [21 (14%)], as shown in Table 1. The rejection rate in our study was 3.29%. The rejection of blood donors was categorized under three main categories: Personal causes, Medical examination causes, History causes illustrated in Table 1. Most of the donors were temporarily rejected [132 (88)], and the rest of the donors were permanently rejected [18 (12%)].

Table 1: Sex distribution, categories of the causes of the rejection, and type of rejection.

Sex	No. rejected	No. rejected in %
Male	129	86
Female	21	14
Category of causes of rejection		
Personal causes	15	10
Medical Examination causes	68	45.33
History causes	67	44.67
Type of Rejection		
Temporary rejection	132	88
Permanent rejection	18	12

In this study, we found that the rejection rate of donors was different among voluntary and replacement donors. Sub-group analysis in males and females showed a difference in the rejection rate, illustrated in Figure 1.

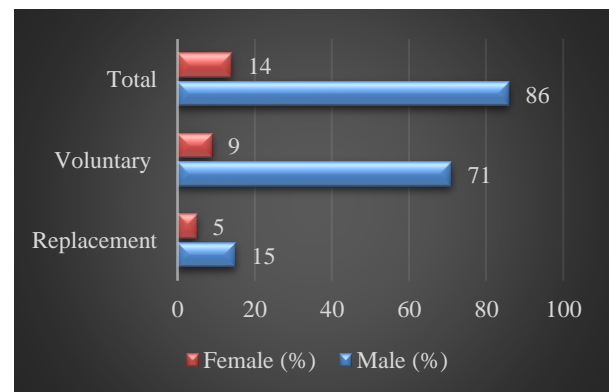


Figure 1: Sub-group analysis of voluntary and replacement donors in males and females.

The etiologic distribution of rejection of blood donors is listed in Table 2. It showed that the most common reason for the temporary rejection of blood donation was low hemoglobin level, followed by abnormal blood pressure. Out of 70 donors who had low hemoglobin, males were 9, and females were 61. Abnormal blood pressure was mostly seen in the age group of 41-50 years. The proportion of females was higher in the underweight group than in males. Recent alcohol intake was seen only in male donors, while thyroid disorders were seen in only female donors. HIV was found equally in male and female donors. The most common cause of permanent rejection was found to be hypertension in our study.

Table 2: Etiologic distribution of rejection of blood donors.

Reason for rejection	No. of rejection	No. of rejection in %
Low haemoglobin	70	46.67
Abnormal blood pressure	11	7.33
Under age	9	6.00
Under weight	14	9.33
Recent alcohol intake	5	3.33
Recent drug/medicine intake	6	4.00
Menstruation	3	2.00
Thyroid disorders	3	2.00
Recent history of jaundice	1	0.67
History of major surgery	2	1.33
Asthma	2	1.33
Epilepsy	1	0.67
Allergy	1	0.67
Heart/Lung disease	3	2.00
Uncontrolled Diabetes	5	3.33
Malaria	2	1.33
Hepatitis	3	2.00
HIV	6	4.00
Others	3	2.00
Total	150	100

DISCUSSION

The eligibility criteria for blood donors is to strengthen the safety of the donor and the recipient; however, failed to meet that criteria lead to negative effects on the donors' mind, and it is a painful and sad experience for the donors as well as for the blood bank centers which screens the donor.⁸ Therefore, it is crucial to reduce the rejection rate as much as possible. For that, the etiologic distribution of donor rejection has to be studied and analyzed carefully so the appropriate steps could be taken to decrease that.

The eligibility criteria for blood donors are based on the science and the informed medical consensus, which are designed to protect the donors and the recipients from harm.⁹

Our study demonstrated an overall rejection rate of 3.29% for 16 months. This is similar to be reported by other studies. Agnihotri conducted a study at a center in Western India over 18 months, showing the rejection rate of 11.6%.¹⁰ Reikvam et al. conducted a study in Norway for 18 months and reported a rejection rate of 3.9%.¹¹

In this study, the most common reason for rejection of blood donation was low hemoglobin level and being it a temporary cause, it provides us the scope to educate and counsel the donors about the cause of rejection and

treatment strategy to over that, which will allow them to donate blood in the future. Moreover, reassurance and motivation of rejected donors are of utmost importance, helping to donate blood later.

Our study demonstrated different rejection rates in both the sexes and the predominant cause in both the sexes was different. While the low hemoglobin level was the most common cause of rejection in females, abnormal blood pressure was the primary cause in males. This was probably because these females were in their reproductive age groups and had menstrual blood loss that contributed to low Hb, while in males, that was because most of the males were in the age group 31-40 years and were hypertensive.

Recent alcohol intake was only seen in males. This could be due to the higher prevalence of alcohol consumption in males than females.

It is advised to explain them in detail and spare some extra time in counseling who were rejected due to any reason as it could allow them to donate later after fulfilling the eligibility criteria. A low Hb is amenable to treatment after finding the cause, and those who were under-aged should be advised to come after the attainment of 18 years of age.

Females who were rejected because of active menstrual bleeding could be advised to come after a week for blood donation.

Thus, proper donor education on the risk factors is necessary for the safe transfusion practice and improves the motivation of the donors that could improve the return rates for blood donation.^{12,13}

CONCLUSION

In modern medicine, blood banking is one of the pillars and backbone of tertiary care hospitals; however, it carries a significant risk of transmitting the infections. Appropriate pre-screening donors play a pivotal role in avoiding these complications and ensuring the quality of the donors. A vast majority of donors were rejected temporarily, while the rest of them were rejected permanently. Low Hb in females and abnormal blood pressure in males were the commonest causes of blood donor rejection. Recent alcohol intake was also an important factor for rejection in males, and menstruation was an important factor in females. Many factors affect the similarities and variations between the most typical causes of blood donor rejection, such as geographical area, cultural, socio-economic, and educational factors.

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