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Original Research Article

Blood Transfusion as a Reason for Donor Deferral: Safe Donation Practices

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Abstract:

Aim: The aim of this study was to find the causes of deferral of blood donors, which can help prospective donors better understand the requirements for blood donation and the dangers of receiving transfusions.

Methodology: Through a combination of medical history, physical examination, and serological testing for transfusion-transmissible infections (TTIs), 159 rejected blood donors were examined cross-sectionally in order to determine the causes of deferral.

Results: 130 (81.8%) of the 159 deferred donors were rejected due to medical and temporary criteria.29 (18.2%) were deferred because of positive TTI screening results. Males made up 93.85% of deferred donors, while females made up 6.15%. The age group of 26–40 years old accounted for 43.08 percent of all deferrals. Hypertension was the most common reason for deferral (39.23%), followed by recent vaccination (15.38%) and low haemoglobin (6.92%), which only affected female donors.

Conclusion: High deferral rates emphasize how crucial careful donor screening is to guaranteeing the safety of blood donors. The main causes were transient conditions like recent vaccinations and hypertension. The results highlight the necessity of focused health education to increase donor eligibility and reduce avoidable deferrals**.**

Keywords: Blood donation deferral, Transfusion-transmitted infections, Blood donor screening, Blood transfusion and donor eligibility, Blood safety and transfusion.

Introduction

For a number of ailments including chronic anaemia, trauma and surgery, blood transfusion can save lives. They are essential to global healthcare systems. However, since infectious diseases can be transmitted during transfusion, blood supply safety is crucial to halting their spread. Donors who have received blood transfusions may be temporarily deferred by blood donation organisations in order to ensure the safety of blood products[1] .One important factor in donor deferral policies is the window period, or the interval between an individual contracting an illness and when it can be identified by contemporary blood screening tests. Blood transfusions can spread transfusion- transmissible infections (TTIs), including HIV, hepatitis B, hepatitis C, and syphilis.

Because recipients of blood transfusions may be more likely to carry undetected infections, deferral periods are in place for a predetermined period of time (usually 12 months) following a transfusion [2,3] (Centres for Disease Control and Prevention [CDC], 2019; World Health Organisation [WHO], 2020). Generally speaking, a deferral period of at least 12 months following a transfusion is advised, though guidelines for donor deferral due to transfusions differ by nation and blood service organisation. This lessens the chance that infectious agents will spread through donated blood by allowing latent infections to develop[4,5]. Despite the significance of this precaution, donor deferral policies may have an effect on the blood supply as a whole, particularly if they affect repeat donors or those who require frequent blood donations (Laperche et al., 2016)[6].

Different national guidelines and screening methods for TTIs complicate the implementation of donor deferral policies. The impact of deferral policies on donor availability and blood supply security must be examined. For instance, while many nations support a 12-month deferral, some may have different deferral criteria depending on the prevalence of specific infectious diseases (Leroy et al., 2018; Van der Meer et al., 2017). It is essential to look at how these deferral policies impact donor availability and blood supply security. This study aims to evaluate the criteria, duration, and rationale for donor deferral following a blood transfusion. With a focus on finding the optimal balance between safety and donor retention, it will also look at how these policies impact blood safety and donor eligibility.

Materials & Methods

Through a combination of medical history, physical examination, and serological testing for transfusion-transmissible infections (TTIs), 159 rejected blood donors are examined cross-sectionally in order to determine their causes of deferral.

Study Design and Population

Using a cross-sectional design, the study looks at a group of people at one particular moment in time.

A standardised method is used to evaluate potential donors.

Medical History

A comprehensive examination of the donor's past medical records, encompassing previous ailments, operations, and prescription drugs.

Physical Examination

A physical examination is performed to look for any indications of infection or other medical conditions that might make a person ineligible to donate. The data were obtained from routine blood donor screening records maintained at the blood bank. These records provided comprehensive information about each donor’s demographic details, medical history, lifestyle behaviours, and laboratory results.

Serological Testing

Antibodies or antigens linked to TTIs are looked for in blood samples. HIV, hepatitis B, hepatitis C, and syphilis are among them (VDRL).

Source of Data

The information was taken from the blood bank's regular donor screening records. These documents included thorough details about the medical history, lifestyle choices, demographics, and lab results of each donor**.**

Group 1: Postponed Donors

Several non-infectious criteria were used to assess this donor group. Among the fundamental demographic information collected were age and sex. A comprehensive medical history was acquired, with particular attention paid to conditions such as anaemia, hypertension, and recent surgical procedures. Among the lifestyle-related factors considered were current medication use, recent tattoos, and alcohol consumption. Additionally, the history of vaccinations was reviewed, specifically for rabies, COVID-19, and Hepatitis B. Based on these assessments, members of this group were deferred for non-infectious reasons.

Group 2: Donors with seropositive results

This group consisted of individuals who tested positive for blood transfusion-transmitted infections. Syphilis, HIV, Hepatitis B surface antigen (HBsAg), and Hepatitis C virus (HCV) were all screened for using the VDRL test. The gender distribution within this group.

To find any demographic patterns, the gender distribution of these seropositive donors was examined. Indeterminate HCV results were observed in a few instances. This group's donors were grouped according to the particular infection that was found.

Ethical Considerations

Because all donor data was anonymised and no personal identifiers were used at any point, the study was able to maintain strict confidentiality. Before data collection and analysis, ethical approval was acquired from the relevant departmental authority.

Statistical Tools and Analysis

R and SPSS software were used for data analysis. The results were summarised using descriptive statistics, such as mean age, percentages, and frequency distributions. Depending on the data distribution, the Chi-Square or Fisher's Exact tests were used to examine correlations between variables. Additionally, subgroup analyses were performed, such as comparing HCV positivity with gender with low haemoglobin levels or tattoo history.

Results

159 rejected blood donors were screened during the study. Of these, 130 donors (81.8%) were deferred due to medical, lifestyle, or temporary criteria, and 29 donors (18.2%) were deferred due to positive serological screening for transfusion-transmissible infections (TTIs) such as HIV, Hepatitis B, Hepatitis C, and VDRL. Of the 130 deferred donors, 122 (93.85%) were men and 8 (6.15%) were women. This notable male preponderance suggests a gender gap in donor presentation, which could be brought on by behavioural, cultural, or physiological factors. It is also in line with findings from similar regional studies. Of the donors, 38 (29.23%) were between the ages of 18 and 25, 56 (44.08%) were between the

ages of 26 and 40, 23 (17.69%) were between the ages of 41 and 50, and 17 (13.18%) were over 50.

Table 1: Demographic Distribution of Deferred Donors (n = 130)

Sex Distribution		
Sex	**Number**	**Percentage**
Male	122	93.85%
Female	8	6.15%
Age Distribution		
Age Group	**Number**	**Percentage**
<18 years	1	0.77%
18–25 years	38	29.23%
26–40 years	56	43.08%
41–50 years	23	17.69%
>50 years	17	13.08%

Table 2: Causes of Donor Deferral (n = 130)

Cause of Deferral	Number of Cases	Percentage (%)
Hypertension	51	39.23%
Vaccination (COVID, Rabies, HBV)	20	15.38%
Low Haemoglobin (all females)	9	6.92%
Low Blood Pressure	5	3.85%
Medication	8	6.15%
Tattoo (recent & history)	5	3.85%
Recent Surgery/Dental Procedure	2	1.54%
Blood Donation <3 months	3	2.31%
Alcohol in last 24 hrs	3	2.31%
Low Pulse Rate	3	2.31%
Increased Hemoglobin	2	1.54%
Inadequate Sleep	1	0.77%
History of Hepatitis B	1	0.77%
Seizure	1	0.77%
Skin Disease	2	1.54%
Jaundice	1	0.77%
Increased Bilirubin	1	0.77%
Invisible Vein	2	1.54%
Ear Piercing	3	2.31%
Dog Bite	1	0.77%
Antibiotics	1	0.77%
Underweight	1	0.77%

Table 3: Seropositive Donors (n = 29)

Infection Type	Total Cases	Male	Female	Percentage (%) of 29
HIV Positive	12	8	4	41.38%
Hepatitis B Positive	8	5	3	27.59%
Hepatitis C Positive	2	0	2	6.90%
HCV Indeterminate	3	—	—	10.34%
VDRL Positive	4	0	4	13.79%

Note: All low haemoglobin cases were found in female donors.

Discussion

Out of the 159 donors who were screened for transfusion-transmissible infections (TTIs) in this study, 130 (81.8%) were deferred for behavioural, medical, or temporary reasons, and 29 (18.2%) were deferred based on reactive serological results. Studies conducted in developing countries, where stringent predonation screening standards ensure transfusion safety, are consistent with this relatively high deferral rate [11] [9,10].

Medical and Temporary Deferral Patterns

The most frequent reason for donor deferral in this study was hypertension, which was observed in 51 donors (39.23%). In addition to reflecting the rising prevalence of non-communicative diseases like cardiovascular conditions in the general population, this highlights the importance of routine blood pres-

sure screening during donor selection. Previous research [11] has also identified hypertension as a major contributing factor to donor ineligibility, particularly in older donors. Temporary deferrals caused by recent vaccinations, particularly COVID-19 and rabies, were also noteworthy (15.38%). Following certain vaccinations, the World Health Organisation (WHO) recommends a brief delay because of the potential presence of live-attenuated viruses or unknown immunogenicity in recipients [12]. These types of cases have become more frequent in blood banks since the recent global rollout of COVID-19 vaccinations. Low haemoglobin levels were found in nine donors (6.92%), and only in female donors. This is consistent with global findings that iron-deficiency anaemia remains a major cause of female donor deferral[13]. This issue is particularly prevalent in countries like India, where nutritional deficiencies are fairly common. Other less common but valid reasons for temporary deferral included recent surgery, low blood pressure, alcohol consumption, recent tattoos, and medication use. These components highlight the need for a multifaceted approach to donor screening, one that considers recent lifestyle choices, medical history, and current health.

Transfusion-transmissible infections (TTIs) and seropositive donors

HIV was the most common infection among the 29 seropositive donors (41.38%), followed by Hepatitis B (27.59%), VDRL (13.79%), and Hepatitis C (6.90%). Although such specifics were not recorded in this study, the high rate of HIV among male donors may be a reflection of underlying high-risk behaviours, such as unprotected sexual activity or IV drug use. The fact that all VDRL-positive cases are female is noteworthy and could indicate structural deficiencies in women's sexual health education and screening.

The seroprevalence observed here is higher than that reported in high-income countries when compared to global averages, so there is a greater need for public awareness campaigns, pre-donation counselling, and more comprehensive deferral education[14,15]. For instance, a study by Glynn et al. (2006) on blood donors in the United States found that improved donor selection, education, and testing practices have led to a notable decrease in the prevalence of HIV and HCV over time[16]. The prevalence of HIV among first-time U.S. donors fell from 0.030% in 1991 to 0.015% in 1996, and similar declines were observed for HCV. These findings underscore the need for robust screening protocols, comprehensive pre-donation counselling, and enhanced public awareness campaigns in settings with limited resources, such as ours [14,16].

Consequences for Blood Transfusion Services

This study indicates that there might be a pool of eligible donors available if appropriate health education and follow-up measures are implemented, since a significant portion of donor deferrals are preventable or temporary. Some tactics that can improve donor retention and reduce unnecessary loss of potential donations include improving female nutrition, controlling hypertension, and informing donors about post-vaccination waiting periods. Regular audits of deferral reasons can also optimise donor recruitment strategies, boost donor return rates, and ultimately improve the safety and sufficiency of the blood supply.

Conclusion

This study found that 81.8% of prospective blood donors postpone, with most giving medical, lifestyle, or temporary explanations. A lower but still noteworthy portion (18.2%) of deferrals were due to seropositivity for transfusion-transmissible infections (TTIs), underscoring the continued need for stringent screening protocols to safeguard blood recipients. Hypertension was identified as the most common cause of donor deferral, followed by recent vaccinations and low haemoglobin levels, the latter of which only affected female donors and suggested a barrier to eligibility specific to gender. The majority of deferred donors are men, which is consistent with regional patterns and may be due to cultural or physiological factors that affect donor participation.

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