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Blood Donor Deferral Pattern and Frequency at a Tertiary Care Hospital, Lahore

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Abstract

Objectives: To determine the frequency and the common causes of donor deferral in blood bank of Shalamar hospital Lahore.
Methodology: Retrospective study was conducted at blood bank of Shalamar Hospital Lahore from Jan 2020 to December 2021. The data of blood donors who were registered in the blood bank during the mentioned period were reviewed. As per mandatory WHO guidelines eligible donors were screened for Hemoglobin and Transfusion Transmitted Infection (HBsAg, HCV antibody, HIV 1/2 antibody, Syphilis and Malaria). The screening data of donor was analyzed in order to determine the frequency and most common causes of deferral using SPSS version 19.
Results: Among 6616 blood donors who registered in blood bank during mentioned period, donor deferral rate was 4.2%. The mean age of deferred individuals was 31.39 ±8.0 years. The most frequent cause of temporary deferral was Low Hb (32.8 %) followed by Syphilis detected in 20.6% of donors .Hepatitis C Virus infection (25.5%) was leading cause of deferral among permanently deferred donors followed by Hepatitis B virus (18.8%) and HIV (2.3%). No positive case of malaria was detected in this study.
Conclusion: Deferral for blood donations accounts for 4.1%. Low Hb and HCV infection were the two most common causes of deferral observed in present study. The substantial rate of deferral due to anemia and HCV infection poses a significant public health concern, necessitating regulatory bodies to implement measures at national level aimed at enhancing community health and minimizing infection rates by public awareness and strict regulatory policy
Keywords: Blood donor, Deferral pattern, Donor selection, Transfusion Transmittable infection

Introduction

Blood transfusion plays a pivotal and life-saving role in modern medicine. WHO emphasizes the importance of achieving self-sufficiency in the supply of safe blood components to meet the transfusion demands of the population.[1] In Pakistan, the annual collection of approximately 3.5 million blood donations plays a pivotal role in catering to diverse medical needs of individuals with chronic transfusion dependent anemia, trauma patients, supporting surgical interventions, managing hemorrhage cases and assisting pregnant females with Obstetric complications. [5]

Pakistan confronts one of the highest global prevalence rates of hepatitis B virus (HBV) and hepatitis C virus (HCV), with unsafe blood transfusion practices exacerbating this public health challenge. [3] The transmission of HBV and HCV infections remains a significant concern through blood-borne routes, impacting around 7.4% of the general population. [6]

In Pakistan critical challenges in ensuring the safety of blood transfusions encompass the high incidence of HBV and HCV infections within the general population, the absence of standardized donor screening protocols in majority of blood banks, limited reporting of transfusion-transmitted infections (TTIs) at national level due to lack of central registry. The selection criteria for potential blood donors include donor history, weight, vital signs, and hemoglobin levels, these parameters are pivotal for ensuring the safety of the donor while, screening donor samples for TTIs is a cornerstone of guaranteeing a safe supply of blood products to the recipient . WHO recommends the minimal essential screening of donor blood samples for five globally prevalent infectious agents: HBV, HCV, HIV, malaria, and syphilis.[6] Yearly statistics revealed that unsafe blood transfusion is the most

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common cause of spread of these infections in developing countries due to unavailability of basic health facilities in accessing safe blood product primarily attributable to the absence of fundamental healthcare infrastructure for the secure access to blood products. This scenario gives rise to unsafe practices across the supply chain, a lack of awareness, non-compliance with WHO directives, and the use of inadequately screened blood.[7]

The problem of blood donor deferral, whether temporary or permanent deferral, is a pertinent concern contributing to the reduction of the potential donor pool and resulting in an insufficient supply of blood and its components for transfusion. The frequency of donor deferrals exhibits variations, but it is imperative to acknowledge that donor deferral is a worldwide challenge experienced by blood centers in both developing and developed nations.[4] The identification of the underlying causes for donor deferrals can catalyze the process of enhancing strategies for donor motivation, recruitment, and retension[9]. Given the prevailing absence of established practices ensuring safe transfusions and the implementation of comprehensive data management policies in Pakistan, this study aims to estimate the frequency and patterns of donor deferral based on low hemoglobin levels and TTIs within the private sector hospital in Lahore.

Methodology

This was a retrospective study carried out at the Blood Bank of Shalamar Hospital Lahore from January 2020 to December 2021 after approval from Institutional Review Board (Letter No. SMDC-IRB/AL/112/2021, IRB number 282). Data on donor screening was meticulously gathered during this specified period involving a total of 6616 registered blood donors at Shalamar Hospital. All potential donors underwent thorough evaluations based on the Donor History Questionnaire and physical examination. Criteria for donor selection included individuals aged 18 to 60 years, weighing ≥50 kg, and with hemoglobin levels ≥ 12.5 g/dl for women and ≥ 13.5 g/dl for men (13.5-16.0 g/dl). The Donor History Questionnaire included detailed inquiry about past illnesses, encompassing conditions such as TB, Hepatitis B, Hepatitis C, Malaria, Diabetes, Hypertension, and Epilepsy.

Donors CBC was analyzed on Sysmex KX 21 automated hematology analyzer. The donors who met the eligibility criteria for donation based on Hb level were further tested for viral screening (HBsAg, HCV antibody and HIV 1/2 antibody. Screening for specific treponemal antibodies were performed on Abbott i 1000 SR working on CLIA technique that provides the most reliable results. Internal and external quality controls were run daily on this platform to ensure reliability and accuracy of results. Testing for malaria was performed using Rapid diagnostic technique based on Immunochromatographical detection of Plasmodium Antigens. The Data was analyzed to determine the frequency of donor deferral using SPSS version 19.

Results

Among 6616 donors who presented for blood donation, overall deferral rate was 4.2 %(n= 271) . The mean age of deferred individuals was 31.39 ±8.0 years. The youngest individual was 18 years, while the eldest one was 55 years of age. Among the 271 Deferred Donors, 53.5 %(n=145) were temporarily deferred on the basis of low Hb and Syphilis whereas, 46.5%(n=126) were deferred permanently based on HbSAg, Anti HCV and HIV reactivity (Figure 1)

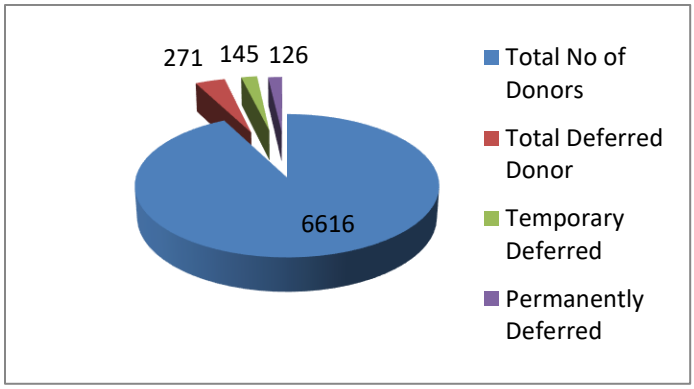

Figure No 1. Frequency of Donor Deferral.

The most frequent cause of deferral was low Hb 32.8 % (n = 89,) followed by HCV infection 25.5% (n = 69).VDRL was detected in 20.6% (n=56%) followed by HBV infection 18.8% (n = 51) and HIV 2.3%. No positive case of malaria was detected in present study. (Table I)

The deferral of blood donors occurs when potential donors do not meet the necessary eligibility criteria. Whether temporary or permanent, these deferrals result in a diminished pool of donors and insufficient availability of blood and its components for transfusions. The occurrence of blood donor deferrals varies significantly among different countries and various socioeconomic groups. Regardless of this variability, it is crucial to

emphasize that donor deferral is a universal challenge confronted by the majority of blood centers in both developing and developed nations

Table I: Pattern of Donor Deferral.	
Mean Age of Donors	31.39 ±8.0 years
Total no of Donors Deferred	271
Frequency of Donor Deferral %	4.1
Temporary Deferred	145 (53.1%)
Causes of Donor Deferral	
Permanently deferred	126 (46.5%)
Low Hb	89 (32.8%)
Anti HCV	69 (25.5%)
Syphilis	56 (20.6%)
HBsAg	51 (18.8%)
HIV	06 (2.3%)

In present study Donor deferral rate was 4.1% it is low in comparison with studies conducted in other cities of Pakistan such as Peshawar regional blood center[9] 6.3% ,Islamabad [11] 8.8% Multan[8] 13% and in Karachi [10] it was reported to be highest as 24%. Donor Deferral frequency of our study is comparable to study conducted in India 5.1% [12] whereas it was reported as 20% in study conducted in Bangladesh [13] and Nigeria (8.7%).[14] These differences are primarily attributed to variation of socioeconomic status of donors, demographic characteristics of study population and different clinical settings where the study was conducted and variations in sample size.

The present study revealed low Hb as a leading cause of donor deferral. This is comparable to study conducted in Multan[8], Islamabad 30%[11] and Karachi (24%)[12] in Pakistan as well as in India (27%)[12] , Bangladesh(20%) [13] and Nigeria[14] which depicts that low Hb is the significant and primary cause of donor deferral in most of the blood banks.

The pattern of donor rejection due to TTI showed Anti HCV as a leading cause of deferral (25.5%) followed by Syphilis (20.6%) ,HbsAg (18.8%) and HIV (2.3%).These results are comparable to study conducted by Iqbal et .al [8] and Jamal e.al[10] in Pakistan whereas Saba et al reported HBsAg (30.3%)as a leading causes of deferral among TTI in Peshawar.[9] Probably because prophylactic vaccination was introduced in Pakistan in late 90s and it was included in Extended Program on Immunization in 2009 . The study conducted by Thivya et.al[12] in India and Haque et.al[13] in Bangladesh reported HbsAg as the leading cause of deferral in their population. Regarding frequency of positive Syphilis cases in present study it was reported as high as 20.6% compared to study conducted at Peshawar regional blood center (14.1%) [9] and in Nigeria it was 9.1%.[14] High rate of syphilis detection could be due to sensitivity and specificity of techniques used for screening. Above statistics clearly depicts that Syphilis is a significant cause of donor deferral in addition to HCV and HBV positivity in local settings as well as in other developing countries. HIV positivity was seen in 2.3% of deferred donor this is comparable to study conducted by Saba et al in Peshawar[10], whereas it is reported as 18% in Southern Nigeria.[15]

No case of Malaria was detected in our study this is comparable to study conducted in Islamabad[11]whereas study conducted in Peshawar and Karachi blood center revealed frequency of 2.2% and 3.4% respectively. [09, 10]

Conclusion

The study concluded that donor deferral was comparatively low in blood banks of private sector hospital probably donors of these facility mostly belongs to middle socioeconomic group and availability of better TTI screening facilities in blood bank compared to public sector hospital of the country. However, Anemia is still a leading cause of deferral due to dietary habits and nutritional status followed by HCV infection in our study. The outcomes of the current study also highlight the importance of implementing effective preventive strategies to address common reasons for deferrals, reasons such as Anemia and Hepatitis C which needs to be addressed at the national level.

Limitations

1. Results may not be representative of the entire population due to limited sample size.
2. Data was collected from blood bank of a private hospital do not represent the population of low socioeconomic group.

Suggestions:

1. A larger study may be conducted to make more meaningful outcomes.
2. Comparison of study conducted at public sector hospital is required.

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