Original Article

Blood Donor Deferral Causes

A Study of Blood Donor Deferral Causes: Pre versus Post Donation and Transfusion Transmissible Infections

Meraj Fatima[1], Qurra-Tul-Ain[1], Aneeqa Naz[2], Rana Khalid Mahmood[1], Muhammad Ibrahim[3] and Munawar Hussain Shah[1]

ABSTRACT

Objective: To evaluate the prevalence of various donor rejection causes prior to and after blood donation, using donor selection tools, and to compare the effectiveness of the Chemiluminescence Immunoassay (CLIA) technique against a rational screening kit method in detecting borderline cases of transfusion transmissible infections.

Study Design: Cross-sectional descriptive study

Place and Duration of Study: This study was conducted at the Blood bank setting of Nishtar Hospital in Multan, Pakistan from January 2022 to December 2022.

Materials and Methods: A total of 1000 participants were recruited for the study, including both male and female donors aged 18 to 65 years. The study utilized both quantitative and qualitative methods to assess the quality of service, in terms of safety and hygiene, efficiency of staff, and the overall satisfaction of the donors. SPSS version 23 was used for data analysis.

Results: The most common causes for deferral in temporally rejected donors were anemia and low platelets, as 34.4% and 29.5% cases, respectively. But the most common causes for deferral in permanently rejected donors were HBsAg Positive and Anti HCV positive, as 27.7% and 25.5% cases, respectively. In our study, it was noted that the borderline cases in HCV was 16.6%. But in HIV cases, 66.6% was in borderline and in window period

Conclusion: Donor deferral is a major issue in our country, with 8.8% of prospective blood donors being turned away. This puts a spotlight on the need to identify the causes of deferral and to address them efficiently to ensure the safety of both donors and potential recipients.

Key Words: Anemia, Blood donors, Deferral, Screening, Transfusion transmissible infections

Citation of article: Fatima M, Qurra-Tul-Ain, Naz A, Mahmood RK, Ibrahim M, Shah MH. A Study of Blood Donor Deferral Causes: Pre versus Post Donation and Transfusion Transmissible Infections. Med Forum 2023;34(3):8-11.

INTRODUCTION

Blood donation is an incredibly important process that is essential for saving lives in many medical contexts[1]. Unfortunately, it is also one of the most heavily regulated medical procedures, with donors having to meet strict guidelines in order to be accepted[2].

It is therefore essential to understand the various causes of donor deferral, both pre- and post-donation, in order to ensure the safety of not only the donors, but also the recipients of the blood[3]. To understand the causes of donor deferral, it is important to consider the pre-donation phase and the post-donation phase. Regarding pre-donation, the most common causes are issues related to the donor's health. These include high-risk medical conditions, such as HIV/AIDS, Hepatitis B and C, Syphilis, and so on[4]. Other common causes of deferral include a history of drug use or alcohol abuse, as well as issues related to the donor's age, weight and hemoglobin levels[5]. In the post-donation phase, the most common cause of deferral is due to transmissible infections that can be passed through the donated blood[6]. These include HIV/AIDS, Syphilis, and other viral infections. Tests are therefore performed on the donated blood in order to detect any of these infections, and the donor is deferred if any are found[7].

The need for increased voluntary blood donation in developing countries such as Pakistan is dire[8]. The current rate of less than 0.05% of the population is far too low to meet the increasing demands for blood transfusions. Finally, it is essential to spread the message that voluntary blood donation is a valuable and necessary service[9]. The more people are made aware of the importance of blood donation, the more likely they are to be motivated to donate. Public education

1. Department of Pathology, Nishtar Medical University & Hospital, Multan.
2. Department of Pathology, Multan Medical and Dental College Multan.
3. Department of Biochemistry, Bahauddin Zakariya University, Multan.

Correspondence: Dr. Meraj Fatima, Demonstrator of Pathology, Nishtar Medical University & Hospital, Multan.
Contact No: 0301 8908333
Email: drmerajfatima4@gmail.com

Received: January, 2023
Accepted: February, 2023
Printed: March, 2023

campaigns and outreach efforts can help spread the message and encourage more individuals to become voluntary blood donors[10].

MATERIALS AND METHODS

The descriptive study aimed to assess the quality and effectiveness of healthcare services provided in the blood bank setting of Nishtar Hospital in Multan, Pakistan from January 2022 to December 2022. It was conducted in accordance with the Code of Ethics, and permission was obtained from the Ethical Review Board of the Hospital. A total of 1000 participants were recruited for the study, including both male and female donors aged 18 to 65 years. The study utilized both quantitative and qualitative methods to assess the quality of service, in terms of safety and hygiene, efficiency of staff, and the overall satisfaction of the donors. Written informed consent was taken from participants after detail description of study purpose. Non probability consecutive sampling technique was used. Sample size was calculated from a previous study conducted by Hanif et al [16] describing 8.8% deferral, 95 confidence interval and 80% power of study. The evaluation of voluntary blood donors was conducted using a comprehensive questionnaire. The questionnaire included questions related to the individual's personal history, such as behaviors, travel, and medical conditions. The questionnaire was designed to ensure the safety of donated blood for recipients and to ensure that donors were aware of the risks associated with donating blood. The questionnaire also addressed any ethical considerations associated with the donation of blood. All questions were answered honestly and in complete detail to provide a full and accurate analysis of the donor's health and eligibility. The intended blood donor underwent a medical examination to ensure their health and safety before donating. The medical examination consisted of taking their weight, height, and vital signs, as well as basic blood tests for basic blood parameters. These tests included blood group by forward and reverse grouping, haemoglobin estimation, platelet count, and White Blood Cell (WBC) count, which were all performed using a Mindray 5 part hematology analyser. The results of these tests were then used to determine the donor's suitability to donate blood. The donor was required to sign a consent form to confirm that they were aware of any potential risks before proceeding with the donation.

After the preliminary procedure of testing and screening the donor's blood, aseptic measures are employed to collect it. The blood sera is then tested further for five transmissible infections (TTI): malaria, hepatitis C virus (HCV), hepatitis B surface antigen (HBsAg), human immunodeficiency virus (HIV), and venereal disease research laboratory (VDRL) test for syphilis. These tests are performed using screening kits and chemiluminescence immunoassay (CLIA) techniques.

RESULTS

Overall, 1000blood donors were included in our study, in which108 (10.8%) were rejected. Further, 108 rejected donors, 61 (6.1%) were temporally rejected and 47 (4.7%) were permanently rejected. (Figure. I).The distribution of age, sex and area of residence were almost equal in rejected and accepted donors, (p>0.050). (Table. I).

Table No.1: Demographic characteristics of all blood donors and rejected donors

Characteristic	108 (10.8%) Rejected Cases	892 (89.2%) Accepted Cases	p-value
Age (years)	34.94±9.54	36.18±8.72	0.167
Sex			
Male	79 (73.1)	590 (66.1)	0.144
Female	29 (26.9)	302 (33.9)	
Area of residence			
Urban	87 (80.6)	644 (72.2)	0.064
Rural	21 (19.4)	248 (27.8)	

Table No.2: Causes of deferral in temporality and permanently rejected donors

Characteristic	108 (10.8%) Rejected Cases	892 (89.2%) Accepted Cases	p-value
Temporally rejected 61 donors			
Anemia	21 (34.4)	0 (0.0%)	--
Low Platelets	18 (29.5)	0 (0.0%)	--
High TLC	3 (4.9)	0 (0.0%)	--
Hemoglobin (increased)	4 (6.6)	0 (0.0%)	--
HTN on medicine	4 (6.6)	0 (0.0%)	--
Tuberculosis	3 (4.9)	0 (0.0%)	--
Epilepsy	3 (4.9)	0 (0.0%)	--
Increase Bilirubin	2 (3.3)	0 (0.0%)	--
Low TLC	3 (4.9)	0 (0.0%)	--
Permanently rejected 47 donors			
HBsAg Positive	13 (27.7)	0 (0.0%)	--
Anti HCV positive	12 (25.5)	0 (0.0%)	--
VDRL(Syphilis) Positive	16 (34.0)	0 (0.0%)	--
HIV positive	6 (12.8)	0 (0.0%)	--

The most common causes for deferral in temporally rejected donors were anemia and low platelets, as 21 (34.4%) and 18 (29.5%) cases, respectively. But the most common causes for deferral in permanently rejected donors were HBsAg Positive and Anti HCV positive, as 13 (27.7%) and 12 (25.5%) cases,

respectively. (Table. 2). In our study, it was noted that the borderline cases in HCV was 2 (16.6%). Whereas, in HIV cases, 4 (66.6%) was in borderline and in window period. (Table. 3).

Table No.3: Borderline cases in anti HCV and HIV

Characteristic	Borderline cases N (%)
Anti HCV (12 cases)	2 (16.6)
HIV (6 cases)	4 (66.6)

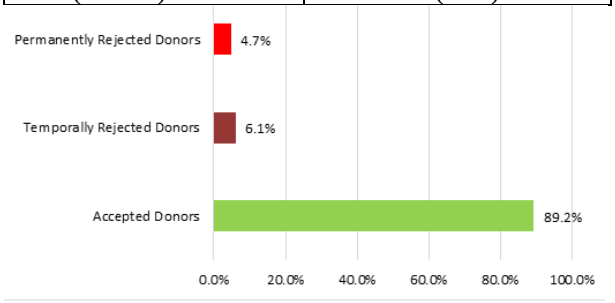

Figure No.1: Blood Donors Status

DISCUSSION

According to the World Health Organization (WHO), a minimum of 1% of a population must donate blood in order to meet a country's needs. However, the donation frequency in developing countries is usually 15 times lower than in developed countries[11]. In order to combat this challenge, blood banks must work to increase public awareness about the importance of donating blood, as well as create safe and convenient donation systems. They must also regularly review their blood supply and implement new technologies to ensure the quality and safety of their blood products. Finally, they must work to build trusting relationships with their donors to ensure a reliable supply of blood[12].

Pakistan is facing an alarming shortage of blood donations, with only 10.6% of donations coming from voluntary non-remunerated sources, according to the World Health Organization's global database on blood safety[13]. This is in stark contrast to developed nations, where these voluntary donors provide more than 90% of all donations. In Pakistan, the average yearly blood collection rate is 3.5 million, which translates to 16.6 donations per 1000 people. This means that only a small percentage of the population is contributing to the country's required blood supply. Unfortunately, replacement donations, which have a higher incidence of transfusion transmissible infections (TTI), make up the majority of collected donations[14].

A study conducted by Tufail et al[15] in Pakistan reported a donor deferral rate ranging between 8-9.5%. The researchers found that the rate of infectious diseases was significantly higher in male donors compared to female donors. Moreover, the rate of deferral was also higher in donors aged above 25 years. Causes of permanent rejection were HIV, HCV, HBV and syphilis and temporary rejection was due to anemia and leukocytosis. In a study conducted by Hanif et al[16] reported that 8.8% deferral and most common cause is low hemoglobin and among permanent deferral hepatitis C is leading cause account for 4.7%. According to a study conducted by Basavarajegowda et al[17], anemia constituted 1.21% of total donors. Anemia is caused by a variety of factors, including iron deficiency, vitamin B12 and folate deficiency, and chronic diseases such as kidney disease, sickle cell anemia, and thalassemia. Sultan et al[18] conducted a study that revealed thrombocytopenia to be the least encountered cause of deferral, with only 0.08% of total donors and 1.0% of deferred donors affected. This issue was discovered to be one of the most common reasons why potential donors were not able to donate blood.

A study conducted by Arshad et al[19] and published in the journal BMC Infectious Diseases in April 2020 revealed that the overall incidence of HIV, HBV, HCV, and Syphilis in the studied population was 0.04%, 1.84%, 1.7%, and 2.1% respectively. The study included a total of 548 people in the study group and sampling was conducted in urban and rural areas in Pakistan. In another study by Mandal et al[20] reported that the cumulative seroprevalence of HIV, hepatitis B and C and syphilis infections was 0.42%, 1.24%, 0.62%, and 0.65%, respectively. The risk of transmission of infectious diseases, including hepatitis C, via transfusion of blood and blood products has been drastically reduced over the past decade due to rigorous screening and testing protocols in the United States[4].

CONCLUSION

Donor deferral is a major issue in our country, with 8.8% of prospective blood donors being turned away. This puts a spotlight on the need to identify the causes of deferral and to address them efficiently to ensure the safety of both donors and potential recipients.

Author's Contribution:

Concept & Design of Study:	Meraj Fatima
Drafting:	Qurra-Tul-Ain, Aneeqa Naz
Data Analysis:	Rana Khalid Mahmood, Muhammad Ibrahim, Munawar Hussain Shah
Revisiting Critically:	Meraj Fatima, Qurra-Tul-Ain
Final Approval of version:	Meraj Fatima

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Tariq S, Tariq S, Jawed S, Tariq S. Knowledge and attitude of blood donation among female medical students in Faisalabad. J Pak Med Assoc 2018;68(1):65–70.

2. Enawgaw B, Yalew A, Shiferaw E. Blood donors' knowledge and attitude towards blood donation at North Gondar district blood bank, Northwest Ethiopia: a cross-sectional study. BMC Res Notes 2019;12:729.
3. AlNouri AK, Maghrabi LA, Hamdi SS, Abd El-Ghany SM, AlNouri KA. Analysis of the most common causes of blood donor deferral in northern Jeddah: a single-center study. J Blood Med 2019;10:47-51.
4. Steele WR, Dodd RY, Notari EP, Xu M, Nelson D, Kessler DA, et al. Transfusion-Transmissible Infections Monitoring System (TTIMS). Prevalence of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus in United States blood donations, 2015 to 2019: the Transfusion-Transmissible Infections Monitoring System (TTIMS). Transfus 2020;60(10):2327-39.
5. Quee F, O'Brien SF, Prinsze F, Steele WR, Grégoire Y, Cutajar A et al. Biomedical Excellence for Safer Transfusion (BEST) Collaborative. Whole blood donor return rates after deferral for tattooing or body piercing—Survey across blood donation services: The BEST collaborative study. Vox Sanguinis 2022;117(9):1085-9.
6. Iqbal H, Tameez Ud Din A, Tameez Ud Din A, Chaudhary FMD, Younas M, Jamil A. Frequency and Causes of Deferral among Blood Donors Presenting to Combined Military Hospital Multan. Cureus 2020;12:e6657.
7. Steele WR, Dodd RY, Notari EP, Haynes J, Anderson SA, Williams AE, et al. Transfusion-Transmissible Infections Monitoring System (TTIMS). HIV, HCV, and HBV incidence and residual risk in US blood donors before and after implementation of the 12-month deferral policy for men who have sex with men. Transfus 2021; 61(3):839-50.
8. Maresch C, Schluter PJ, Wilson AD, Sleigh A. Residual infectious disease risk in screened blood transfusion from a high-prevalence population: Santa Catarina, Brazil. Transfus 2008;48:273-281.
9. Khan M, Bashir S, Naeem MA, Raja MI, Rathore MA, Babar S. Effectiveness of Combined Verbal Screening and Uniform Donor Questionnaire in Blood Donor Deferral; Evaluation at a Regional Blood Bank. Pak J Med Health Sci 2022; 16(08):277-81.
10. Hans R, Marwaha N. Nucleic acid testing-benefits and constraints. Asian J Transfus Sci 2014;8:2-3.
11. World Health Organization. Blood Donor Selection: Guidelines on Assessing Donor Suitability for Blood Donation.Geneva: World Health Organization 2012. 16–23.
12. Basnotra RM, Sidhu MD. Donor notification in reactive donors and their response to communication. Int J Res Med Sci 2019;7(4):87-9.
13. Aabdein M, Selim N, Himmat S, et al. Prevalence and trends of transfusion transmissible infections among blood donors in the State of Qatar. BMC Infect Dis 2020;20:617.
14. Sauvage C, Spinardi R, Pelat C, Pouget T, Danic B, Woimant G, Lot F, Gross S, Laperche S, Pillonel J, Steering Committee. Noncompliance with blood donor selection criteria-Complidon 2017, France. Transfus 2020;60(1):73-83.
15. Tufail S, Babar F, Ikram N, Raza M, Abdul-Shakoor H. Blood donors deferral-causes. J Rawalpindi Med Coll 2013;17:119–21.
16. Hanif F, Ali S, Habib MB, Siddiqa A, Anees M. A Study of Blood Donor Deferral Causes: Pre vs Post Donation and Transfusion Transmissible Infections. J Haematol Stem Cell Res 2022;2(1):13-8.
17. Basavarajegowda A. Whole blood donor deferral causes in a tertiary care teaching hospital blood bank from South India. Hematol Transfus Int J 2017;5:219–22.
18. Sultan S, Irfan SM, Baig MA, Usman SM, Shirazi UA. Insight into donor deferral pattern based on peripheral blood counts: An experience from South Pakistan. Asian J Transfus Sci 2017; 11:151-5.
19. Arshad A, Borhany M, Anwar N, Naseer I, Ansari R, Boota S, et al. Prevalence of transfusion transmissible infections in blood donors of Pakistan. BMC Hematol 2016;16:27.
20. Mandal R, Mondal K. Transfusion transmissible infections among blood donors from a sub-Himalayan rural tertiary care center in Darjeeling, India. J Tradit Complem Med 2016; 6:224-9.