https://doi.org/10.3329/cbmj.v14i1.79296

Common Causes of Donor Rejection in Blood Transfusion Services at Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh

*Nahar K[1], Binni SY[2], Nine SMAZ[3], Shams KZ[4]

Abstract

A cross-sectional, descriptive study was carried out in the Department of Transfusion Medicine of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, between April 2008 and March 2009, to determine common causes of donor rejection in blood transfusion services. From the register book of the department data was curated. A total of 16,619 donors were included in data analysis. Among them, a total of 765 were rejected donors: party donor and voluntary donor were 558(73%) and 207(27%) respectively. The majority of the rejected donors were in 18-30 years age group (68%), followed by 31-40 years age group (24.2%), 41-60 years age group (5.9%), 60-65 years age group (0.7%). In sex distribution, 603(78.8%) were males and 162(21.2%) were females; male-female ratio was 3.7:1. The majority of the study subjects belonged to the 18-30 years age group (68%), followed by 31-40 years age group (24.2%), 41-60 years age group, >60 years age group (0.7%). Most of the donors were students (40.8%); among females most of them were housewives. Party donor and voluntary donor rejection 558(73%) and 207(27%) respectively. Donor rejection was due to medical causes 443(57.9%), serological causes 207(27.1%) and non-medical causes 115(15.0%). Among medical causes, history of sensitive/contraindicated medication 98(12.8%), ongoing menstruation 37(4.8%), history of jaundice 26(3.4%) and asthma 21(2.7%) were common. Among non-medical causes, 100(13.1%) were rejected due to short interval from previous blood donation, while 10(1.3%) were rejected due to underage (<18) and 5(0.7%) for being over age (>65). Among physical findings, 101(13.2%) of were rejected due to underweight, 27(3.5%) due to high blood pressure, 17(2.2%) due to low blood pressure, 21(2.7%) for low hemoglobin levels and 13(1.7%) allergic skin conditions. Donor rejected for serological causes involved 188(24.6%) HBsAg positive and 19(2.5%) HCV positive cases.

CBMJ 2025 January: Vol. 14 No. 01 P: 34-39

Keywords: Donor rejection, safe blood transfusion, voluntary blood donation, transfusion medicine

Introduction

Collection of blood is the most important function of a blood transfusion center. If the procedure of the donor selection and blood collection is carried out meticulously, it will assure a safe and adequate blood supply. To obtain safe blood and blood components, it is important to ensure that the donors are healthy and free from transfusion transmissible infections.[1] Medical assessments and selection of prospective blood donor is a routine established procedure run by blood transfusion services all over the world. Selection call prospective blood donors are done on the basis of internationally accepted World Health Organization (WHO) and International Society of Blood Transfusion [(SBT) donor selection Criteria.[2] Each blood transfusion service must design the questionnaire and selection procedure in such a way that blood donation should neither

1. *Dr. Kamrun Nahar, Assistant Professor, Department of Transfusion Medicine, Bangladesh Medical College and Hospital.
2. Dr. Subrina Yesmin Binni, Associate Professor, Department of Transfusion Medicine, Rajshahi Medical College and Hospital, Rajshahi.
3. Dr. S. M. A Zulker Nine, Assistant Professor, Department of Cardiothoracic Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka.
4. Dr. Khanam Zahida Shams, Blood Bank, Ex-Consultant, Ibn Sina Hospital Dhaka.

Address of Correspondence:
Email: kamrunznp@gmail.com

be harmful for the donor nor the recipient acquire transfusion transmissible infections.[3-5] In the first step of the practice, verbal conversation with the donor will help to identify some important scrutiny for voluntary/party blood donation. In the second step, physical examination helps further in this respect. During the course of conversation some important information, such as age, history of serious illness, allergy, tattoo, ear or other skin piercing, acupuncture, and other risk factors help donors decide self-deferral.[3,6] Another important point for female donors asking whether they are in the periods (menstruation) or any other obstetrical/gynaecological blood loss.[3,6,7]

Medication history is also important for all donors as drug such as insulin, anti-hypertensive, hormones, antibiotics and substance use disorders may be revealed, which needs careful assessment. Physical examination helps to identify important disqualifications such as underweight, anemia, any irregularities in heart rhythm, jaundice, skin disease, and edema.[3,6] Rejection of donors by physical examination is much less than by verbal conversation with the donor.

History of previous infections like malaria, hepatitis B Virus (HBV), hepatitis C Virus (HCV), human immunodeficiency virus (HIV), and other infectious venereal disease need a meticulous scrutiny and laboratory investigations before selecting blood donors for transfusion procedure.[3,6-9] Based on those precautions, we proposed to determine common causes of donor rejection in blood transfusion services (BTS) at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, which is one of the largest blood transfusion services in the country.

Methods

This cross-sectional, descriptive study was carried out in the Department of Transfusion Medicine of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, between April 2008 and March 2009. From the register book of the department data was curated. A total of 16,619 donors were included in data analysis. Among them, 765 were rejected donors (603 males and 162 females). Data collected were checked, verify and editing as per the specific objectives and key variables. Analysis of the data were done by using SPSS version 16.0 for windows. Data were presented in tabulated form. All values were expressed as frequency and percentage. The study was approved by the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh.

Results

A total of 765 donor rejection were found; among them, party donors and voluntary donors were 558(73%) and 207(27%) respectively. The majority of the rejected donors were in 18-30 years age group (68%), followed by 31-40 years age group (24.2%), 41-60 years age group (5.9%), 60-65 years age group (0.7%). In sex distribution, 603(78.8%) were males and 162(21.2%) were females; male-female ratio was 3.7:1. Most of the rejected donors were students (40.8%), while among female rejected donors, housewives were dominant (12.5%) (Table-I). Among medical causes, history of sensitive/contraindicated medication 98(12.8%), ongoing menstruation 37(4.8%), history of jaundice 26(3.4%) and asthma 21(2.7%) were common. Among non-medical causes,

100(13.1%) were rejected due to short interval from previous blood donation (Table-II), while 10(1.3%) were rejected due to underage (<18) and 5(0.7%) for being over age (>65). Regarding the cause of rejection due to physical findings, it was observed that the majority 101(13.2%) of the rejection donor was rejected due to underweight, 27(3.5%) rejected due› to high BP, 17(2.2%) low BP, 21(2.7%) low hemoglobin and 13(1.7%) skin disease. Regarding the cause of rejection due ten physical findings, it was observed that the majority 101(13.2%) of the rejection donor was rejected due to underweight, 27(3.5%) rejected due› to high BP, 17(2.2%) low BP, 21(2.7%) low hemoglobin and 13(1.7%) skin disease (Table-III). Donor rejected by serological screening involved HBsAg positive 188(24.6%) and HCV positive 19(2.5%) (Table-IV).

Table-I: Demographic characteristics of the rejected donors (n=765)

Variables	Frequency	Percentage
Age group (in years)		
15-17	10	1.3
18-30	520	68.0
31-40	185	24.2
41-60	45	5.9
60-65	5	0.7
Sex		
Male	603	78.8
Female	162	21.2
Occupation		
Student	312	40.8
Private employee	217	28.4
Housewife	96	12.5
Businessperson	83	10.8
Government service	33	4.3
Others(day worker, rickshaw puller, jobless	24	3.1

Table-II: Distribution of donor rejection based on medical causes

Medical causes	Frequency	Percentage
Medication	98	12.8
Menstruation	37	4.8
Past history of Jaundice	26	3.4
Asthma	21	2.7
Vaccination (recent)	18	2.4
Viral fever	12	1.6
Past history of Typhoid	9	1.2
Tuberculosis	7	0.9
Diabetes taking insulin	7	0.9
Breast feeding	5	0.7
Major Surgery	5	0.7
Any blood transfusion received in last 1 year	5	0.7
Malaria	5	0.7
Chicken pox	3	0.4
Heart disease	2	0.3
Epilepsy	2	0.3
Rheumatic fever	2	0.3
Total	**264**	**34.5**

Table-III: Distribution of non-medical causes of donor rejection

Non-medical causes	Frequency	Percentage
Over age (>65)	5	0.7
Underage (<18)	10	1.3
Short interval from previous donation (<4 months)	100	13.1
Total	**115**	**15.0**

Table-IV: Causes of donor rejection according to physical findings

Physical Causes	Frequency	Percentage
Underweight< 100 lbs	101	13.2
High BP (systolic>180mmHg) (diastolic >100mmHg)	27	3.5
Low BP (systolic <100mmHg) (diastolic <60mmHg)	17	2.2
Low Hemoglobin (12 gm/dl)	21	2.7
Allergic skin conditions	13	1.7
Total	**179**	**23.4**

Table-V: Distribution of rejected donors by serological tests

Serological Causes	Frequency	Percentage
HBsAg	18	24.6
HCV	19	25
Total	**20**	**27.1**

Discussion

In our study on donor-deferral, party donor was found predominant (73%) as because we still have lack of awareness about the importance of voluntary blood donation.[5,10] Donor disqualification represents loss of valuable time and efforts and creates negative attitude towards donation of blood and blood products.[10,11] Moreover, a significant loss is the exclusion of a potentially lifesaving unit of blood from inventory.[10] Hence, donor deferral should be reduced to the minimum consistent with safety of the donors and patients. Evidence showed that donor refection rates vary from 10.3% to 17.6%.[11] Our donor rejection rate was 13.2% (a total of 765 donors); we think it is higher than desirable as considering the perennial shortage of blood in Bangladesh. Chaudhary *et al.*[10] reported 16.4% donor rejection which was even higher. In our study, the majority of the rejected donors were in 18-30 years age group (68%), followed by 31-40 years age group (24.2%), 41-60 years age group (5.9%), 60-65 years age group (0.7%). Almost similar findings observed by de Zoysa[12], where he observed the largest number in the 21-30 years age group, followed by the 31-40 years age group. Similar findings were observed by Islam *et al.*[13]. In our series, 78.8% male and 21.2% female donor-deferral were observed; male-female ratio was 3.7:1. A study done in Sri Lanka by De Zoysa[12] reported almost similar male predominance (81.4% male and 18.6% female). However, two other previous studies in Bangladesh showed much higher male predominance; Islam *et al.*[13] reported 85.79% male and 14.21% female, while Chaudhary *et at.*[10] observed 91.3% male and 7.7% female. In the present study, most of the rejected donor were students 312(40.8%), while among females, most were housewives, which also closely resembles the findings of Islam *et al..*[13]

In the present study, among medical causes, 264(34.5%) were due to medical history and 179(23.4%) were due to abnormal physical findings. Regarding the cause of rejection on medical history in the present study it was found that 98(12.8%) subject rejected due to medication followed by menstruation 37(4.8%), history of jaundice 26(3.4%), asthma 21(2.7%), recent vaccination 18(2.4%), tuberculosis 7(0.9%), diabetes taking insulin 7(0.9%), malaria 5(0.7%), heart disease 2(0.3%) and epilepsy 2(0.3%). According to Chaudhary *et al.*[10], 17% subjects were rejected due to jaundice, 4.7% for fever,

2.3% for medication, 1.3% for tuberculosis, 0.8% for malaria, 0.6% for diabetes mellitus, 0.8% for heart disease, and 0.04% for epilepsy. On the other hand, Islam *et al.*[13] observed 48.98% donor rejection due to jaundice, 1.72% for fever, 3.79% for medication, 0.34% for tuberculosis, 1.03% for asthma, 0.68% for recent vaccination, 4.13% for menstruation, 0.68% for heart disease and for breastfeeding 1.03%. Those two previous study findings support our findings. Among non-medical causes, 100(13.1%) of the subjects were rejected due to short interval of previous donation, 10(1.3%) for being underage (<18) and 5(0.7%) for being over age (>60). Islam *et at.*[13] reported 1.03% rejection for underage (<18) and 0.68% for over age (>60), which closely resemble our findings. 8.1% rejected due to underage (<18) and 5.2% due to over age (>60). Donor deferral due to physical findings include underweight (<100lbs) in 13.2% donors, high blood pressure in 3.5%), low blood pressure in 2.2%, low haemoglobin in 2.7% and allergic skin conditions in 1.7%. Chaudhary *et al.*[10] observed that 32.3% got rejected due to underweight (<100lbs), 4.0% for high BP, 18.6% for low haemoglobin and 2.3% for skin disease, while Islam *et al*.[13] reported that 8.27% got rejected due to underweight (<100lbs), 3.79% due to high BP, 5.51% for low BP, 12.75% for low haemoglobin and 3.44% for skin disease. Our findings are comparable with the above mentioned findings.

Conclusion

We observed that medical causes of donor rejection are much more prevalent than that of non-medical and serological causes. Intensive health education is needed to encourage and promote an interest to hood donation and lower deferral rates by allowing prospective donors to "pre-screen" themselves. We recommend that a large sample size is needed for further retrospective study with long period follow-up, computerized data should be preserved for emergency donor selection or rejection and voluntary blood donors should be encouraged to participate in more voluntary blood donation campaigns to inspire others.

References

1. *World Health Organization (WHO). The Clinical use of blood in medicine, obstetrics, pediatrics, surgery and anesthesia, trauma and burns. Geneva: WHO; 2001.*
2. *Harmening DM. Modern Blood Banking and Transfusion Practices. 7th ed. Philadelphia: FA Davis Co; 2019.*
3. *Klein HG, Anstee DJ. eds. Blood donors and the withdrawal of blood. In: Mollison's Blood Transfusion in Clinical Medicine. 11th ed. Oxford: Blackwell Publishing; 2005.*
4. *International Society of Blood Transfusion (ISBT). The ISBT Code of Ethics: Revised and Updated. 2017. Retrieved from: https://www.isbtweb.org/resource/english.html (Accessed December 16, 2023).*
5. *Nurunnabi A, Jahan MU, Alam MA, Hoque MM. Safe blood transfusion and ethical issues in transfusion medicine. J Dhaka Med Coll 2010;19(2):144-9.*
6. *World Health Organization (WHO). Blood donor selection: guidelines on assessing donor suitability for blood donation: Guidelines on assessing donor suitability for blood donation. Geneva: WHO; 2012.*

7. *Farrugia A. Globalization and blood safety. ISBT Sci Ser. 2006;1(1):25-32.*

8. *World Health Organization (WHO). Universal Access to Safe Blood Transfusion. Geneva: WHO; 2008.*

9. *Allain JP, Stramer SL, Carneiro-Proietti AB, Martins ML, Lopes da Silva SN, Ribeiro M, et al. Transfusion-transmitted infectious diseases. Biologicals. 2009;37(2):71-7.*

10. *Chaudhary RK, Gupta D Gllpta RK. Analysis of donor-deferral pattern in a voluntary blood donor population. Transfus Med.1995;5:209-12.*

11. *Coates JB Jr, McFetridge EM. eds. Blood program in World War II. Washington, DC: Office of the Surgeon General, Department of the Army, USA; 1989.*

12. *de Zoos NS. Survey of the blood donors in Sri Lanka, 1985. Ceylon Med J. 1992;37(4):129-30.*

13. *Islam MA, Shil N, Khatun A, Biswas J, Husain M. An analysis of the donor deferral pattern – a transfusion center based study. Bangladesh Renal J. 2004;23(2):61-3.*