The Pattern and Causes of Blood Donor Deferrals in Duhok Blood Banking Center

Sawer Sabri Ahmed*
***Medical Laboratory Technology, Shekhan College of Health and Medical Techniques, Duhok Polytechnic University, Duhok**
Correspondence: sawer.ahmed@dpu.edu.krd

(Ann Coll Med Mosul 2023; 45 (2):203-208).
Received: 2nd April 2023; Accepted: 5th July 2023.

ABSTRACT

Background: Blood safety is a significant transfusion medicine problem around the world; The selection of blood donors is essential for the safety of donors and recipients as well as maintaining an adequate blood supply, and this can be accomplished by enforcing donor deferral guidelines and investigating potential Transfusion Transmitted Infections (TTI).

The purpose of this study: was to examine the demographics of blood donors as well as the frequency and factors that contribute to donor deferral in the province of Duhok.

Method: This cross-sectional study was carried out at the Duhok blood banking center from December 2021 to May 2022. The participants in this study were the blood donors who attended the center during the research period. SPSS 26 was used for data gathering and statistical analysis.

Results: Most of the donors were in the age group 30-39 (39.2%). In terms of occupation, most subjects were unemployed (63.01%) followed by military persons (21.23%). Of all the potential blood donors were males 1148 (98.30%) and 20 (1.70%) were females. Deferral occurred in 1168 (17.81%) of attempts; 190 (91.35%) of all deferrals were temporary and 18 (8.65%) permanent. The three main causes of deferral were medication use (25.96%), a recent donation (21.63%), and anemia (10.57%).

Conclusion: The pattern of donor deferrals described in this study was the same as those in other regional investigations. The reason for donation was mainly voluntary rather than replacement. The majority of contributors were men, so it's critical to support and motivates female donors in order to expand the total number of donors. In order for the deferred donors to participate in future blood donations, they must be actively satisfied.

Keywords: Blood donation, donor deferral, Duhok province, North Iraq

نمط وأسباب تأجيل المتبرعين بالدم في مركز بنك الدم في دهوك

ساور صبري احمد*
*تقنيات مختبرات الطبية، كلية التقنيات الصحية والطبية في شيخان، جامعة دهوك التقنية, دهوك

الخلاصة

الخلفية: تعتبر سلامة الدم مشكلة كبيرة فى مجال طب نقل الدم فى جميع أنحاء العالم ، وبالتالى ، فإن اختيار المتبرعين بالدم أمر حيوى لسلامة المتبرعين والمتلقين إلى جانب الحفاظ على إمدادات الدم الكافية ويمكن تحقيق ذلك من خلال تنفيذ إرشادات تأجيل المتبرعين والتحقيق فى احتمالية الأمراض المنقولة عن طريق نقل الدم (TTI).

الهدف من هذه الدراسة: هو دراسة خصائص المتبرعين بالدم وتواتر وأسباب تأجيل المتبرعين فى محافظة دهوك.

الطريقة: أجريت الدراسة فى مركز بنك الدم فى دهوك. تم إجراء دراسة مقطعية فى مركز بنك الدم فى دهوك من فبراير ٢٠٢٢ إلى مايو ٢٠٢٢. تم تسجيل المتبرعين بالدم الذين زاروا المركز خلال فترة الدراسة فى هذه الدراسة. تم إجراء جمع البيانات والتحليل الإحصائى باستخدام SPSS 26.

النتائج: كان معظم المتبرعين فى الفئة العمرية ٣٠-٣٩ (٣٩.٢٪). من حيث المهنة ، كان معظم الأشخاص عاطلين عن العمل (٦٣.٠١٪) يليهم العسكريون (٢١.٢٣٪). من بين جميع المتبرعين المحتملين بالدم كان هناك ١١٤٨ من الذكور (٩٨.٣٠٪) و ٢٠ (١.٧٠٪) من الإناث. حدث التأجيل فى ١١٦٨ (١٧.٨١٪) من المحاولات ؛ ١٩٠ (٩١.٣٥٪) من جميع التأجيلات كانت مؤقتة ١٨ (٨.٦٥٪) بينما ١٨ (٨.٦٥٪) دائمة. كانت الأسباب الرئيسية الثلاثة للتأجيل هى استخدام الأدوية (٢٥.٩٦٪) ، والتبرع الأخير (٢١.٦٣٪) ، وفقر الدم (١٠.٥٧٪).

الخلاصة: أبلغت هذه الدراسة عن نمط مماثل للتأجيل من المانحين كما هو الحال فى الدراسات الإقليمية الأخرى. كان سبب التبرع فى الأساس طوعيًا وليس استبدالًا. يشكل الذكور معظم المساهمين ، لذلك من المهم تشجيع وتحفيز المتبرعات لزيادة مجموع المانحين بشكل عام. يجب أن يكون المتبرعون المؤجلون راضين بشكل فعال حتى يتمكنوا من المساهمة فى التبرع بالدم فى المستقبل.

الكلمات المفتاحية : التبرع بالدم ، تأجيل المتبرعين ، محافظة دهوك ، شمال العراق .

INTRODUCTION

Donated blood is necessary for a variety of medical procedures to correct losses due to surgery, major trauma, hematological diseases and neoplasms, and management of pregnancy-related complications.[1] A excellent blood transfusion service is critical to a good healthcare delivery system.[2] Selection of blood donors, which attempts to protect both donors' and recipients' health, is the cornerstone of blood transfusion safety.[3]

Blood donors can be voluntary, paid, or replacement donors who are usually relatives of patients.[4] WHO advises that all blood donations be voluntary, unpaid, and that no pressure should be applied to get donors to provide.[5]

Both a temporary and permanent exemption are possible. Every blood donor must be treated with respect and confidentiality, given a full explanation of why they were rejected to donate blood, and given the chance to ask questions.[1] Deferral rates and the reasons for deferral vary among different population.[6] The Australian Red Cross discovered that temporary deferral significantly lengthened the time between donations, decreased the likelihood of future donations, and increased the dropout rate. The unnecessary deferral may have psychological effects on blood donors who may decide not to donate again in the future.[7]

In Duhok province blood is required for many centers like adult and pediatric Hematology/Oncology centers, maternity and emergency hospitals as well as Duhok burn and nephrology centers, therefore, knowing the rate and causes of donor deferral is very important as this can help in designing more efficient future donor recruitment strategies and plans.

The study aimed to evaluate the characteristics of the blood donors, and the frequency and causes of donor deferral in Duhok province.

SUBJECTS AND METHODS

This is a cross-sectional study carried out at the Duhok Blood Banking Center in Duhok City, Northern Iraq. The study was carried out after obtaining ethical approval from the Duhok Directorate of General Health. The data was collected between the periods from December 2021 to May 2022. A total of 1168 donors selected with appropriate interview and sampling methods participated in the study. Blood samples were obtained by taking two ml of (K2EDTA) Ethylene-diamine tetra-acetic acid anticoagulated blood for a complete blood count (CBC). EDTA anticoagulated samples were put on a mixer instrument for 5 minutes with gentle mixing. Complete blood count (CBC) analysis was performed by an automated blood analyzer (Swelab).

The hematological indices such as hematocrit (HCT), hemoglobin (Hb), white blood cells (WBC), and Platelets counts were all recorded. Another 3 ml of blood was put in a yellow top gel tube, and serum was obtained after centrifugation at 1000 gm and for 10 min, and donors were screened for viral infections and syphilis.

In this study males with Hb > 18.5 gm/dl and females with Hb > 16.5 gm/dl were defined as polycythemia and Hb < 13.5 gm/dl and < 12.5 gm/dl were used as the lowest value for donation for males and females respectively. The acceptable upper and lower limits for potential donors' total leucocyte and platelet counts have not yet been established by the American Association of Blood Banking (AABB). Individuals with total white blood cells > $13*10^9$/L are defined as having leukocytosis and those with platelet count < $100*10^9$/L were defined as having thrombocytopenia and were rejected for donating blood. Statistical analysis: The data analysis was done, and the frequency, mean, median, and standard deviations were calculated using the SPSS software (Version 26:00).

RESULTS

Among the 1168 individuals who came to the center for blood donation. Men made up the majority of individuals who showed out to give blood (98.3% versus 1.7%), 925 (79.2%) were second-time donors and 243 (20.8%) were first time donors. Self-employee persons having contributed more to blood donation 63% (736) of voluntary blood donors. Table 1 lists the characteristics of the people that came in to donate blood. Most of the participants 458 (39.2%) were aged between 30 and 39 years followed by 340 (29.1%) who were aged 30 to 49 years. Almost more than two-thirds of the participants 874 (74.8%) came from an urban region where the center for blood banking is located in the central

part of the city as well as the great majority were from the Muslim religion and were married with a positive history of smoking, The demographic data of the participants is shown in Table 1.

The total number of voluntary donors was more than that of replacement donors i.e., 987 (84.50%) and 181 (15.50%) respectively as mentioned in Table 2. Out of the entire group, 208 (17.81%) were deferred from donation. Among the deferred donors, 8.65% (18) were deferred permanently Table 3.

The deferral rate was higher among women than in men (25% of females were deferred compared to 17.8% of males) and among single individuals (29.29%) than those married (23.54%), rural than urban residency (20.41% versus 16.93%), first-time donors (22.22% versus 16.65% repeated donors), health care professions and students (50% and 33.33%) respectively. The deferral rate was also higher amongst those below 20 years and those older than 50 years (33.33% and 28.23%) correspondingly. The most common reasons for deferral were medications (25.96%), recent donation (21.63%), followed by low hemoglobin, and polycythemia, with the common cold and leukocytosis occurring in almost equal percentages (10.57%, 10.10%, and 6.73 and 6.25%) respectively, among the 20 participating females, 5 (25%) were deferred, anemia and recent medications ingestion accounted for equal percent (25%). The most common reason for deferral among first-time donors was low hemoglobin levels followed by medication (25.93%,18.52%), and among donors with a history of previous donation, were a recent donation, followed by medication and low hemoglobin levels (29.22%, 28.57% and 11.04%) respectively Table 4.

The list of the drugs taken by blood donors and contributed to their denial are shown in Table 5.

Table 1. Characteristics of the accepted or deferred blood donors (n = 1168).

		Participants	Percent	Not Deferred	Deferred
Gender	Male	1148	98.3	945 (80.90%)	203 (17.68%)
	Female	20	1.7	15 (75%)	5 (25%)
Religion	Muslim	1064	91.1	883 (82.99%)	181 (17.01%)
	Yezidi	96	8.2	73 (76.04%)	23 (23.95%)
	Christian	8	0.7	4 (50%)	4 (50%)
Residence	Urban	874	74.8	726 (83.06%)	148 (16.93%)
	Rural	294	25.2	234 (79.59%)	60 (20.41%)
Occupation	Self employed	736	63.01	591 (80.30%)	145 (19.70%)
	Military persons	248	21.23	217 (87.5%)	31 (12.5%)
	Employee	150	12.84	130 (86.67%)	20 (13.33%)
	Student	30	2.57	20 (66.67%)	10 (33.33%)
	Health care profession	4	0.34	2 (50%)	2 (50%)
Marital status	Single	140	11.98	99 (70.71%)	41 (29.29%)
	Married	1028	88.01	786 (76.46%)	242 (23.54%)
Smoking	Yes	806	69	677 (84%)	129 (16.00%)
	No	362	31	283 (81.18%)	79 (21.82%)
Alcoholism	Yes	66	69	50 (75.76%)	16 (24.24%)
	No	1102	31	849 (77.04%)	253 (22.96%)
Hookah	Yes	133	100.0	103 (77.44%)	30 (22.56%)
	No	1035		857 (82.80%)	178 (17.20%)
Frequency of donation	1	243	20.8	189 (77.78%)	54 (22.22%)
	2	925	79.2	771 (83.35%)	154 (16.65%)
Age groups	< 18	24	2.1	16 (66.67%)	8 (33.33%)
	18 – 29	222	19.0	177 (79.73%)	45 (20.27%)
	30 – 39	458	39.2	391 (85.37%)	67 (14.63%)
	40 – 49	340	29.1	287 (84.41%)	53 (15.59%)
	≥ 50	124	10.6	89 (71.77%)	35 (28.23%)
	Total	1168	100.0	100.0	

Table 2. Donor distribution based on type of donation (voluntary or replacement).

Donor category	Numbers	% of total donors (1168)
Voluntary	987	84.50
Replacement	181	15.50
Total	1168	100

Table 3. Distribution of donor deferral types.

	Frequency of donation		
Donor deferral state	1= 243	>2 = 925	Total
Permanent	9 (50%)	9 (50%)	18 (8.65%)
Temporary	45 (23.7%)	145 (76.3%)	190 (91.35%)
Total	54 (22.22%)	154 (16.65%)	208

Table 4. Causes of Blood Donor Deferrals (Frequency wise).

Cause of deferral	Frequency	Percent of total deferrals
Medication	54	25.96
Recent donation	45	21.63
Low Hb	22	10.57
High Hb	21	10.10
High WBC	14	6.73
RT infection	13	6.25
Alcohol consumption	8	3.84
Heart problem	8	3.84
Recent Vaccination	5	2.40
Elderly	5	2.40
Low Platelet	5	2.40
Less than 18 years	2	0.96
Difficult venipuncture	2	0.96
Hypertension	2	0.96
WBC high and Platelet	1	0.48
Recent surgery	1	0.48
Total	208	100%

Table 5: List of the drugs contributed to blood donor deferral in this study

Drugs/ Medications	No.	Percent
Anti-hypertensive	14	25.93
Antibiotics	10	18.52
More than one drug taken	9	16.67
Anti-diabetics	7	12.96
Aspirin	5	9.26
Insulin	2	3.7
Plavix	1	1.85
Tegretol	1	1.85
Methotrexate	1	1.85
Steroids	1	1.85
Thyroxin	1	1.85
Dutasteride	1	1.85
Isotretinoin	1	1.85
Total	54	100

DISCUSSION

After interviewing potential donors at the blood banking center, the process of choosing blood donors began with a history taking and the completion of a specialized donor questionnaire form by a licensed health care professional. This was followed by a physical examination and the evaluation of vital signs. Last but not least, the health status of the donors was assessed based on the outcomes of laboratory tests, which can result in the donor's approval or rejection. Among 1168 donors (98.29%) were male and 20 (1.71 %) were females, which is similar to the findings of a study in Mosul where males constituted (99.43%) and females (0.57) of all donors, clinical unsuitability, pregnancy, breast feeding, monthly blood loss of child bearing women as well as in adequate social support with the wrong belief that the women can't donate and the fear of donation are all possible causes of poor female donation.[8] This finding is also in keeping with previous studies done in Saudi Arabi by Elsafi 2020 [9] and Alkantara et.al [10] and was also similar to the results reported by Jaiswal [11], Arora and Singh in India[12], but was different from those reported by other researchers Khurram [13] and Madrona et.al .[14.]

Out of the1168 persons enrolled in this study, 208 (17.81%) donors being deferred due to various causes, the percentage of presenting donors who were postponed in our study is consistent with data

from Saudi Arabia's (19.2%) by Bashawri , [15] and (19.4%) in UAE by reported by Al Shaer.[16] and is even higher than those reported in studies in Saudi Arabia researchers Al;antara et.al [10] Abdelaal,[17] and in Iran by Hatami e al. [18], some reports have cited donor deferral rates of up to 35.6% by Kasraian [19], Khurram et al. [13]

First-time donors formed (20.8%) of the total donor population in this study which is lower than the 36.17% and 76% those reports by Unnikrishnan et al. [20]. On the other hand most of blood donors in the present study were voluntary donors (84.5%) compared to (15.5%) replacement donors, the high proportion of voluntary blood donors has been mentioned by other authors from different countries form Iran by S. Khurram, [13] but was different from those reported in India by John,[21] and Unnikrishnan et al.[20]

Age group of donors and deferrals: Most of the blood donors were younger than 30 years, the finding is in keeping with those reported by Al Shaer study[16], Alkantara et.al [10] and Kasraian [19],the possible explanation for such finding is that most of the donors were younger than 30 years and were an aware about the preparation for donating blood.

Analysis of the deferrals showed that the temporary deferral was more common than permanent (91.35 vs 8.65%), because majority of the reasons of exemption temporary and were mostly related to inadequate knowledge of the donors about the causes of deferral, the findings are in keeping with those reported by Dayalaxmi 2019 [22] and Sayed in Pakistan [23] and Patil and Jayaprakash 2021.[24]

The deferral rate based on the frequency of donation showed higher among females and first-time donors (22.22%), the finding is similar to those for Al Shaer , [16] and Abdelaal and Anwar . [17]

The commonest causes for exemption was the use of certain medications (25.96%) the figure is close to that reported by Maleki (23.7%),[25] Bashawri (26.8%)[15] and Elsafi (24.4%) [9] but was higher than the findings of Hatami (15.6%),[18] with history of recent donation coming in the second row (21.63%) and the possible explanation for such high figure is related to poor knowledge of the people about preparations and causes of deferments.

CONCLUSION

According to the study, blood donor deferral rates were comparable in different regional nations, and the main cause was the consumption of drugs that could affect on the quality of donated blood.

REFERENCES

1. WHO Guidelines Approved by the Guidelines Review Committee. (2012). In Blood Donor Selection: Guidelines on Assessing Donor Suitability for Blood Donation. World Health Organization. https://apps.who.int/iris/handle/10665/76724
2. Aneke, C. J., Ezeh, U. T., Nwosu, A. G., & Anumba, E. C. (2016). Retrospective evaluation of prospective blood donor deferral in a tertiary hospital-based blood bank in South-East Nigeria. Journal of Medicine in the Tropics, 18(2), 103. DOI: 10.4103/2276-7096.192241
3. Gillet, P., & Neijens, E. (2018). An original approach to evaluating the quality of blood donor selection: checking donor questionnaires and analyzing donor deferral rate. Frontiers in Medicine, 5, 74. https://doi.org/10.3389/fmed.2018.00074
4. Organization, W. H. (2016). 2016 Global status report on blood safety and availability. 2016 Global status report on blood safety & availability. https://apps.who.int/iris/handle/10665/254987
5. Organization, W. H. (2010). Towards 100% voluntary blood donation: a global framework for action. https://apps.who.int/iris/handle/10665/44359
6. Sundar, P., Sangeetha, S., Seema, D., Marimuthu, P., & Shivanna, N. (2010). Pre-donation deferral of blood donors in South Indian set-up: An analysis. Asian journal of transfusion science, 4(2), 112. https://doi.org/10.4103/0973-6247.67037
7. Hillgrove, T., Moore, V., Doherty, K., & Ryan, P. (2011). The impact of temporary deferral due to low hemoglobin: future return, time to return, and frequency of subsequent donation. Transfusion, 51(3), 539-547. https://doi.org/10.1111/j.1537-2995.2010.02881.x
8. Al-Nuri, R. N. A.-D. (2021). The Frequency of Blood Donors and Polycythemia among General Population in Nineveh Governorate, Iraq. Annals of the College of Medicine, Mosul, 42(2), 141-147. doi:10.33899/mmed.2020.128424.1049
9. Elsafi, S. H. (2020). Demographical pattern of blood donors and pre-donation deferral causes in Dhahran, Saudi Arabia. Journal of Blood Medicine, 243-249. doi: 10.2147/JBM.S254168
10. Alkantara, J., Alenezi, F., Cruz, C. P., & Alcantara, T. Y. (2016). Donor deferral pattern of a hospital-based blood bank in Saudi Arabia. Int Blood Res Rev, 5(4), 1-9. DOI: 10.9734/IBRR/2016/26835
11. Jaiswal, M. Analysis of pre-donation deferral causes in blood donors at a Rural Medical Institute of Rohilkhand Region, India.

12. Arora I, S. S., Singh S. (2018). Pattern and Trend of Female Donors in Blood Bank and Outdoor Blood Donation Camps-A 7 year Comparative Study from Blood Bank. JMSCR 6(7), 7. DOI: https://dx.doi.org/10.18535/jmscr/v6i7.148
13. Khurram, S., Borhany, M., Anwar, N., Naseer, I., Boota, S., Mirza, I., Nadeem, M., & Shamsi, T. (2017). Frequency and reasons of donor deferral prior to blood donation process: a single centre experience. Transfusion Medicine, 27(1), 10-15. https://doi.org/10.1111/tme.12368
14. Madrona DP, Fernández Herrera, MD, Prados Jiménez D, Gómez Giraldo S, Campos RR. (2014). Women as whole blood donors: Offers, donations and deferrals in the province of Huelva, south-western Spain. Blood Transfus, 12(SUPPL.1), 10. doi: 10.2450/2012.0117-12.
15. Bashawri, L. A. (2005). A review of predonation blood donor deferrals in a university hospital. Journal of family & community medicine, 12(2), 79. PMID: 23012080 PMCID: PMC3410126
16. Al Shaer, L., Sharma, R., & AbdulRahman, M. (2017). Analysis of blood donor pre-donation deferral in Dubai: characteristics and reasons. Journal of Blood Medicine, 55-60. doi: 10.2147/JBM.S135191
17. Abdelaal, M., & Anwar, F. (2016). Analysis of blood donor deferral in Jeddah, Saudi Arabia: Characteristics and causes. High temperature, 22, 1-5. PMID: 27812054.
18. Hatami, H., Maghsoodlu, M., Salehifar, P., Karimian, M. S., & Ferdowsi, S. (2018). Analyzing the Causes of Blood Donor Deferrals and Characteristics of Deffered Individuals in Kurdistan Province, Iran. International Journal of Basic Science in Medicine, 3(3), 114-119. doi: 10.15171/ijbsm.2018.21
19. Kasraian, L., & Negarestani, N. (2014). Rates and reasons for blood donor deferral, Shiraz, Iran. A retrospective study. Sao Paulo Medical Journal, 133, 36-42. doi: 10.1590/1516-3180
20. Unnikrishnan, B., Rao, P., Kumar, N., Ganti, S., Prasad, R., Amarnath, A., et al. (2011). Profile of blood donors and reasons for deferral in coastal South India. The Australasian medical journal, 4(7), 379. doi: 10.4066/AMJ.2011.641
21. John, F., & Varkey, M. R. (2015). Evaluation of blood donor deferral causes in a tertiary hospital, South India. Int J Biomed Adv Res, 6(03), 253-258.
22. Dayalaxmi D, K. D., Devi D, Khiangte D, Rajesh Singh D, Singh D, et a. (2019). Blood Donor Deferral Pattern in a Tertiary Care Hospital of North Eastern India. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 18(12), 4. DOI: 10.9790/0853-1812110104
23. Sayed MA, L. S., Thakur A. (2020). A Study of 507 Deferred Blood Donors, for the Evaluation of Causes of Their Deferral, at the Blood Bank of a Tertiary Care Hospital. Annals of International Medical and Dental Research, 6(4), 5.
24. Patil O, Jayaprakash CS. (2021). Evaluation of Causes of Deferral among Blood Donors. Journal of Hematology & Transfusion, 8(1), 4. https://doi.org/10.47739/2333-6684/1089
25. Maleki, F., Mohammadi, H. R., Taghinejad, H., & Shoohani, M. (2015). Study of reasons for exemption for deferral of blood donors in Ilam blood transfusion center. Journal of Basic Research in Medical Sciences, 2(3), 10-16. http://jbrms.medilam.ac.ir/article-1-98-en.html