Original Research Article

ANALYSIS OF DONOR DEFERRAL IN A TERTIARY HEALTH INSTITUTION IN SOUTH-WESTERN NIGERIA

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ABSTRACT

AIM: This study aimed at evaluating the deferral pattern among blood donors, in order to draw out lessons that will help canvass for a strengthened policy framework and encourage better outcomes in voluntary blood donation.

STUDY DESIGN: This was a retrospective study.

PLACE AND DURATION OF STUDY: All the data were sourced from the central database of donors, as recorded by the Haematology Department of Babcock University Teaching Hospital Ilisan-Remo, Ogun state, Nigeria. The data used spanned through a period of 5 years, from 2017 to 2021.

METHODOLOGY: A total of 7,362 voluntary and non-remunerated blood donors were included in this study. Their records were accessed and used for the study. Data were analysed using SPSS version 25. Level of statistical significance was set at $P < 0.05$.

RESULT: In this study, half (50.2%) of the entire population of volunteers were between the ages of 18 and 30 years while only 3.7% of them were between 51 and 60 years of age. There were more male volunteers for blood donation compared to the females who only represented 10.8% of the population. 61% of the voluntary donors were accepted for blood donation while 39% were regarded as unfit and hence, deferred. The 3 main reasons for deferral in this study were inadequate hemoglobin (54.7% of deferral cases), unmatched blood group (30.9%) and transfusion transmissible infections (14.4%). Age and gender had a statistically significant ($P < 0.05$) relationship with the pattern of deferral of the volunteers.

CONCLUSION: The high deferral rate observed in this study may reveal an urgent need for a community-based intervention and targeted efforts by necessary agency to help improve the general health status of possible future voluntary blood donors.

KEY WORDS: BLOOD DONOR, DEFERRAL, HAEMOGLOBIN, BLOOD BANK, TRANSFUSSION

INTRODUCTION

Blood and blood products remain an integral part of medical interventions till date [1]. Its medical importance is associated with different health conditions such as thalassemia, sickle cell disease, cancer, trauma, surgery, malaria induced anaemia, especially in pregnant women, and children under the age of five, etc. Safe blood availability and sufficiency, therefore remains paramount. To achieve this purpose, many strides have been recorded so far in blood substitutes/alternative science [2] [3] [4].

There are three basic types of blood donation; the Voluntary Non-Remunerated Blood Donation (VNRBD), Family/replacement donation, and commercial donation. Of these three forms of blood donation, VNRBD is the safest, and most reliable source of blood donation. They are said to be the first defence line in preventing the transmission of HIV, hepatitis viruses and other transfusion-transmissibleinfections [5] [6].

Voluntary donors are regardedas the most trustworthy donors because they are believed to be motivated by altruism, a desire to help others, and a sense of moral duty or social responsibility. They have no reason to conceal information about their lifestyles or health status that may make them unsuitable to donate blood. They are not pressuredto donate blood by hospital staff, family members or the community and they are confident that their blood donations will be used as needed, rather than for specific patients. The only payment they get is personal fulfilment, self-worth and pride. In a well-organized blood donor program, voluntary donors, in particular regular donors, are well-informed about donor selection criteria and are more likely to self-defer if they are no longer eligible to donate, thus reducing the need for temporary or permanent deferrals. This also leads to less wastage of donated blood, with all its associated costs, because fewer blood units test positive for infection and need to be discarded [7].

However, there is a need to constantly keep this group of donors, and other prospective voluntary donors updated on emerging stringent donor selection criteria, in order for them to own the process, and by becoming agents of recruitment for safe blood donation, especially as they age, and other critical habits which can make hospital staff turn down voluntary donors, keeps evolving in the world.

It is however pertinent to reiterate that low haemoglobin level, transfusiontransmissibleinfections (TTI's), among others, still remain the most common challenges that confront many willing voluntary donors, whenever they turn up in the hospitals [4]. If conditions that predispose people to these rejection criteria are not properly curbed, many prospective voluntary donors, will end up being unfit to donate.

Therefore, the aim of this study is to analyse the deferral pattern among blood donors over a 5 years period which may help to contribute to the public enlightenment on the factors responsible for deferral in this part of the world, and to canvass for a strengthened policy framework, which will hopefully encourage more people to voluntarily donate blood, thereby increasing the number of voluntary donors, make their blood safe, and protect them from rejections.

MATERIALS AND METHODS

Study design- This was a retrospective study.

Study site- The Haematology Department of Babcock University Teaching Hospital Ilisan-Remo, Ogun state, provided the data used in this study. The 204-bed Babcock University Teaching Hospital is a medical facility in Ogun state, one of Nigeria's southwestern states. Even though it is a non-government controlled private tertiary healthcare facility, the hospital has evolved through time into a referral hub for many other healthcare facilities in its environ. This is due to its wide range of approach to health care services including specialized services related to orthopedic, pediatric, obstetric/gynecologic, gastroenterologic, as well as cardiac and vascular medical care (it is one of the few institutions providing cardiovascular related surgeries in the country).

Data source and collection - All the data were sourced from the central database of donors, as recorded by the haematology department.A total of 7,362 voluntary and non-remunerated blood donors were included in this study which spanned across 2017-2021. Being a retrospective study, with anonymized data collected, necessary institutional approval was obtained before proceeding with the study.
Standard operating procedures (SOP) based on Drugs and Cosmetic Act 1940 amendment 1945 was followed by Biomedical Scientists of our blood bank. Proper detailed history, counseling & physical examination (pre-tested structured questionnaire) was done for donor selection and deferral.

The eligibility for blood donation was assessed using a standardized history questionnaire that investigates health, lifestyle, and disease risk factors, followed by physical examination, hemoglobin estimation, pulse rate, blood pressure, and temperature. The questionnaire included the demographic feature of the donor such as age, gender, and the reason for donation. Other information that might have revealed a specific risk such as behavior, travel history, and other factors that potentially affect the safety of the donor or the recipient were also included. The causes of pre-donation temporary deferral of prospective donors were also reported.

Data analysis - Data were analyzed using SPSS version 25 (SPSS Inc., Chicago, IL, USA). Descriptive statistics such as frequencies and percentages were used to measure demographic variables. Association between variables was evaluated using chi-square test. Level of statistical significance was set at $P < 0.05$.

RESULT

In table 1, it is seen that half (50.2%) of the entire population of volunteers were between the ages of 18 and 30 years while only 3.7% of them were between 51 and 60 years of age. The table also reveals that there were more male volunteers for blood donation compared to the females who only represented 10.8% of the population. Among the study population, O-positive was the most reccurring blood group representing 63.7% of the volunteers. On the other hand, only 3 (0.04%) volunteers were AB-negative.

Figure 1 reveals that of the population of volunteers in this study, 61% were accepted for blood donation while 39% were regarded as unfit and hence, deferred.

In figure 2, it is shown that there were 3 main reasons why volunteers were deferred from blood donation. Of these reasons, the most frequent was inadequate hemoglobin level which was implicated in 54.7% of the volunteers who were deferred. In the same vein, 14.4% of the deferred volunteers were considered unfit for blood donation because of the presence of transfusion transmissible infections in their blood.

In table 2 it is revealed that hepatitis B virus was the most prevalent infectious agent found among the deferred voluntary donors that had cases of TTI. This was seen in 36.8% of all the cases of TTI in the study population which represented 2.1% of all the volunteers. Cases of HIV were also seen among the volunteers but represented just 1.1% of the total population of volunteers.

In table 3, it was observed that the female volunteers had a higher percentage of deferral (77.7%) compared to the male population (34.2%). This was statistically significant ($P < 0.05$). It was also observed that the older population seemed to have a higher rate of deferral compared to the younger population ($P = 0.002$).

TABLE 1: Demographics of Volunteers for Blood Donation

VARIABLES	FREQUENCY	PERCENTAGE
AGE (YEARS)		
18-30	3703	50.2
31-40	2574	34.9
41-50	830	11.2
51-60	272	3.7
SEX		
MALE	6585	89.2
FEMALE	975	10.8
BLOOD GROUP		
A-POSITIVE	956	15.3
B-POSITIVE	753	12.1
O-POSITIVE	3965	63.7
AB-POSITIVE	86	1.4
A-NEGATIVE	65	1.0
B-NEGATIVE	36	0.6
O-NEGATIVE	365	5.9
AB-NEGATIVE	3	0.04

FIG. 1: Proportion of deferred/accepted volunteers for blood donation

FIG. 2: Reasons for deferring individuals volunteering to donate blood

TABLE 2: Incident TTI's Among Deferred Voluntary Blood Donors

INFECTIOUS AGENTS	FREQUENCY	% AMONG TOTAL TTI's	% AMONG DEFFERRALS	% AMONG TOTAL POPULATION
HBV	152	36.8	5.3	2.1
HCV	114	27.6	4.0	1.5
VDRL	101	24.4	3.5	1.4
HIV	78	18.9	2.7	1.1

TABLE 3: Gender and Age Characteristics of Deferred Volunteers

VARIABLES	N (% among group)	χ^2	P-VALUE
AGE (YEARS)			
18-30	1443 (39.1)		
31-40	941 (36.6)	15.38	0.002*
41-50	363 (43.9)		
51-60	113 (41.9)		
SEX			
MALE	2244 (34.2)	564.56	<0.05*
FEMALE	617 (77.7)		

*Statistically significant at $P < 0.05$

DISCUSSION

Several reasons for deferring blood donors exist from one center to another, the aim however has been to make sure that both donor and recipient have the safest outcome in the blood donation process such that no harm is done. It is however important to evaluate and understand these reasons in order to create public awareness and policies that will in turn strengthen and maximize the blood banking process.

In this study, there was an overall deferral rate of 39% among the population of volunteers. The overall deferral rates differ from one country to another; and these variations may be due to either the lack of donor selection criteria or appropriate donor selection procedures, or even different donor registration practices. Studies in the past have reported deferral rates that ranged from less than 1% to over 37% with a median of 12% [1]. Deferral rate among this present population was rather high, indicating a possible need for advocacy, in the environment of the study area, on the need to live an overall healthy life. A system may also be needed in which deferred donors will be motivated to overcome negative mental and psychological trauma and encouraged to become future well prepared healthy donors.

A critical look into the reasons for the deferrals among the study population showed that inadequate hemoglobin level topped the list in a very significant way. This outcome is similar to several studies done in the past [8] [9]. In a study by Nippun et al., (2016) [10] which analyzed donor deferral in 101 voluntary blood donation camps by tertiary care hospital of North-Western India, it was observed that the most common reason for deferral among the blood donor population was low hemoglobin which represented 39.7% of total deferred donors with nearly 65% of these anemic donors being females.

There seem to be a possibility of many individuals, in the area of study, being anaemic and notaware. It will therefore be important to incorporate hemoglobin check as part of routine medical checkup for individuals who visit the hospital for this purpose. Diets that help improve healthy blood levels should also be encouraged among the inhabitants of these study area. In the same vein, to improve on blood donation among the general populace, some governments have proposed elemental iron tablets for voluntary blood donors for a period of 100 days [11]. The potential of this may need to be tested and possibly generally adopted if viable.

Furthermore, it was observed that unmatched blood group was the second most prevalent reason for deferral of voluntary blood donors among this study population. This was particularly in cases of replacement donors. Although there were no paid donors, family replacement donors in this population constituted a good number of the donations. These set of voluntary blood donors remain a critical source of non-remunerated blood that meets all standard conditions of voluntary nonremunerated donors and should be seen as authentic and paramount at this point of time instead of being discouraged [12]. However, this reason for deferral may remain, considering the belief in some communities that blood is a precious substance that should be shared only with their beloved ones and not donated to or accepted from others. Some also prefer to receive blood from a known person or family member than from a foreigner. A synergy may also need to be established between blood banks to help reduce this burden of blood donor rejection, especially in cases where a blood bank may not want to have a large amount of one blood type in storage, where the 35-day expiry period of blood is being considered.

In this study, it was revealed that transfusion transmissible infections were the third common reason for deferral among the volunteers. The incidence of TTI's observed in this study is similar to the findings made by Ahmed et al., (2020) [13] in which the transfusion transmitted infections among male blood donors of White Nile State, Sudan was investigated. In the study, it was seen that out of total donors, 1734 (15.91%) were tested positive for TTI's. Likewise, 1669 (15.31%) had a serological marker of a single type of TTI's. The high level of TTI's observed in this present study may be due to the sensitive technique used for the screening of donors in the institution. In developing countries lack of resources for universal and effective screening of blood donors is still a major source of transmission of infections in the recipients. A study conducted among poly-transfused thalassemic children in Karachi showed that 34.8% of the thalassemic children were anti-HCV positive due to inappropriate screened blood transfusions [14].

In the same vein, it was further observed that hepatitis B virus was the most prevalent TTI with HIV being the least. This is a similar trend to what was observed by Abdelaziz (2020) [15] in a study that evaluated the prevalence of transfusion transmissible infection among healthy blood donors at Dongola Specialized Hospital, Sudan. There may be a need for a community-based screening for the hepatitis B virus which may be useful to curb any occult spread of the infection among the populace.

There was a significant deferral rate among the older population in this study compared to the younger volunteers. Previous studies have indicated that age affects blood donor and donation rates [6] [16]. The high percentage of young donors reported in our study was probably due to a strong focus on recruitment among university students as the hospital is university based. As a large proportion of young adults are therefore able to donate blood, the prospects of recruiting young people as voluntary blood donors seem generally positive.

Also, gender seemed to play a significant role in the deferral rate of the volunteers in this study. The female volunteers seemed to be deferred more often than their male counterpart. Over time, calculating the eligible and potential blood donor pool has been on the basis of age alone (population between 18 and 60 years of age). According to the study by William et al., (2007) [17] if age alone is taken as the criteria, there is a chance of having overestimated eligible donor prevalence (calculated using deferral incidence) by approximately 59 percent. This study also supports the need to include such parameters as gender into calculating such potential blood donor pool.

CONCLUSION

This study has shown a high deferral rate among the population of voluntary blood donors. This level of deferral was especially due to a large number of the volunteers not meeting up with the haemoglobin cut-off necessary for donation. The study also showed that age and gender played a significant role in the pattern of deferral among the study population.

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