

Negative peri-donation events among whole blood donors in a blood bank in Ibadan, Nigeria

Foluke A. Fasola

Department of Haematology, University College Hospital/College of Medicine, University of Ibadan, Ibadan, Oyo state, Nigeria

Abstract

The existence and sustenance of the blood bank depends on blood donors. It is imperative that the donation experience is satisfactory for the donors. Therefore this study was carried out to determine the frequency of undesirable events experienced by the blood donor as part of donor haemovigilance. This was a retrospective descriptive study of the events that occurred amongst the blood donors of the blood bank of a tertiary institution. The blood donor incident book was reviewed for the period of six months. Negative undesirable events occurred in 2% of the donor populations, of which 45.8% could not complete the blood donation process while only 16.7% completed the blood donation process. Mild vasovagal attack occurred in 0.2% of the donor population. Undisclosed deferrable risk factors/ behaviours were identified by the phlebotomist in the bleeding room which made donors unfit for donation even though they had passed the donor screening criteria. This accounted for 20.8% of those with negative experience. Guidelines are required to identify donors that are not likely to complete donation to avoid wastage of time, blood, resources and reduce undesirable experiences.

Introduction

There is a growing global blood shortage with maximum concentration in developing countries. In 2010, the World Health Assembly corroborated this statement when they reported that Sub-Saharan Africa, has the lowest blood donation rates, this situation has not changed since then. Millions of people depend on blood donated by blood donors to survive. The existence and sustenance of the blood bank is premised on blood donors who donate and return to donate after the first donation. These are the group of blood donors who are retained as voluntary blood donors. Most countries in Sub-Saharan Africa collect less blood than is required. In Nigeria, the system of organ-

isation of the Blood Transfusion Services is centralized, decentralized and informal.¹ Estimated blood needed per 1000 populations in Nigeria is 10 while the National blood transfusion service supplies 0.3 per 1000 populations (2014).^{1,2} There is a dearth of information on adverse events that occur when blood donors in developing countries are performing their altruistic function.

Donating blood is a relatively safe procedure but occasionally unpleasant events may occur which might not be life threatening but may discourage the blood donor from coming back to donate. Instances had occurred when blood donors seek outside medical care for an adverse event after blood donations.³ Various studies conducted all over the world showed that the rate of adverse events associated with donations ranged from 0.3% to 3.8%.⁴ Negative experiences of donors which include donors being deferred or experiencing an adverse reaction occur in 11-57% of donors.^{5,6} Some blood donation-related adverse events which upset and reduce donor satisfaction can negatively impact the blood donor return rate and decrease donor retention.³ Providing safe and adequate blood is an integral part of every country's national health care policy and infrastructure. The donating experience could contribute to blood safety by encouraging the blood donors to return as voluntary repeat blood donors. The rate of blood-transmissible diseases is lower in these donors,⁷ and they are more likely to donate for altruistic reasons and feel greater responsibility toward recipients.⁸ The presence of repeat donors also stabilizes the number of blood units available in the blood bank by providing a stable base of donors.^{8,9} In the event of an unpleasant experience during blood donation, donor health, donor satisfaction and blood donor return rate might be negatively impacted.

The events occurring during blood collection and post blood donation are not routinely documented and treated as a priority in many blood collection centers in Nigeria and therefore there are few studies in this area. During blood donation, blood is drawn from an individual to give another person who needs blood transfusion therefore the comfort and safety of the donor around the time of blood collection should be addressed as a priority. The evaluation of donor adverse events and experiences helps to improve the donation process and donor compliance. There are varying reports in literature. It is part of the quality system of a blood transfusion service. This study aims to determine the frequency of undesirable events related to blood donation experi-

Correspondence: Foluke A. Fasola, Department of Haematology, College of Medicine, University of Ibadan, Ibadan, Oyo state, Nigeria. Tel.: 234.8033375785. E-mail folukefasola@yahoo.com

Key words: Events; peri-donation; whole blood; donor; Nigeria.

Acknowledgments: I wish to acknowledge Mr Richard Akpan who ensured that the events that took place in the bleeding room were recorded.

Conflict of interest: the author declares no potential conflict of interest.

Received for publication: 25 June 2017.

Revision received: 29 July 2017.

Accepted for publication: 4 August 2017.

This work is licensed under a Creative Commons Attribution NonCommercial 4.0 License (CC BY-NC 4.0).

©Copyright F.A. Fasola, 2017

Licensee PAGEPress, Italy

Journal of Public Health in Africa 2017; 8:720

doi:10.4081/jphia.2017.720

enced by the blood donor as part of donor haemovigilance to improve blood collection process and increased blood donations from eligible donors.

Materials and Methods

This is a retrospective descriptive study of the events that occurred to eligible blood donors from the moment the donors were attended to in the bleeding room, during blood collection and the immediate post-donation period in the blood bank of a tertiary institution. The study location is a hospital blood bank that has been involved in blood collection and processing for over 40 years. The study population included all eligible blood donors who entered the bleeding room to donate blood for allogeneic transfusion and was attended to by the phlebotomist in the bleeding room. The blood donors were those selected for blood donation after passing the donor screening tests which included responses to a set of standard systematic oral questions on health status and risky behavior, copper sulphate test to rule out anaemia and seronegative result on screening for HIV, HBV and HCV. The questions administered for selection and recruitment were designed by the health facility. Our minimum requirements for a blood donor are: age between 18 to 60

years, haemoglobin >12.5 gm% represented by sinking of a drop of blood from the donor to the bottom of a copper sulphate solution with specific gravity of 1.053¹⁰ and minimum weight required for donation was 50 kg. Paid donors are not accepted for donation by the hospital policy. All donors are requested to eat before blood collection. The donor who passes the screening criteria is then given a blood bag and led to the bleeding room where the donor is attended to by the phlebotomist. The blood donation process involves donor lying in supine position and a tourniquet is tied round the upper limb selected for puncture of vein to withdraw blood. The vein in the ante cubital fossa is often selected. The part is prepared by application of iodine with cotton swab to clean the site. After labelling of blood bag, venipuncture is carried out using a 16 G needle of the bleeding set and blood is allowed to freely flow into CPDA containing blood bag. The blood bag is placed on adjacent platform a little lower than the index forearm use for blood donation. During the process of donation the donor is asked to tighten and loosen grip around a catch while the blood is intermittently mixed with anticoagulant in the blood by the phlebotomist. After collection of approximately 450 ml of venous blood, the blood bag is disconnected from the donors by releasing the tourniquet and withdrawing the needle of the bleeding set from the donor. After donation, the blood donor is allowed to rest for 15 to 30 minutes before leaving the blood collection point. All prospective blood donors who were not eligible to donate blood were excluded from the study.

The data was collected by reviewing blood donor incident report book over a period of six months from September 2013 to February 2014. The report in the book included the number of donors bled and event that occurred to blood donors during and after donation in the bleeding room. The events were divided into complications with local symptoms, generalized symptoms and events with a temporal relation to a donation were reviewed.¹¹

Data analysis was carried out using descriptive statistics. This was carried out

using frequency of events and percentages. The events that occurred to donors were categorized into: i) local complications which included failed Venipuncture, poor blood flow, haematoma; ii) generalized complications which included vasovagal reaction; iii) those who did not donate due to failure of self-disclosure of deferrable risk factors or behaviors; iv) those without documented reason for not completing donation process. The standard list of events could not be applied to this study as a limitation of retrospective study and in order to capture all the unique events that took place in the bleeding room but did not fit into the standard classification.

Results

One thousand two hundred blood donors were bled in the hospital blood bank donor room during the study period out of which 24 (2.0%) had issue with blood donation. Blood donation was uneventful in 1176 (98.0%) of the blood donors. The documentation in the record of incidents was not systemic as that was the first attempt to develop a blood donor incident book. The ages of the donors who had a negative encounter with the phlebotomist were not recorded in the incident book however the gender was documented, there was a male: female ratio of 3:1 (Table 1). The adverse events recorded were related to failed venipuncture, poor blood flow, discontinuation of the donation process without documented reasons, haematoma and mild vasovagal reaction (Table 1). Failure of blood donors to disclose full and truthful information leading to questionable eligibility was observed in 20.8% of donors who passed the screening test and were therefore denied donation by the phlebotomist (Table 1). Of the 24 blood donors who had undesirable events during donation, 11 (45.8%) could not complete the donation process. The reason for discontinuation of the donation process was not given in 7 donors while the reason given for one of the donors was that the donor blood clotted in the blood bag. The other reason given for 3 donors was that the blood flow was sluggish and there

were intermittent interruptions of flow from donor, therefore donation could not be completed. The blood of one of the donors clotted in the blood bag despite frequent mixing with anticoagulant therefore the bleeding process was stopped. All blood bags from donors who did not complete donation were discarded.

Of the 9 donors who did not donate, 4 had either tiny or poorly visible veins for venipuncture. Two to 4 Attempts were made at venipuncture before donors were reassured and dismissed. The male: female ratio of those with failed venipuncture was 1:3. The reasons giving for the remaining five donors who did not donate were related to non-disclosure of information that could confirm their eligibility status. One of the blood donors declined donating on getting to the bleeding room despite giving his consent at the donor interview while one was not allowed to donate because she informed the phlebotomist that she is a peptic ulcer patient. Three donors (2 male and a female) (12.5%) were denied the opportunity to donate because 2 of them were known paid blood donor and the other person donated a month earlier. Four donors required specific interventions during and after the donation process (Table 2). The events that occurred to

Table 1. Characteristics of blood donors and adverse events in the blood donor room.

Variables	Number	Percentages (%)
Gender		
Male	15	62.5
Female	9	7.5
Type of donor		
Voluntary	3	12.5
Replacement	21	87.5
Donation status		
Complete donation	4	16.7
Interrupted donation	11	45.8
No donation	9	37.5
Adverse events		
Failed Venipuncture	4	16.7
Poor blood flow	5	20.8
No documentation	7	29.2
Denied donation	5	20.8
Haematoma	1	4.2
Vasovagal reaction	2	8.3

Table 2. Management of blood donors with adverse events who require specific intervention.

Gender	Intra and Post donation event	Treatment
Female	Poor blood flow	Aided with sphygmomanometer put at 50 mmHg
Male	Sweating profusely after donation. BP-was 110/70 mmHg, PCV- 39%	Fainted and administer oral glucose and beverage. Discharged home after observation
Female	Sweating, dizzy and twitching. BP- 120/70 mmHg. Post donation PCV- 34%	Administered IVF, Normal saline 500 mls. Discharged home after observation
Male	Haematoma	Advice to put ice pack at home

the 4 donors who donated and the management of the events are as shown in Table 2. Two donors had mild vasovagal attack constituting 0.2% of the entire blood donors. There was no loss of consciousness in any of the donors. The donors were attended to by the Haematology doctors who discharged them home after stabilization.

Discussion

Blood donations in Nigeria are insufficient to cover the transfusion needs of patients. Addressing issues relating to the comfort of eligible blood donors could increase the capacity of blood bank to supply blood through its effect on donor recruitment and retention. The occurrence of negative peri-donation events in 2% of the blood donors is higher than 0.6% and 0.76% reported for adverse events from India and Netherland respectively.^{4,12} The higher incidence in our blood donors may be related to the types of events included in this study but was left out of the studies carried out. The Working Group on Donor Vigilance of the International Society of Blood Transfusion (ISBT) Working Party on Haemovigilance in collaboration with The International Haemovigilance Network (IHN) and The AABB Donor Haemovigilance Working Group in 2014 revised the complications related to blood donation.¹¹ The major classification of adverse events in allogeneic blood donors are that due to local symptoms, generalized symptoms, major cardiovascular event and other complications. The list of events did not capture events such as several failed attempted venipuncture in donors who did not verbally communicate distress and donors who experience psychosocial displeasure from being turned back at the point of donation or had their donation procedure interrupted despite being adjudged eligible. These negative experiences which re also donor adverse events might be peculiar to settings with replacement donors where the motivation to donate blood is less altruistic. Other studies in Netherland which examined the negative experiences of blood donor such as adverse events and deferral reported a higher prevalence than the observation from this study.⁵ The donation-related adverse events in this study were not assigned to categories according to standardized criteria in order to capture all eligible donors who were attended to by the phlebotomist and had unacceptable experience.¹³ There might be need to consider events observed in our donors in the development of standard basic information to

report in a donor incident record for blood banks that use replacement donors. The type of donors bled might also account for the frequency of adverse events. The donors who are largely replacement donors are likely to be first time donors.¹⁴ The frequency of incidents observed in this study is however, comparable to that reported for first time donor by Burkhardt *et al.*¹⁵ but less than that reported for repeat donors. The incidence is less than one third of the blood donors in United States in whom one or more adverse events was reported.³ This might be because common complications based on a postdonation interview such as bruise, sore arm, and fatigue which were recorded in that study were not documented in this study. The lack of this information is a limitation of this study being a retrospective study. A postdonation interview might give knowledge of the full range and frequency of adverse events in our donors. Those donors who received several attempts of venipuncture are likely to be victims of bruising and sore arm. Newman *et al* reported an incidence of 23% and 10% for bruising and sore arm respectively.³ Another study from Canada¹⁶ reported a prevalence of 45.5% for adverse events with a total of 32% of first-time and 14% of repeat donors. The most frequently adverse symptoms were bruising followed by feeling faint or weak. Fifty-one percent of donors consulted an outside physician and also called Canadian Blood Services. A survey from Nigeria reported that people who had previously donated blood complained of pain at the donation site and drowsiness post donation.¹⁷ These complaints were not brought to the attention of the blood bank staff. Complaint of fear of adverse events as the reason for not donating blood was documented for 8.4% of respondents in the study.¹⁷ Piliavin *et al.* showed that factors such as fear, anxiety and bad experiences with a previous donation can affect the decision to donate again.¹⁸ These complaints were not recorded in our study probably because only those occurring in donor room were considered besides direct questions were not asked on their experience rather attention was given to obvious problems. The possibility of an underreporting of the donor side effects should be considered in this study. The most frequent undesirable event are venous access and needle related complications evidenced by failed venipuncture on donors and phlebotomist had to carry out several attempts at the venipuncture, poor blood flow with discontinuation of donation process and haematoma. This finding in higher number of female donors is corroborated by other

studies.¹² Though medically inconsequential, it is certainly not acceptable to the donors. This is associated with loss and wastage of blood, time and resource. The impression of the blood donor on the blood collection process can affect subsequent recruitment of new ones donors interact with. Negative donation experiences, like being deferred or experiencing an adverse reaction, might upset and reduce donor satisfaction. Adverse events also result in disrupted workflow at blood donor centres and impact on customer service to other donors. Though the donors were re-assured, Guideline to identify and manage donors likely to have problem with venous access should be available to minimize adverse incidents associated with donations. Applying a blood pressure cuff inflated to 40-60 mm Hg, to make the vein more prominent may be a more reliable means of making the vein obvious. The cuff is released when the blood flow is established or after 2 minutes, whichever comes first. Changes in blood flow that may indicate the needle has moved in the vein, and needs to be repositioned.¹⁹

The refusal of 12.5% of the donors by the phlebotomist from donating due to undisclosed unaccepted standard reveals that some of the donors who are not fit to donate could disguise and sneak into the eligible donor pool to donate. This suggests that there is a need to explore a more effective screening method. The refusal of one of the donors who has passed the screening test to donate after getting into the bleeding room requires diligent investigation. Computerization of the blood donor data will allow for easy identification of blood donors who have previously been disqualified or donated blood recently. Easy identification of blood donors who could evade the selection standard would not only contribute to blood safety but also prevent the phlebotomist from bleeding donors who are vulnerable to having side effect like the donor who donated blood a month previous to presentation. The psychosocial effect of being declined at the point of donation could be reduced by paying strict attention to rules and procedure for recruitment and selection. This might also suggest that the staff involved in recruitment and selection require retraining. Negative donation experiences, like being deferred or experiencing adverse reactions could result in anticipatory stress responses such as elevated pre-donation blood pressure at the subsequent visit.⁵ The frequency of vasovagal reaction is lower than that reported from other studies.^{12,20} Strict adherence to the minimal weight of 50kg and ensuring that donors

had food before donating blood might have contribute to the low incidence. There was no case of donor losing consciousness or requiring hospitalization. Those with vasovagal reactions had presyncopal symptoms.¹³ It is very important that donors are informed of the need to notify blood bank staff of any unusual feelings during the process of blood donation so that the blood bank staff could react swiftly to initial complaints of donors to prevent serious events. Vasovagal attack could be avoided by giving blood donor fluid before phlebotomy.¹⁹ Unfortunately information on age, height and weight was not available in the donor incident report data, therefore these experiences of the blood donors could not be related to their age and body mass index. One of the limitations of this study is that detail information on the blood donations is not available as is often seen with a retrospective study. A prospective study will be useful to elucidate the characteristics of the donors with adverse effect. A study from Nigeria reported that a high percentage of the donors donated once and never returned.¹⁷ This is because the blood donor system in Nigeria depends on a combination of voluntary and replacement donors¹⁴ with a significant proportion being replacement. Most of these replacement donors are first time donors. The replacement donors can be retained as future regular voluntary donors if their experience during blood donation is a pleasant one. Studies suggests that first time donors can be retained by paying extra attention to adverse events.²¹ An undesirable experience by an eligible blood donor may discourage the donor from revisiting the blood bank for future donation thereby negatively impacting donor recruitment and retention. Although many individuals in the population are eligible to donate, only a small proportion donates.²² A limited number of donors are eligible to donate following screening guidelines and donor qualification criteria used to guard against transfusion-transmitted diseases, therefore efforts should be made to give the donors a pleasant experience. The negative pre-donation events in this study were both physical and psychosocial distress. Blood centres have an obligation to constantly monitor risks of blood donation and to make a concerted and committed effort to achieve the lowest possible rate of complications. It is suggested that a study should be conducted to identifying the donors at risk in order to adopt environmentally appropriate measures that can reduce risk and improve donor satisfaction.

Conclusions

This study provides information on blood donation related experiences of donors which might not affect the donors physically and are not included in Standard for Surveillance of Complications Related to Blood Donation but may be psychosocially unpleasant such as stopping blood donation midway with eventual discard of donor blood and donors being denied the opportunity to donate despite scaling through the screening test. There is a need for a well-defined haemovigilance structure and protocols to collect more information on adverse events which should include verbal reports from donors with delayed reactions.

References

1. Factsheet on Nigeria's blood services: 2015. Available from: http://www.mamaye.org.ng/sites/default/files/evidence/NG%20blood%20factsheet_2015.pdf
2. World Health Organization. Towards 100% Voluntary Blood Donation: A Global Framework for Action. Geneva: WHO; 2010.
3. Newman BH. Blood donor complications after whole-blood donation. *Curr Opin Hematol* 2004;11:339-45
4. Pathak C, Pujani M, Pahuja S, et al. Adverse reactions in whole blood donors: an Indian scenario. *Blood Transfus* 2011;9:46-9.
5. Hoogerwerf MD, Veldhuizen IJ, van den Hurk K, et al. Negative experiences and pre-donation blood pressure at the subsequent donation in blood donors. *Vox Sang* 2016;110:107-15.
6. Hoogerwerf MD, van Dongen A, Middelburg RA, et al. Negative experiences and pre-donation blood pressure: the role of attitude and anxiety. *Transfus Med* 2017;27:105-13.
7. Kasraian L, Torab Jahromi SA. Prevalence of major transfusion-transmissible viral infections in blood donors attending Fars Blood Transfusion Center Shiraz 2002-2005. *Iran J Med Sci* 2007;32:114-7.
8. Kasraian L. Causes of discontinuity of blood donation among donors in Shiraz, Iran: cross-sectional study. *Sao Paulo Med J* 2010;128:272-5.
9. Whitaker BI, Green J, King MR, et al. The 2007 National Blood Collection and Utilization Survey. Rockville, Maryland: The United States Department of Health and Human Services; 2008.
10. Conteras M, Taylor CPF, Barbara JA. Clinical blood transfusion. In: Hoffbrand AV, Catovsky D, Tuddenham EGD, eds. *Postgraduate Haematology*. 5th Edition. Oxford: Blackwell Publishing Ltd; 2005. pp 249-276.
11. Standard for Surveillance of Complications Related to Blood Donation. Donor Vigilance of the International Society of Blood Transfusion Working Party on Haemovigilance in collaboration with The International Haemovigilance Network and The AABB Donor Haemovigilance Working Group December 11, 2014. Available from: <https://www.aabb.org/research/hemovigilance/.../Donor-Standard-Definitions.pdf>
12. Wiersum-Osselton JC, Marijt-van der Kreek T, Brand A, et al. Risk factors for complications in donors at first and repeat whole blood donation: a cohort study with assessment of the impact on donor return. *Blood Transfus* 2014;12:s28-36.
13. Eder AF, Dy BA, Kennedy JA, et al. The American Red Cross Donor Hemovigilance Program, complications of donation. *Transfusion*. 2006;46:2037-42.
14. Kotila TR, Fasola FA. Pattern of blood donation in a Nigerian tertiary hospital: The way forward. *Africa Sanquine* 2008;11:19-21.
15. Burkhardt T, Dimanski B, Karl R, et al. Donor vigilance data of a blood transfusion service: A multicenter analysis. *Transfus Apher Sci* 2015;53:180-4.
16. Goldman M, Osmond L, Yi QL, et al. Frequency and risk factors for donor reactions in an anonymous blood donor survey. *Transfusion* 2013;53:1979-84.
17. Udegbe ALN, Odukoya OO, Ogunnowo BE. Knowledge, attitude, and practice of voluntary blood donation among residents in a rural local government area in Lagos state: A mixed methods survey. *Nigerian J Health Sci* 2015;15:80-8.
18. Piliavin JA, Callero PL, Evans DE. Addiction to altruism? Opponent-process theory and habitual blood donation. *J Personality Social Psychol* 1982;43:1200-13.
19. WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy. Geneva: World Health Organization; 2010. 4, Venepuncture for blood donation. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK138671/>
20. Goncalves TT, Sabino EC, Schlumpf KS, et al. For the NHLBI Retrovirus Epidemiology Donor Study-II (REDS-II), International Component. Vasovagal reactions in whole blood donors at 3 REDS-II blood centers in Brazil. *Transfusion* 2012;52:1070-8.
21. van Dongen A. Easy come, easy go. Retention of blood donors. *Transfus Med* 2015;25:227-33.
22. Ownby HE, Kong F, Watanabe K, et al. Analysis of donor return behavior. *Retrovirus Epidemiology Donor Study*. *Transfusion* 1999;39:1128-35.