



Assessment of Peri-Donation Undesirable Events among Voluntary Non-Remunerated Blood Donors: Experience at a Private Blood Banking and Donor Recruitment Centre in Benin City, Edo State, Nigeria

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Abstract

Background: There has been an increasing blood shortage in sub-saharan Africa. Much progress has not been made in voluntary blood donation and retention of blood donors. This makes availability of safe blood in our blood banks very difficult. Undesirable events during blood donation are some of the reasons that would discourage blood donors from coming back to donate again. This study was aimed at determining the prevalence and make assessment of these adverse events. **Methods:** This was a cross-sectional study carried out for a period of 11 months at a private blood banking facility in Benin City, Nigeria. Semi-structured and pre-tested questionnaire was used to collect vital information from consenting respondents. The data collected was analyzed using SPSS software version 23. Approval for this study was granted by Research Ethics Committee, Faculty of Clinical Sciences, Edo University, Iyamho. **Results:** A total of 2,229 people donated blood during the study period. Forty-seven had blood donation adverse events giving a prevalence of 2.1%. The mean age was 24.15±6.74 years. Females were 74.5% while males were 25.5%. The adverse events were dizziness (70.2%), Fainting (17.0%), weakness (8.5%) and vomiting (4.3%). **Conclusion:** The prevalence of adverse events is low in a private blood bank facility similar to public institutions. The adverse events were mainly mild complaints due to vasovagal reactions. We recommend more counselling sessions and other modalities to allay the fears of potential blood donors.

Keywords: Peri-donation; Undesirable events; Voluntary blood donors.

1. Introduction

The problem of blood shortage is increasing globally with developing countries being the worse culprit. The World Health Assembly supported this statement a decade ago (2010) when they said that sub-Saharan Africa has the lowest blood donation rates. Despite the fact that this report was made a decade ago, the situation has remained unchanged as not much progress has been made in that direction. The blood donated by blood donors are the hope of millions of people to survive. The existence of any blood bank is hinged on the blood donors who donate and return to donate again some months after their first donation. These are the group of blood donors who are retained as voluntary non-remunerated blood donors. Most countries in Sub-Saharan Africa collect less blood than is required [1].

In Nigeria, the Blood Transfusion Services are centralized, decentralized and informal [2]. It is estimated that blood needed per 1000 populations in Nigeria is 10 whereas the National Blood Transfusion Service (NBTS) supplies 0.3 per 1000 populations (2014) [2, 3].

Donor adverse reaction has been defined as symptoms or signs of donor discomfort that is severe enough to either warrant the donor calling for attention of the blood bank staff or was noticed by the staff [4]. These adverse events can be conveniently grouped into mild and severe reactions. The mild reactions include agitations, sweating, dizziness, cold feeling, weakness, nausea; while severe donation events are vomiting, fainting, loss of consciousness and convulsions [5].

Peri-donation undesirable or unpleasant events which may occur during and immediately after blood donation might not be life threatening but can discourage the blood donor from coming back to donate another day; and such a donor is lost from being retained in the donor pool. There are few instances when blood donors seek outside medical treatment for an adverse event that occurred after blood donation [6]. Studies all over the world revealed that the rate of post-donation adverse events ranged from 0.3% to 3.8% [7]. Some authors reported a prevalence as high as 6.0% but believe that serious adverse reactions leading to loss of consciousness are rarely encountered and reported in only 0.08-0.3% of the donor population [8, 9].

Any unpleasant effect which reduces donor satisfaction could discourage the blood donor from returning hence, decrease donor retention rates [6]. Provision of safe and adequate blood is an important part of every country's

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national health care policy. Experiences encountered during blood donation could contribute to blood safety by encouraging the blood donors to return as voluntary blood donors. The blood donated by voluntary donors are far better and safer than those obtained from commercial donations, the practice which is seriously being discouraged in Nigeria. The rate of transfusion transmissible infections are lower in voluntary donors, [10] as they donate for altruistic reasons and have greater empathy towards recipients [11]. The retention of repeated non-remunerated donors stabilizes the number of blood units available in the blood banks as they are being serviced by this pool of blood donors [11, 12]. Any adverse event experienced during a blood donation would negatively impact on the health, satisfaction and return rate of the donors. Donor vigilance is the systematic monitoring of adverse reactions and incidents in blood donor care with a view to improving quality and safety for blood donors [13].

The adverse events occurring during blood collection and post blood donation are not usually documented in many blood collection centres in Nigeria and hence few studies are done in this area. This, without doubts, has resulted in dearth of information on adverse events that occur when blood donors in developing countries are performing their altruistic function. To our knowledge no private blood bank centre in Nigeria has done any studies concerning adverse events among blood donors.

The aim of this study is to estimate the prevalence and assess the undesirable events experienced by blood donors during blood donation at a private blood collection and banking centre with a view to improving blood collection process and increase blood donations from eligible donors.

2. Materials and Methods

2.1. Study Design

This was a prospective cross sectional study carried out at Safe Blood for Nigeria foundation (SBNF) which is a private-owned blood bank and donor recruitment centre. The centre was established and registered in Nigeria on 13th February, 2012 by Cooperate Affairs Commission (RN: RC 50285) with a mission statement to ensure availability of safe blood and blood product through voluntary non-remuneration (VNR). The vision is to ensure a pool of regular blood donors who will commit to VNR blood donation. It boasts of collection and making available an estimated 3,500 units of safe blood per annum.

2.2. Study Population/Ethical Consideration

This study was carried out from 1st of January, 2019 to 30th November, 2019. Blood donors were selected based on WHO established blood donor criteria [14] such as basically age of 18-65years, weight not less than 50kg, haemoglobin concentration of not less than 13.5g/dl and 12.5g/dl for adult males and females, respectively. Donors were also screened based of their last blood donation as the adult males and females who donated less than previous three and four months, respectively were not recruited into the study. Informed consent was sought for and obtained from the blood donors after providing explanations on the purpose of the study and having assured them that the information sought for are strictly for the purpose of research. Prospective blood donors who did not meet the blood donation criteria and also those who refused to give consent were not recruited into the study. The approval for this study was granted by Research and Ethics Committee (REC) of the Faculty of Clinical Sciences of Edo University, Iyamho, Edo State, Nigeria. During the 11-month study period 2,229 individuals donated blood at SBNF.

2.3. Data Collection

A semi-structured and pre-tested questionnaire was used to collect information from the donors while the donor was still in the donor rooms. The donor room is well furnished for the comfort of the donors; it has donor couches, air-conditioner, and basic resuscitative apparatus and medications. The questionnaires were administered by a trained staff of SBNF who observed the donors during and immediately after donation for possible adverse events for about 30minutes. The questionnaire had questions that sought the donors' age, gender, and any of these complaints and events: headache, dizziness, fever, swelling at the site of blood collection, fainting; a space was provided to fill any other events or complaints outside the ones already outlined.

2.4. Data Analysis

Data entry was made on excel spread sheet and data analysis was done using the IBM Statistical Package for Scientific Solutions (SPSS) version 23.0 software. Frequency distribution tables and pie charts were used for presentation of selected variables.

3. Results

A total of 2,229 people donated whole blood from 1st of January, 2018 to 30th November, 2018. Out of this number, a total of 47 people had peri-donation complaints and undesirable events. This represented a prevalence of 2.1%.

Table-1. Age of the donors with undesirable events/complaints

Age (years)	Frequency (%)
18	5 (10.6)
19	6 (12.8)
20	3 (6.4)
21	8 (17.0)
22	6 (12.8)
23	3 (6.4)
25	2 (4.3)
26	1 (2.1)
27	1 (2.1)
28	1 (2.1)
29	3 (6.4)
30	1 (2.1)
32	2 (4.3)
33	1 (2.1)
34	3 (6.4)
55	1 (2.1)
Total	47(100)

Table 1 shows the age of the donors who had peri-donation undesirable events. Minimum age was 18years while the maximum age was 55years. The mean age was 24.15 ± 6.74 years. Approximately 70% of these donors were between 18 and 25years.

Fig-1. Sex of donors with undesirable events

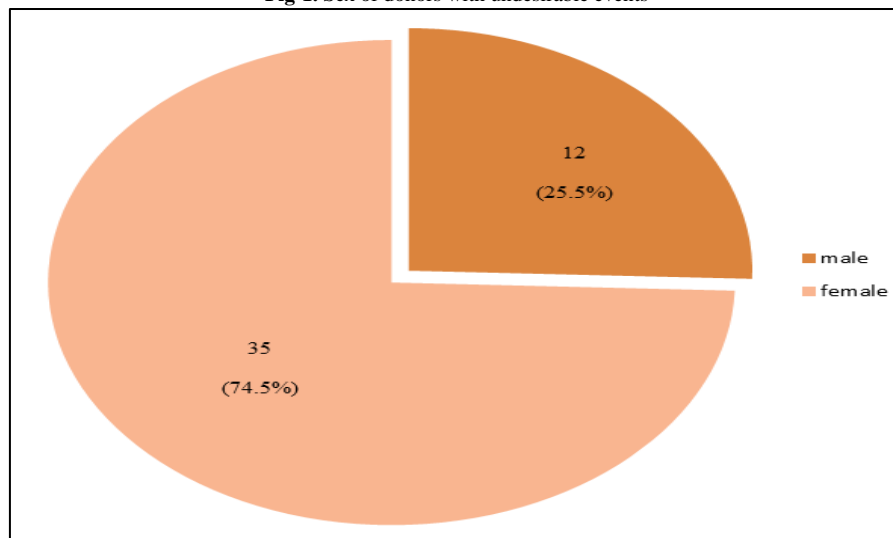


Fig 1 shows the sex distribution of the donors. They were made up of 12 males (25.5%) and 35 females (74.5%) giving a male to female ratio of 1:3.

Fig-2. Complaints/undesirable events of Donors

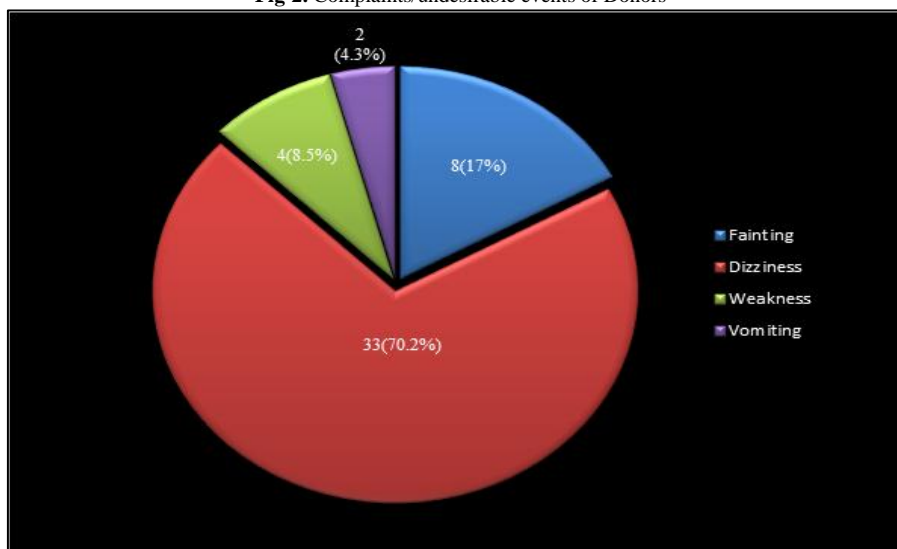


Fig 2 shows the complaints and events recorded from the donors. Most of the common complaints among the VNR donors were dizziness which represents 70.2% of the undesirable events. This was followed by fainting, 17.0%; weakness, 8.5%; and vomiting, 4.3%.

4. Discussion

Among voluntary non-remunerated blood donors, our study showed a prevalence of 2.1% of undesirable complaints and events. This agrees with a similar study in a western Nigerian tertiary hospital which recorded a prevalence of 2.0% [15]. Another study in a teaching hospital in south-east Nigeria had a prevalence of 1.6% [16]. Their lower prevalence compared to ours can be attributable to their larger study population with donors of over 3,520 and longer study duration, while our studies had 2,229 blood donors in 11 months period. Studies outside Nigeria showed a far much lower prevalence. The prevalence studies in Saudi Arabia was 1.3%. Almutairi, *et al.* [17], and another in Pakistan that studied close to 20,000 donors recorded a prevalence of 1.1% [18]. Again, these much lower values are corroborating with our earlier observation that the higher the number of donors the more the likelihood to observe a lower prevalence of adverse events. Unlike in developed countries, getting a large number of voluntary unpaid donors in Nigeria is still very difficult because only about 5% of donor bloods used in Nigeria come from voluntary donors; family/ replacement and paid donors are still the major sources of donor blood procurement [19-22]. It is high time we changed the paradigm and join the League of Nations where voluntary unpaid blood donation has been universally practised. Apart from other advantages, blood from unpaid donors are more beneficial to the patients than blood from commercial donors because studies have shown that they have higher haematocrit, haemoglobin and red cell concentrations than commercial donors [23].

Our study also showed a mean age of 24 years which is very close to findings from studies done by Burdorf, *et al.* [24] and Sultan, *et al.* [18], with age-specific prevalence of blood donation effects observed among donors of ages 25 and 26 years, respectively. The majority of our donors who had adverse events were within the age range of 18-25 years, this is not unconnected with the fact that majority of blood donors at SBNF are of the younger age groups. Most of the donor drives and campaign rallies of SBNF are targeted at communities of higher learning such as, universities, colleges of education, polytechnics and the orientation camps of National Youth Service Corps (NYSC) in addition to widely and extensive use of social media which has as its audience a large population of youths. This is not the same with another study in Atlanta, USA where the highest percentage of their blood units come from individuals between 40 and 49 years [25]. This can be explained by the demographic changes in most western countries where there is increasing numbers of older people with the population structure shifting from younger to older age groups [26]. This stems from decrease in birth rates, ageing of previous high birth rate cohorts with stabilisation at a current low level [26].

Another revelation from our study is that females make up about 75% of the donors with adverse events. This is contrary to the findings of previous authors [16, 17] where males had more adverse effects than females which is expected since studies have shown that males donate blood more than females [27-29] and are more likely to do so again than their female counterparts [30]. SBNF uses the internet a lot and various social media platforms in campaigning for voluntary unpaid blood donations. Community studies have proven that females use social media more than males; [31, 32] hence this may explain why we have more females as eligible donors and of course the donors with complaints of adverse events.

Assessing the incidence occurrence, our study showed that dizziness was the most common peri-donation adverse events. A similar finding was observed in a study carried out in a nearby city of Asaba, Delta state, Nigeria [33]. Dizziness and weakness, from our study, constitute almost eighty percent of blood donation adverse events. These are mild symptoms arising from vasovagal reactions and have been demonstrated to express a significant association with young age and female gender [17, 34, 35] which are the demographics of the majority of our study population. It is also very likely that many of the donors in our study were first-time donors, who had admitted in a study to fear and anxiety prior to blood donation [35]. Severe donation reactions were rare in this study accounting to less than fifteen percent. This is because we have very few old people among our donor population which goes to show the advantage of young donors than old people; hence, young individuals should be encouraged to engage in regular blood donations. In addition, having a donor pool of young people will still ensure availability of good number of donors in many years to come as they will still comprise the population of donors who would meet the age criteria by WHO donors in many years to come as they will still fall in the age bracket criteria by WHO.

We encountered some challenges during this study. One of the major challenges we encountered during this work was in the area of data collection. Some of the sociodemographic variables were not documented such as tribe, marital status, educational level and number of previous donations. We would have loved to establish the relationship between these variables (especially first-time donors) and peri-donation adverse events.

5. Conclusion

We have shown, for the first time, that the prevalence of peri-donation undesirable events among voluntary non-remunerated blood donors (VNRD) is low at a private blood bank facility in Nigeria similar to the findings in public hospitals and district blood banks. There is likelihood that this prevalence would have been further reduced if larger population of donors were studied. We therefore recommend a more extensive study among a larger number of prospective blood donors in subsequent studies. In addition to other means of campaigning and creating awareness about VNRD, we recommend the use of mass media which has been shown to be another good means of recruiting blood donors [36]. In Nigeria, the mass media are seriously underutilized in this regard. The undesirable adverse events were mainly mild complaints due to vasovagal reactions. Female gender and young age were more associated

with mild donation complaints. There is need to curtail the vasovagal reactions hence we recommend more effective counselling sessions for all the prospective blood donors especially the youths/young donors, the females and first-time donors. In our donor rooms, continuous streaming of educative videos where people donate blood safely will go a long way to allay the fears and anxieties of potential blood donors and also reduce the incidence of vasovagal reactions.

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