

Deferral patterns of voluntary blood donors at the National Blood Transfusion Service, North East zonal centre, Maiduguri

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Summary

Appropriate donor selection is an important step in ensuring safe supply of blood and blood products. In this study deferral patterns of voluntary non-remunerated blood donors were determined at the North-Eastern Zonal Centre of the National Blood Transfusion Service. The study was conducted between April 2007 and April 2009, and it involved the administration of a structured questionnaire. A total of 4032 voluntary blood donors were recruited, seven hundred and thirteen (17.7%) were temporarily deferred. The commonest reasons for deferral were low haemoglobin, self-deferral, high blood pressure, low weight and high risk behaviour. Other reasons are use of certain medications, low blood pressure and failed venopuncture. Gender analysis showed that more females were deferred for low haemoglobin and more males were self-deferred. Following donor recall, 146 of the 173 donors temporarily deferred came back to donate. These consisted of 113 deferral due to low haemoglobin, 30 self-deferred and 3 induced in risky behaviour. Effective education or counseling, the old tradition of giving haematinics and good dietary advice to those with low haemaglobin values, improved the safety and availability of blood and blood products. Donors who are self-deferred and those involved in high risk behaviour should never be persuaded to donate blood. There is also the need for a review of operational guidelines with regards the uniform acceptable cut-off point of 12.5g/dl haemoglobin value for males and females

Keywords: Donor deferral, donor health questionnaire, donor recall.

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Résumé

La sélection appropriée des donneurs de sang est une étape importante pour assurer l'approvisionnement en sang sécurisée et des produits sanguins. Cette étude de la fréquence de volontaire de don de sang rémunérés étaient déterminés dans la zone centrale du Nord-Est du Service National de transfusion sanguine. Cette étude était conduite entre Avril 2007 et Avril 2009, par l'aide d'un questionnaire structure. Au total 4032 donneurs de sang volontaire étaient recrutés, sept cent treize (17.7%) étaient temporairement déferés Les raisons communs pour être déferés incluent le taux hémoglobine faible, pression artérielle élevée, poids bas, et les risqué élevés de comportements. Autres raisons sont l'usage de certain médicaments, hypotension et échec de la venopuncture. L'analyse du genre démontrait que les femmes étaient plus déferées a cause du taux d'hémoglobine faible et la plupart des hommes étaient déferé volontairement. Suivant la revu des donneurs, 146 de 173 donneurs déferés temporairement revenaient pour le don de sang. Ceux-ci consistaient de 113 cas du a l'hémoglobine faible, 30 déferés volontaires et 3 induit pour des comportements a risque. Une éducation effective ou conseille, la veille tradition de donner des hematiniques et un bon régime alimentaire a ceux ayant un taux d'hémoglobine faible, amélioreraient la sécurité et la disponibilité du sang et de ses composantes. Les donneurs qui étaient déferés et ceux ayant des comportements a risqué ne doivent pas être persuadé à faire d don de sang. Il est nécessaire de revoir les guides opérationnelles en vue uniformisé la valeur acceptable du taux d'hémoglobine de 12.5g/dl pour les males and femelles.

Introduction

The safety of blood and blood product is a major concern all over the world. The cornerstone of safe blood is the establishment of a donor programme based on recruitment, selection and retention of voluntary non-remunerated blood donors from low risk population [1, 2]. This fact continues to be

supported by numerous studies related to seroprevalence and risk factors in blood donor populations [3]. There are many ways of preventing transfusion transmitted infections (TTIs) but careful donor selection is one of the most important factors [4]. Using proper recruiting techniques, potential donors are properly pre-screened by use of an appropriate questionnaire to establish that prospective donors adhere to the lifestyles that minimize the risk of blood being in the window period of the various viruses that can be transmitted by blood transfusion. The regulation on the donor eligibility for blood donation and the reasons for permanent or temporal deferral or exclusion differ from country to country. A study from Turkey concluded that the most commonly defined causes for deferral of potential blood donors were recent sexual exposure in high-risk activity, recent ingestion of certain medication, low haemoglobin level, abnormal blood pressure, being underweight, tattoos, piercing or acupuncture, recent history of infection and presenting for a subsequent donation too soon [5]. Similarly, a study from Thailand found that donor self-deferral was valid for reducing the risk of HIV transmission through blood transfusion in Thailand [6]. Published reports on the reasons for temporary deferral of voluntary non-remunerated donors are lacking in this country. In this study, we retrospectively reviewed the donor deferral patterns of voluntary non-remunerated blood donor as seen from April 2007 to April 2009 at the North-East Zonal Centre of the National Blood Transfusion Service.

Materials and method

This is a retrospective study carried out in the North-East Zonal Centre of The National Blood Transfusion Service from April 2007 to April 2009 using a well structured health questionnaire. All the blood donors in this study are voluntary non-remunerated and are either recruited during mobile blood drives or walked-in donors at the centre. Mobile donor recruitment at our centre starts with identification of target groups in Universities, Colleges and faith based organizations as well as civil servants in work places like hospitals and banks, Police recruits in training and people working in private organizations etc. After identification of target groups, we usually obtained permission from the respective authorities concerned through official communication for our donor recruiters to give awareness health talk to potential blood donors. The awareness health talk essentially involves welcoming the potential donors and brief introduction of the National Blood Transfusion Service including our mission and objectives, importance of voluntary blood donation by the general population

and who can give blood and who should not give blood, the purpose of blood in our body, need for preventing transfusion transmissible infections and risk associated with blood collected from paid donors, myths or superstition about blood and blood products, assuring harmlessness of blood, community responsibility for blood donation, information about collection, processing and distribution etc. After the awareness health talk, potential voluntary blood donors have to undergo pre-donation counselling which involves registration and brief interview with a well structured questionnaire to determine if they are appropriate candidates. This is followed by conducting free medical check up, brief physical examination and finally one on one counselling before collecting a unit of blood if found eligible to donate. Those found not eligible to donate blood for temporary reasons were appreciated and given shorter appointments usually within two weeks to come to our centre for possible donation after re-evaluation. However, those on permanently deferral list were appropriately counselled and encouraged to offer voluntary service by recruiting voluntary donors to the centre. The questionnaire basically has general information on the benefits of blood donation and on the risk factors for transmission of infections. In addition, specific questions on medical history and risk behaviour are also highlighted (Appendix i). Prospective donors weighing less than 50kg, donors having Haemoglobin (Hb) value of less than 12.5g/dl for males and females and systolic blood pressure of more than 180mmHg as well as diastolic blood pressure of more than 100mmHg are some of the exclusion criteria used for this study [7]. Haemoglobin estimation in all the donors studied was carried by capillary tube method using HemoCue 301 haemoglobinometer (HemoCue AB, Angelholm Sweden). The HemoCue 301 haemoglobinometer is small portable device, powered by an AC 6 volt adapter or alternatively by four AA batteries. It provides a simple and reliable anaemia screening method by either copper sulphate or the haemoglobin colour scale, it is simple to use, even by persons with no previous experience in laboratory technology [8]. In our centre, donors temporarily deferred on account of low haemoglobin were routinely given dietary advice with haematinic supplements. Donor recall by text, phone call or e-mail as determined by donor's preference was routinely practised in our centre. Sero-prevalence records of temporary deferred donors (on account of high risk behaviours, self-deferral) following donor recall were also analysed. We routinely screened all samples for HBsAg, Anti-HIV I and II, Anti- HCV and Anti- *Treponema pallidum* using Enzyme Immunoassay with a DARLEZ Auto-analyser ELISA Machine

(DARLEZ Nig Ltd). BIO-RAD GENSCREEN ULTRA HIV Ag-Ab, 3, Bd Raymond Poincare'92430 MARNES LA COQUETTE-FRANCE was used for HIV I &II screening, MONOLISA HBsAg ULTRA 3, Bd Raymond Poincare'92430 MARNES LA COQUETTE-FRANCE was used for HBsAg screening and DIA.PRO SYPH Ab & HCV Ab, Diagnostic Bioprobes Sri Via Columella n° 31 20128 Milano-Italy. Statistical Package for Social Sciences (SPSS) software version 15.0 was used for data analyses.

Results

During the study period, a total of 4032 voluntary non-remunerated blood donors were recruited for blood donation. Three thousand nine hundred and seventy three (98.5%) were first time donors while 59 (1.5%) were regular donors. Of these voluntary non-remunerated blood donors, 3374 (83.7%) were recruited as first time mobile drive donors and 481 (11.9%) were first time walked-in donors at the centre (Table 1). Seven hundred and thirteen (17.7%) were temporarily deferred (consisting of 710 first time donors and only 3 regular donors). 42.8% of those deferred were youths in Universities and colleges between the ages of 18-25 years while those between the ages of 26-35 years comprised 31.8%. 58.1% of those deferred were females and 41.9% were males. The commonest reasons for deferral were low haemoglobin (56.8%), self- deferral (22.0%), high blood pressure (6.6%), low weight (6.2%), and high risk behaviour etc (Table 2).The median weight of donors deferred for weighing less than 50kg was 45kg \pm 1.6SD.

Gender analysis of those deferred due to low haemoglobin showed that 119 (29.4%) were males and 286 (70.6%) were females with a median haemoglobin values of 12g/dl \pm 1.1SD and 11g/dl \pm 0.77SD respectively. Similarly, 105 (66.9%) males were self- deferred, 36 (76.6%) males were deferred because of high blood pressure and 14 (63.6%) females were deferred because of high risk behaviour. Following donor recall a total of 146 (20.5%) came back to donate blood, consisting of 113 (28.0%) deferred as a result of low haemoglobin, 30 (19.1%) self- deferral and 3(13.6% due to involvement in high risk behaviour. The screening result for transfusion transmissible infections showed that out of the 30 donors who self- deferred and later came back voluntarily to donate, 6 had positive test result for HBsAg and 1 had positive test result for HIV 1&2.Two of the 3 donors with high risk behaviour had positive test result for HBsAg.

Table 1: Voluntary non-remunerated blood donor types

Donor types	Number	%
first time walked- in donors	481	11.9
second time walked- in donors	98	2.4
first time blood drive donors	3374	83.7
second time blood drive donors	18	.4
third time walked- in donors	28	.7
fourth time walked- in donors	21	.5
fifth time walked- in donors	6	.1
Sixth time walked- in donors	3	.1
Sixth time blood drive donors	1	.0
seventh time walked- in donors	2	.0
Total	4032	100.0

Table 2: Reasons for temporary deferral of voluntary non-remunerated blood donors

Reasons	Number	%
Low Hb	405	(56.8)
Low weight	44	(6.2)
High Blood Pressure	47	(6.6)
Self- deferral	157	(22.0)
Failed venepuncture	8	(1.1)
Low Blood Pressure	10	(1.4)
High risk behaviour	31	(4.4)
On medication	11	(1.5)
Total	713	

Discussion

Registering and interviewing prospective voluntary non-remunerated blood donors through a structured questionnaire is an important first step in ensuring that only safe blood donors are selected to donate blood. Temporary donor deferral rate of 17.7% observed in this study is lower than the 44.4% observed in Turkey [5]. Donor questionnaire comprehension by prospective donors and the question of how honest the blood donors are when they fill in the questionnaires are some of the reasons that may explain the differences [9]. School and/or organization-based donor education on the requirements to donate blood prior to fill in questionnaire may also be responsible for the lower deferral rate observed in this study. The main cause of donor deferral in this study was low haemoglobin value. More females were deferred due to low haemoglobin value compared to male donors. A study from Turkey also concluded that low haemoglobin was the third commonest cause of donor deferral with more females affected [5]. Although the monthly menstrual flow and oestrogen effect on females may explained the low haemoglobin and the reason for

deferral, the cut of value of 12.5g/dl for haemoglobin used in this study for both gender may be another reason for the higher deferral rate due to low haemoglobin. A study from South-west, Nigeria examined 136 males and 94 females and reported normal haemoglobin values as between 12.5g/dl to 18.0g/dl and 11.0g/dl to 16.0g/dl respectively for males and females [10]. Similar study from America reported increasing deferral for failing to achieve minimum haemoglobin criteria for blood donation [11]. There is a need for a review of our operational guidelines with regard the uniform accepted cut-off point of 12.5g/dl haemoglobin value for both males and females. This is important so as to reduce the number of donors that may be deferred due to low haemoglobin. Good dietary advice and effective donor recall brought back 113 of prospective donors deferred due to low haemoglobin to donate blood. Self-deferral was the second commonest reason for donor deferral. More males self-deferred than females. This group of donors should not be compelled to donate blood because the information they had giving on the health questionnaire may not be an honest answer. Following a donor recall, 30 out of the 157 who self-deferred came back and donated blood. Of the 30 that came back voluntarily and donated, 1 was tested positive for HIV 1 and 2 and 6 were tested positive for HBsAg. Similarly, 31 of the donors were deferred due to high risk behavior. Following donor recall and further counselling, only 3 out of the 31 who self-deferred due to high risk behaviour came back and donated blood voluntarily and 2 were tested positive for HBsAg. This finding just like the Thailand study [6] may suggest that donor self-deferral and donor exclusion due to involvement in high risk behaviour can reduce the risk of transfusion transmissible infections. Incidental high blood pressure on medical check up was the third commonest reason for donor deferral and accounted for 6.6% of the cases. These prospective donors are not aware of having high blood pressure. Information like this can be used during donor education to build donors confidence in the system and also support the fact that donors safety is also of paramount importance in voluntary blood donation. Low weight (less than 50kg) was the fourth commonest reason for donor deferral and accounted for 6.2% of the cases. Although the current operational guidelines [8] states that persons less than 50kg body weight may donate half the volume of the standard unit (220-275ml), the non-availability of the paediatric blood bags at the centre could not allow for the flexibility. The old practice of calculating the amount of blood

to be withdrawn using the adult blood bag by expressing the excess anticoagulants needs to be validated. Low BP, Current medication and failed bleed were the least reasons for donor deferral. The low deferral due to failed bleed (failed venepuncture) may reflect the importance of having well trained Phlebotomist. Donor's first experience during the process of blood collection can determine whether they are likely to return for subsequent donation.

In conclusion this study has shown that a well administered and comprehended structured questionnaire is an important first step in ensuring that only safe blood donors are selected to donate blood. Effective donor recall couple with the old tradition of giving haematinics and good dietary advice to those with low haemoglobin value can improve the safety and availability of blood and blood products. Donors who self-deferred and those involved in high risk behaviour should never be persuaded to donate blood. There is also the need for a review of our operational guidelines with regard the uniform accepted cut-off point of 12.5g/dl haemoglobin value for both males and females.

Acknowledgements

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APPENDIX I
NATIONAL BLOOD TRANSFUSION SERVICE

NORTH EAST ZONAL CENTRE, MAIDUGURI

Donors please complete this section

Donor Registration Form

Surname:.....
 Previous Surname:.....
 First Name: Initials
 Other Names: Date of Birth.....
 Donor National ID #Age (in Years)
 Male ___ Female ___ Marital Status: Single ___ Married ___ Divorced: ___
 Home Address:
 Telephone Home:Work.....Cell/GSM.....
 Email:
 Tribe/Ethnic Group:.....Language.....
 State of Origin:NationalityCountry of Birth
 Occupation:..... Employers.....
 Work Address
 How Did You Learn About Blood Donation? NBTS\Relatives\TV/
 Radio\Newspaper\Poster\Friends\Blood Donors\Teacher\School\Awareness Health Talk Meeting
 How would you like to be reminded for blood donations? Letter\Phone\Cell or GSM\E-Mail
 Have you donated blood before? Yes \ No
 Have you ever been refused as a blood donor or told not to donate blood? Yes \ No
 Have you ever Donated at Another Service Yes \ No
 If Yes Where (Place of Donation) _____ Date _____ \ _____ \ _____
 No of Previous Donations _____

For office use To be completed by a staff member
 Donor Group\Clinic: Date:..... Donor Accepted? Yes\No
 Donor Number: Collection Start Time.....Collection End Time:.....
 Volume Donated:Haemoglobin:.....
 Phlebotomist:Assistant..... Donor Weight:.....
 Signature..... Signature BP in mm Hg:.....
 UNIT NUMBER (Barcode
Pulse.....
Bag Type:.....
No of Donations:.....
No record available _____ **Transfer** _____ **Visitor** _____ : **From**.....
Remarks donor status

Health Questionnaire

1. Are You Well and Healthy?
2. Had meal or snack in last 4 hours?
3. Have you suffered from night sweats/weight loss/persistent fever/diarrhoea in last 12 months?
4. Are you in a hazardous occupation (driving heavy duty vehicle, flying aeroplane, etc)?
5. Have you ever had rabies shots?
6. Have you taken aspirin or any pain reliever in last 3 days?
7. Have you taken any medication in last 3 days?
8. Have you had a major dental procedure in last 3 days?
9. Have you been vomiting or have diarrhoea in last 4 weeks?
10. Do you have high or low blood pressure?
11. Have you ever had rheumatic fever, Chest pains or heart disease?
12. Have you ever had lung disease, tuberculosis or asthma?
13. Have you ever had cancer or any blood disease, Bleeding disorder or duodenal ulcer?
14. Have you ever had diabetes, kidney disease or epilepsy?
15. Have you ever had yellow jaundice, hepatitis? Or liver disease (excluding jaundice at birth)?
16. Have you been in close contact with person with hepatitis in last 12 months?
17. Have you ever had pituitary growth hormone or fertility hormone injections, or seen a neurosurgeon or neurologist?
18. Have you ever had tissue or organ transplant e.g Cornea, duramater, kidney, liver, bone marrow?
19. Have you been tattooed, ear piercing or Acupuncture etc in last 12 months?
20. Have you or sex partner received blood Transfusion in last 12 months?
21. Do you or a relative have unexplained brain Condition?
22. Have you had an attack of malaria in last 2 weeks?
23. What malaria treatment did you receive?

FEMALE DONORS ONLY

- ** If you are menstruating it is advisable not to donate on the first or second day.
24. Have you had a baby or a miscarriage in past 6 months?
 25. Are you currently breast feeding or pregnant?

Yes No The lives of patients who receive your blood are totally dependent On your complete honesty and frankness in answering the following The following questions:

Risk Behaviour and HIV/AIDS

- | Yes | No |
|--|-----------|
| 1. Have you had casual sex\more than one partner\sex? with person of unknown background in the last 6 months? | |
| 2. Have you had male-to-male sex in past 5 years? | |
| 3. Have you had sex with prostitute\exchange money or Drugs for sex in last 5 years? | |
| 4. Have you had any sexually transmitted disease in last 5 years? | |
| 5. Do you have AIDS or are HIV? | |
| 6. Have you had accidental exposure to blood or body Fluids in last 12 months? | |
| 7. Have you ever injected yourself or been injected any drugs, substance including steroid, not prescribed by a doctor? | |
| 8. Have your partner ever injected himself/herself or Been injected any drugs, substance including steroids, not prescribed by a doctor? | |
| 9. Have you come to donate just to be tested for HIV/AIDS? | |

Declaration

I have read and understand the information in the pamphlet "Are you Giving Blood for the Right Reason?" I do not consider myself to be a person at risk of spreading HIV/AIDS. I consent to my blood Being testes for transmissible disease including HIV? AIDS. Should any of the test be positive I understand that I will be inform of an initial reactive result by letter to the address provided. I confirm that I have answered al the questions truthfully and I am donating Blood on the understanding that it will be transfused to a patient. I accept that my blood will be used at the discretion of the service, For transfusion, for the preparation of reagents or for scientific research, the main objective of which is to increase safety of the Blood supply to patient. I understand that my willful misrepresentation of the facts could endanger the patient, and Others, and lead to legal proceedings.

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