Original Article

Indian Journal of Pathology: Research and Practice
Volume 6 Number 2, April - June 2017 (Part 1)
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.6217.12

Evaluation of Blood Donor Deferral Pattern in a Tertiary Care Teaching Hospital in North Karnataka

Katti Trupti Vyasrao[*], Manjula Adinarayan[**]

[*]Associate Professor, Dept of Pathology, Navodaya Medical College, Hospital & Research Centre, Raichur, Karnataka, India.
[**]Associate Professor, Dept of Pathology, The Oxford Medical College Hospital & Research Centre, Bengaluru, Karnataka, India.

Abstract

Background: The safety of blood and blood products is improved by stringent donor selection. Donor deferral, either temporarily or permanently is an important documentation towards safe blood transfusion. Thus it should be evaluated on regular basis. *Aims:* To analyze the donor deferral rate, to document the causes and their frequency distribution with respect to gender. *Settings and Design:* This was a prospective study conducted on potential donors registering in Blood bank, Navodaya Medical College, Hospital and Research Centre, Raichur, Karnataka. Detailed history taking, physical examination and screening tests on the blood units collected were performed. *Methods and Material:* This study was conducted over 2 years (Jan 2014 to Dec 2015). Donor request form was given and those who did not fulfill the donor selection criteria were deferred and analyzed. Results: A total of 6834 donors were registered for blood donation, of which 909 cases (13.3%) were deferred. Deferral rate was 89.2% among males and 10.8% among females. Majority were temporarily deferred- 704 cases (77.4%); most frequently due to low hemoglobin value (17.7%) followed by fever (14.3%). Permanent deferral category included 205 cases (22.6%); mainly due to Hepatitis B virus (HBV) seropositivity (44.9%) followed by hypertension (20.9%). Female donors were deferred more frequently (47%) than males (8.2%); commonest reason being low hemoglobin and fever in both. *Conclusion:* Donor deferral is beneficial for donors and recipients as it minimizes potential health problems within the community. Hence regular evaluation guides transfusion committee in modifying planning strategies to preserve donor pool.

Keywords: Blood Donor; Donor Deferral; Permanent; Temporary.

Introduction

Transfusion of blood saves millions of lives. However safe and adequate supply of blood and blood products is a major public health issue faced across the world. According to Department of AIDS Control Ministry of Health and Family Welfare Government of India, the annual rate of blood donation in India is about 9 million units against the requirement of 12 million units [1].

The need is not only for blood but also for "safe blood". For this, donor selection is necessary in addition to the screenings of blood bags for Transfusion Transmissible Infections (TTIs). Donor deferrals lead to loss of precious blood and blood components available for transfusion. In order to prevent this, there is need to know the causes of deferral and their frequency [2].

A large number of blood donors are not able to donate blood for several reasons either temporarily or permanently. The deferred blood donors are less likely to return in future for any blood donation. Hence the knowledge of rate and causes of donor deferral can guide the recruitment strategy [3].

The objectives of this study are to analyze the donor deferral rate, to document the causes of deferrals and frequency distribution of these causes with respect to gender.

Corresponding Author: Trupti Vyasrao Katti, Associate Professor, Department of Pathology, Navodaya Medical College, Mantralaym Road, Raichur, Karnataka- 584103, India.
E-mail: drtrupti1305@gmail.com

(Received on 13.01.2017, **Accepted on** 23.01.2017)

Methods

This prospective study comprised of all the donors who are registered for blood donation at Blood bank, Navodaya Medical College, Hospital and Research Centre, Raichur from Jan 2014 to Dec 2015. They were grouped into voluntary/ unrelated and directed/related donors. A donor questionnaire was provided to each and every donor and the data entered by them was analyzed with respect to medical history, physical examination, body weight, age, pulse rate, blood pressure, hemoglobin estimation and temperature. The potential donors who didn't fulfill the standard criteria for donor selection as per WHO and NACO guidelines were deferred and the details were recorded in the deferral register.

Hemoglobin value was determined by Semi automated hematology analyser Pentra ES 60. Blood samples of the donors (human serum/plasma) were screened for transfusion transmitted infections (TTIs) using following methods:

1. HIV- ELISA method- 4th generation Microlisa HIV Ag and Ab for detection of HIV-1 p 24 Antigen and antibody to HIV-1 including Group O and subtype C and HIV-2. (J.Mitra & Co. Pvt Ltd., New Delhi)
2. HBsAg- Hepalisa - Microwell test for HBsAg (J.Mitra & Co. Pvt Ltd., New Delhi)
3. Anti HCV-3rd generation HCV Microlisa- Microwell ELISA test for detection of antibodies to HCV i.e. HCV Antigens for core NS3, NS4 and NS5. (J.Mitra & Co. Pvt Ltd., New Delhi)
4. Syphilis-Strip test VDRL Syphilis Rapid Test (ASPEN) R - A rapid screen test for qualitative detection of Syphilis- One Step Immunoassay rapid test for in vitro diagnosis.
5. Malaria- Card test. SD (Bioline) Malaria P.f/P.v- one step rapid immunochromographic test for simultaneous detection of malaria P.f/P.v (Plasmodium falciparum and plasmodium vivax) antibodies- SD Biostandard Diagnostics Pvt Ltd, Gurgaon, India.

Deferred donors were categorized with respect to age, gender and reason for deferral. Data collected was tabulated and analyzed by using Microsoft Excel. Descriptive statistics were summarized as percentages of the group total and comparisons between groups were analyzed using chi-square test wherever appropriate. p-value of 0.05 is used for tests as a threshold for significance.

Results

A total of 6834 donors were registered for whole blood donation, of which males were 6445 (94.3%) and females were 389 (5.7%) in number, while voluntary donors were 4175 (61.1%) and related were 2659 (38.9%) respectively. We observed that 909 donors (13.3%) were deferred. Out of these, males were 811(89.2%) and females were 98 (10.8 %), leading to male to female (M:F) ratio as 8.2:1 [Figure 1].The deferral rate was 47% in females and 8.2% in males. Among males, maximum deferrals were in the age group of 18-30 yrs, while female donor deferrals were mainly in 31-40 yrs of age group [Figure 2].

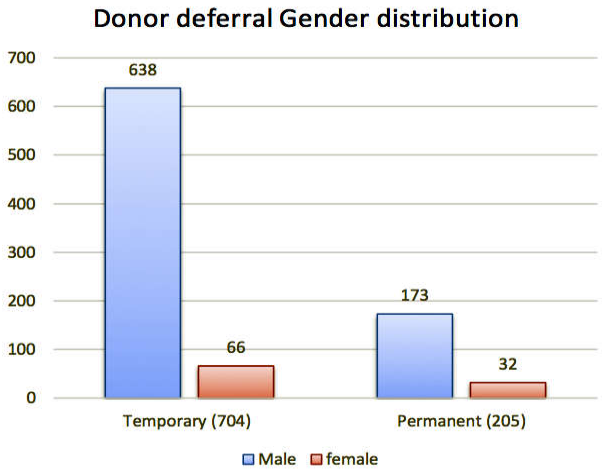

Fig. 1: Demographic prolife of donor deferrals.

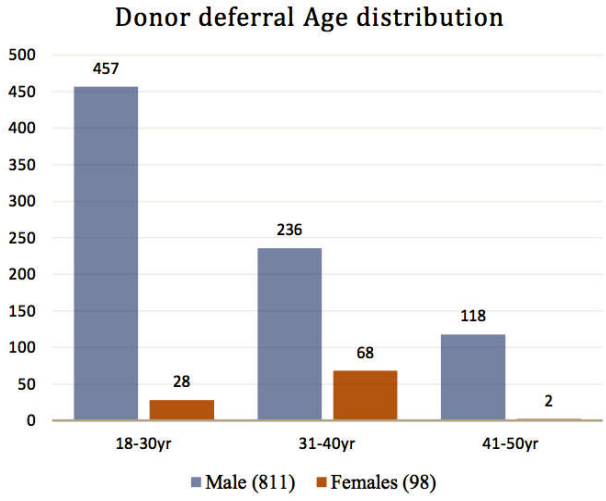

Fig. 2: Donor deferral age distribution

Majority of donors were in temporary deferral category - 704 donors (77.4%) whereas permanent deferrals were in smaller proportion - 205 donors (22.6%). Among various causes for temporary deferral, 125 donors (17.7%) had low hemoglobin value,

followed by 111 donors (14.3%) presenting with fever [Table 1]. The permanent deferral category showed seropositivity for HBV which was documented in 92 donors (44.9%) as the commonest cause followed by hypertension in 43 donors (20.9%) [Table 2].

Causes for temporary deferral in males included low hemoglobin value in 106 donors (16.6%), followed by fever in 101 donors (15.8%) [Table 1]. Similarly, in females, low hemoglobin value was observed in 19 donors (28.7%), followed by fever in 10 donors (15.1%). With respect to permanent deferral, most common cause in both genders was seropositivity for HBV i.e.74 (42.7%) in males and 18 (56.2%) in females, followed by hypertension i.e. 40 (23.1%) in males and HIV i.e. 7 (21.8%) in females as second common cause [Table 2].

Table 1: Frequency distribution of causes for temporary donor deferrals

Causes for temporary deferrals	Male	Female	Total
Low hemoglobin	106	19	125
Underweight	74	7	81
Low BP	32	5	37
Alcoholic	73	0	73
Fever	101	10	111
Medication	52	3	55
Under age	38	2	40
Recent donation	71	5	76
Menstruation	0	5	5
Tattoo	26	0	26
Anxious	19	2	21
Dog bite	15	2	17
Malaria	21	3	24
Typhoid	5	2	7
Repeated diarrhea	5	1	6
Total	638	66	704

Table 2: Frequency distribution of causes for Permanent donor deferrals

Causes for permanent deferrals	Male	Female	Total
Hypertension	40	3	43
HBV	74	18	92
HCV	19	2	21
HIV	35	7	42
Asthma	4	2	6
High Hemoglobin	1	0	1
Total	173	32	205

Discussion

The availability of safe donor is the first step towards Safe Transfusion Services. This is achieved by following donor selection criteria. Insight into the reasons of donor deferral is very important to prevent the permanent loss of the donors.

The donor deferral rate in the present study was 13.3%. This was consistent with that reported in similar studies conducted by Custer et al (13.6%) [4] in the United States and Arslan (14.6%)[5] in Turkish donors. In contrast, Rabeya et al reported lower deferral rate of 5.6% [6]. Difference in the donor deferral rate of various studies may be attributed to the adoption of different donor selection criteria.

Present study documented most of the deferred donors in the age group of 18–30 years (53.3%). This was similar to other studies by Gajjar et al [7] and Rehman et al [8], thus emphasizes the fact that a sizeable proportion of the young population is unfit for donation, thereby markedly reducing availability of blood. Interventions like nutritional advice, iron supplementation and motivation of donors to seek medical attention for the treatment of anemia, will improve the eligibility of donors in future.

Most of the donors were males (94.3%), while females accounted for only 5.7%. Present study showed that the female donors (40.7%) were deferred more frequently than male donors (8.2%), which was similar to the observations made by Rehman et al [8] and Rabeya et al [6]. The reason could be due to the fact that this group of the population is more prone to decreased iron stores, thereby low hemoglobin levels due to poor socio economic status, multiple pregnancies and lack of education.

In our study, 77.4% of the donors were deferred for

temporary reasons. This was similar to that reported by Arsan et al 90% [5] and Rehman et al 63.73% [8] in their respective studies.

Low hemoglobin value (17.7%) was the commonest cause in both genders. This was in accordance to the similar study done by Rehman et al where it constituted 17.9% of the temporary deferral [8]. Whereas Arslan et al [5] and Halperin et al [9] documented similar observations with 20.7% and 46% respectively. Anemia can be cured by treatment of the donors with follow up.

Fever accounted for second most common cause of temporary deferral which might be due to the fact that surroundings from where most of the donors were received in this study were endemic zones for mosquito borne diseases. The incidence of fever can be decreased by organizing educational programmes regarding the control of mosquito breeding in the areas by health authority.

The other causes for temporary deferral included underweight, alcohol intake, low blood pressure, recent donation of blood, history of medication, under age, tattooing, anxiety, dog bite, malaria, typhoid and repeated diarrhea. There is need for follow up of temporary deferral donors through computerized donor registry so that these donors can be recruited back in donor's pool [10].

Permanent donor deferral in the present study was 22%. Rehman et al [8] in a similar study showed slightly higher percentage of 36%; whereas Custer et al [4] documented much lower permanent deferral rate of 10.6%. Present study showed HBV (44.8%) seropositivity as the most common cause of permanent deferral. Similar result was shown in the study by Rehman et al 64.7% [8]. In contrast, Bahadur et al documented hypertension (29.4%) as the commonest cause [2].

Among female donors, positive serology for HBV was the commonest cause of permanent deferral followed by HIV. This was similar to other studies. In males, HBV infections followed by hypertension were two most common causes for permanent deferral. Whereas other similar studies documented hypertension as the commonest cause among permanently deferred male donors [2].

This observation is of great concern as Hepatitis B infection is increasing more among the local population and public awareness programs relating to routes of transmission for these infections should be undertaken. Further this infection can be controlled by vaccination which should be encouraged.

Documentation of donor deferral is beneficial for both donors and recipients as it minimizes the risk of potential health risks within the community. Thus, the evaluation of deferral rates regularly is a necessity in order to retain blood donors and to ensure availability of safe blood.

Abbreviations

HBV - Hepatitis B virus,

HCV - Hepatitis C virus

HIV -Human immunodeficiency virus.

References

1. Department of AIDS Control Ministry of Health and Family Welfare Government of India Annual report 2013-2014; 43.
2. Bahadur S, Goel RK, Pahuja S, Jain M. Analysis of blood donor deferral characteristics in Delhi, India. Trop Med Public Health. 2009; 40(5):1087-91.
3. Lim JC, Tien SL, Ong YW. Main causes of pre-donation deferral of prospective blood donors in Singapore, Blood transfusion services. Ann Acad Med Singapore. 2010; 22(3):326-331.
4. Custer B, Johnson ES, Sullivan SD, Hazlet TK, Ramsey SD, Hirschler NV, et.al. Quantifying losses to the donated blood supply due to donor deferral. Transfusion. 2004; 44:1417–26.
5. Arslan O. Whole blood donor deferral rate and characteristics of the Turkish population. Transfus Med. 2007; 17:379–83.
6. Rabeya Y, Rapaiaah M, Rosline H, Ahmed SA, Zaidah WA, Roshan TM. Blood pre-donation deferrals – A teaching hospital experience. Southeast Asian J Trop Med Public Health. 2008; 39:571-4.
7. Gajjar H, Shah FR, Shah NR, Shah CK. Whole blood donor deferral analysis at General hospital blood bank – A retrospective study. NHL Journal of Medical Sciences. 2014; 3:72-6.
8. Rehman S, Arif SH, Mehdi G, Mirza S, Saeed N, Yusuf F. The Evaluation of Blood Donor Deferral Causes: A Tertiary Care Centre- based Study. J Blood Disorders Transf. 2012; 3:131-3.
9. Haiperin D, Baetens J, Newman B. The effect of short-term, temporary deferral on future blood donation. Transfusion. 1998; 38:181-3.
10. Pruthvi D, Shankar S, Shashikala P. The need for computerized inter blood bank, blood donor deferral registry-An Evaluation. International Journal of Current Research. 2012; 4:54-6.