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THE EVALUATION OF BLOOD DONOR DEFERRAL PATTERN : RETROSPECTIVE STUDY AT TERTIARY HEALTH CARE HOSPITAL IN RANCHI JHARKHAND INDIA.

Pathology

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ABSTRACT

Blood donors are deferred from donating blood for several reasons, either permanently or temporarily. Blood safety is a major issue all over the world in transfusion medicine. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. Deferrals lead to loss of precious blood/ components available for transfusion. For preventing this, we should be having knowledge of causes of deferral and their frequency. In this study, causes of donor deferral were evaluated retrospectively in the blood bank, and donation that occurred in blood camps organized by Rajendra Institute Of Medical Sciences(RIMS) Ranchi (India) in association with NACO from 1st January 2016 to 31st December 2017. Analysis of the deferrals showed that temporary deferral was more common than permanent deferral. Most common cause in permanent deferral was HBsAg positivity. Causes among temporary deferral were anemia (Hb<12.5 gm%), malaria in last 3 months, jaundice, alcohol intake in last 3days, weight <45 kg, age <18 yrs, patients on antibiotic, previous donation in last 3 month, typhoid in last 1 year, dog bite etc.

KEYWORDS

Introduction

The paucity of healthy, safe blood donors has always been a serious problem for blood banks worldwide. In current medical and surgical practice, a blood transfusion can be a vital, life-saving procedure. But it requires an adequate supply of safe blood from a healthy donor. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. However deferrals lead to loss of precious blood/components available for transfusion. For preventing this we should be having knowledge of causes of deferral and their frequency. According to World Health Organization (WHO) figures, over 112.5 million units of blood are collected annually worldwide. Of these, 100.6 million were whole blood donations and 11.9 million were apheresis donations[1].The National AIDS Control Organization's (NACO) statistics show that the annual rate of blood donation in India is about 10.9 million units, against the requirement of 12.8 million units [2]. Deferrals are divided into permanent and temporary. Few studies done in India in the past have provided different common reasons for deferral of whole blood donors, highlighting differing demographic profile in different parts of the country [3,4]. A blood bank plays an important role in ensuring the supply of safe blood as and when required. While it is important to ensure that there is an adequate supply of blood, it is also essential that the blood collection process does not harm either the donor or the recipient. This is achieved by having donor deferral criteria[5] and stringent screening of collected blood for possible Transfusion Transmissible Infections (TTIs)[6]. The aim of our study is to know the profile of the blood donors and causes of the permanent and temporary deferral and their frequency. This retrospective study was conducted in the blood bank of RIMS, RANCHI (India) from January 2016 to December 2017.

Materials and Methods

This retrospective study included all the donors reporting for blood donation in the blood bank ,and donation that occurred in blood camps organized by Rajendra Institute Of Medical Sciences Ranchi (India) in association with NACO from 1st January 2016 to 31st December 2017. The donors were evaluated on the basis of physical examination, clinical history , blood pressure Hb estimation , and temperature. NACO guidelines were used for deferral of blood donors. Data was collected from the records maintained by the blood bank. Hemoglobin was screened by standardized CuSO4 test (specific gravity 1.053). Blood samples of these donors were screened for HIVI and II Ag/Ab (4th generation kit- Abott diagnostic), HBsAg and anti HCV by 3rd generation kit- Abott diagnostic by using chemiluminescence technique (Manufacturer- Abbott, Model-Architect i 1000SR) Malaria by SD Malaria Ag Pf/Pan and syphilis by CARBOGEN, RPR card test.

Result

Out of 60950 people who had come for blood donation, 54,855 were males (90%) and 6095 were females (10%) (Table 1). 6050 donors (9.92%) deferred out of which 4420 (73.05%) were temporary and 1630 (26.95%) were permanent (Table 2). Overall males (4570; 7.49%) were deferred more than the females (1480; 2.42%) but females (1480; 24.28%) were found to have higher deferral rate among the female donors than males (4570; 8.33%) (Table 3). Analysis of the deferrals showed that the temporary deferral was more common than permanent deferral

	No. of registrations	No. of deferrals	% deferrals of total registration
male	54855	4570	7.49%
female	6095	1480	2.43%
total	60950	6050	9.92%

Table 1: Demographic profile of the donors.

	No. of deferrals	% total deferals	% deferrals of total registration
Temporary deferrals	4420	73.05%	7.25%
Permanent deferrals	1630	26.95%	2.67%
Total no of deferrals	6050	100%	9.92%

Table 2: Frequency of permanent and temporary deferrals.

	No. of donations	No. of deferrals	% of deferrals among male/female donors
male	50285	4570	9.09%
female	4615	1480	32.06%

Table 3: Frequency of deferrals among male and female donors.

Most common cause among temporary deferral was anemia (Hb <12.5%), followed by weight <45 kg (Table 4). Most common cause in

permanent deferral was HBsAg positivity followed by age >60 yrs (Table 5).

Causes	Number	%Temporary deferrals	% Total deferrals
Anemia, Hb <12.5%	1402	31.71%	23.17%
Malaria in last 3 month	570	12.89%	9.42%
Weight < 45kg	410	9.27%	6.77%
Alcohol in last 72 hrs	380	8.59%	6.28%
Jaundice last 1 year	305	6.9%	5.04%
On antibiotic/ aspirin for last 3 days	270	6.10%	4.46%
Upper respiratory tract infection	194	4.38%	3.20%
Age < 18 years	143	3.23%	2.36%
Hypertension	140	3.16%	2.31%
Typhoid in last 1 year	125	2.82%	2.06%
Diabetes on insulin	114	2.57%	1.88%
Syphilis for 1 month	106	2.39%	1.75%
Dental extraction/surgery in last 6 month	65	1.47%	1.07%
H/O Tuberculosis with no ATT intake/ incomplete treatment.	56	1,26%	0.92%
Age < 18 years	44	0.99%	0.72%
Tattoo /ear piercing in last 1 year	36	0.81%	0.59%
pregnant/lactating female	28	0.63%	0.46%
Dog or cat bite/rabies	12	0.27%	0.19%
Poor vein	10	0.22%	0.16%
Stroke	5	0.11%	0.08%
Previous donation in last 3 months	5	0.11%	0.08%
	4420	100	73.05%

Table 4: Causes of temporary deferrals with their relative proportions

Causes	Number	% Permanent deferrals	% Total deferrals
HBV positive	512	31.41%	8.46%
Age >60 years	346	21.22%	5.71%
Chronic obstructive lung disease and asthma	312	19.14%	5.15%
Heart disease	162	9.93%	2.67%
HCV positive	138	8.46%	2.28%
HIV-1,2 positive	88	5.39%	1.45%
Epilepsy	36	2.20%	0.59%
leukemia/lymphoma/multiple myeloma	28	1.71%	0.46%
patient who received chemotherapy	08	0.49%	0.13%
	1630	100%	26.95%

Table 5: Causes of permanent deferrals with their relative proportions.

Discussion

Donor selection has vital importance in blood banking and transfusion medicine. In this study, we analyzed donor deferral patterns in an attempt to provide insight into the reasons for donor deferral in a country where blood donors are usually just relatives of patients admitted to the hospital. Blood donor suitability criteria based on science, informed medical opinion, and regulatory rules influence donor demographics and lead to specific deferral patterns[7]

Most of the donors were males (90%); women accounted for only 10% of the donors. Present study showed that female donors (32.06%) were deferred more frequently than male donors (9.09%) which might be due to wide prevalence of anemia in female donors.

Donor deferral (9.92%) in the study was very much similar to various American, European and Asian studies. Zou et al.[4] reported a deferral rate of 12.8% in their 6 years study of American Red Cross blood service and Custer et al.[8] showed a deferral rate of 13.6%. In a European study conducted by Lawson-Ayayi and Salmi[9], 10.8% of donors were deferred. Lim et al.[10] reported a deferral rate of 14.4% in Singapore (Asia) . Arslan[11] reported a donor deferral rate of 14.6% in Turkish donors and Bahadur et al[4] reported 9% in Delhi (India).

Rabeya et al.[12] found a very low deferral rate in their study (5.6%) Alok et al (2.5%), Talonu T et al (4%) and Kulkarni (4.27%)[13,14,15]. which could be due to different donor selection criteria.

In our study the most common cause among temporary deferral was anemia (31.71%) as compared to Halperin et al.[16] which showed low hemoglobin as the most common cause in 46% of the temporary deferral. The study done by Arslan[9] in Turkish donors showed low hemoglobin as the most common cause of deferral in 20.7% of overall deferral. Malaria accounted for second most common cause of temporary deferral which might be due to the fact that Ranchi city and its surroundings from where most of the donors received were in endemic zone. This finding is not reported in any of the previous studies, due to the fact that most of the studies were conducted in non endemic zones of malaria. The incidence of malaria can be decreased if the breeding of mosquito is controlled by organizing educational programs regarding the control of mosquito breeding as well as by upgrading the malaria control programs in these endemic zones by the government. Anemia can be cured if proper treatment of these donors is undertaken with follow up. The other causes of temporary deferral included low body weight, alcohol in last 72 hrs, antibiotic/ aspirin for last 3 day, upper respiratory infection, syphilis, jaundice and others which are easily curable. A proper track for follow up of temporarily deferred donors regarding their management should be made in the blood bank so that these donors can be recruited back in donors' pool.

In our study 26.95% of donors were deferred for permanent reasons. Our findings (26.95%) were much higher than Custer et al [8] who reported a permanent deferral rate of 10.6% and Arslan[11] who reported a rate of 10%. This high frequency was due to the inclusion of transfusion transmissible infection in our study especially Hepatitis B infection (HBV) which was not studied thoroughly in the above mentioned publications. Present study showed HBsAg positive as the most common cause of permanent deferral as compared to Bahadur et al.[6] who showed Hypertension as the most common cause. The method used for Hepatitis B testing as mentioned in material and method detect HBsAg positivity, indicates that either the donor had a subclinical disease/acute or chronic viral infection/false positive cases. So for the benefit of the patients these donors were deferred permanently. This is very important finding which should be of great concern as Hepatitis B infection is increasing more among the local population and knowledge of routes of transmission of TTI can decrease the sero-prevalence of Hepatitis B infection, further this infection can be controlled by vaccination which should be encouraged. Public awareness programs relating to routes of transmission for these infections should be encouraged

Conclusion

Donor deferral leads to loss of many people from the donation pool to ensure the safety of blood for recipients. The present study showed that although donor deferral rates were very much similar in different populations, the reasons for deferral differ, reflecting difference in socioeconomic status and environment. However, some studies showed different deferral rate which could be due to different donor selection criteria. Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening especially of those who are having higher frequency e.g., Anemia, Malaria and Hepatitis B infection. Temporary deferred donors require proper follow up and management so as not to lead to a diminished supply of future donors. Government establishment need proper attention to control malaria. For this prevention of mosquito from breeding is needed. Hepatitis B infection can be prevented by educating people regarding the importance of Hepatitis B vaccination and routes of transmission. Finally, the approach to improve safety of blood and blood products and to decrease loss of precious blood/ component must include four steps: (1) detail history based on NACO/ WHO guidelines, (2) physical examination, (3) laboratory tests including ELISA for anti HIV, anti HCV and HBsAg and other test for malaria and syphilis and (4) public awareness programs. So to conclude, it is important to determine the rate and causes of blood donor deferral for the safety of blood/component transfusion and also to guide the recruitment efforts to prevent loss of precious blood/components at local, national and international levels.

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