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Donor Reactions- A One Year Study At RIMS Hospital

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Abstract
Background: *Adverse reactions during blood donation have a negative impact on donor retention which subsequently results in decrease voluntary blood donation and availability of adequate blood supply.*
Objective: To analyse the types of adverse reactions in blood donors in a tertiary hospital.
Subjects and methods: *This study was a prospective one, conducted on whole blood donors who presented to our department over a period of one year. Donors were observed for the occurrence of any adverse reactions such as vasovagal reactions, injury and weakness, etc.*
Results: *12376 donors were enrolled of which 7021 were first time donors with respect to 5355 numbers of repeated donors. Donor reactions were observed in 113(0.91%) donors, out of which 25 were females and 88 were males. Male RBD (66=0.79%) donor recorded more reactions while female VBD recorded more reaction (17 =2.64%) than female RBD (8 =1.55%). The only donor reactions recorded in our study was vasovagal reaction and maximum number of donors had mild vasovagal reactions without loss of consciousness and injury in both the sex.*
Conclusion: *Vasovagal reactions are the only reactions in our study. Since these reactions have a negative impact on donor reaction, we need to highlight the various preventive measures.*
Key words: *Donor reaction, donor retention, vasovagal reaction.*

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I. Introduction

Donor vigilance includes all activities that contribute to improving the health outcomes for blood donors as well as safety and effectiveness of blood donation for purposes of medical treatment of patients.
A national blood donor vigilance programme(NBDVP) was launched on June 14, 2015 on the world blood donor day at Science City, Kolkata, West Bengal, India. NBDVP was launched with the following objectives: -[1] 1). Improve donor safety and satisfaction through monitoring, analyzing and researching adverse events. 2) Analyse risk factors, implement and evaluate preventive measures. 3) Provide evidence based support for blood donation process improvement. 4) Reduce the frequency of adverse events. 5) Increase donation frequency.
Under this programme, adverse blood donor reactions are broadly classified as [2]
A1) Complications mainly characterized by the occurrence of blood outside the vessels 1) haematoma 2) arterial puncture 3) delayed bleeding/re-bleeding.
A2) Complications mainly characterized by pain 1) nerve injury /irritation 2) other painful arm
A3) Localised infection/inflammation along the course of a vein.1) thrombophlebitis 2) cellulitis
A4) Other major blood vessel injury needing specialist medical diagnosis and attention.1) deep vein thrombosis.2) arteriovenous fistula .3) compartment syndrome.
B) Complications mainly with generalized symptoms : vasovagal reactions.
C) Complications related to apheresis
D) Allergic reactions.
E) Other serious complications related to blood donation.
F) Other reactions.

A one page adverse donor reaction reporting form (ADRRF) has been devised to capture information about adverse reactions related to blood donation. The information collected in ADRRF is forwarded to the coordinating centre i.e. the National Institute of Biological (NIB) through a software developed in house by NIB information technology division. This study was undertaken to ascertain the type and trend of donor reactions occurring in our hospital and no such study have been reported from this part of country.

II. Materials And Method

This study was a prospective one conducted on whole blood donors who presented to our department, a tertiary care centre, over a period of one year (from February 2017 to January 2018). For the selection of eligible blood donors, the criteria used were the ones laid by Drugs and Cosmetics Act, Ministry of Health and Family Welfare, Government of India. Blood collection was done in the phlebotomy room by trained personals. Each donor was observed before, during and after donation for the occurrence of any adverse reactions such as vasovagal reactions, hematoma at the venesection site or injury and weakness, etc. Ethical approval for the study was also taken from the Institutional Ethics board.

III. Results

The study was conducted during a period of one year. Total numbers of donors recruited were 12376 of which 7021 were first time donors with respect to 5355 numbers of repeated donors; and 11,000 donors reported to the blood bank while 1376 donors donated at the outdoor camp. Replacement blood donors (RBD) outnumbered the Voluntury blood donors (VBD) which is shown in table 1. There were more male donors (11218) as against 1158 female donors.

Table 1 showing the demographic distributions of donors

	Male	*Female*	*Total*
1. No of donors	11218(90.6%)	1158(9.4%)	12376
2. Type of donors			
a)VBD	3214(25.96%)	643(5.1%)	3857(31.16%)
b)RBD	8004(64.67%)	515(4.1%)	8519(68.83%)

Donor reactions were observed in 113(0.91%) donors, out of which 25 were females and 88 were males. Maximum number of donor reactions occured in the age range of 18-30 years and weight range of 45-55 kgs in both sex(as shown in table 2). Among males more reactions were recorded with RBD (66=0.79%) while female VBD recorded more reaction (17 =2.64%) than female RBD (8 =1.55%), as shown in table 3. Overall, RBD outnumbered VBD in the total number of reactions.

Table 2 showing the demographic distribution of donors with adverse reactions

PARAMETERS		*Male*	*Female*
Age group (in years)	18-30	70	22
	31-40	14	3
	41-50	4	0
	51-65	0	0
Weight group (in Kgs)	45-55	30	15
	56-65	27	9
	66-75	21	1
	76-85	9	0
	>85	1	0
Total	113(0.91%)	88(0.78%)	25(2.15%)

Table 3 showing the distribution of donor reactions in different type of donors

Type of donor		Male	Female	Total
1	a)VBD	24(0.74%)	17(2.64%)	41(1.06%)
	b)RBD	64(0.79%)	8(1.55%)	72(0.84%)
2	a)Repeat donations	21	3	24(0.44%)
	b)First time donation	67	22	89(1.26%)
3	a)Donation at Blood Bank	84	15	99(0.90%)
	b)Donation at outdoor Camps	4	10	14(1.01%)

Vasovagal reaction has been recorded as the only donor reactions in our study and maximum number of donors had mild vasovagal reactions without loss of consciousness and injury in both the sex (as shown in table 4).

Table 4 showing the distribution of severity of vasovagal reaction in the donors

Sl no	*Vasovagal reaction*	*Male*	*Female*
1	*Severity of vasovagal reactions*		
	a)Loss of consciousness<60 seconds	14(0.12%)	5(0.43%)
	b)Loss of consciousness>60 seconds	2(0.01%)	0
	c)Without loss of consciousness	72(0.64%)	20(1.72%)
2	*Vasovagal reaction with injury*		
	a)Yes	0	1(0.08%)
	b)No	88(0.78%)	24(2%)
Total		88	25

IV. Discussion

In this study, male don**ors** (90.64%)dominate. Total no. of male donors is 11,218 out of which 3214 are VBD and 8004 are RBD. Total no. of female donors is 1158 out of which 643 are VBD and 515 are RBD. Similar male dominated donor pool (87.76%) is reported by John et al [3] Agnihotri N et al[4] also reported a male dominated donor pool.

We found a reaction rate of 0.91%(113 reactions in 12,376 donors). This rate is lower than that reported by John et al[3] (1.6%), Boynton HH et al[5] (8.9%) and Agnihotri N et al[4] (2.5%). However , Kumari S et al [6]has reported a lower rate of 0.7%. Donor reactions are found in 88 males(0.78%) and 25 females(2.15%) in this study. Most studies[7,8,9]have reported higher prevalence in female donors , although there is contradictory data too[10,11]

In our study, donor reactions are found more in VBD (1.06%) than RBD (0.8%). This is in contradiction to earlier studies which had emphasized that non voluntary donors are prone to more adverse reactions.

When we compared donor reactions between first time donors and repeated donors, we found reaction rate of 1.26% in the first group and 0.44% in the later group. This is in accordance with "opponent-affective theory" which states that repeated exposure to adverse stimuli gradually decreases the intensity of response to stimuli[12]

In our study,frequency of donor reactions decreased as the weight of the donor increased from 45 kg to more than 80 kg in both male and female. Newman[10,13]showed that reaction rate was inversely proportional to the weight of the donor while Boynton and Taylor reported that reactions were twice that expected in donors weighing less thanr 120lbs. In contrast, in a study on Indian donors by Tondon et al, the weight of the donor had no significant effect on the occurrence of vasovagal reactions[14]

There is no significant difference between the reaction rates of donors at outdoor camps (1.01%) and those donors who came to donate at our blood centre(0.90%).

All the adverse reactions in our study fall under vasovagal reactions. Vasovagal reactions are found to be the most common reactions by earlier studies[4,6]. Vasovagal reactions occur due to changes in blood volume and typically happen toward the end or after donation[15]. Importantly, the occurrence of vasovagal reactions has been observed to negatively impact on blood retention[16,17,18,19]

V. Conclusion

In recognition of the significant influence of vasovagal reactions on donor safety, retention and adequate availability of blood in any blood transfusion service, a number of interventions need to be explored as ways of preventing vasovagal reactions in blood donors.

This highlights the importance of adequate donor counseling and observation before and after blood donation, as well as the application of measures like water fluid preloading , application of muscle tension and decreasing blood donation duration. In our centre, there is no system for the donors to report any delayed adverse reaction. In future, this problem can be tackled by giving paper handouts containing phone numbers to contact the department in case of any delayed adverse reactions.

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