

## Adverse Events in Blood Donors & Adoption of Measures to Reduce Such Occurrence

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### ABSTRACT

**Introduction:** Though blood donation is considered a safe procedure, at times, it can lead to mild to severe adverse reactions. The aim of the present study is to analyse the frequency and type of adverse events in blood donors and to assess the practices which will help to decrease their occurrence.

**Methodology:** The present study was conducted in the Department Of Transfusion Medicine, Sriram Chandra Bhanja (SCB) Medical College & Hospital (MCH) Cuttack, Odisha state in India, based on data from July 2013 to March 2015. Blood was collected from donors with Hemoglobin level of more than 12.5 gm/Dl. 350 ml of whole blood was collected from donors weighing between 45-55 Kg and 450 ml from donors weighing more than 55Kg.

**Results:** Out of 38,661 blood donations, adverse events were noticed in 944 (2.44%) cases. Vasovagal reactions were the commonest, comprising 52% of all adverse reactions.

**Conclusion:** Though complications relating to blood donations are low, it will have a detrimental effect on the return of the same donor for subsequent donation & could lead to long term morbidity and disablement in some cases.

**KEYWORDS:** Adverse events, Blood donation, Vasovagal reaction.

### INTRODUCTION

Blood donation is a noble cause for saving a precious life and considered to be a safe procedure. Recognized donor reactions occur in around 1% of blood donation during or at the end of the collection in voluntary as well as replacement donors. The most common adverse event is usually the vasovagal reaction. Among 2-6% donors experiencing adverse events, syncopal reaction with loss of consciousness are said to be seen in 0.08-0.3% of cases.<sup>1,2,3</sup> Other factors which are generally said to predispose a donor to any untoward event are young age, female sex, donating blood for the first time, low weight & Caucasian race.<sup>3,4,5</sup> The real challenges for Blood Banks are to meet the increasing demand for blood & blood components by maintaining a safe and adequate supply of blood from a decreasing pool of eligible donors as well as to reduce the frequency of adverse events associated with blood donation which can decrease the rate of repeat donations. The aim of the present study is to estimate the frequency & type of adverse events occurring in whole blood donations by both voluntary and replacement donors & to assess the practices to minimize these in order to retain the Donors for further repeat donations. Introduction and

streamlining of a few new practices can motivate the repeat donors and can add up many new voluntary donors for blood donation, by which we can slowly achieve the need of the hour, that is, 100% voluntary non-remunerated blood donation. Though our study is similar to few other studies which have elaborated on donor reactions,<sup>6</sup> finding most common adverse event to be mild vasovagal reactions, and a few international studies showing a range of 0.3% to 3.8% of adverse events in blood donation, the present study has highlighted the occurrence incidences along with measures to be taken during and after the donation procedure for reducing any adverse events.

### MATERIALS AND METHODS

A retrospective single-center study was conducted from July 2013 to March 2015 in the Department of Transfusion Medicine, SCB MCH, Cuttack on 38,661 healthy donors. Blood collection was performed in the blood donation area of the Department within Hospital premises and in Outdoor Voluntary Blood Donation Camps organized at various locations in and around the Cuttack District of Odisha State in India. Approval by

Institutional ethical committee was taken prior to study. Blood from all donors were collected using 16 gauge needles from the antecubital vein after cleaning the venipuncture site using Betadine and alcohol.

Blood was collected from donors with Hemoglobin level of more than 12.5 gm/Dl. 350 ml of whole blood was collected from donors weighing between 45-55 Kg and 450 ml from donors weighing more than 55Kg. Attention was prioritized towards the donors complaining of giddiness, light headedness, pallor, etc., and they were given immediate attention by stopping the donation immediately and were asked to raise their legs to prevent vasovagal reactions. After the donation, donors were given refreshments and retained in the recovery room for at least 30 minutes before being released.

The adverse events as suggested by American Red Cross Hemovigilance were classified as Major/Minor according to the Severity rating.<sup>6</sup> Presyncopal symptoms consisting of pallor, sweating or light-headedness without loss of consciousness, were considered to be minor. Syncopal types of events with transient loss of

consciousness for more than a minute were classified as Minor, and the Major ones are those which are complicated by loss of bowel/bladder control, seizures or convulsions. Local adverse events were hematomas which can be small (< 25.8 mm<sup>2</sup>) or large (> 25.8 mm<sup>2</sup>), bruises, infiltration, allergic reactions and a tingling/burning sensation.

**RESULTS**

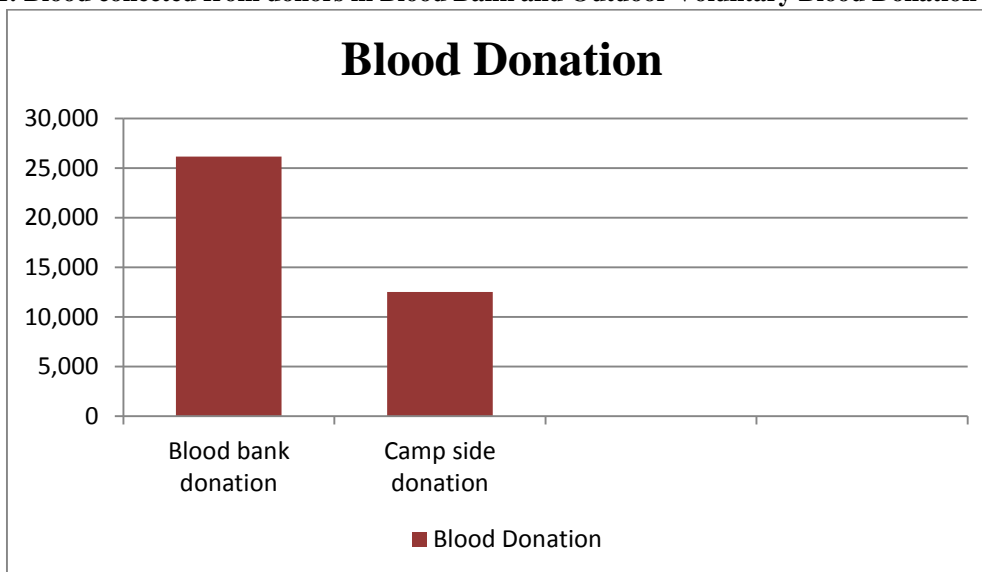
Overall, 944 (2.44%) adverse events were reported in 38,661 donations. The demographic data of all the donors are presented in table 1. All demographic variables were split into various categories like gender (male/female), age (≥ 50/≤ 50 years), weight (≥55 kg/≤ 55 kg) and donation status (first time/repeat donor). Majority of them were male donors within 50 years of age with weight more than 55 kilograms and were first-time donors.

We recorded a total number of 38,661 whole blood donations (350 ml/450 ml) during the study period comprising of 26,157 Blood Bank donations and 12,504 camp side collections. (Fig 1)

**Table 1: Demographic data of the healthy donors**

		Number	Percentage
GENDER	MALE	35658	92.3 %
	FEMALE	3003	7.7 %
AGE	>50	1586	4.1 %
	< 50	37075	95.89 %
WEIGHT	<55KG	734	1.8 %
	>55 KG	37927	98.1 %
DONATION STATUS	FIRST TIME DONORS	29460	76.2 %
	REPEATED DONORS	9201	23.8 %

**Fig 1: Blood collected from donors in Blood Bank and Outdoor Voluntary Blood Donation Camp**



Males constituted 35,658 and females were 3003 in number. (Fig 2) The majority events were mild like vasovagal attack seen in 491(52%) cases. These attacks were generally seen in cases of patients who were initially complaining of weakness, discomfort and

dizziness. This was followed by hematoma in 339(36%) cases, vomiting in 58(6.1%) cases, nerve injury in 258(2.6%) cases, thrombophlebitis in 18(1.9%) cases, hyperventilation in 05(0.52%) and rigor in 05(0.52%) cases. Major syncopal adverse reactions were very rare,

seen in only 03 cases (0.31% of all donations), who recovered spontaneously within the premises of blood bank after taking rest and none of which required hospitalization (Fig 3). In 637 cases, in cases of those who were donating for the first time, adverse events were noticed, whereas only 307 multiple donors complained of any adverse events. Blood donation was

found to be safer in Blood Banks where less number of adverse events were seen, in 542 (2.07%), than at the Outdoor Voluntary Camp Sites showing 402 (3.21%) number of adverse events. This may be due to the conducive atmosphere along with more attention given at the Blood Bank than at the sites organizing blood donation camps.

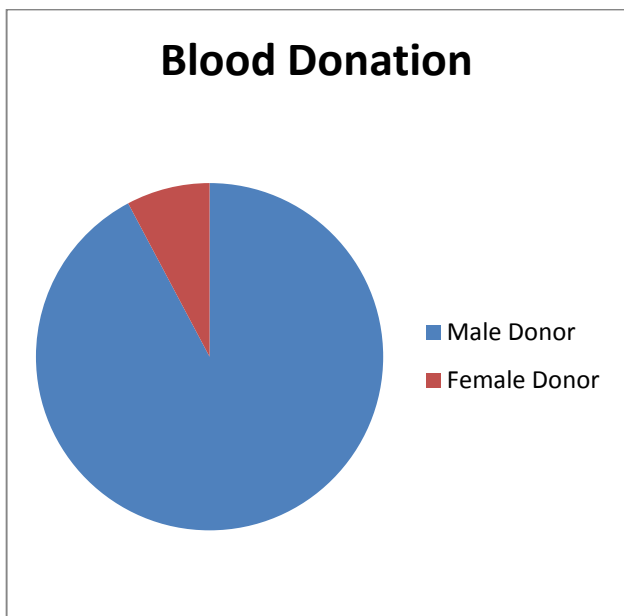


Fig 2: Number of male and female blood donors

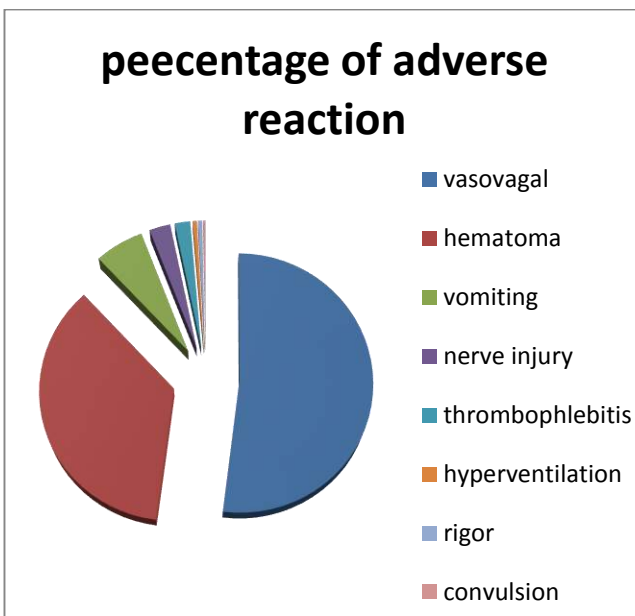


Fig 3: Different types of adverse reactions to blood donation in percentage

**DISCUSSION**

Blood Bank has to ensure two important things to be carried out, i.e., to supply adequate number of safe blood components to the communities and, at the same time, ensuring the safety and well-being of their donors. The most common events relating to the donors are medically considered inconsequential. But these can very well decrease the likelihood of repeat donations.<sup>7,8</sup> Broad heterogeneity in adverse events in blood donations is referred to in medical literature, although blood donation is considered to be safe.<sup>9,10</sup> The aim of the present study is to assess the frequency of adverse events in blood donations and to implement certain measures which will prevent or reduce the occurrence of these reactions helping in retaining the first time donors who, later on, can be converted to repeat donors.

Adverse events noted in the present study were 944 (2.44%) out of 38,661 donations and these figures are very much in accordance with various studies conducted all over the World in which rate of adverse events associated with donations ranged from 0.3% to 3.8%.<sup>11-15</sup> We found that the most common type of complications were vasovagal reactions and hematoma. Local reactions like hematoma, nerve injury and thrombophlebitis were caused by blood donation-related neurological needle injuries. Recovery time for these complications ranged from less than three days to more than six months.<sup>16</sup>

Incidences of Major syncopal reactions found in our study were low (0.31%), similar to some other studies.<sup>11,13,14</sup> In these cases there was no need for hospitalization of the donors or administration of intravenous fluids. Blood donation was found to be safer in Blood Banks where adverse events were seen in 542 cases (2.07%) than at the Outdoor Voluntary Camp Sites showing 402 (3.21%) number of adverse events.

In the present study, the complications in blood donation were found more in the persons donating blood for the first time-637 (1.64%) – than in repeat donors-307 (0.79%). To retain these first time donors for future repeat donations, it is advisable to minimize the adverse reactions. It is essential to provide friendly, warm and comfortable atmosphere for the donor and to distract the attention by engaging him in conversation. In our center, we educate the donors by providing advice on preparation of blood donation by advising donors/ camp organizers about the need to have light food and fluid intake prior to the donation. During the donation, we try to provide a friendly, warm, comfortable conversation, and try to distract the donor’s attention. Besides, we allow the donor to leave the blood bank after having milk/juice and biscuits/cakes etc., and resting for at least half an hour. We also advise for avoidance of strenuous physical activity and post-donation alcohol consumption.

The phlebotomists are trained to react swiftly to the initial complaints by the donor like giddiness, light-headedness or pallor. On the onset of these events, the donation procedure is immediately stopped and the legs are raised (anti-shock position) to prevent further consequences of severe vasovagal reactions. These strategies have not only minimized the adverse effects but also motivated the donors to become Repeat Donors. Donors with significant risk of recurrence of serious adverse reactions are permanently deferred.

Though blood donation is a safe procedure, it can be made event-free by adopting certain friendly, tactful and reassuring practices. The donor's physical experience has a significant impact on the willingness to return and to donate in the future. The interval between donations is directly proportional to the severity of donor reaction and is prolonged in many donors who have experienced the reactions.<sup>17</sup>

## CONCLUSION

Blood donation is considered as safe procedure. Adverse reactions are around 1 – 3% worldwide (ours is 2.41 %). This can be further reduced with appropriate donor selection, proper counseling, accompanying donor during procedure at post donation phase. These actions reduce donor reactions, reduce severity of reaction and help the donors to be repeated donors in spite of having adverse reactions. Our present study shows voluntary blood donation is safe and turnover of adverse reaction victims can be excellent if they get proper care.

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