Research Article

Evaluation of Vasovagal and Hypotensive Reactions Reported in the Blood Donations in Kerala

P. K. Sreekumar[1]*, T. M. Pramodkumar[2], G. Parthasarathi[3], Debasish Gupta[4], Pallavi Prakash[5]
[1]Office of the Assistant Drugs Controller, Thiruvananthapuram, Kerala, India.
[2,3]Jagadguru Sri Shivarathreeswara University, Mysore, Karnataka, India.
[4]Sri Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, Kerala, India.
[5]JSS Hospital, Mysore, Karnataka, India
***Corresponding author's E-mail:** skumardi@gmail.com

Received: 28-06-2018; **Revised:** 25-07-2018; **Accepted:** 07-08-2018.

ABSTRACT

The present study was aimed to evaluate the frequency of vasovagal and hypotensive reactions reported in the blood banks of Kerala, so that appropriate actions can be taken through education and training to prevent the occurrence and reoccurrences of these incidences. For that, a retrospective review of all the vasovagal and hypotensive reactions reports of 19 blood banks for a period of two years was done. It was found that the total number of donations were 246092 and 999 (0.41%) had an adverse vasovagal reaction. Majority of the vasovagal reactions affected was males compared with females. The age group of 21-30 years was mainly affected. Mostly, the adverse reactions were developed at post donation stage. In case of hypotensive reactions, 160 donors showed hypotensive reactions. Male donors were mainly affected and most of the reactions were found at post donation stage. The study concluded that the adverse reactions can be reduced with appropriate donor selection, proper counseling, accompanying donor during and after donation. Importantly, strict adherence to the rules is essential to ensure donor safety. These actions may reduce the adverse donor reactions or reduce severity of the reactions and encourage the donors for subsequent donation.

Keywords: Blood donors, Adverse donor reactions, Vasovagal reactions, Hypotensive reactions, Haemovigilance.

INTRODUCTION

Even though, blood donation procedure is considered safer, there is a chance for the development of some inherent adverse reactions in the donors[1-3]. Risks of infection, hematoma, thrombophlebitis, vaso vagal reactions are few among them [4]. These reactions may occur during or at the end of the procedure of blood collection [5]. Vaso-vagal reactions, a type of systemic reactions, triggered by the pain of venipuncture, by the donor observing his or her own blood or by the donor observing another donor unwell, by the anxiety and state of tension of undergoing the donation, etc. It is characterized by the appearance of pallor, sweating, dizziness, gastrointestinal disorders, nausea, hypotension, and bradycardia. Prompt therapeutic intervention may necessary to avoid the development of vasovagal syncope which may end in convulsive syncope [6].

Haemovigilance is an important tool to improve the transfusion safety. It is an ultimate indicator of quality of a transfusion service [7]. Of course, strict adherence to the rules is essential to ensure the safety of donors. Such steps reduce the adverse donor reactions and encourage the donors for subsequent donations. Also, adverse events analysis helps in identifying the donors at risk of adverse reactions. With this view, the present study was under taken to evaluate the vasovagal and hypotensive reactions reported in the blood donations in Kerala.

METHODS

In the present study, a retrospective evaluation of all vasovagal and hypotensive reactions reported by 19 leading blood banks of both Govt. and private sectors across the state of Kerala was done. For that, the haemovigilance data for the period of two years from 01/01/2014 to 31/12/2015 was collected from these blood banks by using a standard pro forma designed with the guidance of an expert team of doctors in the Dept. of transfusion medicine. The collected data was evaluated based on the incidence of vasovagal and hypotensive reactions with respect to age and gender of donors and different phases of donation.

RESULTS

In the present study, it was found that, a total of 246092 blood donations were done during the study period. Among them, 233711 (95%) donations were done by males and remaining 12381 (5%) donations were given by females. Totally, 999 (0.41%) vasovagal reactions were reported out of 246092 donations. These reactions were observed in 929 (93%) males and 70 (7%) females. From this it was clear that 0.56% in total female population and 0.39% in total male population were affected with vasovagal reactions (Table 1).

Table 1: Distribution of blood donations and prevalence of vasovagal reactions based on gender

Gender	Number of donors	Percentage	No. of vasovagal reactions observed	Percentage in total population
Male	233711	95%	929	0.39%
Female	12381	5%	70	0.56%
Total	246092	100%	999	

Analysis of prevalence of vasovagal reactions based on the age of donors revealed that, majority, 474 (47.4%) vasovagal reactions were occurred in the age group of 21-30 and it was 328 (32.8%) in the age group of 18-20. 136 (13.6%) reactions were noted in the age group of 31-40. In the age group of 41-50, 54 reactions (5.4%) were found. Only 7 reactions (0.7%) were noted in the age group of 51-60 (Table 2).

Table 2: Distribution of vasovagal reactions based on the age of donors

Age group	No. of vasovagal reactions	Percentage
18-20	328	32.8
21-30	474	47.4
31-40	136	13.6
41-50	54	5.4
51-60	7	0.7
Total	999	100

It was found that, 483 reactions (48.3%) were occurred during blood donation, 509 (51%) reactions were noticed at post donation phase. In the pre donation stage, only 7 reactions (0.7%) were found (Table 3).

Table 3: Distribution of vasovagal reactions based on the phase of blood donation

Phase of blood donation	No. of reactions noted	Percentage
Pre donation	7	0.7
During donation	483	48.3
Post donation	509	51
Total	999	100

Regarding with hypotensive reactions, the results showed that, totally, 160 donors were affected with hypotensive reaction. Among them, 134 donors (83.7%) were males and 26 donors (16.2%) were females. From this, it was found that 0.05% of males and 0.20% of females in their respective total population were affected with hypotensive reactions (Table 4). It was identified that 65 (41%) donors were affected with hypotensive reaction during blood donation and remaining 95 donors (59%) were affected at post donation stage.

Table 4: Distribution of reported hypotensive reactions based on gender of donors

Gender	No. of donors	No. of donors affected with hypotensive reaction	Percentage	Percentage
Male	233711	134	83.7	0.05
Female	12381	26	16.2	0.20
Total	246092	160	100	

DISCUSSION

In the present study, the vasovagal and hypotensive reaction occurred in the blood donors were assessed with attention to their gender, age and the phases of donation to identify the appropriate actions to prevent such type of reactions.

It was found that totally 246092 donations were done during the study period. In these, 95% donors were male and only 5% were females. In case of vasovagal reactions, it was observed in 999 (0.41%) donors in total. 93% were male and remaining 7% were female among the donors affected with vasovagal reaction. From this it was found that 0.56% in total female population and 0.39% in total male population were affected with vasovagal reactions. This is in accordance with the study of Smita Mahapatra *et al.,* 2016. In our study, analysis of vasovagal reactions reported donors based on age revealed that the majority of the reactions 47.4% were reported in the age group of 21-30 years. Next to that, 32.8% reactions were reported in the 18-20 years age group.13.6% of reactions was noted among the donors of the age between 31-40 years. Donors belong to 41-50 years age group showed only 5.4% of reactions and finally 0.7% was reported in 51-60 years age group. Mangwana S., 2013, found that 0.5 % females developed adverse events and 0.25% is the rate for males. Reaction percentage within the age groups were highest (0.37%) in 36-45 years followed by 26-35 years and 18-25 years age groups (0.30% each) while the lowest in 46-55 years age groups as 0.12%. There was no adverse event in 56-65 years age group. The present study revealed that, majority of reactions, 50.9% were occurred at post donation stage, 48.3% of reactions were occurred during donation and only 0.7% occurred at pre donation stage. The study conducted by Zervou EK *et al.,* 2005 indicated that a reduction in vasovagal reactions has

been documented with use of a water drink before donation, muscle tensing, social distraction and lower collection volume for donors with small estimated blood volume.

We have noted 160 hypotensive reactions in 134 (83.7%) males and 26 (16.2%) females. 65 (41%) donors show the reaction during donation and 95 (59%) at post donation stage. Out of the female donors 0.20% developed hypotensive reactions while 0.05% of male donors developed hypotensive reactions. Generally, hypotensive reactions are seen more in whole blood than apheresis collection due to large fluid deficit. Sweating, in fact, causes a further decrease in blood pressure because of vasodilatation. Pauwel NS *et al.,* 2014 concluded that there was currently no evidence that hypotensive blood donors have a greater risk for donor adverse events compared with their normotensive counterparts.

We found a very low incidence of vasovagal reactions and the reaction rate is more in females and younger donors. Most of the reactions occur during donation stage and post donation stage. Hypotensive reactions are slightly more during post donation stage. Our study reinforces the fact that blood donation is a very safe procedure, which could be made even more event-free by following certain friendly, reassuring practices and by ensuring strict pre-donation screening procedures and ensuring comfort of donors. Strict adherence to the rules is essential to ensure donor safety. Moreover, a streamlined mechanism for data collection using standardized tools at hospital level and good coordination at national level can bring up effective hemovigilance system in a country. The data from a well functioning hemovigilance system can be used as quality indicator for monitoring blood safety and also contribute significantly to evidence-based medicine as well as help to introduce new and /or access the existing blood policies. There is need to strengthen and to bring uniformity in the hemovigilance system globally.

CONCLUSION

Adverse donor reactions can be minimized by certain activities such as appropriate selection of donor, proper counseling to donors, accompanying donor during and at post donation stage. Such activities not only reduce the adverse donor reaction but also encourage the donors for subsequent donation. Moreover, evaluation of adverse donor events has an important role in this regard. This type of evaluations facilitates the identification of donors at the risk of adverse reactions. They are also useful in applying proper motivational strategies, providing counseling before donation, and care on donors during and after donation and also important for shaping the guidelines and haemovigilance programme. All these make the blood donation safe procedure.

Acknowledgement: We would like to thank Mr. J. Kumaran, M. Pharm., (Pharmaceutical Biotechnology), for his assistance in the preparation of this manuscript.

REFERENCES

1. Chintamani Pathak, Meenu Pujani, Sangeeta Pahuja, Manjula Jain, Adverse reactions in whole blood donors: An Indian scenario, Blood transfusion, 9(1), 2011, 46-49. DOI 10.2450/2010.0002-10
2. Isabella Crocco, Massimo Franchini, Giovanni Garozzo, Anna Rosa Gandini, Giorgio Gandini, Pietro Bonomo, Giuseppe Aprili, Adverse reactions in blood and apheresis donors: Experience from two Italian transfusion centres. Blood Transfusion, 7(1), 2009, 35-38. DOI 10.2450/2008.0018-08
3. Sreekumar PK, Pramodkumar TM, Parthasarathi G, Debasish Gupta, Pallavi, Evaluation of adverse donor reactions reported in the blood banks of Kerala, International Journal of Pharmaceutical Sciences Review and Research, 48(2), 2018, 25-27.
4. Joseph Philip, Sarkar RS, Neelesh Jain, A single-centre study of vasovagal reaction in blood donors: Influence of age, sex, donation status, weight, total blood volume and volume of blood collected. Asian Journal of Transfusion Science, 8(1), 2014, 43–46.
5. Sadia Sultan, Mohammad Amjad Baig, Syed Mohammed Irfan, Syed Ijlal Ahmed, Syeda Faiza Hasan, Adverse reactions in allogeneic blood donors: A tertiary care experience from a developing country, Oman Medical Journal 31(2), 2016, 124-128.
6. Antonio Crocco, Domenico D'Elia, Adverse reactions during voluntary donation of blood and/or blood components. A statistical-epidemiological study, Blood Transfusion 5(3), 2007, 143-152. DOI 10.2450/2007.0005-07
7. Sreekumar PK, Pramod Kumar TM, Partha Sarathi G, Debasish Gupta, Pallavi, Retrospective evaluation of adverse reactions associated with blood transfusions reported in the blood banks of Kerala, Journal Of Medical Science And Clinical Research, 5(3), 2017, 18819-18824. DOI: https://dx.doi.org/10.18535/jmscr/v5i3.87
8. Smita Mahapatra, Dibyajyoti Sahoo, Satayabrata Patjoshi, Debasish Mishra, Adverse events in blood donors & adoption of measures to reduce such occurrence. International Journal of Medical Research Professionals, 2(2), 2016, 62-65.
9. Mangwana S, Donor hemovigilance programme in managing blood transfusion needs: Complications of whole blood donation, Journal of Pathology of Nepal 3(6), 2013, 459-463. DOI: http://dx.doi.org/10.3126/jpn.v3i6.8993
10. Zervou EK, Ziciadis K, Karabini F, Xanthi E, Chrisostomou E, Tzolou A, Vasovagal reaction in blood donors during or immediately after blood donation. Transfusion Medicine, 15(5), 2005, 389–394.
11. Pauwels NS, Cusack L, De Buck E, Compernolle V, Vandekerckhove P, The effect of pre-donation hypotension on whole blood donor adverse reactions: a systematic review, Journal of the American Society of Hypertension, 8(6), 2014, 429-436.

Source of Support: Nil, **Conflict of Interest:** None.