



Profile of blood donors and reasons for deferral in coastal South India

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RESEARCH

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Abstract

Background

A blood transfusion is a life-saving procedure in many instances. An adequate supply of safe blood is ensured by exercising donor deferral criteria and screening for Transfusion Transmitted Infections (TTI). The aim of this paper is to study the profile of blood donors and reasons for donor deferral in coastal South India.

Method

The study was conducted at a tertiary care hospital in Mangalore. All those who donated between 1 January 2008 and 31 December 2008 were included in the study. Data was collected using a pre-tested semi-structured proforma and analysed using SPSS version 11.5.

Results

Most of the donors were under the age of 25 (42.92%).

Donors were predominantly male (95.20%). In terms of occupation, most subjects were students (28.01%) followed by businessmen (18.61%). Slightly more than three-quarters of the donors (77.20%) were replacement donors. The main reasons for deferral were consumption of medication in the past 72 hours (15.15%), hypertension (13.18%), a low haemoglobin level (12.34%) and alcohol intake in the past 72 hours (12.20%). Among the TTIs identified, most samples were positive for Hepatitis B surface Antigen – HBsAg (0.87%) or tested positive for Anti-Hepatitis C (HCV antibodies (0.36%).

Conclusion

From the study it was concluded that the majority of the donor population was young and educated. The reason for donation was mainly replacement rather than voluntary.

This issue needs to be addressed by exercising proactive measures to increase the number of voluntary, non-remunerated, low-risk donors.

Key Words

Blood donors, deferral, transfusion transmitted infections, South India

Background

In current medical and surgical practice, a blood transfusion can be a vital, life-saving procedure. However, it requires an adequate supply of safe blood. The National AIDS Control Organization's (NACO) statistics show that the annual rate of blood donation in India is about 7.4 million units, against the requirement of 10 million units.¹ The state of Karnataka contributed about 500,000 units, with 62% coming via



voluntary blood donation.² Voluntary blood donation is the donation of whole blood or plasma voluntarily without inducement or reward.³ A replacement donor is a person who donates blood upon the request of a specific patient or patient’s family or acquaintance which, in principle, is intended to be used specifically for the treatment of that patient.⁴ According to World Health Organization (WHO) figures, over 81 million units of blood are collected annually but only 39% are collected in developing countries which have 82% of the world’s population.⁵

A blood bank plays a pivotal role in ensuring the supply of safe blood as and when required. However given the ever changing socio-economic environment and human factors involved, healthy donor recruitment and retention is a challenge that faces the health industry today.⁶ Hence studying the profile of blood donors will help identify sections of the population which could be targeted to increase the pool of voluntary blood donors.

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 criteria⁷ and stringent screening of collected blood for possible TTIs⁸.

The aim of this study was to determine the profile of donors who presented themselves at a tertiary care hospital in Mangalore as well as to ascertain the reasons for blood donation deferral among these donors.

Method

The present hospital-based retrospective study was carried out in the blood bank of a tertiary care private hospital. Data was collected from the records maintained by the blood bank.

Study participants included all those who donated blood between 1 January 2008 and 31 December 2008. The data was collected using a pre-tested, semi-structured proforma (Annexure). The proforma was devised from other studies

as well as in consultation with pathologists working at a blood bank. The proforma was divided into different sections such as socio-demographic data, reasons for donation, reasons for deferral and TTIs. The collected data was analysed using SPSS Version 11.5.

The protocol was approved by the institutional ethics committee.

Results

A total of 13,722 people came to donate blood during the study period. In the present study a majority of the donors were under the age of 25 (42.92%), followed by those aged 26–35(37.20%). Only 0.48% of the donors were above 55 years. Males dominated the donor population (95.13%) with females making up the numbers with 4.87%. Slightly more than three-quarters of the donors (77.20%) were replacement donors and voluntary donors formed 22.80% of the study group. The most common occupations among subjects were students (28.01%), businessmen (18.61%), the service sector (17.28%) and professionals (9.12%) (Table 1).

Table 1: Baseline characteristics of blood donors (N=13,722)

Reason For Deferral	Number (%)
On medication in the past 72 hours	108 (15.15%)
Hypertension	94 (13.18%)
Low haemoglobin level	88 (12.34%)
Alcohol intake in the past 72 hours	87 (12.20%)
Fever	61 (8.56%)
Others	96 (13.46%)
Malaria infection in the last six months	32 (4.49%)
Underweight	28 (3.93%)
Donated blood in the last 6 months	25 (3.51%)
Underage	46 (6.45%)
Other medical conditions (asthma, hypotension, jaundice)	21 (2.95%)
Menstruation	17 (2.38%)
Tuberculosis	10 (1.40%)
Total	713 (100%)



The commonest cause for deferral was consumption of medications in the past 72 hours (15.15%). This was followed by hypertension (13.18%), a low haemoglobin level (12.34%) and alcohol intake in the past 72 hours (12.20%). Less common causes included being underweight, fever, being under age, history of malaria in the past six months, menstruation and tuberculosis (Table 2).

Table 2: Reasons for deferral among blood donors (N=713)

Baseline Characteristics	Number (%)
Age (in years)	
17–25	5890 (42.92%)
26–35	5105 (37.20%)
36–45	2085 (15.20%)
46–55	576 (4.20%)
>=56	66 (0.48%)
Gender	
Male	13054 (95.13%)
Female	668 (4.87%)
Reasons for donation	
Voluntary	3129 (22.80%)
Replacement	10593 (77.20%)
Previous donation	Number (Percent)
Yes	8760 (63.83%)
No	4962 (36.17%)
Occupation (N=8710)	
Agriculture	212 (2.43%)
Business	1621 (18.61%)
Professional	795 (9.12%)
Student	2440 (28.01%)
Skilled	863 (9.91%)
Service	1505 (17.28%)
Technical	614 (7.05%)
Unemployed	49 (0.56%)
Housewife	131 (1.50%)
Labour	480 (5.51%)
Total	8710 (100%)

Among the samples testing positive for TTIs, most were HBsAg positive (0.87%) followed by anti-HCV positive

(0.36%), HIV positive (0.28%) and VDRL positive (0.07%) (Table 3).

Table 3: TTIs among blood donors (N=13,722)

TTI	Number (%)
HIV	39 (0.28%)
HBsAg	120 (0.87%)
Positive for Anti HCV antibodies	50 (0.36%)
VDRL	9 (0.07%)

Discussion

This study attempts to analyse the pattern of blood donation in a tertiary care hospital between 1 January 2008 and 31 December 2008.

The donors in this study are young, 80.12% were under the age of 35, and males formed 95.13% of the donor population. Students made up 28% of the donor population, who by virtue of their education are more aware of the importance of blood donation. Professionals and people from the service sector formed 26.40% of the donor population. Corporate social responsibility is a new concept that has risen amongst the corporate sector⁹ and they do their part by organising blood donation drives. Education generates awareness¹⁰ and is the major reason for our donor population consisting of a large number of students. In addition, students donate to fulfil their social responsibility.

Furthermore, students usually form the target group when the blood bank organises any blood donation drive as they can easily be motivated in an effort to retain them as repeat voluntary donors.



In the study conducted by Shashahani et al, it was found that moral duty and altruism, charity, maintenance of one's own health and free blood investigations were some of the factors motivating people to donate blood.¹⁰

This study highlights significant similarities between the demographics of the donor population in the hospital and the donor populations in the city of Sao Paulo¹¹ and Srinagar¹² in terms of age, gender and reason for donation.

In our study it was found that 22.80% of donations were voluntary, which is higher than the findings of Bahadur et al¹³ (0.6%). However, it is still below the national average of 39.3%.¹⁴

It is encouraging to note that the blood bank in this study has functioned in accordance with guidelines issued by NACO¹⁵ regarding banning professional donors as none were identified in the period of study.

First-time donors formed 36.17% of the total donor population in this study at the tertiary level hospital, which is lower than the 76% that was seen in the Srinagar study.¹² But at a global level this is higher than centres in the US and other parts of the world having 15–25% first-time donors.¹⁶

Infectious disease markers were found to be present in 1.58% of the donor population in our study while in Srinagar the value was 2.2%.¹² The major infection among the TTIs was Hepatitis B (0.87%) followed by HCV (0.36%). Singh et al¹⁷ found that 1.8% of samples were rejected for Hepatitis B and 0.5% for Hepatitis C, while Kaur et al¹⁸ found 1.7% and 0.8% for HBV and HCV respectively. The Hepatitis B and Hepatitis C infection rates were lower than their respective national prevalence which was 1–5% and 1% respectively.¹⁹ In our study, 0.28% of the sample was positive for HIV, much lower than other Indian studies (Singh et al 0.8%¹⁷, Kaur et al 0.6%¹⁸). The HIV infection rate was similar to the national prevalence of 0.29%.²⁰

The overall deferral rate was about 5.20%, similar to Sundar et al (6%)²¹ and Rabeya et al (5.6%)²² but lower than Lawson-Ayayi et al (10.8%)²³ and Lim et al (14.4%).²⁴

From the deferred pool in our set-up, 15.15% was due to consumption of medication in the past 72 hours, 13.18% due to hypertension and 12.34% due to low haemoglobin levels, similar to the Srinagar study.¹²

In a Saudi Arabian study²⁵, 26.8% were deferred for consumption of drugs, 15.5% for low haemoglobin but only 5.7% for hypertension. However, a number of other studies showed anaemia as the major cause (Arslanet et al 20.7%)²⁶ (Halperin et al 46%).²⁷ In a study in Trinidad and Tobago²⁸ a history of high-risk sexual activity was the commonest cause of deferral.

It is seen that the most common cause for deferral, in over 15% of blood donors, was the ingestion of a drug 72 hours prior to blood donation. There could be various reasons why this was a cause. One possibility is that potential donors were unaware of the prerequisites of blood donation, including drugs that cannot be consumed prior to a blood donation. The public need to be educated regarding this. The blood bank could also follow-up patients who have been deferred due to drug intake and suggest a later date for them to return, with specific instructions on the 'dos and don'ts' before they come for a donation which will optimise donor recruitment and retention in the long run.

The other common cause of deferral was hypertension accounting for 13.18%. A plausible reason for this could be the fears that many people harbour when donating blood. A fear of phlebotomy, fear of the sight of blood etc., or white coat hypertension — a common phenomenon seen in people almost as soon as they enter a hospital. This may be compounded by the fact that our study had a majority of first-time donors who would be more prone to these fears. Exercise and stress which are known to transiently increase blood pressure could be also a probable cause. Moreover,



hypertension being a modern epidemic often goes undiagnosed and is an incidental finding in most cases.²⁹

Anaemic patients also constituted a major deferred group. Anaemia is very prevalent in a developing country like India³⁰ and this is a significant cause for deferrals among donors who come forward enthusiastically for donation, but are unable to donate. Referring these cases to a physician for evaluation and treatment of anaemia and asking them to donate at a later date is pivotal in ensuring donor recruitment and retention.

Conclusion

The study showed that most of the donors were young with the majority being students. This is an encouraging note, as they could be motivated to become regular voluntary donors.

However, a large number of donations were from the replacement pool. Thus in order to increase the number of voluntary, non-remunerated, low-risk donors a concerted effort by all parties concerned is essential in raising awareness regarding the importance of voluntary blood donation. This includes advertising campaigns and distribution of brochures stating the requirement of blood products in the area and clarifying myths about blood donations. Furthermore, non-monetary incentives such as pre-donation medical check-ups and testing could be provided to nurture the habit of regular blood donation in our population.

The major cause for deferral was consumption of medications in the past 72 hours. Hence it is imperative that potential donors be equipped with knowledge pertaining to deferral criteria as this might help eliminate the rejection factor when one is deferred and increases the probability of returning at a later date.

Profile of blood donors and reasons for deferral in coastal South India

Proforma

1. Serial No
2. Gender
 - a. Male
 - b. Female
3. Age (Years): -----
4. Occupation: -----
5. Residence: -----
6. Reason for blood donation:
 - a. Voluntary
 - b. Replacement
7. Previous history of blood donation:
 - a. Yes
 - b. No
8. If yes,

Number of times donated blood: -----

Date & year of last donation: -----
9. History of following conditions in the past 6 months:
 - a) Unexplained weight loss
 - b) Repeated diarrhoea
 - c) Swollen glands
 - d) Continuous low grade fever
 - e) Any other (Specify):-----
10. Did you undergo/suffer from the following in the past year?
 - a) Major surgery
 - b) Hepatitis
 - c) Jaundice
 - d) Rabies vaccine
 - e) Typhoid
11. Did you take any medications in the past 72 hours?
 - a. Yes
 - b. No

If yes, specify: -----
12. Did you consume alcohol in the past 72 hours?
 - a. Yes
 - b. No
13. Has donor suffered or is suffering from any of these diseases?

HIV/AIDS	Hepatitis
Malaria	Syphilis
Heart disease	Lung disease
Tuberculosis	Kidney disease
Diabetes	Epilepsy
Malignancy	Leprosy
Schizophrenia	Polycythemia
Asthma/Allergic disorder	

Any other (Specify):-----



14. For female donors

Is she pregnant?

- a. Yes
- b. No

Did she have any abortion in the past 6 months?

- a. Yes
- b. No

Was she menstruating?

- a. Yes
- b. No

References

1. Department of AIDS Control Ministry of Health and Family Welfare Government of India Annual report 2008-2009 pg 27 [Online]. Available from: http://nacoonline.org/upload/Publication/Annual_Report_NACO_2008-09.pdf.
2. Karnataka State AIDS Prevention Society. Annual Action Plan 2010 – 2011. p. 129
3. WHO Biregional Workshop on Blood Donor Management. Meeting Report p. 8.
4. WHO Technical Report Series No 941, 2007. Recommendations for the production, control and regulation of human plasma for fractionation, p.195. [Online] Available from <http://www.who.int/bloodproducts/publications/TRS941Annex4blood.pdf>.
5. Baxi A. Misconceptions over blood donation causing shortage in India. Sunday Economic Times [Online] February 10, 2008. Available from: http://economictimes.indiatimes.com/Features/The_Sunday_ET/Consumer_Life/Misconceptions_over_blood_donation_causing_shortage_in_India/articleshow/2770144.cms.
6. Shenga N, Pal R, Sengupta S. Behavior disparities towards blood donation in Sikkim, India. Asian J Transfusion Sc. 2008; 2(2): 56-60.
7. Newman B. Blood donor suitability and allogenic whole blood donation. Transfus Med 2001;15(3):234-44.
8. Choudhury LP, Tetali S. Notification of transfusion transmitted infection. Indian J Med Ethics. 2008;5(2):58-60.
9. India PR Wire. Dharampal Satyapal Group organises blood donation camp in partnership with the Indian Red Cross Society(IRCS). India PR Wire. [Online] September 6, 2010. Available from: <http://www.indiaprwire.com/pressrelease/tobacco/2010090661330.htm>.
10. Shahshahani HJ, Yavari MT, Attar M, Ahmadiyeh MH. Knowledge, attitude and practice study about blood donation in the urban population of Yazd, Iran. Transfus Med. 2006;16:403-9.
11. Gonçalez T, Sabino EC, Chamone DF. Trends in the profile of blood donors at a large blood center in the city of São Paulo, Brazil. Pan Am J Public Health. 2003; 3(2/3):144-7.
12. Madan N, Qadiri J, Akhtar F. Study of blood donor profile in a tertiary care teaching hospital. Journal of the Academy of Hospital Administration. 2005;17(2):31-4
13. Bahadur S, Jain S, Goel RK, Pahuja S, Jain M. Analysis of blood donor deferral characteristics in Delhi, India. Southeast Asian J Trop Med Public Health. 2009; 40(5):1087-91.
14. Kapoor D, Saxena R, Sood B, Sarin SK. Blood transfusion practices in India: results of a national survey. Indian J Gastroenterol. 2000;19:64-71.
15. NACO. An action plan for blood safety, MOHFW, GOI, [Online]. 2007. Available from: <http://www.nacoonline.org/upload/Final%20Publications/Blood%20Safety/An%20Action%20Plan%20for%20blood%20safety.pdf>.
16. Brecher ME, editor. Technical Manual 15th edition AABB (Technical Manual of the American Association of Blood Banks). Maryland, 2005.
17. Singh B, Kataria SP, Gupta R. Infectious markers in blood donors of East Delhi: prevalence and trends. Indian J Pathol Microbiol. 2004;47(4):477-9.
18. Kaur G, Basu S, Kaur R, Kaur P, Garg S. Patterns of infections among blood donors in a tertiary care centre: A retrospective study. Natl Med J India. 2010;23(3):147-9.
19. Choudary N, Phadke S. Transfusion transmitted diseases. Indian J Pediatr. 2001;68:951-8.



20. Department of AIDS Control, Ministry of Health and Family Welfare. Annual Report 2009-10 p.4 [Online]. Available from @ https://nacoonline.org/upload/AR%202009-10/NACO_AR_English%20corrected.pdf.
21. Sundar P, Sangeetha SK, Seema DM, Marimuthu P, Shivanna N. Pre-donation deferral of blood donors in South Indian set-up: An analysis. *Asian J Transfusion Sc.* 2010;4(2):112-5.
22. Rabeya Y, Rapiaah 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(3):571-4
23. Lawson-Ayayi S, Salmi LR. Epidemiology of blood collection in France. *Eur J Epidemiol.* 1999;15:285-92.
24. Lim JC, Tien SL, Ong YW. Main causes of pre-donation deferral of prospective blood donors in the Singapore blood transfusion service. *Ann Acad Med Singapore.* 1993;22:326-31.
25. Bashawri LAM.A review of predonation blood donor deferrals in a university hospital. *Journal of the Saudi Society of Family & Community Medicine* 2005;12(2):1-6
26. Arslan O. Whole blood donor deferral rate and characteristics of the Turkish population. *Tranfus Med.* 2007;17:379-83.
27. Halperin D, Baetens J, Newman B. The effect of short-term, temporary deferral on future blood donations. *Transfusion* 1998;38:181-3.
28. Charles KS, Hughes P, Gadd R, Bodkyn CJ, Rodriguez M. Evaluation of blood donor deferral causes in the Trinidad and Tobago National Blood Transfusion Service. *Transfus Med.* 2010;20(1):11-4.
29. Trembath CR, Hickner JM, Bishop SW. Incidental blood pressure elevations: a MIRNET project. *J Fam Pract.* 1991;32(4):378-81
30. Malhotra P, Kumari S, Kumar R, Varma S. Prevalence of anemia in adult rural population of north India. *Journal of Association of Physicians of India.* 2004;52:18-20

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests

ETHICS COMMITTEE APPROVAL

The protocol was approved by the Institutional Ethics Committee.