

Profile of Blood Donors in Model Blood Bank Mizoram, India: A Record Based Case Series Study.

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ABSTRACT

Background: Blood transfusion is a life-saving procedure in many instances. A blood bank plays a pivotal role in ensuring the supply of safe blood as and when required. 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. Objectives: To study the profile of blood donors utilizing Model blood bank services. To determine the association between seroprevalence and selected variables of interest. **Methods:** A case series study was done using secondary data from blood donors register and Hospital Management Information System in Model blood bank, all 10723 blood donors who donate blood during one calendar year were included in the study. Analysis was done using SPSS software version 16. Data were analyzed using descriptive statistics like mean, percentage. Chi-square test and Fisher's exact test used for testing significance. p value < 0.05 is considered significant. **Results:** Out of 10723 donors age ranges from 18-59. Maximum (84%) of the donors are below 30 years and 87% of them are male. 83% donate voluntarily. O+ve blood group comprise of 38% followed by A+ve donors (32%). Infectious disease markers are found in 1.91% of the donors population. The major infection among the TTIs were HCV (1.03%) followed by Hepatitis B (0.68%). HIV and HCV were significantly higher among older age group. HCV is significantly higher among male and replacement donors (p=0.000) and those belong to urban. Hepatitis B is also significantly higher among male donors (p=0.022). **Conclusion:** The study reveal that majority of the donors were from younger generation, which is a good sign as they can easily be motivated to become regular voluntary blood donors.

Keywords: Blood donors, seroprevalence, voluntary donation.

INTRODUCTION

Human blood is an essential element of human life and there are no substitutes. Safe blood is a critical component in improving health care and in preventing the spread of infectious diseases globally.^[1] “Safe Blood” is blood that does no harm to the person who receives it. Safe blood can be life-saving, but contaminated blood, or blood that is transfused to the wrong patient, can cause serious illness or even death to the recipient.^[2]

Blood Banks need to concentrate basically on collecting blood from healthy individuals. This can be done by meticulous selection of donors and by encouraging voluntary donation.

Safe blood is a critical component in improving health care and in preventing the spread of infectious diseases globally. A healthy person has healthy blood, and receiving blood from non-remunerated voluntary blood donors is a first step towards the safety of the

recipient. Screening of donated blood for diseases like hepatitis B, C, HIV, malaria and syphilis is the second step towards the safety of the recipient. It must be remembered that the methods employed to screen blood are not a hundred per cent sensitive.^[3] In our country, collected blood is tested for HIV, Hepatitis B, Hepatitis C, Malaria and VDRL.

The overall estimated annual requirement of blood based on the norms of 1% population by NACO is 12 million units in India. Only 10.8 million units of blood were reported to be collected annually.^[4]

Thus there is a need for launching an Intensive voluntary blood donation campaign in the country.

It is the need of hour to increase the number of blood donors, for that it is essential we should first understand the different factors which are motivating or creating the hindrances in blood donation. Most important reason for not donating blood, described in literature, seemed to be two folds. First, it seems to be related to personal perception of the blood system and blood donation. This is influenced by misinformation, lack of information, misunderstanding and image. Second, non-donation is related to several practical circumstances, infrastructure, time, distance, sociocultural background, economic level and health status.^[5]

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10 Blood banks in Mizoram collect around 25,000 units of blood in a year but only 75% of the blood were from voluntary donors. Despite the awareness campaign both by government agencies and NGOs, the number of people who volunteer to donate blood voluntarily is still not up to the satisfactory level.

Keeping in view the significance of blood donation and transfusion, the present study was conducted to analyse the profile of blood donors, 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.

MATERIALS AND METHODS

A case series study was done using secondary data from blood donors register and Hospital Management Information System in Model blood bank, Aizawl, Mizoram. All 10723 blood donors who donate blood bank during one calendar year between 1st Jan to 31st Dec 2017 were included in the study. Permission to conduct the study was sought from Institutional Ethics committee.

As a routine practice, blood donors questionnaire were filled up by the donors and medical check up were done by the trained medical staffs. Written consent was obtained from all donors at the time of pre-donation counseling. Blood grouping and Rh typing was done by slide method.

In the study period, serum specimens were screened for the presence of HBsAg (SD company, Mumbai, India), anti-HCV antibody (SD company, Mumbai, India) and anti-HIV antibody (Erba Lisa, Transasia Bio-Medicals, India) and VDRL by rapid plasma reagin RPR card test. Data collected were checked for consistency and completeness. Analysis was done using SPSS software version 16. Data were analyzed using descriptive statistics like mean, percentage. Chi-square test and Fisher's exact test was used for testing the significance. p value of < 0.05 is considered as significant. Sample size and sampling was not calculated as the study include all the blood donors donating during one calendar year.

RESULTS

Out of the total 10723 blood donors under study, mean age was 24.64 ± 6.24 years with minimum age of 18 years and maximum of 59 years old. Maximum (84%) of the donors are below 30 years of age and 87% of them are male. 83% of the donors donate voluntarily and one fourth of the donors were first time donors. Majority of the donors i.e. 79% of them were from Urban area [Table 1]. Maximum of the donors belong to O +ve blood group comprising of 38% of the donors followed by A+ve donors (32%), B+ve (22%) and AB+ve (8%) respectively, there are 5 A-ve, 7 B-ve, 6 O-ve blood donors [Figure 1].

[Figure 2] shows that infectious disease markers are found to be present in 1.91% of the donors population a total of 205 infections. The major infection among the TTIs were HCV (1.03%) followed by Hepatitis B (0.68%) and HIV (0.19%) respectively. HIV and HCV were significantly higher among older age group ($p=0.009$ and 0.000 respectively). Also HCV is significantly higher among male donors ($p=0.016$) and similarly among replacement donors ($p=0.000$) and those belong to urban areas ($p=0.001$). Whereas Hepatitis B is found significantly higher among male donors ($p=0.022$) [Table 2-4]

Table 1: Baseline characteristics of blood donors (N=10723)

Characteristics	Numbers (%)
Age (in years)	
18-30	9009(84)
31-40	1453(13)
41-50	244(2)
51-60	17(1)
Gender	
Male	9329(87)
Female	1394(13)
Reasons for donation	
Voluntary	8900(83)
Replacement	1823(17)
Previous donation	
Yes	8042(75)
No	2681(25)
Area distribution	
Urban	8471(79)
Rural	2252(21)

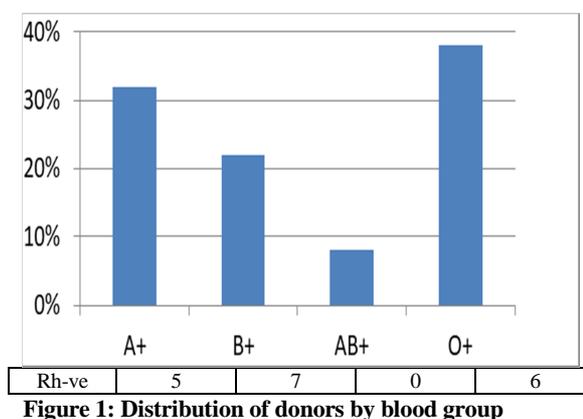


Figure 1: Distribution of donors by blood group

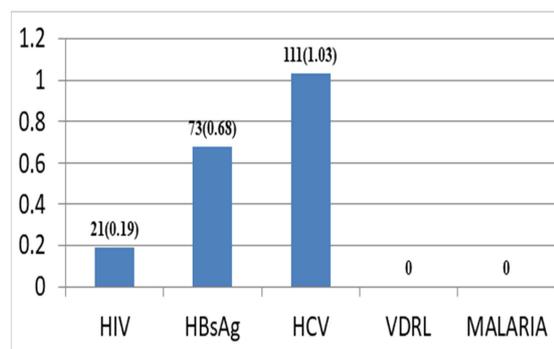


Figure 2: Seroprevalence among blood donors

Table 2: Association between baseline characteristics and HIV status of blood donors

Characteristics	HIV		χ^2 P value
	+ve (%)	-ve (%)	
Age (in years)			
≤ 22	4 (0.1)	5099 (99.9)	6.872
>23	17 (0.3)	5603 (99.7)	0.009*
Gender			
Male	17 (0.2)	9300 (99.8)	0.651
Female	4 (0.3)	1402 (99.7)	0.420
Area Distribution			
Urban	19 (0.2)	8466 (99.8)	0.284**
Rural	2 (0.1)	2236 (99.9)	
Reasons for donation			
Voluntary	16 (0.2)	8917 (99.8)	0.766
Replacement	5 (0.3)	1785 (99.7)	0.381

* Statistically significant at p value <0.05, **Fisher's exact test

Table 3: Association between baseline characteristics and HBsAg status of blood donors

Characteristics	HBV		χ^2 P value
	+ve (%)	-ve (%)	
Age (in years)			
≤ 22	34 (0.7)	5069 (99.3)	0.030
>23	39 (0.7)	5581 (99.3)	0.862
Gender			
Male	70 (0.8)	9247 (99.2)	5.229
Female	3 (0.2)	1403 (99.8)	0.022*
Area Distribution			
Urban	56 (0.7)	8429 (99.3)	0.260
Rural	17 (0.8)	2221 (99.2)	0.610
Reasons for donation			
Voluntary	63 (0.7)	8870 (99.3)	0.474
Replacement	10 (0.6)	1780 (99.4)	0.491

* Statistically significant at p value <0.05

Table 4: Association between baseline characteristics and HCV status of blood donors

Characteristics	HCV		χ^2 P value
	+ve	-ve	
Age (in years)			
≤ 22	26 (0.5)	5077 (99.5)	26.26
>23	85 (1.5)	5535 (98.5)	0.000*
Gender			
Male	105 (1)	9212 (99)	5.847
Female	6 (0.4)	1400 (99.6)	0.016*
Area Distribution			
Urban	102 (1.2)	8383 (98.8)	11.06
Rural	9 (0.4)	2229 (99.6)	0.001*
Reasons for donation			
Voluntary	71 (0.8)	8862 (99.2)	30.17
Replacement	40 (2.2)	1750 (97.8)	0.000*

* Statistically significant at p value <0.05

DISCUSSION

In the present study more than 80% of the donors were below 30 year of age. Roopa R M et al in their study report out of 6003 donors 64% of them belong to <30 years of age.^[10] Umnikrishnan B et al also report a majority of the donors were under the age of 25 (42.92%),^[7] followed by those aged 26–35(37.20%). Only 0.48% of the donors were above 55 years. Majority of the donors being from younger generation may be because of the health condition and motivation campaign being focused on them as they can easily be motivated in an effort to retain them as repeat voluntary donors.

Majority ie 87% of the donors were male and 79% belongs to Urban area in the present study. Roopa R M et al also report most of the donors (96.93%) being male and 70.85% were from Urban areas.^[10] Kumar A et al report 96.25% were male donors and 66.25% were from Urban setting.^[13] This difference in gender may be due to anaemia, fear of pain, many women being underweight and being exposed to the risk of pregnancy, lactation and menstruation. Most of donors were from urban area, may be due to easy accessibility to blood bank and more awareness in urban settings.

The study also reveal 83% were voluntary donors, 25% were first time donor. Kumar A et al report 68.75% donate voluntarily and 31.8% were first time donors.^[13] Umnikrishnan B et al reveal 22.8% were voluntary donors and Roopa R M et al report only 5.94% blood donors were voluntary donors.^[7,10] The present study is in line with the report by National blood transfusion council where average blood collections through voluntary blood donors is 78%.

Majority of the blood donors belong to O+ve blood group followed by A+ve, this findings is in line with the study conducted by Rao C et al who report blood group O was 42.0% (40.1% O Rh positive and 1.8% O Rh negative) from 14,798 donors under study.^[9]

In this study infectious disease markers were found to be present in 1.91% of the donors population. The major infection among the TTIs were HCV (1.03%) followed by Hepatitis B (0.68%) and HIV (0.19%) respectively. Roopa R M et al reported seroprevalence of HBsAg, HIV, HCV and syphilis were 2.8%, 0.4%, 0.3%, 0.03% respectively, whereas.^[10] Umnikrishnan B et al reveal HBsAg positive (0.87%) followed by HCV positive (0.36%), HIV positive (0.28%) and VDRL positive (0.07%).^[7] Arora et al reported that seroprevalence of HBsAg, HIV, HCV and syphilis was 1.7%, 0.3%, 1.0%, 0.9% respectively.^[14] In order to ensure easily accessible and adequate supply of safe and quality blood and blood components, collection of blood should be focused on voluntary non remunerated blood donation and improved quality testing of donated blood for TTI so as to avoid transmission of infection through transfusion. The present study found out that HIV and HCV were significantly higher among older age group (p=0.009 and 0.000 respectively). HCV is significantly higher among male (p=0.016) replacement donors (p=0.000) and those belong to urban areas (p=0.001). Hepatitis B is also significantly higher among male donors (p=0.022)

CONCLUSION

The study reveal that majority of the donors were from younger generation, which is a good sign as they can easily be motivated to become regular

voluntary blood donors. Focus needs to be drawn towards measures to collect more blood from rural area in order to increase a pool of blood collection. Even though blood collected from voluntary donors are above national average, extensive awareness campaign needs to be generated towards achieving 100% voluntary blood donation.

Seroprevalence was more in replacement donors as compared to voluntary donors. Therefore, it is concluded that voluntary blood donation should be encouraged to prevent transmission of transfusion transmissible infections. Due to high percentage of transfusion transmissible infections among blood donors effective donor education and selection program that promotes self-exclusion by donors at risk of transfusion transmissible infections should be encouraged.

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