

SEROPREVALENCE OF HBV, HCV AND HIV INFECTION AMONG VOLUNTARY NON REMUNERATED AND REPLACEMENT DONORS IN NORTHERN PAKISTAN

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ABSTRACT:

Objective: To compare the prevalence of Hepatitis B, hepatitis C and human immunodeficiency virus (HIV) in voluntary non-remunerated and replacement donors in Shifa International Blood Transfusion Services, over a period of 14 months from January 2002 to February 2003.

Setting: Blood transfusion service of a tertiary care center in northern Pakistan

Method: A total of 3430 donors were bled. Out of these, 3187 (92.9%) pints were from replacement donors and 243 (7.1%) pints were from voluntary non- remunerated donors. Screening of both groups for hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV) antibody and HIV1/2 antibody were performed by using fully automated random access AXSYM (Abbott) which utilizes MEIA technology.

Results: The prevalence of HBsAg, HCV antibody and HIV 1/2 antibody in 3187 replacement donors was 2.51%, 5.14% and 0.25% respectively. The prevalence of same in 243 voluntary non-remunerated blood donors was 0.82%, 2.46% and zero % respectively.

Conclusion: Prevalence of HBsAg, HCV antibody and HIV antibody was much lower in voluntary non-remunerated blood donors as compared to replacement donors. In Pakistan where main source of blood is from replacement donors, the source of blood ought to be changed to voluntary non-remunerated blood donors. This is the only way to achieve the safest blood in Pakistan under current circumstances.

KEY WORDS: Blood donors, hepatitis B, hepatitis C, HIV

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INTRODUCTION

Over 1.5 million pints of blood are collected in Pakistan each year¹. The main source of blood (65%) is from replacement donors^{2,3} with another 10% from professional/or paid donors³. Only 25% of total blood donations come from volunteer non-remunerated blood donors³. Most of the replacement donors are patients' relatives or friends. They are often pressurized to give blood in replacement. At times, this is the only alternative for the relatives to save the life of their dear ones. As a result, these donors either lie about their health and past medical history or bring paid donors and present them to blood bank authorities as patient's relative. These hidden paid donors are mostly professional donors and being part of the mafia surrounding the blood banks in pub-

lic and private sector are extremely high risk for hepatitis B, hepatitis C and HIV.

Blood Banks, on the other hand, keep their pressures on doctors, nurses and patients' relatives and urge them to send replacement donors to maintain their stocks. Because of the lack of proper legislation regarding collection of safe blood, it is very easy for blood bank staff to collect blood from anyone who presents himself to their doorstep. They do not make any effort to motivate and to collect blood from voluntary non-remunerated blood donors. Government and media do not provide any support to blood banks in this regard, which acts as an impediment in recruitment of voluntary donors.

Similarly, most of the bags collected are either not screened⁴ or screened with less sensitive, low quality kits which give false negative results⁵, thus resulting in transfusion of hepatitis B, hepatitis C or HIV agents to recipients⁶⁻⁸. Financial constraint is an important reason for the selection of low quality screening kits in most blood banks.

It has been accepted internationally that prevalence of transfusion-transmitted diseases is much lower in healthy voluntary non-remunerated blood donors⁹⁻¹². Considering these facts, to ensure a safe blood supply, the best option is to improve the donor selection criteria for replacement donors and to increase the number of voluntary non-remunerated donors. The aim of this study, therefore, was to evaluate the differences of these diseases in these two groups of donors in our population so as to form a rationale to increase the proportion of voluntary donors.

SUBJECTS AND METHODS

Shifa International Blood Transfusion Services uses American Association of Blood Banks (AABB) criteria for donor selection and follows it strictly. Following are the various factors taken into account and are applied to all replacement/hidden paid donors, who present at Shifa Blood Transfusion Services at random.

Age	18-60 years
Weight	> 50 kg
Hemoglobin	Male >13.5 g/dl Female >12.5 g/dl
Blood Pressure	Systolic 100-180 mm of Hg Diastolic 60-100 mm of Hg

Following reasons are used for deferral, based on History:

- History of jaundice after the age of 10 years.
- History of close contact with jaundice patients in the last six months
- History of any major illness
- History of surgery or transfusion of blood and blood products in the last one year
- History of tooth extraction in the last 3 days
- History of immunization in the last one week
- Recent history of drug intake like antibiotics etc.

In order to increase the number of voluntary non-remunerated blood donors, two blood camps were organized in Shifa International Hospital premises in August 2002 and January 2003. The aim was to create awareness about the importance of voluntary donation through motivational material in the form of brochures, posters, leaflets and banners and to motivate medical students, employees and general public to donate blood. All healthy voluntary non-remunerated donors were selected at random using the same AABB criteria as used routinely for replacement donors, although relaxation in age limit and weight had to be allowed seeing the insistence of motivated donors for blood donation and individuals with age range from 17-62 years and those with weight >45 kg were allowed to donate. Replacement donors consisted of subjects who presented to blood bank on the request of patients admitted in Shifa who needed blood. Non-materialistic incentives like refreshments (also given to routine replacement donors), nutritional health checkup and free serum cholesterol, triglyceride and glucose tests were also offered to donors.

All donations whether replacement or voluntary were collected in triple blood bags (JMS) and all were fractionated into packed cells, platelets concentrate and fresh frozen plasma using closed system. Screening for HBsAg, HCV antibody and HIV 1/2 antibody was done on fully automated random access Abbott's AXSYM, which utilizes MEIA technology giving highly reliable results. Both internal and external quality assurance (NRL Australia) was exercised for accurate and reproducible results and well calibrated AXSYM equipment was used after the controls have been run and found to be within the two standard deviation.

STATISTICAL ANALYSIS:

Data was collected and entered into Automated Blood Bank Software System, developed by MIS department Shifa International Hospital in Fox Pro as a front end application and back end data base management system and analyzed by standard statistical techniques. Z test was used to compare the difference in proportions regarding the prevalence of HBV, HCV and HIV in replacement/hidden paid and voluntary non remunerated blood donors. P values were calculated along with 95%

confidence interval for difference in proportions among the two groups.

RESULTS

A total of 3430 individuals were bled. Among these, 3187 (92.9 %) were replacement donors. Out of these, 3090 (96.96%) were males and 97 (3.04%) were females, with a mean age of 30.37 years. The deferral rate of these donors on history and physical examination was 10%. Among 243 (7.1 % of total), voluntary non-remunerated blood donors, 188 (77.37 %) were males and 55 (22.63%) were females, with a mean age of 26.77 years. The deferral rate of these donors was 5.8 %. Main reasons for deferral were being underweight and low hemoglobin. Thus, males with hemoglobin <13.5g/dl and females with hemoglobin <12gm/dl were not entertained.

Age distribution of replacement donor and volunteer donors showed that voluntary donors were a little younger in age (Table-I).

All viruses were positive in significantly higher percent cases in replacement/hidden paid donors. A total of 7.9% were positive in replacement/hidden paid donors and 3.28% positive in voluntary donors when B, C and HIV were combined (Table-II).

Table-I: Age distribution of Blood Donors

Age (years) donors (%)	Number of replacement donors (%)	Number of voluntary
17-25	1304 (40.92)	135(55.55)
26-35	1243 (39.0)	47(19.34)
36-45	489 (15.34)	38 (15.64)
46-62	151 (4.74)	23 (9.47)

Table-II: Positivity of HBsAg, HCV and HIV in Blood Donors

	Replacement/Hidden Paid Donors N = 3187	Voluntary Donors N = 243	P value	95% CI
	Number (%)	Number (%)		
HBsAg	80 (2.51)	2 (0.82)	0.048	-0.29-3.68
Anti-HCV	164 (5.14)	6 (2.46)	0.03	-0.14-5.5
Anti-HIV	8 (0.25)	0 (zero)	0.21	-0.37-0.87
TOTAL	252 (7.9)	8 (3.28)	0.004	1.17-8.07

DISCUSSION

This study showed that there was a high rate of HBV, HCV and HIV in replacement/hidden paid donors, despite the high deferral rate of donors on history and physical examination and strict observation of donor selection criteria. Significant *p* value was observed in HBV, HCV and HIV antibodies when compared in aggregate between the two groups. When analyzed individually, *p* value was significant for HCV antibodies and HBsAg revealing high prevalence of these diseases in replacement/hidden paid donors as compared to voluntary non remunerated blood donors. HIV Antibodies had low prevalence of this disease in our donor population.

As healthy voluntary non-remunerated blood donors donate blood of their own free will without any pressure, the prevalence of transfusion-transmitted diseases is much lower in these donors as has been shown in other studies^{9,11,12,13}. They do not donate blood if there is any risk factor and often do not lie about their past medical history, as is usually seen in replacement and hidden paid donors.

All blood banks where main source of blood is replacement/or hidden paid donors, a large percentage of blood bags are discarded leading to increased cost and increased workload to blood bank staff and an overall financial burden on hospitals, whether public or private, which subsequently leads to increase in patient care cost

In Pakistan, the source of blood ought to be changed from replacement/hidden paid/ professional donors to healthy voluntary non-remunerated donors¹⁴ as our data clearly shows that seroprevalence of hepatitis B, hepatitis C and HIV is much lower in voluntary non-remunerated blood donors as compared to replacement /hidden paid donors. This is the only way of achieving the safest possible blood for patients, especially in circumstances where proper screening and confirmatory tests are not available. Better donor selection criteria¹⁵ should be used to exclude doubtful donors on history and physical examination. All

blood banks and blood collection societies should be advised to collect blood from voluntary non-remunerated blood donors by motivating the general public through motivational print material and by arranging blood camps and thus achieve a safe and adequate blood supply by recruitment and retention of voluntary non-remunerated blood donors¹⁶. In this way, blood banks can slowly decrease the percentage of replacement/or hidden paid donors.

Although some of the provincial as well as the Federal Government of Pakistan have passed regulations for safe blood transfusion, the full implementation of these is still awaited. Unauthorized blood banks should not be allowed to collect and distribute blood and blood products. Registration of all blood collection agencies should be done as soon as possible and only those should be allowed to work which fulfill required criteria for donor selection, collection and storage of blood products according to international standards and screen all blood bags for HBsAg, HCV antibody and HIV antibodies with sufficiently sensitive kits.

Media can play a very important role to create awareness among the masses about voluntary donations by eliminating the fears and misconceptions about blood donations¹⁷ and conveying its advantages to general public¹⁸. Partnership between public and private blood collection and distribution agencies is the need of the time. Government help is required to evolve a uniform and non-fragmented national safe blood transfusion policy. The aim should be to change the source of blood and achieve almost 100% voluntary non-remunerated blood donors and mandatory screening of all blood components.

CONCLUSION

In Pakistan, where main source of blood as a whole is from replacement donors and where the screening coverage and modality of screening is variable, the source of blood ought to be changed to regular voluntary non-remunerated blood donors. This is the best way of achieving

safest blood. Government help is required for implementation of recently passed regulations regarding safe blood. Motivation of the public with the help of the government and the media is needed for achieving the goal of 100% regular voluntary non remunerated blood donation through out the country.

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REFERENCES

1. Mujeeb SA. Donation of Blood in Pakistan: Risks and Resources. Blood Transfusion. A Technical and Clinical Care. Mujeeb SA (ed) Karachi, pp 1-8, 1998.
2. Mujeeb SA. Single unit blood transfusion, a bad clinical practice? Transfusion Today 1997; 36: 5-7.
3. El-Nageh M. An overview of blood transfusion services in countries of the Eastern Mediterranean region. Transfusion Today 1998; 37: 12-19.
4. Mujeeb SA. State of Blood Transfusion services in Karachi: A review in the context of Blood Transmitted infections. Inf Dis J Pak 2000; 11: 129-130.
5. Mujeeb SA, Hafeez A. Low cost screening of blood for HCV infection in the developing world. Vox Sang, 1998;74:210.
6. Kumar H, Naqvi SA, Ahmed A, et al. Hepatitis C antibodies in hemodialysed vs non hemodialysed patients. J Pak Med Assoc 1994; 44: 28-30.
7. Luby S, Rafique K, Maliha A, et al. Evaluation of blood bank practices in Karachi, Pakistan and government's response. Health Policy Plan 2000; 15: 217-222.
8. Mujeeb SA. Blood Sport. Tuesday Review. Daily Dawn, Karachi 1996, Jan 23, pp 29.
9. Mujeeb SA, Kausar A, Khalid M. Seroprevalence of HBV, HCV and HIV infection among college going voluntary blood donors. J Pak Med Assoc 2000; 50: 269-270.
10. Ahmed A, Shamsi TS, Hafiz S, et al. Seroprevalence of hepatitis B and C virus among professional blood donors: a single center study of 135 donors in Karachi. J Pak Med Assoc 1995; 45: 309.
11. Mujeeb SA, Hussain W, Haq A. Prevalence of hepatitis B infection in professional and voluntary blood donors. J Pak Med Assoc 1994; 44:226.
12. Bastiaans MJ, Nath N, Dodd RY, et al. Hepatitis-associated markers in the American Red Cross volunteer blood donor population. Vox Sang 1982; 42:203-210.
13. Kakepoto GN, Bhally HS, Khaliq G. Epidemiology of blood borne viruses. A study of healthy blood donors in Southern Pakistan. Southeast Asian J Trop Med Public Health 1996; 27: 703-712.
14. Mujeeb SA, Mahmood K. Prevalence of hepatitis B, C and HIV infection among family blood donors. Ann Saudi Med 1996; 16:702-703.
15. Mujeeb SA. Guidelines for selection of blood donors. J Inf Dis 1998; 5: 18-19.
16. WHO Consensus statement on how to achieve a safe and adequate blood supply by recruitment and retention of voluntary non remunerated blood donor. April 8-11. 1999 Global programme on AIDS. Geneva. WHO/LBS/93.2.
17. Khalid H. Blood donations, the myths, the costs and the risks. The Daily News, Karachi 1995, March 10, pp 11.
18. Sullivan JL. Blood donation may be good for the donors. Vox Sang 1991; 61: 161-164.
19. Salonen JT. Donation of blood is associated with reduced risk of myocardial infarction. The Kuopio Ischemic Heart Disease Risk Factor Study. BMJ 1997;314:793-794.