

Original Article

SAFE BLOOD BEGINS WITH SAFE DONORS

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ABSTRACT:

Objective: To identify the safest group of blood donors demographically with regard to risk of transmission of diseases in order to develop effective recruitment and retention strategies.

Design: Demographic data and the results of screening for HIV, HBV & HCV in three different groups of blood donors have been analysed to identify the safest group of blood donors. All donors were subjected to medical interview and examination to exclude any donor who responded in the affirmative for any recognized risk factors or was considered unfit to donate blood as per national standards & guidelines. Additional data regarding educational and socio-economic status was also obtained & analysed.

Subjects: Initially 703 donors registered to donate blood. None responded in the affirmative for any of the risk factors. 65 (9.25%) were deferred for different reasons and 638 donors were bled from the following three groups:

- 1) Healthy college going first time volunteers,
- 2) Healthy factory workers also first time volunteers and
- 3) Healthy voluntary non-remunerated donors (VNRD) who had donated at least twice in the calendar year at a hospital based blood bank.

Setting: Blood from groups 1 and 2 were collected on mobile bleeding sessions, while data for group 3 was obtained from two busy teaching hospital blood banks. Testing for HIV, HBV, & HCV were carried out by rapid serological screening methods. All initially reactive donors were confirmed on EIA at the laboratories of the Institute of Haematology & Blood Transfusion Service, Punjab. All false positive, initially reactive, donors were excluded from the study.

Main Outcome Measures: Identification of safest blood donor group.

Results: We found that generally younger people in our society posed a lesser risk to transmission of diseases as blood donors. The frequency of HCV positivity is alarmingly high amongst the poor in our society. Even amongst repeat donors the incidence of infectious disease markers are considerable. If appropriately motivated, women are equally poised to donate blood altruistically.

Conclusions: There is a need to target younger people in recruitment and retention programmes for blood donations. Incentives like free hepatitis B vaccination should be given to preserve the existing repeat donor pool. Donor deferral registers need to be created and placed for easy reference at all blood banks. Due to the high risk of HCV transmission through blood obtained from the less fortunate class in our society, large scale HCV screening of the general population should be started and epidemiological studies undertaken to identify causes of such high frequency in order to curtail impending catastrophe.

KEY WORDS: Blood Safety; Safe blood donors; recruitment & retention strategies.

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INTRODUCTION

Blood donors belong to heterogeneous groups of people in the society, differing in their demographic characteristics and the psychological factors that motivate their behaviour.¹ It is important to analyse the various blood donor characteristics in order to manage blood donor programmes. Blood safety and blood supply are profoundly impacted by the method

of recruitment, specific health history taking and blood screening.

Not only are newer diseases being identified that spread through transfusion but testing methodologies for known transfusion transmitted infections (TTIs) are also reaching the limits of sensitivity due to multiple factors. The limitation for detection of transfusion-transmitted viruses is universally being felt. It is increasingly being realized that refinement in the testing methodologies will be an ongoing exercise and new methodologies have to be tried, refined and reconfigured to increase blood safety. With the introduction of higher sensitivity tests, the costs of transfusion services are soaring and investment to such an extent in screening methodologies may not be the best way to use limited resources devoted to blood safety². This is even more relevant to developing countries where a lot can be done by simpler and cheaper proactive approaches³.

Unfortunately, too much reliance is laid on screening, even though all are cognisant of the existence of window periods for TTIs. The focus of efforts to increase the safety of the blood supply that weighs heavily on screening, needs to be shifted strongly to the selection, interview and the medical examination of the prospective donor. The value of volunteer, altruistically motivated blood donors in the maintenance of a safe blood supply is clear. However, as the numbers of lifelong repeat donors diminish, blood centres and hospital blood banks find it difficult to bring in an adequate number of "safe" new donors into the system⁴. Even in the US, first time donors constitute approximately 51% of whole blood donations⁵. In Pakistan, we need to modify our approach to donor recruitment so that the "safest" donors are recruited and retained. Increased attention has, therefore, focused on the identification and recruitment of donors whose individual or demographic characteristics place them in a category of increased safety.

Definitive risk groups of blood donors have been well defined and it is generally believed that safe donors are those who report no behavioural risk factors, and whose donations

are repeatedly negative on screening⁶. It is also believed that altruistic repeat volunteers are generally safer donors as compared to replacement or family donors. First time and paid donors are usually viewed with suspicion. The bias needs to be re-assessed especially as a lot of ambiguity exists even in the West regarding what is the most appropriate definition of paid donors. It has been reported that employers in some countries, give substantial amounts of "money" in the form of paid time, off work, for donating blood and yet can still be considered by the FDA to be "volunteers". In the 1996 AABB annual meeting, one such employer was honoured with an Outstanding Achievement Award for its blood programme in which employees were paid 1.5 hours' salary as often as every sixty days to donate blood. This practice seems contrary to the philosophy of true volunteerism⁷. In Pakistan, the major issue is not paid versus non-remunerated donor but first time versus repeat donations. As our blood collection comes predominantly from first time replacement donors, we have conducted this study to show that in the local context, age, sex, education and to some extent socio-economic factors play a pivotal role in blood collection and blood safety, rather than the number of times a person has donated blood. We have analysed the screening data from first time volunteer donors who are young college going students and first time factory workers in a slightly higher age group, with limited education and belonging to the less privileged segment of the society. We have also analysed the screening data of regular repeat blood donors who donated at least twice in one calendar year at our blood banks. We have compared their data to that of our general prevalence rates reported earlier by our Institute on a much larger database. Our findings also reflect on the need to re-orientate our awareness, recruitment and retention strategies in order to maintain adequate and safe blood supply for the future.

MATERIALS AND METHODS

Over a period of one year, 638 blood dona-

tions were collected from three different volunteer blood donor groups as follows:

1. Healthy college going first-time volunteer donors,
2. Healthy factory workers also first-time volunteer donors and
3. Healthy voluntary non-remunerated donors (VNRD) who had donated at least twice in one calendar year.

The blood collection was carried out at mobile field sessions for groups 1 & 2. Blood from the third group of blood donors was collected at hospital based blood banks.

All blood donors were aged between 18-60 years, with acceptable weight and haemoglobin. A detailed interview and medical examination was carried out to exclude any donor reporting a known risk factor as per national standards & guidelines. Two other parameters were additionally evaluated; the donors were requested to group themselves according to their or their family income into appropriate socio-economic group starting from poor to upper class and information regarding their level of education starting from no formal education to beyond graduation, irrespective of subjects, was also obtained.

Initial screening was carried out on ICT devices for HIV & HCV and by latex agglutination using Biotec (U.K) kit for HBV. All ini-

tially reactive donors were confirmed by EIA at the Institute. Any false positive, initially reactive, donor data has been excluded.

RESULTS

Table-I shows two important demographic variables noticed in the study groups. The foremost noticeable difference is the high number of female blood donors (45.5%) amongst the college-going first-time blood donors. In the other groups combined, the females constitute only 3.1%. The other difference is in the average age of the donors. However, the age factor can be ignored as it was logical for college-going students to be in a younger age group.

Table-II shows the distribution of donor deferral in the different groups of donors.

Out of 65 (9.25%) of the donors deferred, 1(0.15%) donor was epileptic, 2(0.3%) were hypertensive, 2(0.3%) reported to have had jaundice and 1(0.15%) to have had malaria in the recent past. All these deferred donors belonged to the group of factory workers. The remaining 59(8.4%) were healthy college going first time volunteers. Of these 37(5.3%) were under weight and 22(3.1%) were deferred due to low haemoglobin. All 59 in this group were females. No donor was deferred in the VNRD group studied. No donor reported any behavioural risk factors.

Table-I : Age and sex distribution in the Study groups

Types of donors	No. of donors Bled	Age Range in years	Average age in years	Sex Distribution	
				Male	Female
College Students	288	18-22	21.4	157	131
Factory workers	98	22-49	35.6	98	0
VNRD	252	18-43	31.8	241	11

Table-II : Donor deferral in the different Study groups

Types of donors	No. of donors regd.	No. of donors bled	No. of donors deferred	%age donors deferred	Sex Distribution	
					Male	Female
College Students	347	288	59	17.0	Nil	59
Factory workers	104	98	6	5.8	6	0
VNRD	252	252	Nil	Nil	Nil	Nil
Total	703	638	65	9.25	6	59

Table-III shows the educational levels of the donors in the study groups. First-time college going students were predominantly undergraduates. Amongst factory workers, first time donors, none had education beyond schooling. There was marked variation in the educational level of the VNRD or repeat donors, but here also undergraduates showed more commitment followed by those who had completed formal schooling. Educated people on the whole showed more commitment and realisation to donate blood both as first-time or even continuing as repeat donors.

Coming to the socio-economic status of the blood donors, we found that 79.2% of our donors combined belonged to the middle class. This class was divided into two groups, lower middle class (38.9%) and upper middle class(40.3%). We found that the poor (15.4%) and the rich (5.5%) contributed least to the donor pool. Further, 91.8% of the factory workers who were donating blood for the first-time categorized themselves as poor (Table-IV). This attains marked significance when we analyse their TTI status.

Table-V shows the percentage frequency of the major infectious disease markers in the three groups of blood donors studied. It will be noticed that the frequency of HIV is 0% in all the three groups. Hepatitis B shows the lowest frequency amongst college-going first time blood donors, followed by VNRD/ repeat donors. The first time blood donors working at factories showed a slightly higher frequency of HBV positivity as compared to both the other groups.

The finding that there is no statistically significant difference in the HBV & HCV frequency of healthy college going first time donors and VNRD/repeat donors and the HBV frequency of first time donors working at factories, should be a cause of concern for blood banks. The NVRD/repeat donors are considered he 'safest' blood donors but this finding points to the number of related issues discussed later and fortifies the conclusion drawn.

What we have found to be more disturbing in this data is that the frequency of HCV is lowest in the college students and a little higher in VRND/ repeat donors; but as we move to the group of the factory workers, we find that this

Table-III: Educational levels in the study groups

Types of donors	No. of donors	No formal education	Middle	Matric	Under graduate	Graduate or above
College Students	288	---	---	---	288	Nil
Factory workers	98	13	27	58	Nil	Nil
VNRD	252	03	22	74	114	39

Table-IV: Socio-economic status of the study groups

Types of donors	No. of donors	Poor class	Lower middle class	Upper middle class	Upper class
College Students	288	-	191	89	08
Factory workers	98	90	8s	-	-
VNRD	252	08	49	168	27

Table-V: Distribution of TTI status in the study groups

Types of donors	No. of donors	Average age	TTI % age positivity		
			HIV	HBV	HCV
College Students	288	21.4	0.0	1.12	0.7
Factory workers	98	35.6	0.0	1.67	11.8
VNRD	252	31.8	0.0	1.47	1.3

frequency jumps tremendously to 11.8%. Although the sample size is small, such a high frequency needs further evaluation.

As there were no females in the group of factory workers, we are unable to comment on sex variability. However, it is evident from the different tables above, that these donors who showed a frightening frequency of HCV positivity were of higher average age, belonged predominantly to the poor socio-economic class, and none had received education beyond schooling.

DISCUSSION

The donor base in our service is predominantly first-time replacement or first-time voluntary donors. There is a very small pool of repeat or voluntary non-remunerated blood donors. The first-time voluntary donors are mostly students of different colleges or factory workers who donate on mobile camping sessions arranged by the Institute in collaboration with the blood donor societies or welfare societies working in these institutions. The service has been unable to establish a large base of true altruistic voluntary non-remunerated blood donor pool due to a variety of reasons. Although, it is true that repeat donors are considered to be safer as compared to first-time donors, in our social and psychological environment, we find it difficult to recruit appropriate numbers of voluntary repeat donors to match our needs in running the largest blood transfusion service in Pakistan.

Although, steps are afoot to meet increasing demands through repeat donations, in this study, we indulged in a little introspection to see whether viewing the first-time donors with the sort of suspicion they are generally subjected to by the blood transfusion services, is correctly warranted. We manage a large public sector blood transfusion service, funded by the Government through a network of almost 120 hospital based blood banks of different tiers and spread out throughout the province. Our total annual collection, on the average, exceeds 300,000 pints of blood. The service is totally free for the patients who seek treatment at these

Government hospitals where the blood banks are located.

The data of infectious disease test results representing donations from three groups were analysed with the aim to assessing the prevalence of key infectious disease markers amongst first time and repeat donors of allogenic whole blood. We analysed the results of college-going students who donated blood for the first time in response to motivation/awareness drives of the Institute as well as test results of regular repeat donors who donate at least twice in one calendar year, under empathy for friends or relatives at hospital based blood banks. We selected another group of voluntary first time donors for comparison purposes of the important infectious disease markers. These donors were of lower educational background and belonged to lower middle to poor socio-economic class, consisting of factory workers. The rationale was that in our local scenario, it might not only be how many times one has donated that affects the risk behaviours which are documented to affect TTI status in donors, but a host of other factors as well that affect blood safety.

The very first striking difference we have noted amongst our different study groups is the marked predominance of male donors amongst repeat donors and first-time blood donors working at factories. The difference in sex distribution in the group of factory workers can be brushed aside due to the gender bias or gender proclivity in the selection of such workers in our social set-up, however we also noted a marked & clear difference in the sex distribution of VNRD and first-time college going blood donors. This could be due to a number of reasons; firstly due to increase in the female population, together with higher number of girls going to colleges, as well as to the higher level of conscientiousness due to the motivational talk that is given before mobile sessions. When we analyse the data of repeat donors, we noted that there is a wrong impression about women folk or false sense of providing protectionism for the women folk in our society. This hinders us from seeking their help

in collecting blood. After-all, how many times have each one of us sought cooperation of women in donating blood for our own relatives when we are looking for repeat donors? Why is it that we expect only men to come forward and donate blood? Our women folk are equally capable, at least in so far as our educated people are concerned. Massive efforts need to be taken to re-educate ourselves and to do away with this social taboo. Women on their part have proven that they are prepared to come forward to help us as is evident from the good percentage of female donors amongst the college students. This is perhaps, a data unique to a conservative society like ours. In the West, the proportion of male and female one time whole blood donors is reported to be almost equal⁴.

The donor deferral rate in our study was 9.25%. Donors who were deferred due to other risk factors like jaundice, hypertension, epilepsy & malaria belonged to the group of factory workers, were poor and slightly older. The younger blood donors were deferred not due to any medical reason but simply either due to low haemoglobin or for being under weight. Further, these 59 donors were all females. This could reflect on our poor eating habits and are easily correctible. We also found that donors do not report any behavioural risk factor. This could either be due to ignorance or fear of social taboo or some other reason. It is therefore necessary that appropriate education of prospective donors together with a system of confidential unit exclusion be developed. In another study, a similar figure has been reported regarding donor deferral in Pakistan. In that study, although, the reasons for deferral were different, it is pertinent to point that even with vigilant donor interview and deferral process 2% of their repeat donors tested positive for one of the infectious disease markers⁸. It is interesting to mention here, that after the 9/11 incidence, different studies are advocating changing deferral criteria⁹ and even seeking FDA clarification on blood donor incentives in order to fulfil the demands for transfusion¹⁰. One of the incentives being suggested is schol-

arship programmes for high school students¹¹. This is some food for thought for us as well.

Another notable difference in the demography, is in the average ages of the three study groups. College going students donating for the first time, were naturally younger, while first-time factory working donors and repeat donors were in more or less the same but slightly higher age group. The higher average age of repeat donors could be due to their commitment, motivation and fewer apprehensions regarding blood donation as compared to first-time donors. Our findings are in consonant with the Reds Study, wherein 37% of total whole blood donors were below the age of 25 years, with 38% of them having only high school education. Repeat donors were older and had a higher level of education⁵.

This difference gains significance if viewed together with the occupation and TTI status. First-time college going students are naturally younger, and the risk of TTIs, is also less. Young college going students are therefore the best and appropriate target group for voluntary donations. This finding has also been reported in Pakistan previously¹². Recently after 9/11 episode, even in the US the prevalence rates of all markers among the first-time donors were found to be slightly lower than those seen previously. This study also highlights the impression that media concerns regarding new donors of being at undue risk of carrying transfusion transmissible pathogens is not entirely true¹³.

It is perturbing to note the fact that increasing age especially in the occupational group studied shows marked increase in the frequency of positive reactivity for TTI markers especially for hepatitis C. The VNRD, even though belonging to a higher age group, do not show such marked changes as compared to our previously reported data on a much larger database, wherein the seroprevalence of HIV is 0.001% and that of HBV is 2.259%¹⁴. Amongst the major TTI markers screened for in our service, the overall seroprevalence of HCV is the highest at 4.1% as reported earlier¹⁵. Although, greater commitment of repeat

donors would have us believe that the prevalence/incidence rates of TTIs would be lower, formal evidence in support of an inherently lower risk is less as compared to our total data especially that of HBV. This can be explained by analysing the educational level of this group and their socio-economic status. The blood donors with lower levels of education and socio-economic status have higher frequency of HBV and markedly high frequency of HCV positivity. This may partially be due to the fact that, by the time, an average member of this group reaches this age in our society, they are married and have had children. The financial burdens they have to bear as bread winners of the family leaves little allocations ever made for health care. Low wages force such workers often to seek cheap health care that is invariably substandard and ridden with malpractices. The re-use of disposable syringes, unsterilized or improperly sterilized medical & dental instruments, and the observation that this class of people generally even get their beards shaved by barbers whose razor might be doing more harm than good, are only some of the reasons to explain this finding. Commitment on the part of all concerned is needed to curb this growing menace. It is our observation that not only occupation, but education and socio-economic status also influence the risk of TTIs. All college-going first time donors showed lowest TTI markers, while the VNRD donors showed little variance. But factory workers also first-time donors, had the highest incidence of both HBV and HCV. It is also pertinent to point out that the increased HCV positive donors belonged to the lower socio-economic strata of the society.

Blood donor recruitment and retention are areas that need constant and changing attention to live up to the dynamisms of the challenge to obtain enough blood to match the transfusion requirements. The threat to blood safety by seronegative individuals during the infectious window period should be seriously evaluated especially as a significant number of repeat donors have tested positive later. Look back techniques whereby facilities attempt to

identify recipients of blood donated by individual donors who subsequently test positive for TTIs should be practiced.

CONCLUSIONS

We feel that important core issues have been identified and need to be addressed in the appropriate perspective in developing blood donor recruitment and retention programmes. The strategies that we would like to advocate in the light of our findings, are:

1. Young college going students in the age group 20-25 are the safest group of blood donors.
2. Recruitment programmes must reach out & appeal to this group of donors.
3. Public awareness and donor counselling should be stepped up and provision of confidential unit exclusion should be put into practice at the blood banks.
4. Donor deferral registers must be placed at all blood banks and referred to in order to avoid bleeding a infectious repeat donor.
5. Lookback techniques should be put into practice to identify and investigate recipients of blood/blood products from donors who subsequently test positive for TTIs.
6. Hepatitis B vaccination should be given free as an incentive to any donor who donates atleast twice in one calendar year.
7. Altruism as the cornerstone of all volunteer blood supply is not sufficient; donor incentive programmes need to be developed which may include scholarships, awards at the governmental level, or graded health care facility for blood donors.
8. Empathy for friends & relatives is a major factor in the large number of replacement donors in Pakistan which should not be viewed wrongly.

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