

Are university students a favorable target group for blood donation campaigns?

Üniversite öğrencileri kan bağış kampanyaları için uygun bir hedef kitle midir?

Bülent Eser¹, Fatih Kurnaz¹, Leylagül Kaynar¹, Mehmet Yay², Serdar Şıvgın¹, Ali Ünal¹, Mustafa Çetin¹

¹Department of Hematology, Erciyes University Medical School, Internal Medicine, Kayseri, Turkey

²Blood Bank, Erciyes University Medical School, Kayseri, Turkey

Abstract

Objective: The aim of this study was to investigate the willingness of university students regarding blood donation and to compare results among residents living in the Kayseri city center.

Materials and Methods: Admission for blood donation after donor acquisition campaigns and the rates of repeated donation over a one-year period were compared between the two groups.

Results: Between November 2006 and August 2008, a total of 29614 people were included in the study. After educational campaigns, the rate of admission for blood donation was 66% among university students, while it was only 29% among the city residents. Although the deferral rate and adverse events during donation were found to be higher in the student group, they had a higher repeated donation rate and higher return rate after a short message system.

Conclusion: University students appear to be good candidates for long-term regular blood donation. Use of a short message system to issue reminders about blood donation may be a reasonable method to replenish the blood supply. (*Turk J Hematol* 2010; 27: 275-81)

Key words: Blood donation, university, student

Received: June 24, 2010

Accepted: August 10, 2010

Özet

Amaç: Bu çalışmanın amacı üniversite öğrencilerinin kan bağış konusundaki istekliliklerini araştırmak ve bu grubu Kayseri şehir merkezinde yaşayan insanlarla karşılaştırmaktır.

Yöntem ve Gereçler: İki grup donör kazanım kampanyaları sonrası kan bağış için başvurma ve bir yıl içinde tekrar kan bağış yapma oranları yönünden karşılaştırıldı.

Bulgular: Kasım 2006 ile Ağustos 2008 arasında toplam 29614 kişi çalışmaya dahil edildi. Eğitimsel kampanyalar sonrasında kan bağış için başvurma oranı üniversite öğrencilerinde %66 iken bu oran üniversite dışı grupta sadece %29 idi. Reddedilme ve kan verme işlemi sırasında istenmeyen etki

gözlenme oranı öğrenci grubunda daha fazla gözlenmesine rağmen bu grupta toplam tekrar donör olma ve kısa mesaj sistemiyle hatırlatma sonrası yeniden donör olma oranı daha yüksekti.

Sonuç: Üniversite öğrencileri uzun süreli düzenli kan bağışçısı olmak için iyi bir aday grubudur. Kan bağışının hatırlatılması için kısa mesaj sisteminin kullanılması kan stoklarının yerine konması için akılcı bir yöntem olabilir. (Turk J Hematol 2010; 27: 275-81)

Anahtar kelimeler: Kan bağışı, üniversite, öğrenci

Geliş tarihi: 24 Haziran 2010

Kabul tarihi: 10 Ağustos 2010

Introduction

The recruitment and retention of sufficient numbers of regular, volunteer blood donors are important issues for maintaining an adequate and safe blood supply. The World Health Organization (WHO) and the Council of Europe recommend that blood and blood components should be collected only from voluntary donors in order to ensure the safety of blood products [1,2]. According to this recommendation, a person donates of his/her own free will and receives no payment; thus, the donation should be voluntary and non-remunerated. It is of the utmost importance to prevent the transfusion-transmissible infectious diseases. Paid donations are prohibited by law in Turkey. Blood product requirements are generally provided from voluntary blood donors and partially from patients' relatives in the country. Acquisition of regular volunteer blood donors remains an important issue for maintaining the blood supply.

Volunteer blood donation recruitment and retaining strategies include all the activities that increase the number of volunteer donors. Television, posters, bulletins, newspapers, and the internet are some of the methods that promote blood donation and acquaint individuals with the process [3]. It seems the best means of providing face to face information to blood donor candidates about blood donation and to inform them regarding the importance of the safety of blood and blood products for patients in order to increase donor retention [4]. To remind regular donors and request their donations are also important steps toward replacing depleted blood supplies. There are some methods that have been used for this purpose; however, the short message system (SMS) request via mobile phones has not been widely used in our country.

It is not enough to just inform candidates about the benefits and necessity of blood donation; they

must also be convinced to put aside any misconceptions they may have on the subject [5,6]. Educational and social status and prior misconceptions are important factors in blood donation. Young people may be good candidates for becoming regular blood donors. Furthermore, red blood cells obtained from those younger in age have a longer survival potential than the cells obtained from older individuals because of less deformability of the red blood cells [7]. As university students are well educated and young, we investigated their willingness regarding blood donation and compared results with the willingness among other residents in the city center.

Materials and Methods

Approximately 25,000 units of whole blood are collected annually in Erciyes University Blood Bank. The data between November 2006 and August 2008 were evaluated. Up to November 2006, it was not a routine practice for regular volunteer donors to donate blood because limited regular blood donors were available in the city. In general, blood products were obtained from occasional replacement donors (from the close friends and family of the patients). In order to increase the number of voluntary blood donations, an acquisition program was started in November 2006. Two experienced blood bank employees were trained for two weeks concerning donor motivation. Then, they were charged with donor motivation members to reach the volunteers effectively and to create a high awareness about the importance of blood donation. Six persons, including three nurses and one doctor, were also assigned as a mobile blood collection team. People were informed with announcements and publications via television, the internet, brochures, and posters. The information contained a brief education about the necessity of blood donation for the patients and the

safety of the blood donation process. Each group consisted of 40-50 persons and information was given in approximately 20 minutes. Any suspicions or questions from the audience were addressed and a face to face interview was conducted if required. After being given information about blood donation, candidates were kindly asked whether or not they wanted to be a blood donor. A questionnaire was then distributed for all candidates older than 18 years who were admitted for donation. All candidates underwent a medical examination and laboratory tests including pulse rate, arterial blood pressure, fever and hemoglobin (Hb) level. If the physical examination results and Hb level were within normal ranges, a physician interviewed the candidates to investigate the risk of syphilis and blood transmissible viral infections (hepatitis B, C and human immunodeficiency virus [HIV]). The deferral criteria of donor candidates were evaluated according to the directives of Turkey's Ministry of Health. Candidates were compared regarding reasons for deferral after pre-donation screening interviews. The appropriate candidates were asked to donate blood.

Adverse events during blood donation were also recorded. Samples for syphilis and viral markers (HBsAg, Anti-HCV, and Anti-HIV) were obtained from the blood bags. The syphilis test was conducted with VDRL and others with the ELISA method. Tests were studied with the micro ELISA method in Etimax 3000 device; a second generation bio-assay (Diasorin) was used for HBsAg, a third generation bio-assay (Diasorin) for anti-HCV, and a fourth generation bio-assay (Diasorin) for HIV. Viral parameters (HBsAg, anti-HCV, anti-HIV), reasons for donor deferral and adverse events were compared between the two groups. The donors' personal data were recorded on the computer, and they were followed up for further donations. Mobile phone numbers were also requested in order to recall them via the SMS. They were invited for blood donation by SMS when stores of rare blood groups were depleted or in the case of emergent blood product requirements. In the content of the SMS, the candidate was asked to donate for emergency patients by admitting to our blood bank or to call us regarding a donation. Donations could be taken in the donor's own locale, if they so desired. SMS requests were

sent only once for each donor, and all volunteer donors were thus asked once a year for blood donation sequentially. At the time of donation, the candidates were queried regarding whether the admission was voluntary or in reply to a SMS request.

The data were evaluated and analyzed by Pearson's chi-square statistical method. A p value less than 0.005 was considered statistically significant. Analyses were performed with SPSS, release 16.0 (SPSS, Inc., Chicago, IL).

Standard written informed content forms were obtained from all donors for blood donation, according to the directives of Turkish Ministry of Health.

Results

From November 2006 to August 2008, 29614 people were informed about the safety of the donation procedure and the importance of voluntary contribution of blood products for patients. A total of 8730 students were registered on the university campus, and 5832 (66%) of them applied for blood donation. Blood was drawn from 4424 (75%) of those who were eligible for donation. Median age of the students was 20 years (range: 18-22 years). Of the donors, 1198 (27%) were female and 3226 (73%) were male. Outside the university, 20884 people residing in the city center were informed, 6111 (29%) of those applied as volunteer donor, and 5341 (87%) of them were eligible for blood donation. The group consisted of 267 (5%) females and 5074 (95%) males, and the median age of the group was 31 years (range: 18-60 years). Most of the donors (19840 of 20884) from outside the university had high school or lower educational levels (95%). The rate of application for donation after the brief education was significantly higher among the student group than the other donors ($p < 0.001$).

A total of 2178 persons were deferred; from the whole group, the top deferral reason was low Hb level in 892 (40%). Types of deferrals and their distribution are outlined in Table 1. There were significant differences between the two groups with respect to the deferral reasons of low body mass index (BMI), fear and age ($p < 0.001$).

Infectious screening test results were as follows: HBsAg was detected in 46 of the students (1.03%) while anti-HCV was detected in only 1 (0.02%).

Table 1. Causes of donor deferral

Causes of donor deferral	U group n (%)	OU group n (%)	Statistics
1 Hb levels outside normal limits	654 (15.8)	238 (4.5)	p<0.001
2 Hypertension or hypotension	33 (0.8)	48 (0.9)	p>0.05
3 Outside age limits (>65, <18 years old)	119 (2.7)	48 (0.9)	p<0.001
4 BMI <18 kg/m ²	208 (4.7)	72 (1.3)	p<0.001
5 High risk for hepatitis or HIV infection	35 (0.8)	59 (1.1)	p>0.05
6 Fear (hospital, nurse, needle, hematophobia)	88 (2.0)	40 (0.7)	p<0.001
7 Acute infections	28 (0.6)	31 (0.6)	p>0.05
8 Chronic diseases or drug use	170 (3.8)	172 (3.2)	p>0.05
9 Blood donation within last 2 months	26 (0.6)	35 (0.6)	p>0.05
10 Other	47 (1.1)	27 (0.5)	p<0.05
Total	1408 (24.1)	770 (12.6)	p<0.001

U: University; OU: Outside university; BMI: Body mass index

HBsAg was detected in 92 (1.7%) of the donors from outside the university and anti-HCV was detected in 1 (0.018%). The rate of HBsAg positivity was significantly higher ($p=0.005$) in the group from outside the university. There was no statistically significant difference in the rate of anti-HCV positivity between the university group and those from outside the university. HIV and syphilis test results were negative in both groups.

During the study period, volunteers were followed concerning repeated donation for a one-year after their donation. A total of 1403 volunteer donors (32%) from the university group applied more than once for blood donation (1088 once more, 315 more than twice). In this group of volunteers, 533 were responders to SMS and 870 applied of their own accord (without any call or SMS). On the other hand, 582 donors (11%) in the group outside the university applied more than once (419 once more, 163 more than twice). While 434 of them applied to the blood bank after SMS messages, 148 applied of their own accord. The rate of candidates who donated blood more than once was significantly higher in the university donor population when compared with the other group ($p<0.001$). The donation rate after SMS requests was also significantly higher in the university group (12% vs. 8%; $p<0.001$).

There were 106 recorded adverse events. The most commonly observed adverse reaction related to the donation procedure was vasovagal symptoms ($n=97$), including sweating, pallor, nausea

and dizziness. Others were hematomas near the venipuncture site ($n=5$) and signs of hypocalcemia ($n=4$). There was no serious adverse reaction. Adverse events were significantly more frequently observed ($p<0.001$) in the university group ($n=77$) than in the group from outside the university ($n=29$) (1.7% and 0.5%, respectively) (Figure 1a, 1b).

Discussion

In recent years, there has been an increase in blood consumption. Improvements in the areas of surgery, stem cell transplantation and cancer chemotherapy are some of the factors responsible for this increment in blood demand [8-10]. Stringent eligibility criteria for donors increase safety standards in blood transfusion, but this approach may decrease the number of voluntary donors due to donor deferrals [8,9,11]. Young adults, in general, have good health and may have a long donor career. An increase in the number of younger blood donors gives us an opportunity to improve donor recruitment and its maintenance [4,12]. In Turkey, the number of young people under 28.5 years represents approximately 50% of the population, so it is very important to make efforts in recruiting and retaining this source of young donors in the country [13].

Lack of request was the most frequently reported reason for not donating blood among young donors [12,14]. Effective communication is one way of raising awareness among eligible donors while

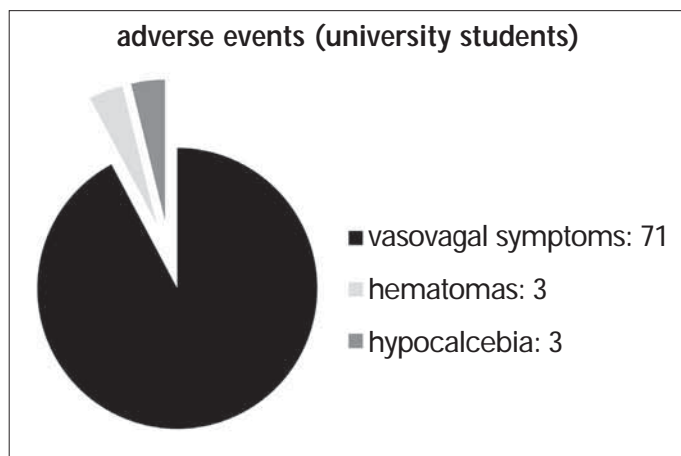


Figure 1a. Distribution of adverse events during donation in university students

also increasing the frequency of donations. Personal communication, advertisement using classical communication instruments (i.e. newspaper, TV), the internet, brochures, and posters have all been used in the recruitment of new donors. In the present study, it was observed that after receiving brief information about the importance of volunteer blood donation, willingness rates among individuals were significantly higher in the university population than among those from outside the university (66% and 29%, respectively). Some studies have suggested that a higher educational level is associated with a higher return rate [5], and our study supports these findings.

Phone calls, SMS, letters, and e-mails can be used both to remind donors to give blood and to retain regular donors [4,14]. In one study, a survey of 3,167 blood donors revealed that only 15.7% of those who received automated telephone recalls returned for blood donation, whereas 35% of those who received a telephone call from a donor recruiter returned to donate blood [2007, unpublished]. This shows that direct communication is a more effective way to retain donors [4]. In the present study, volunteer donors were reminded by SMS to replenish the increased blood need, especially when stores of rarely found blood groups were depleted. In this way, a total of 9625 volunteer donors were requested and 967 (10%) of them returned for blood donation. The return rate was higher in the university student population. The university students might be more sensitive about the importance of blood donation. Difficulty in getting permission from employers, transportation difficul-

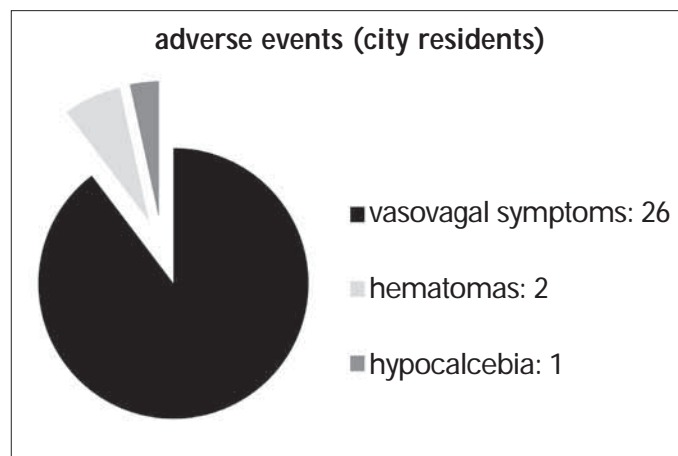


Figure 1b. Distribution of adverse events during donation in city residents

ties, and physical and economic loss may be some of the reasons for low blood donation, particularly in developing countries. To establish a wider donation web, the formation of a donor access team to take blood from donors in their own area should lead to an increase in donation rates.

There are some eligibility criteria in order to maintain blood safety and to protect blood donors and recipients. In the present study, 24.1% of the student donors and 12.6% of the other donors were deferred. The most common deferral reason was a low Hb level, and the others were chronic diseases or drug use, a low BMI, being outside the age limits, and fear (e.g. of hospitals, nurses, needles, and hematophobia), respectively. Low Hb levels and a low BMI were significantly more frequent among donors from the university population than from outside the university. These results may be due to the higher rate of female donors in the university population (27%) than in the population from outside the university (5%). In the literature, it was shown that approximately 10-15% of potential donors were deferred [15-17]. Our relatively higher deferral rate may be explained by our strict deferral criteria in order to ensure safe donation and to provide safer blood products.

Safe blood donors are the cornerstone of a safe and adequate supply of blood and blood products. There was no positive result for HIV or syphilis in our volunteer donor group. HBsAg was detected in 46 of the students (1.03%) and anti-HCV was detected in only 1 (0.02%), while the rates were 1.7% and 0.018%, respectively, for HBsAg and anti-HCV in the volunteer blood donor population outside the uni-

versity. HBsAg incidence was significantly lower in the university population. Experiences show that the safest blood donors are voluntary, non-remunerated blood donors. Paid donors are statistically more likely to carry some infection. Their blood is more likely to be of a lower standard, as they tend to donate more frequently. Fortunately, paid donations have been prohibited by law in Turkey. Voluntary blood donation from a low-risk population requires identifying such a population and motivating them to donate blood regularly. A younger population is considered more impressionable and has low risks [18]. This may be due to low exposure risk to blood transmissible infections because of youth. In the present study, university student donors were found to be safer than other donors in terms of HBsAg positivity. Donor programs and researches should be focused primarily on retaining regular blood donors since they have a lower incidence of transfusion-transmissible infectious diseases [4,19].

Although complications and adverse reactions during the blood donation process are rare, it is thought that they play a role in subsequent willingness to donate blood [20,21]. In the present study, the most common adverse events were fatigue and vasovagal symptoms. Total adverse events were significantly higher in the university population than in the population outside the university, and this may have been due to the higher number of female donors and the young age. It was shown previously that adverse events were seen frequently in the young donor population [22]. In one study, it was detected that the most common systemic adverse events were fatigue (7.8%), vasovagal symptoms (5.3%), nausea and vomiting (1.1%), and those adverse events were frequent in donors younger than 30 years old [23].

In conclusion, efforts to increase the number of volunteer donors to ensure an adequate and safe blood supply are of great importance. Since it is easy to convince university students and they potentially have a long donor career, they are good candidates for becoming regular volunteer blood donors. A continuous educational program about blood donation and the correction of misconceptions about blood donation will increase donation rates. All technological utilities should be used effectively to reach more donors and to increase the success

of the donor acquisition programs. Well-documented records facilitate easy access to donors in case of increased blood demand. Finally, easy access to donation centers will motivate donors. Mobile blood donation teams for easier access to donors and to facilitate their making blood donations in their own locale may increase donation rates.

Conflict of interest

The authors declare that no conflicting or competing interests of any nature exist between the authors of this work and their academic activity.

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