

Sexual behaviour of Croatian blood donors as a threat to the health of blood recipients

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Background. In this cross-sectional study we assessed the prevalence of the various blood safety sexual risk behaviours among blood donors from East Croatia and the possibilities for improving the present blood donor screening procedure.

Materials and methods. The study included 423 blood donors of both sexes who completed a specially designed anonymous questionnaire immediately after their blood donations. The questionnaire contained questions on demographic data, sexual preferences, and possible sexual risk behaviours in the period before the blood donation.

Results. The study revealed that the most common forms of sexual risk behaviour among Croatian blood donors had been irregular condom use during sexual contacts with new partners (294/423; 69.5%) and five or more sexual partners during the lifetime (213/423; 50.4%). More male than female subjects had had five or more sexual partners during their lifetime ($p < 0.0001$). Compared to married donors, single subjects more frequently reported sexual contacts without using a condom with their new partners in the period from the last blood donation ($p < 0.0001$) and also in the period of 1 month before current blood donation ($p = 0.0060$). A larger number of younger than older subjects had practiced different types of sexual intercourse during the lifetime ($p = 0.0002$) but more older than younger subjects reported irregular use of condom on sexual contacts with a new partner during their lifetime ($p = 0.0231$).

Conclusion. Blood donors who were involved in various forms of sexual risk behaviour represent a serious threat to the health of blood recipients. In this respect a new approach to blood donor screening procedure with additional questions on sexual behaviour in anonymous donor questionnaires would improve the safety of transfusion treatment in East Croatia.

Keywords: blood donors, anonymous questionnaire, sexual behaviour, donor screening, Croatia.

Introduction

At present, the greatest threat to the safety of transfusion treatment is considered to be blood donation from a person serologically negative for various viral diseases but, at the time of the time of donation, in the so-called "window period" associated with the seroconversion, which enables a potential infection to evade detection by the currently available laboratory tests¹⁻³. The development of the laboratory technology used in transfusion medicine has reached a point at which no further improvement in the safety of transfusion therapy can be expected in the near future,

and consequently proper screening and selection of donors have been recognised as crucial factors for reducing the risk of transmission of viral diseases, including human immunodeficiency virus, associated with transfusion therapy, and for upgrading the safety of the overall donated blood stock^{1,3-5}.

In Croatia, blood donation is based on voluntary donation, according to the recommendations of the World Health Organisation and the Council of Europe⁶. The screening of blood donors in Croatia includes educational and informative activities on human immunodeficiency virus infection and other

blood-borne diseases, investigating each donor about possible forms of risk behaviour (including homosexual orientation which is considered a motive for permanent rejection of a potential blood donor) through the use of a questionnaire and an interview with the responsible physician, and a clinical examination⁶. Along with data collected during this screening process, each individual donor confirms, with a signature witnessed by a physician, that he or she has fully understood all the risks (including homosexual orientation) that would defer him or her from blood donation. The physician examining the donor qualifies him or her as eligible to give blood by a signature (code), respecting the established criteria for donor selection, or defers the donor, thus protecting the safety of the blood stock and its potential users^{6,7}. In addition, all the collected blood units undergo laboratory testing for human immunodeficiency virus, hepatitis B virus, hepatitis C virus and syphilis^{6,7}.

Despite all these measures, studies have shown that the majority of serious risk factors related to donors' behaviours are not picked up by objective evaluation and verification through the usage of the screening methods of questionnaires and interviews with the physician prior to blood donation⁵. It is, therefore, difficult to exclude individuals who may pose a health threat to the users through blood donation because of some form of risk behaviour, especially sexual risk behaviour^{8,9}.

It is well-known that first-time blood donors constitute a major risk to the safety of the blood stock, mainly because of the various forms of their sexual risk stated in the screening questionnaire and interview^{9,10}, but very little is known about this kind of risk behaviour among repeat blood donors, which is even more important considering that the majority of blood is collected from individuals who are repeat donors^{9,11}.

The aim of this study was to assess the prevalence of various blood safety sexual risk behaviours among repeat blood donors from East Croatia and to explore possibilities for improving the present blood donor screening procedure.

Materials and methods

Subjects

The study initially included 440 repeat blood

donors of both sexes (from a total of 4000 blood donors registered in east Croatia), who had donated blood on two or more occasions at the Department of Transfusion Medicine in the Clinical Centre of Osijek. The study subjects were randomly selected from among the blood donors aged 20-59. The study was conducted from 1st June to 30th September, 2005. Out of 440 initially selected blood donors, 427 gave their consent to take part in the study, with a 97% response rate. This consent was preceded by thorough verbal and written information on the methodology and the purpose of the study. Four out of the 427 study subjects reported that they had never been sexually active and were then excluded from the study as being incompatible with the study aim. The remaining 423 subjects who reported any kind of sexual activity formed the study set for further statistical analysis.

Anonymous questionnaire

The questionnaire contained questions on the subjects' demographic data, their sexual preferences, and their possible sexual risk behaviours in the period before the blood donation. There were 17 questions, 15 of which were of a closed type (with optional answers to be marked) and two of an open type (the year of birth and age at first sexual contact). Demographic data included the place of residence, age, sex, level of education, and marital status. Data on sexual activity included frequency of sexual contacts, age at first sexual contact, sex of partner(s), receiving or giving payment for sex during lifetime, and type of sexual activities during lifetime. In addition, the regularity of condom usage during sexual contacts with new partners, lifetime history of sexually transmitted disease, number of sexual partners during lifetime, sexual activity in the past year, and number of sexual partners in the past year were recorded. Questions on sexual risk behaviour prior to the blood donation at the Department of Transfusion Medicine, Clinical Centre of Osijek, focusing on sexual contacts without a condom in the period from the last blood donation (within the past 3-4 months, depending on the particular donor's sex) and within a month before the current blood donation were also part of the anonymous questionnaire. The questionnaire used as a research tool in the present study had been previously validated in a small group of blood donors in 2004.

Ethical approval

The study was approved by the Ethics Committee for Medical Research of the Faculty of Medicine, Osijek and written informed consent was obtained from each study participant.

Statistical analysis

Having confirmed the normality of data distribution with the Kolmogorov-Smirnov test, all the data were processed using descriptive statistics. The proportions were calculated and compared using the χ^2 -test for dependent and independent samples. Fisher's exact test was also used to compare calculated proportions. The level of statistical significance was set at $p=0.05$. The statistical analysis was conducted with SPSS for Windows (version 13.0, SPSS Inc., Chicago, IL, USA) statistical software.

Results

Demographic characteristics of the study subjects

The final study sample of 423 sexually active donors from East Croatia consisted of 366 males (86.5%) and 57 females (13.5%), with a mean age of 34.6 ± 10.5 (range, 20.0-57.0) years. According to the place of residence, 283 of the 423 (66.9%) study subjects were from urban areas and 140 (33.1%) from rural areas. With regards to educational level, 323 (76.4%) subjects had a high-school education, 68 (16.0%) had finished university, and 32 (7.6%) had less than high-school education. Two hundred and thirty-three (55.1%) subjects were married and 190 (44.9%) were single. Since age is an important determinant of sexual behaviour^{12,13}, various forms of sexual risk behaviour determined among study subjects were analysed according to age. For this purpose the study subjects were divided into two age groups: the younger group, aged 20-39 years, consisted of 285 individuals (67.4% of all donors in the study), while the older group, aged 40-59 years, was formed of 138 individuals (32.6% of all donors).

Sexual risk behaviour of the study subjects

Data on the donors' sexual behaviour, obtained through the anonymous questionnaire, revealed that the mean age at first sexual contact was 17.7 ± 2.3 (range, 12.0-40.0) years for all study subjects. Two of 423 study subjects (0.5%) reported to have sexual partners of the same or both sexes. Receiving or giving

payment for sex was reported by 15/423 (3.5%), irregular condom usage during sexual contact with a new partner was reported by 294/423 (69.5%), and a history of sexually transmitted disease by 19/423 (4.5%) study subjects. Half of the study subjects (210/423; 49.6%) had had one to four sexual partners, whereas the other half (213/423; 50.4%) reported five or more sexual partners during their lifetime. There was a statistically significant difference in the lifetime number of sexual partners between men and women ($\chi^2=28.369$; $p<0.0001$) (Table I).

Table I - Number of sexual partners during lifetime according to the sex of the blood donors.

Blood donors' sex	Number of sexual partners during lifetime		Total
	1 - 4	5 or more	
Male	163 (44.5%)	203 (55.5%)	366
Female	47 (82.5%)	10 (17.5%)	57
Total	210 (49.6%)	213 (50.4%)	423

Sexual contacts without a condom with new partners in the period from the last blood donation (within 3-4 months) were reported by 73/423 (17.3%) and within a month before current blood donation by 49/423 (11.6%) of the study subjects.

There was a statistically significant difference between married and single subjects in the reported number of sexual contacts without a condom with new partners in the period from the last blood donation ($\chi^2=17.584$; $p<0.0001$) (Table II).

Table II - Reported sexual contacts without a condom with new partners in the period from the last blood donation according to the blood donors' marital status.

Blood donors' marital status	Reported sexual contacts without a condom with new partners in the period from the last blood donation		Total
	Yes	No	
Married	24 (10.3%)	209 (89.7%)	233
Single	49 (25.8%)	141 (74.2%)	190
Total	73 (17.3%)	350 (82.7%)	423

Likewise, there was also a statistically significant difference between married and single subjects with

regards to the reported number of sexual contacts without a condom with new partners within a month prior to the current blood donation ($\chi^2=7.541$; $p=0.0060$) (Table III).

Table III - Reported sexual contacts without a condom with new partners within a month prior to the current blood donation according to the blood donors' marital status.

Blood donors' marital status	Reported sexual contacts without a condom with new partners within a month prior to the current blood donation		Total
	Yes	No	
Married	18 (7.7%)	215 (92.3%)	233
Single	31 (16.3%)	159 (83.7%)	190
Total	49 (11.6%)	374 (88.4%)	423

None of the blood donors practiced exclusively oral sexual activity and only two blood donors, among the group of young males (20-39 years), reported practicing exclusively anal sexual intercourse. Younger blood donors (male and female) more frequently reported practicing all types of sexual intercourse than older blood donors (male and female) ($\chi^2=13.813$; $p=0.0002$).

The majority of blood donors who reported practicing all types of sexual intercourse belonged to the group of young males while there were only two older females (40-59 years) who reported practicing all types of sexual intercourse (Table IV).

There was a statistically significant difference between the younger group (20-39 years) and the older group (40-59 years) of blood donors with regards to the regularity of condom usage during sexual contacts with a new partner ($\chi^2=5.161$; $p=0.0231$) (Table V).

Table V - Irregular use of condom during sexual contacts with a new partner during the lifetime according to the blood donors' age group.

Blood donors' age group (years)	Irregular use of condom during sexual contacts with a new partner during the lifetime		Total
	Yes	No	
Younger (20-39)	188 (66.0%)	97 (34.0%)	285
Older (40-59)	106 (76.8%)	32 (23.2%)	138
Total	294 (69.5%)	129 (30.5%)	423

Discussion and conclusions

The present study clearly showed that repeat blood donors are involved in various blood safety sexual risk behaviours, thus representing a serious threat to the health of blood product recipients. This finding is of even greater significance considering that all of the study subjects were enrolled in the present study after they had undergone the standard procedure of blood donor screening used in Croatia during which they had confirmed, by their signature, that they had fully understood all the risks that would defer them from donating blood^{6,7}. The clear implication of this is that some of the study subjects had not been completely honest during the blood donor screening, especially considering their sexual behaviour but also their sexual orientation⁶. These findings are in concordance with those of other studies which pointed out that the standard procedure of blood donor screening is not always the best way to detect "risky" individuals who should be deferred from donating blood^{9,14,15}.

The observed difference between men and women in the number of sexual partners during lifetime confirmed the finding of other surveys that women usually have fewer sexual partners during their

Table IV - Types of sexual intercourse practiced during the lifetime according to the blood donors' age group and gender.

Practiced types of sexual intercourses during the lifetime	Male		Female		Total
	Younger age group (20-39 years)	Older age group (40-59 years)	Younger age group (20-39 years)	Older age group (40-59 years)	
Exclusively vaginal	109 (44.9 %)	77 (62.6 %)	20 (47.6 %)	13 (86.7 %)	219 (51.8 %)
Exclusively oral	0	0	0	0	0
Exclusively anal	2 (0.8 %)	0	0	0	2 (0.5 %)
All types	132 (54.3 %)	46 (37.4 %)	22 (52.4 %)	2 (13.3 %)	202 (47.7 %)
Total	243	123	42	15	423

lifetime¹⁶. The detected differences between married and single subjects in the reported number of sexual contacts without a condom with new partners in the period from the last blood donation and within a month prior to the current blood donation are also concordant with findings from other studies¹⁶⁻¹⁸. With regards to the forms of sexual activity performed during lifetime, we found that younger subjects more often practice different types of intercourse (including anal and oral sex) which are often unduly neglected as a possible route of transmission of sexually transmitted diseases¹⁹⁻²¹. The finding that young males (20-39 years) more often practice all types of sexual intercourses (vaginal, oral and anal) is consistent with the findings from other studies^{22,23}.

The observed difference between the younger and older groups of blood donors in regularity of condom usage during sexual contacts with a new partner revealed that the younger blood donors, who more often have five or more sexual partners during their lifetime compared to the older blood donors, also more often use condoms as a method of protection against sexually transmitted diseases. These data are consistent with the results of other studies conducted elsewhere and among Croatian youth, which showed that the rate of condom usage is higher among younger individuals who generally have a greater number of sexual partners^{16,24-28}. In this way, through frequent use of condoms as a method of protection, young people tend to neutralise the effect and prevent the occurrence of detrimental consequences (primarily human immunodeficiency virus infection) of their more liberal attitude towards sexual relations^{16,29}.

Throughout the world and, therefore, also in Croatia, there has been a notable increase during the past few years in public concern regarding the safety of transfusion treatment³⁰. Voluntary blood donors are uniquely motivated human subjects who think and feel and do not always behave in uniform and predictable ways³¹. The present study and others conducted elsewhere revealed that there are subgroups of blood donors who are involved in various risky sexual behaviours, but still regularly donate blood, thus seriously jeopardising the health of the recipients of blood products³². In the standard procedure for donor selection used in Croatia, the personal questionnaire and interview

are the most important factors in the assessment of potentially risky behaviours of a blood donor^{6,33}. The studies revealed that around 1-3% of blood donors intentionally or unintentionally do not reply sincerely to questions in standard questionnaires used in blood donor selection procedures^{8,10,34}. Besides this lack of absolute sincerity, it should be highlighted that most standard questionnaires for blood donors do not contain many questions dealing with the potential donors' sexual activity and its different features³³.

In the light of the need for optimisation of costs of the health care services on the one hand and the necessity of the providing the highest possible level of the transfusion treatment safety on the other hand, new solutions such as additional questions in anonymous questionnaires dealing with potentially risky sexual behaviours among blood donors seems to be a very good solution in efforts to improve and sustain the safety of transfusion treatment in Croatia and upgrade daily work with blood donors.

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