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Demographic, risk factors and motivations among blood donors with reactive serologic tests for syphilis in São Paulo, Brazil

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SUMMARY

Objective—To identify the demographic characteristics, risk factors and motivations for donating among blood donors with reactive serologic tests for syphilis.

Background—Post-donation interviews with syphilis seropositive blood donors improve recruitment and screening strategies.

Methods—This case-control study compares 75 Venereal Disease Research Laboratory (VDRL) > 8, EIA+ (enzyme immunoassay) and FTA-ABS+ (fluorescent treponemal antibody); 80 VDRL–, EIA+ and FTA-ABS+; and 34 VDRL– and EIA– donors between 2004 and 2009. Donors were assessed by their demographic characteristics, sexual behaviour, history of alcohol and illicit drugs use, and motivations to donate.

Results—Donors with VDRL > 8 were more likely to be divorced [AOR = 12.53; 95% confidence interval (CI) 1.30–120.81], to have had more than six sexual partners (AOR = 7.1; 95% CI 1.12–44.62) and to report male-male-sex in the past 12 months (AOR = 8.18; 95% CI 1.78–37.60). Donors with VDRL–, EIA+ and FTA-ABS+ were less likely to be female (AOR = 0.26; 95% CI 0.07–0.96), more likely to be older (AOR = 10.2; 95% CI 2.45–42.58) and to have had more than six sexual partners in the past 12 months (AOR = 8.37; 95% CI 1.49–46.91). There was no significant difference among groups regarding illicit drugs use; 30.7%

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CONFLICT OF INTEREST

The authors have no competing interests.

(VDRL> 8) and 12.5% (VDRL–, EIA+ and FTA-ABS+) of donors reported that they had been at risk for HIV infection ($P=0.004$). One-third of donors came to the blood bank to help a friend or a relative who needed blood.

Conclusion—Although donors exposed to syphilis reported and recognised some high risk behaviour, most were motivated by direct appeal to donate blood. Monitoring the risk profile of blood donors can benefit public health and improve blood safety.

Keywords

blood donors; motivation; risk factors; risk-taking; syphilis serodiagnosis

Syphilis is considered a curable sexually transmitted infection (STI); however, 12 million new cases arise each year worldwide, one quarter of which are in Latin America (WHO, 2001). The Brazilian Ministry of Health estimates that 1 million new cases of syphilis occur in the country annually (Boletim-Epidemiológico, 2004). Sexual contact is the primary mode of syphilis transmission, and the next most common mode is transfer of its agent, the spirochete *Treponema pallidum*, across the placenta. The risk of syphilis transmission through blood transfusion is almost negligible due to improved donor selection, serologic screening of blood donors, and an almost universal shift from transfusion of fresh blood to refrigerated blood components (Singh and Romanowski, 1999).

In developed countries, where screening for transfusion-transmitted diseases is universal, the risk of post-transfusion infection has decreased significantly in the last decades (Perkins & Busch, 2010). The last reported case of transfusion-transmitted syphilis in the United States was in 1966 (Chambers *et al.*, 1969). A single subsequent case of syphilis transmission in the developed world occurred in the Netherlands in 1977 (Risseuw-Appel & Kothe, 1983). However, in centres where syphilis screening is not conducted, blood transfusion recipients are at risk for contracting transfusion-transmitted syphilis (Owusu-Ofori *et al.*, 2011).

Donors at high risk for STIs should not be encouraged to donate blood. The potential for transfusion-transmitted STIs poses a risk for transfusion recipients, especially if a blood donation is made during the infection window period. Post-donation interviews with blood donors found to be seropositive for STIs can provide information about the risk factors for transfusion-transmitted infections and motivations to donate. Post-donation interviews can improve recruitment strategies and donor selection procedures and have the potential to minimise recipient risk and wasted resources. A previous study in São Paulo found that younger age, being a male who has sex with males (MSM), bisexual orientation, having two or more sexual partners in the last 12 months and symptoms of syphilis were characteristics associated with recent syphilis infection among donors (de Almeida Neto *et al.*, 2009). Continuous monitoring of the profile of syphilis infected blood donors is warranted to enhance blood transfusion safety.

We conducted a case–control study comparing 75 Venereal Disease Research Laboratory (VDRL)> 8, EIA+ (enzyme immunoassay) and FTA-ABS+ (fluorescent treponemal antibody) and 80 VDRL–, EIA+ and FTA-ABS+ blood donors with a group of 34 VDRL– and EIA– donors. The aim of the study was to identify the demographic characteristics; risk

factors, including sexual behaviour and alcohol and illicit drug use; and motivation to donate among syphilis infected blood donors.

MATERIALS AND METHODS

Overall study design and setting

We conducted a case-control study in which participants, blood donors who returned for notification and counselling from September 2004 to May 2009, were selected according to their serologic test for syphilis (STS) pattern. The demographic characteristics – risk factors, including sexual behaviour and history of alcohol and illicit drug use – and motivation to donate were assessed. Fundação Pró-Sangue (FPS) in São Paulo, Brazil, is located in the largest public hospital in the city. Annually, FPS collects approximately 140 000U of blood and provides blood components to 108 hospitals in the great metropolitan area of the city. This study was approved by the Ethical Committee of Hospital das Clínicas from the University of São Paulo, the ethical review board of FPS (assent no. 700/04).

Study subjects

All qualified candidate blood donors are serologically screened for HIV types 1 and 2, human T-cell lymphotropic virus (HTLV)-1 and -2, hepatitis B [hepatitis B surface antigen (HBsAg) and total antibody to hepatitis B core antigen (anti-HBc)] and C, syphilis, and Chagas disease at FPS. A consecutive, non-matched convenience sample of donors who returned for notification and counselling were interviewed. Donors were assigned to one of two different profiles of reactive STS or to the control group of blood donors with non-reactive STS. Donors presenting with any reactive screening serologic test receive a letter or a telephone call with instructions to return 30 days after donation to collect a new sample for confirmatory testing. An EIA test is performed for syphilis screening. An additional EIA and a VDRL test are run in the confirmatory algorithm performed on the second sample. If the EIA and/or VDRL tests are reactive in the second sample, a fluorescent treponemal antibody absorption test (FTA-ABS) test is performed. Donors who presented with non-reactive EIA and VDRL tests in the second sample are considered to have had a false-positive screening STS and are eligible to donate. Donors with any reactive confirmatory test result are counselled and referred for care. Donors who returned for counselling after confirmatory testing and met the following serologic criteria were eligible cases in this study: (i) a reactive EIA at serologic blood donation screening, (ii) FTA-ABS and EIA tests reactive at retest and (iii) a reactive VDRL, with titres of 16 or greater, or a VDRL non-reactive at retest. A positive VDRL with titres over 1/8 was denominated as VDRL> 8 and VDRL non-reactive and both FTA-ABS and EIA reactive as VDRL-. These STS profiles were chosen because they are the most prevalent profiles found among FPS blood donors. VDRL> 8 was selected to avoid false-positive VDRL results. Donors eligible to be controls in the study had reactive screening tests but non-reactive VDRL and EIA confirmatory tests.

Measures

Data were collected from blood donor interviews conducted after donation and confirmatory tests, for both cases and controls, when they returned to be notified about their serologic status. Interviews conducted at the return visit for confirmatory testing were carried out by

trained physicians through a face-to-face process, applying a standardised questionnaire in a private room. The standardised questionnaire included (i) demographic characteristics, (ii) marital status, (iii) number of sexual partners in the past 12 months, (iv) MSM in the past 12 months, (v) alcoholic drink intake in the past 7 days, (vi) condom use with the past six partners in the past 12 months, (vii) condom use with the past six partners in the past 12 months while consuming alcohol, (viii) history of STIs and symptoms of syphilis (ix) history of treatment for STIs, (x) history of illicit drug (cannabis, snorted cocaine, crack, intravenous drug use, heroin and amphetamines) use ever; (xi) history of illicit drug use in the past 6 months; (xii) condom use with the past six partners in the past 12 months after using illicit drugs; (xiii) if the donor believed she/he had been exposed to HIV; (xiv) co-infection with hepatitis B and C, HIV and Chagas disease and (xv) motivations donors stated for giving blood. Motivations to donate blood were classified as 'direct appeal' ('To help a friend, relative or someone I knew who is sick and needs blood', 'In response to a campaign on TV or radio', 'A friend came to donate and I came together' and 'Someone asked to donate blood'), 'altruism' ('To anonymously help someone who needs blood' and 'To donate is important to the society') and 'self-interest' ('I feel good donating blood', 'I can have a check-up donating blood', 'As I was in the hospital, I donated blood', 'My blood was thick', 'I wanted to renew my blood', 'I was curious about donating blood', 'I get a day off' and 'To pay a promise'). Data of eligible blood donors were collected and entered in a computer by two different data managers using Access (Microsoft Corp., Redmond, WA, USA) with reconciliation against the originally completed forms and interviewer.

Laboratory methods

Laboratory screening was performed using kits approved by the Brazilian Ministry of Health, each with sensitivity higher than 99%, as described in the manufacturer's package insert information. Before use at FPS, all kits are tested with an in-house panel of syphilis sera and are deployed only if all positive samples are detected. Serologic screening and confirmatory testing for syphilis included a competitive EIA (Enzygnost* syphilis, Dade Behring, Newark, NJ, USA), VDRL test (Wiener lab, Rosario, Argentina), and FTA-ABS Fluorescent Treponemal Antibody Absorption test (biolab-Mérieux S/A, Rio de Janeiro, Brazil).

Statistical analysis

Data collected during interviews were first analysed as a series of separate bivariate analyses comparing predictors between donors with recent vs past syphilis exposure and controls using the χ^2 test. Predictors and potential confounders significant in bivariate analyses at P values of less than 0.05 were included in multivariate analysis. Non-significant variables were eliminated from the final multivariate model in a stepwise fashion, unless they substantially confounded associations between syphilis and other variables. All statistical tests were performed with statistical software (stata 9.0, StataCorp, College Station, TX, USA).

RESULTS

During the study period 75, 80 and 34 donors with VDRL $\geq$ 8, VDRL– and false-positive STS were enrolled. VDRL $\geq$ 8 was associated with younger age, single marital status, lower educational level, higher number of sexual partners in the past 12 months and MSM in the past 12 months. VDRL– was associated with older age, lower educational level, marriage and more than six sexual partners in the past 12 months (Table 1). There was no significant difference of ever using illicit drugs between the groups. Frequencies of illicit drug use among groups can be seen in Table 1. Donors with VDRL– had a higher frequency of history of ever having had an STI (75 vs 38.6 vs 41.2%; $P = 0.001$). Symptoms of STIs were record among 23 (30.7%) and 3 (3.8%) donors with VDRL $\geq$ 8 and VDRL–, respectively. Among donors classified as VDRL $\geq$ 8, seven donors (9.3%) reported chancre and one (1.3%) secondary syphilis in the past year. Only three (3.8%) VDRL– donors reported symptoms of syphilis in the past (chancre and lymphadenopathies more than 10 years ago). Most donors reported that they had not used condoms with sexual partners ever or in the past 12 months (see Table 1). Additionally, over 58% of donors interviewed reported that they have not used condoms during sexual relations while consuming alcohol; 30.7% of donors with VDRL $\geq$ 8 believed that they have been at risk for HIV infection in the past 12 months, compared with 12.5% of donors VDRL– and 8.8% of controls ($P = 0.004$); 66.7, 24.2 and 9.1% of donors with VDRL $\geq$ 8, VDRL– and controls ($P = 0.02$), respectively, considered themselves to be at HIV risk because they did not use condoms with their partners. One-third of interviewed donors donated blood to help a relative or a friend who needed blood, and approximately 20% of donors with VDRL $\geq$ 8 and VDRL– and 35% of controls donated blood to help someone who needs blood. Motivations to donate blood for each group are presented in Table 2.

Co-infection was identified in both positive STS groups. Among donors with VDRL $\geq$ 8, two were HIV EIA and Western blot reactive (2.7%), five were HCV EIA reactive (6.7%), two were immunoblot reactive, eight were anti-HBc total reactive (10.7%) and one donor was HIV EIA and Western blot reactive and anti-HBc total reactive (1.3%). The following cases of co-infection among donors with VDRL– were seen: one case of HIV EIA, confirmed positive by Western blot (1.3%), one case of Chagas disease (1.3%) and 16 anti-HBc total reactive cases (20%).

Multivariate analyses showed that compared with controls, donors with VDRL $\geq$ 8 were more likely to be divorced [Adjusted odds ratio (AOR) = 12.53; 95% confidence interval (CI) 1.30–120.81], have had more than six sexual partners (AOR = 7.10; 95% CI 1.12–44.62), and report MSM in the past 12 months than controls (AOR = 8.18; 95% CI 1.78–37.60). Donors who were VDRL– were less likely to be female (AOR = 0.26; 95% CI 0.07–0.96), more likely to be older (AOR = 10.2; 95% CI 2.45–42.58 for donors $\geq$ 39 and $<$ 60 years old, and AOR = 13.5; 95% CI 1.28–142.70 for donors $\geq$ 60 years old), and more likely to have had more than six sexual partners in the past 12 months than controls (AOR = 8.37; 95% CI 1.49–46.91) (Table 3).

DISCUSSION

We found that donors with VDRL> 8 were more likely to be divorced, have had more than six sexual partners in the past 12 months, and report MSM. Donors who were VDRL– were more likely to be male, older, and also have had more than six sexual partners in the past 12 months. Most donors, even among controls, reported that they have not used condoms with sexual partners ever or in the past 12 months. One of every 3 donors with VDRL> 8 and approximately 1 of every 10 donors who was VDRL– or a control reported that they believed they were at HIV risk. The most frequent motivation to donate among donors was to help a friend, relative or someone s/he knew who needed blood transfusions.

MSM and the number of sexual partners in the past 12 months were the most striking risk factors identified among VDRL> 8 donors. The resurgence of infectious syphilis in MSM has been reported worldwide (Botham *et al.*, 2013). Since 2000, cases of syphilis, especially among MSM co-infected with HIV, have increased 10 fold in Canada (Burchell *et al.*, 2013). In the United States, there have been recent increases in primary and secondary syphilis among MSM, mainly among young and minority MSM (Torrone *et al.*, 2008; Su *et al.*, 2011). However, the number of sexual partners among MSM has decreased from 2002 to 2006–2010, suggesting that other factors, such as sexual networks and disease prevalence in these networks, should be examined in relation to recent increases in infection rates (Leichliter *et al.*, 2013). In addition to a high number of sexual partners, our study sample reported a low frequency of condom use, placing them at risk for syphilis and other STIs. Moreover, donors reported that they were aware of the risky nature of this behaviour. The Brazilian Ministry of Health campaigns promoting the use of condoms during sex is the backbone of public health HIV prevention programs. Sexual healthcare tailored to individuals at risk for STIs is needed, and the reasons for the low levels of condom use despite the acknowledged risk among this population must be understood.

VDRL> 8 and VDRL– donors were eight times more likely to report a high number of sexual partners in the past year. The high number of sexual partners found in this population is consistent with the results of a previous study in our institution demonstrating that a large number of blood donors with an STS profile of past infection could be safe donors (de Almeida Neto *et al.*, 2009). However, a small group of VDRL– donors presented similar risk factors to VDRL> 8 donors. Some donors who had syphilis in the past, even after treatment, maintain high risk behaviours and are exposed to other STIs. In Brazilian blood banks, the number of different heterosexual partners in the past 12 months is used to screen blood donation candidates and is associated with HIV and overall ratios of serologic markers of STIs, including syphilis (Patavino *et al.*, 2012). Formerly, in our institution, donors who reported less than five heterosexual sex partners in the past 12 months were eligible to donate. In response to the findings of the Retrovirus Epidemiology Donors Study (Patavino *et al.*, 2012), the cut-off of sex partners was reduced to three in the past 12 months. Our current findings support the concept that the number of partners is a useful criterion for selecting blood donors with lower risk of transfusion-transmitted infections.

Direct appeal was the most frequent motivation for blood donation among donors, except among controls, who reported higher frequencies of altruism. Direct appeal is a common

motivation among Brazilian donors; replacement donations represent 50% of all first time and 30% of repeat donations in the country (Carneiro-Proietti *et al.*, 2010). Gonzalez et al. evaluated different motivations to donate among donors in three large Brazilian blood centres (Gonzalez *et al.*, 2013). They found that the leading motivation to donate was altruism, followed closely by direct appeal. In our population, altruistic motivation was significantly higher among controls than among donors who presented with reactive STS. Less than one-third of donors were motivated by self-interest. Further research on the reason why blood donors who consider themselves to have been at high risk for STIs and who report a high prevalence of symptoms of syphilis attempt to donate blood is needed. The need for STI testing may be an additional motivation of blood donation that overlaps with more socially accepted responses, such as altruism and direct appeal.

An unexpected finding was the high prevalence of STI history, not only among donors but also among over 40% of controls. The Brazilian population has a high prevalence of a history of STIs. Approximately 40% of patients attending primary health care clinics and truck drivers have a history of STIs (Teles *et al.*, 2008; Cavalcante *et al.*, 2012). An important tool for screening donors is to probe the history of STIs during pre-donation interviews as a surrogate marker for high risk behaviours.

We recognise several limitations of this research. First, interviewer biases are common in case-control studies. Audio computer-assisted structured interviews (ACASIs) have been shown to result in increased risk behaviour reporting from blood donors (Blatytá *et al.*, 2013). To normalise data collection, we trained physicians to interview both participants and all blood donors who received notification to return to the blood centre for further testing and counselling. However, it is possible that the prevalence of risk factors may have been underestimated, especially for highly stigmatised risk behaviours. Second, laboratory screening tests alone are not enough to establish a diagnosis. The diagnosis of syphilis depends on clinical findings, examination of lesion material for treponema, and/or serologic tests for syphilis (Larsen, 1983). A positive VDRL with a high titre is correlated with recent infection (McMillan & Young, 2008), whereas donors presenting as VDRL-, FTA-ABS+ and EIA+ are more likely to have had prior exposure to syphilis. It is a challenge for blood banks to classify donors with reactive STS for syphilis, particularly because candidates deny symptoms of STIs during pre-donation screening. Of note, the majority of donors with confirmed serologic findings of syphilis did not mention previous diagnosis or symptoms of syphilis. Finally, we recognise a participation bias in the study. As controls did not have reactive STS upon retesting and were thus eligible to donate, most did not return for an interview. The selection of false-positive donors as the control series reduces the impact of recall bias because they received the same notification, counselling and retesting as the cases. Additionally, the number of participants was sufficient to detect significant risk factor differences among groups.

The presence and awareness of syphilis may lead to earlier utilisation of health care (Spornraft-Ragaller *et al.*, 2013), thereby preventing other STIs, including HIV. Earlier utilisation of health care benefits not only donors but also their partners, children and society (de Almeida Neto *et al.*, 2009). Measures to prevent syphilis transmission by transfusion are needed, especially in countries with a high prevalence of STIs among blood donors.

Continuous surveillance of risk factors associated with syphilis can lead to improvements in blood donor screening and, ultimately, blood donation safety. Further research on the motivations why high risk individuals look for blood banks instead of voluntary counselling and testing centres is needed.

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All authors fulfil the following three criteria: substantial contributions to the research design or the acquisition, analysis or interpretation of data; drafting the paper or revising it critically; and approval of the submitted and final versions.

S. C. F. performed the research, contributed essential reagents or tools, analysed data, wrote the manuscript and reviewed and edited text and tables. C.A.N. designed the research study, performed the research, analysed data, wrote the manuscript and reviewed and edited text and tables. A. S.N. contributed essential reagents or tools and analysed data. C. D. L. O. performed the research, analysed data and reviewed and edited text and tables. J. E. F. analysed data. C. S. A. contributed essential reagents or tools. J. E. L. contributed essential reagents or tools, reviewed and edited the text and analysed data. N. A. S. contributed essential reagents or tools. A. M. analysed the data and reviewed and edited the text. E. C. S. contributed essential reagents or tools, reviewed and edited the text, and analysed data.

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Table 1

Selected demographic characteristics and syphilis risk-related behaviour among blood donors with VDRL > 8, EIA+ and FTA-ABS+; and VDRL-, EIA+ and FTA-ABS+; and controls

	VDRL > 8 N = 75 (%)	VDRL- N = 80 (%)	Controls N = 34 (%)	P-value
Gender				0.189
Male	58 (77.3)	52 (65)	26 (76.5)	
Female	17 (22.7)	28 (35)	8 (23.5)	
Age (years)				<0.0001
<39	44 (58.7)	8 (10)	17 (50)	
39 <60	29 (38.7)	63 (78.8)	15 (44.1)	
60	2 (2.6)	9 (11.2)	2 (5.9)	
Education				<0.0001
<8 years	15 (20)	50 (62.5)	10 (29.4)	
Completed 8 years	17 (22.7)	12 (15)	5 (14.7)	
11 years	36 (48)	13 (16.2)	15 (44.1)	
College and above	7 (9.3)	5 (6.3)	4 (11.8)	
Marital status				0.004
Single	31 (41.3)	14 (17.5)	9 (26.5)	
Married	26 (34.7)	52 (65)	21 (61.8)	
Divorced/separated	12 (16)	9 (11.3)	1 (2.9)	
Other	6 (8)	5 (6.2)	3 (8.8)	
Number of sexual partners (last 12 months)				<0.0001
0-1	37 (49.3)	59 (73.7)	33 (97.1)	
2-5	32 (42.7)	18 (22.5)	1 (2.9)	
>5	6 (8)	3 (3.8)	0 (0)	
Male-male sex in the past 12 months	13 (17.3)	2 (2.5)	1 (2.9)	0.002
Alcoholic drink intake in the last 7 days ^I				0.248
Did not drink	37 (49.3)	44 (55)	17 (50)	
Drank from 1 to 3 days	33 (44)	28 (35)	16 (47.1)	
Drank from 4 to 7 days	4 (5.3)	8 (10)	0	
Condom use with the last six partners (past 12 months) ^I				0.001
Never used	22 (29.3)	48 (60)	17 (50)	
Sometimes used	51 (68)	27 (33.8)	14 (41.2)	
Ever used	1 (1.3)	0	0	
No condom use with the last six partners in the past 12 months after taking alcoholic drinks ^I	49 (65.3)	43 (53.8)	18 (52.9)	0.308
History of STI	29 (38.6)	60 (75)	14 (41.2)	<0.0001
Treatment for STI	20 (26.6)	46 (57.5)	10 (29.4)	0.323
Ever used illicit drugs	14 (18.7)	21 (26.3)	8 (23.5)	0.527
Ever smoked cannabis	12 (16)	18 (22.5)	6 (17.6)	0.583
Ever snorted cocaine	7 (9.3)	9 (11.3)	0	0.142

	VDRL > 8 <i>N</i> = 75 (%)	VDRL– <i>N</i> = 80 (%)	Controls <i>N</i> = 34 (%)	<i>P</i>-value
Ever smoked crack	1 (1.3)	5 (6.3)	1 (2.9)	0.264
Ever used other illicit drugs	4 (5.3)	4 (5)	0	0.409
Use of illicit drugs in the last 6 months	3 (4)	3 (3.8)	0	0.505
Do you consider that you have been at risk for HIV infection in the past year?	23 (30.7)	10 (12.5)	3 (8.8)	0.004

¹Totals may be less due to missing values.

Table 2

Motivations to donate blood among blood donors with VDRL > 8, EIA+ and FTA-ABS+; VDRL–, EIA+ and FTA-ABS+; and controls

Motivations to donate blood		VDRL > 8 n (%)	VDRL– n (%)	Controls ^I n (%)	p ²
Direct appeal	To help a friend, relative or someone I know who is sick and needs blood	22 (29.3)	30 (37.5)	9 (26.5)	0.51
	In response to a campaign on TV or radio	4 (5.3)	6 (7.5)	3 (8.8)	
	A friend came to donate and I came together	7 (9.3)	3 (3.8)	2 (5.9)	
	Someone asked to donate	1 (1.3)	2 (2.5)	2 (5.9)	
Subtotal		34 (45.3)	41 (51.3)	16 (47.1)	
Altruism	To anonymously help someone else who needs blood	16 (21.3)	16 (20)	12 (35.3)	0.04
	To donate blood is important to the society	8 (10.7)	1 (1.3)	1 (2.9)	
Subtotal		24 (32)	17 (21.3)	13 (38.2)	
Self interest	I feel good donating blood	6 (8)	6 (7.5)	1 (2.9)	0.14
	I can have a check-up when donating blood	6 (8)	12 (15)	0	
	As I was in the hospital I donated blood	1 (1.3)	2 (2.5)	1 (2.9)	
	My blood was thick	2 (2.7)	1 (1.3)	1 (2.9)	
	I wanted to renew my blood	0	1 (1.3)	0	
	I was curious about donating	1 (1.3)	0	0	
	I get a day off	1 (1.3)	0	0	
	To pay a promise	0	0	1 (2.9)	
Subtotal		17 (22.7)	22 (27.5)	4 (11.8)	

^ITotals may be less due to missing value.

² χ^2 for group of motivation.

Table 3

Independent correlates of syphilis seropositivity among blood donors with different serologic tests for Syphilis profiles

Variable	AOR (95% CI)
VDRL > 8	
Divorced vs married	12.53 (1.30–120.81)
More than six sexual partners in the past 12 months (yes vs no)	7.10 (1.12–44.62)
Ever had male–male sex (yes vs no)	8.18 (1.78–37.60)
VDRL–	
Gender (female vs male)	0.26 (0.07–0.96)
Age	
39 and <60 years old vs <39 years old	10.20 (2.45–42.58)
60 vs <39 years old	13.50 (1.28–142.70)
More than six sexual partners in the past 12 months (yes vs no)	8.37 (1.49–46.91)