Short Communication

Trend in prevalence of syphilis among voluntary blood donors in Xi’an, China from 2006 to 2010

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1. Introduction

National surveillance data have shown an increased incidence of syphilis in China since 1979 when the first case of relapse syphilis was identified.

In this study, we investigated the prevalence of syphilis among blood donors in the Xi’an region of China by testing samples collected from 2006 through 2010.

2. Methods

Blood samples collected from unremunerated donors in the Xi’an region of China from 2006 through 2010 were tested for syphilis. Socio-demographic data were collected using a questionnaire which was completed prior to donation. All hepatitis B surface antigen-positive subjects and men who have sex with men (MSM) were excluded from donation. The prevalence of syphilis and HIV-positive serology were determined using a Treponema pallidum (TP) ELISA kit (Beijing Wantai Biological Pharmacy Enterprise Co., Ltd, China) and an HIV1/2 ELISA kit (Abbott Laboratories, Abbott Park, IL, USA), respectively.

TP47 and TmpA were the antigens of the TP ELISA kit. The sensitivity and specificity of the TP ELISA were 98% and 100%, respectively. Cut-off (S/CO) values for positive test results were obtained from the manufacturer’s handbook. Optical density (OD) values ≤1 were considered negative, while readings >1 were considered positive.

3. Results and discussion

The prevalence of syphilis was investigated in a total of 159,902 volunteer blood donors over the 5-year period of 2006–2010; 575 (0.36%) samples showed positive anti-TP results (Table 1). The percentage of samples testing positive for syphilis increased from 0.24% in 2006 to 0.51% in 2010 (Table 1).

We then evaluated the prevalence of syphilis in different groups based on gender, age, occupation, and educational status. The increasing trend of syphilis prevalence observed in the total population was seen in both male and female donors, although the overall prevalence of syphilis in females (0.43%) was slightly higher than in males (0.33%). This result is consistent with previous reports from studies conducted in China; but different from the results of other surveys conducted in Western countries. The difference in syphilis prevalence by gender may reflect the fact that MSM were excluded from donating but female sex workers were
The prevalence of syphilis and HIV is not particularly limited from donating. In 2010, the prevalence of syphilis was lowest in the 18–29 years age group (0.20%) and the 50–55 years age group (0.52%), and was highest in the 30–39 and 40–49 years age groups (1.05% and 1.07%, respectively) (Table 1). These results are consistent with those of previous studies.\(^2\)\(^6\)

HIV and syphilis are both sexually transmitted diseases (STDs), and a possible correlation for co-infection with these two diseases has been proposed.\(^7\) In our study, the rate of HIV infection showed an increase from 0.03% in 2006 to 0.05% in 2010 (Table 1). However, co-infection was detected in only four of 55 HIV-positive and 575 syphilis-positive donors. These results do not suggest a correlation between the two infections. However, it should be noted that the survey had strict exclusion criteria and that certain populations at high risk of STDs, such as the MSM population, were excluded from donating blood. The increasing prevalence of syphilis and HIV indicates the potential for a severe epidemic and warrants further scrutiny. In agreement with a previous study,\(^8\) a higher prevalence of syphilis was found among donors with a lower educational level background (>1.5% among donors with <9 years of education) (Table 2). Furthermore, individuals employed in occupations with poor living conditions were at a higher risk of syphilis infection (2.46% and 0.79% infection rates for unemployed donors and farmers, respectively) (Table 2). The prevalence of syphilis was lowest among military staff members and students (0.08% and 0.16%, respectively); therefore, members of these groups should be encouraged to donate blood.

In conclusion, increasing prevalences of both syphilis and HIV infection were found among voluntary blood donors in Xi‘an, China from 2006 through 2010. Therefore, blood transfusion has become an increasing risk factor for the spread of blood-borne infections. The populations identified in this study as being at the lowest risk for syphilis infection should be encouraged to donate blood. Further investigations and improvements are needed to help ensure the safety of donated blood in China.

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**References**