

A High Prevalence of Hepatitis C Virus Infection Among The Human Immunodeficiency Virus Seropositive Blood Donors in Chiang Mai, Thailand

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Abstract: We report the results of serological survey of hepatitis C virus (HCV) and hepatitis B virus (HBV) infections among the human immunodeficiency virus (HIV) seropositive and seronegative blood donors in Chiang Mai, Thailand. Anti-HCV were positive in 17 out of 276 anti-HIV seropositive blood donors (6.2%) and six out of 844 anti-HIV seronegative blood donors (0.7%). HBs-Ag were positive in 20 out of 276 anti-HIV seropositive blood donors (7.2%) and 68 out of 844 anti-HIV seronegative blood donors (8.1%). These findings suggest that anti-HIV seropositive population belongs to a high risk group of HCV infection and there are similar transmission routes between HIV and HCV infections.

Key words: HCV, HBV, HIV, Blood donors, Northern Thailand

INTRODUCTION

Viral hepatitis is one of the most common and serious consequences of blood-borne virus infections (Alter et al., 1972; Alter et al., 1975; Stevens et al., 1984). Since the introduction of routine donor blood screening for hepatitis B surface antigen (HBs-Ag), the incidence of HBV

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infection has decreased and non-A, non-B hepatitis has become the major cause of posttransfusional hepatitis (Stevens et al., 1984). Although the genome of blood-borne non-A, non-B agent, designated as hepatitis C virus (HCV), has been cloned and specific assays for HCV infection have been developed (Choo et al., 1989), there are still many sporadic cases of HCV infection without history of blood transfusions. Several authors reported that there are high risk groups of HCV and HBV infections which relate to human immunodeficiency virus (HIV) infection (Esteban et al., 1989; Sherman et al., 1991; Quan et al., 1993; Eysler et al., 1993; Botti et al., 1992; Bryan et al., 1993). The number of anti-HIV positive populations has increased in Northern Thailand (Nelson et al., 1993). However, no seroepidemiological survey of the HCV and HBV infections has been done among the blood donor populations in this area. It is the purpose of this study to know the prevalences of HCV and HBV infections among the anti-HIV seropositive and seronegative populations and discuss the transmission routes of these blood-borne diseases in Northern Thailand.

MATERIALS AND METHODS

The sera from 276 anti-HIV seropositive blood donors (male: 254, female: 22) and 844 anti-HIV seronegative blood donors (male: 698, female: 146) in the blood bank of Maharaj Nakorn Chiang Mai Hospital, Chiang Mai, Thailand, were collected and stored at -20°C between January and November, 1991. Sera were tested for anti-HIV by using EIA kit (Abbott 3rd generation anti-HIV EIA, Abbott Lab. Ltd., North Chicago, IL, USA). The positive sera were confirmed by using indirect ELISA (Anti-HIV, 1/2 Behring, Germany) and Gel Particle Agglutination method (GPA-anti-HIV, Kyowa Hakko, Japan). The anti-HCV was assayed in all blood donors by a second generation EIA kit (Hepanostika C, Organon Teknika B. V. Boxtel, Holland). The HBs-Ag was tested by Reverse Hemagglutination method (Thai Red Cross, Bangkok, Thailand).

The statistical analysis of the results was performed using chi-square test ($P < 0.0001$).

RESULTS

Table 1 shows the prevalence of HCV infection among the anti-HIV seropositive and seronegative blood donors. Seventeen out of 276 anti-HIV seropositive donors (6.2%) and six out of 844 anti-HIV seronegative donors (0.7%) showed anti-HCV positive ($P < 0.0001$). Among the anti-HIV seropositive donors, male showed slightly high incidence of HCV infection (6.3%) than female (4.5%). Among the anti-HIV seronegative donors, male showed 0.9% of anti-HCV positive and female showed 0.0%.

Table 2 describes the prevalence of HBs-Ag positive among the anti-HIV seropositive and seronegative blood donors. Twenty out of 276 anti-HIV seropositive donors (7.2%) and 68 out of 844 anti-HIV seronegative donors (8.1%) were HBs-Ag positive. Male showed slightly

Table 1 Prevalence of HCV infection among anti-HIV seropositive and seronegative blood donors

	No. tested	Anti-HCV positive
Anti-HIV positive		
Male	254	16 (6.3%)
Female	22	1 (4.5%)
Total	276	17 (6.2%)
Anti-HIV negative		
Male	698	6 (0.9%)
Female	146	0 (0.0%)
Total	844	6 (0.7%)

Table 2 Prevalence of HBV infection among anti-HIV seropositive and seronegative blood donors

	No. tested	HBs-Ag positive
Anti-HIV positive		
Male	254	19 (7.5%)
Female	22	1 (4.5%)
Total	276	20 (7.2%)
Anti-HIV negative		
Male	698	64 (9.2%)
Female	146	4 (2.7%)
Total	844	68 (8.1%)

higher incidence (7.5%) than female (4.5%) among the anti-HIV seropositive donors. Male showed higher incidence (9.2%) of HBs-Ag positive than female (2.7%) among the anti-HIV seronegative donors.

DISCUSSION

Several authors reported that there are high risk groups of HCV and HBV infections among HIV infected populations (Van der Doel et al., 1989; Esteban et al., 1989; Sherman et al., 1991; Stary et al., 1992; Quan et al., 1993; Eysler et al., 1993; Bryan et al., 1993). Although the number of HIV infected populations has increased in Northern Thailand (Nelson et al., 1993), no seroepidemiological survey on HCV and HBV infections has been done among the anti-HIV seropositive populations.

In our study, six out of 844 anti-HIV seronegative blood donor (0.7%) were found to be positive for anti-HCV, which predicts the average incidence of HCV infection among the healthy populations in Northern Thailand. The incidence of 0.7% is relatively low in comparison to the ones of surrounding countries; 3.1% of blood donors in Indonesia (Amirudin et al., 1991), 2.2% of such individuals in the Philippines (Arguillas et al., 1991) and 6.5% of healthy populations in Cambodia (Thüring et al., 1993).

The incidence of anti-HCV positivity among the anti-HIV seropositive donors was 6.2% in the present study, which was almost nine times higher than the one of 0.7% among HIV seronegative donors. This rate is almost similar to those of the previous reports (Sherman et al., 1991; Botti et al., 1992; Eysler et al., 1993; Bryan et al., 1993). These findings suggest that anti-HIV seropositive donors belong to a high risk group of HCV infection. In our results, the high prevalences of anti-HCV and anti-HIV positivities were found among the young age group of male, 20-29 years old, who were active for sexual behaviors. Nelson et al. (1993) reported that the young group belongs to a high risk group of HIV infection through intravenous drug abuse and

prostitute contacts in Northern Thailand. Also several reports described the possibility of heterosexual transmission of HCV infection (Alter et al., 1989, Esteban, 1993). Our findings suggest that one of the transmission routes of HCV infection takes a similar way of HIV infection in this area.

It is well known that HBV infections are very common among the AIDS patients, especially among homosexuals (Botti et al., 1992). However, the prevalence of HBs-Ag positivity in our study was not significantly different between HIV seropositive and seronegative blood donors, 7.2% and 8.1%, respectively. Our finding is not easy to interpret. One of the reasons of this result might be that many of the HIV seropositive individuals in our study were not suffering from immunocompromized stage yet.

In conclusion, the high prevalence of HCV infection was found among the anti-HIV seropositive blood donors in Northern Thailand. This finding suggest that the both blood borne virus infections might share similar routes of transmission.

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