HIGH FREQUENCY OF HIV-1 AND HEPATITIS C CO-INFECTION AMONG YOUNG THAI MEN: EVIDENCE FOR A CHANGING PATTERN OF HIV TRANSMISSION IN THAILAND

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Abstract. To assess whether patterns of HIV transmission have changed in Thailand, we tested for antibody to hepatitis C virus (HCV) as a marker for parenterally acquired infection among HIV-infected and uninfected young Thai men. Antibody to HCV was present in 49.5% of HIV-infected men and 2.2% among uninfected men. These data suggest that a significant number of HIV infections among young men in Thailand may be associated with injection drug use.

INTRODUCTION

HIV-1 in Thailand was initially described as dual epidemics; one of subtype B among injection drug users (IDU), and a second with subtype E among female sex workers and the general heterosexual community. Recent data from northern Thailand demonstrated that the attributable proportion of HIV infections to injection drug use has increased among young Thai men, from 1991-1998 (Nelson *et al*, 2002). Hepatitis C virus (HCV) is often associated with HIV/AIDS due to a common mode of transmission with HIV-1, in the case of blood-borne transmission, and much less commonly, sexual transmission. In Thailand, available data suggest that the prevalence of HCV is over 90% in HIV seronegative IDU's and 1-6% among blood donors (Songsivilai *et al*, 1997; Vanichseni *et al*, 2001). Data on the prevalence of HIV/HCV co-infection and the association with dominant, circulating HIV-1 subtypes in a more representative sample of the Thai population is lacking. Hence, we examined in cross-section the prevalence of HIV/HCV co-infection and association with HIV-1 subtypes B and E in a cohort of young men recruited for military service in the year 2000.

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MATERIALS AND METHODS

Sera were collected from 21-year-old men recruited into the Royal Thai Army (RTA) during May and November 2000. From the 64,884 men screened for HIV-1 antibodies, 711 were positive (1.1%); of these, 612 (86%) had sera available for HCV testing and V3-loop HIV-1 serotyping. All sera were screened for HIV antibodies using two sequential enzyme immunoassays (Abbott HIV-1/HIV-2 third generation EIA, Abbott Labs, USA and Vironostika Uniform II, Organon Teknika, the Netherlands), and confirmed by Western blot (HIV Blot 2.2; Genelab, Singapore), as described previously (Chanbancherd *et al*, 1999a). Sera available from 184 HIV-1 seronegative (from the 64,884 tested), 21-year-old male recruits were also tested for antibody to hepatitis C for comparison. Sera were tested for anti-HCV antibody by a third-generation HCV EIA (HCV 4.0; United Biomedical Inc, Beijing, PRC). Sera from HIV-1 positive recruits were tested for differential binding to synthetic V3 loop peptides from subtypes B and E by ELISA, as previously described (Chanbancherd *et al*, 1999b). All tests were performed according to the manufacturer's instructions. Information on province of residence during the 2 years prior to recruitment was used to compare prevalence between regions for HIV positive recruits. This information was unavailable for the HIV-seronegative recruits.

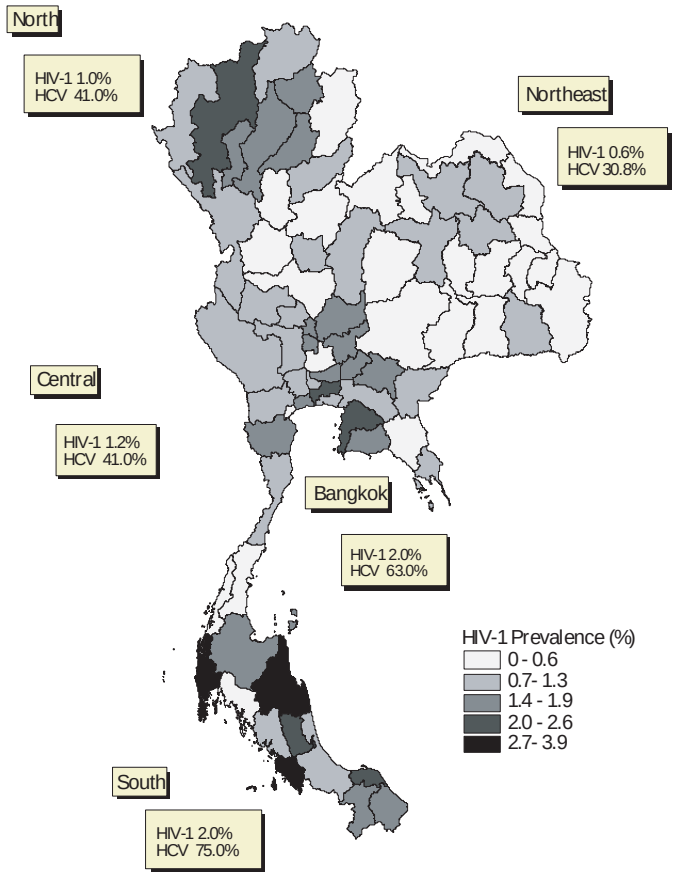

Fig 1–HIV-1 seroprevalence by region and province (HIV-1 only) and HIV/HCV co-infection seroprevalence by region, among young Thai men recruited for military service in the year 2000.

RESULTS

HIV seroprevalence was 711 of 64,884 (1.1%); the distribution by region is shown for comparison in the figure ($p<0.001$, by chi-square test, for comparison between regions). Of the 612 HIV-infected men with available sera, 303 had antibodies to HCV (49.5%), whereas among HIV negative men, 2.2% (4 of 184) were HCV-antibody positive. As a measure of association of hepatitis C and HIV infection, the odds ratio was 22.7; 95% CI 8.6-85.0. Province of residence within the past 2 years in Thailand was available for 570/612 (93.1%) of men who tested HIV-positive in 2000. We found the highest frequency of HCV antibody in HIV-infected young men in the south, 75/100(75.0%) and the lowest in the northeast, 33/107 (30.8%). The prevalence was 75/119 (63.0%) in Bangkok, 66/161(41.0%) in the central region, and 34/83 (41.0%) in the north (Fig 1). Differences for HIV/HCV co-infection among regions were statistically significant ($p<0.001$, chi-square test). Serotypes could be differentiated by antibody binding to V3 peptides B or E in 83% (562 of 612) of HIV-1 positive men, with 70.9% subtype E, 12.6% subtype B, 8.3% reactive to both B and E, and 8.2% non-reactive. The prevalence of HCV-reactive antibody by HIV-1 serotypes were: both B/E reactive, 54.9%; E reactive, 54.6%; B reactive, 37.7%; and non-reactive, 18.0%.

DISCUSSION

Annual nationwide surveillance of Royal Thai Army recruits provides important data about

changes in the regional distribution and prevalence of HIV-1 in a large sample of young men from all parts of Thailand (Mason *et al*, 1998). In this population, the prevalence of HIV/HCV co-infection was much higher than expected based on the previous epidemiology of HIV/AIDS in a similar population of military recruits (Nelson *et al*, 1996), but consistent with more recent data (Nelson *et al*, 2002). In addition, the statistically higher prevalence of both HIV and HIV/HCV co-infection among recruits from southern Thailand, a region with previously lower HIV-1 prevalence, is worrisome. Although not significantly different, hepatitis C infection was more common among those with subtype E, V3-loop seroreactivity. The high rate of HCV/HIV co-infection suggests that HCV and HIV share a common mode of transmission in a substantial subgroup of this population as well, possibly through injection drug use or other means of parenteral infection associated with both HCV and HIV. Since individual information on self-reported drug use was not available from these recruits, further studies are needed to quantify the amount of drug use and other potential risk factors (*eg*, tattooing, body piercing) that may account for this degree of co-infection. In the meantime, prevention and control of HIV in Thailand should focus not only on maintaining continued success in reducing sexually transmitted HIV, but also on strategies that will prevent the parenteral spread of both HIV and HCV.

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