Short Communication
Seroprevalence of hepatitis D virus infection among HBsAg carriers in northern Thailand

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INTRODUCTION

The hepatitis delta virus (HDV) is a small, single stranded RNA hepatotropic virus that depends on hepatitis B virus (HBV) for its survival and replication (Polish *et al*., 1993; Purcell, 1994; Karayiannis, 1998). The hepatitis B virus (HBV) provides the envelope for the HDV, which consists of hepatitis B surface antigen (HBsAg). Because of this relationship, HDV infection occurs only in persons with hepatitis B, either as a co-infection or as a superinfection of a carrier of HBsAg (Rizzetto *et al*., 1980).

The mode of transmission of HDV infection appears to have two patterns: (i) endemic, associated with non-parenteral spread in Italy and (ii) sporadic, associated with parenteral transmission in almost all other areas of the world (Rizzetto *et al*., 1984). In regions where HDV infection is not endemic, the disease is mostly confined to groups at high risk of acquiring HBV infection and high-risk HBV carriers (Polish *et al*., 1993).

Human HBsAg carriers express delta antigen in the liver but do not circulate detectable delta antigen in the blood. Most patients develop antibody to HDV (anti-delta). Detection of anti-delta virus antibodies can indicate an ongoing or a past infection with HDV. The serological detection of this antibody by a sensitive enzyme immunoassay (EIA) provides a tool for recognizing HDV infection and for studying its epidemiology.

Because this viral infection can cause fulminant as well as chronic liver disease, spread of HDV into areas where HBV infection is endemic has serious clinical implications. Prevention depends on the widespread use of hepatitis B vaccine (Polish *et al*., 1993). But those who already have chronic HBV infection continue to be at risk of being infected with HDV (Purcell, 1994). Our study has indicated that northern Thailand belongs to an intermediate prevalence region of HBV infection with 8.7% (Jutavijittum *et al*., 1999) and it needs to be aware of the possibility of superinfection or co-infection of HBV with HDV. Hence, we plan to determine the prevalence of HDV infection among HBsAg carriers in northern Thailand.

MATERIALS AND METHODS

Serum samples from voluntary blood donors in Chiang Mai, Chiang Rai, Lampang, and Lamphun provinces in northern Thailand were screened for blood-transmitted pathogens at the 10th Regional Blood Center office in Chiang Mai. None of the blood donors complained the subjective symptoms of liver dysfunction. Testing for HBsAg was performed using a commercial ELISA kit, Enzygnost® HBsAg 5.0 (Dade-Behring, Marburg Germany). From 1998 to 2000, samples that were HBsAg-positive were collected and stored at −20℃. A total amount of 395 HBsAg-positive (287 males and 108 females) serum samples were obtained, 110 from Chiang Mai, 97 from Chiang Rai, 88 from Lampang, and 100 from Lamphun. The range of donor's age was from 17 to 52 years. The samples were tested for the presence of antibody to hepatitis delta antigen(anti-HD) using ETI-AB-DELTAK-2®, an ELISA kit from Dia-Sorin, Saluggia (Vercelli), Italy.

RESULTS

No anti-HDV was detected among 395 voluntary

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blood donors in 4provinces of northern Thailand.

DISCUSSION

The incidence of HDV varies around the world. Of patients with chronic liver disease in Africa, 73% are positive for HBsAg and 75% of these are also positive for anti-HDV antibodies (Cenac *et al*., 1995). Even in non-endemic areas, HDV antibodies are found in～20% of patients with chronic hepatitis B and acute hepatitis superimposed on chronic hepatitis B infection (Jacobson *et al*., 1985). In contrast, asymptomatic carriers of HBV are only rarely positive for anti-HDV antibodies (Jacobson *et al*., 1985; Louisirirotchanakul *et al*., 1988). In Asia, despite a rich reservoir of HBV carriers, the prevalence of HDV infection is considered to be low, found in～9% (Hao *et al*., 1992; Arakawa *et al*., 2000) although there are areas with high prevalence such as Fiji, Samoa and some areas of China (Vranckx *et al*., 1988).

HDV markers were more frequent in chronic liver disease with 18% than in asymptomatic HBV carriers with 2% (Jacobson *et al*., 1985). In Taiwan, the anti-HDV prevalence among HBsAg carriers was significantly high in STD patients (9.6%), prostitutes (33.1%), and drug abusers (68.1%) than in blood donors from the general population (2.2%) (Chen *et al*., 1992). In Thailand, HDV infection was generally found to be uncommon among cases of HBsAg-positive individuals, 0/27 of asymptomatic HBsAg carriers (Chainuvati *et al*., 1987). About 10% of patients with chronic liver disease and cirrhosis have anti-HDV antibodies, in contrast to～60% of intravenous drug users, and no anti-HDV demonstrated from 46 asymptomatic HBsAg carriers (Louisirirotchanakul *et al*., 1988). We demonstrated that all 395 voluntary blood donors in 4provinces of northern Thailand were negative for anti-HDV. This concurs with previous epidemiological surveys which indicate that in Thailand where HBV infection is endemic, delta infection is rare among asymptomatic HBsAg carriers.

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