J Med Sci 2005;25(2):071-076
http://jms.ndmctsgh.edu.tw/2502071.pdf

Epidemiological Correlates of Impaired Liver Function in Taiwan, an Area Endemic for Chronic Liver Disease

Shu-Ting Luo[1], Yu-Ching Chou[2], Mei-Hsuan Wu[1], Tsan Yang[1], Chi-Ming Chu[1], Ching-Huang Lai[1], Chang-Yao Hsieh[3], San-Lin You[4], Chien-Jen Chen[4], and Chien-An Sun[1*]

[1]School of Public Health, [2]Graduate Institute of Medical Sciences, National Defense Medical Center, [3]Department of Oncology, National Taiwan University Hospital, [4]Graduate Institute of Epidemiology, College of Public Health, National Taiwan University, Taipei, Taiwan, Republic of China

Background: To determine the prevalence and etiology of impaired liver function among Taiwanese. **Methods:** A cross-sectional study was carried out in 7 townships for 11,251 men aged 30-64 years. Blood specimens were tested for serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels and for the presence of hepatitis B surface antigen (HBsAg) and antibodies to hepatitis C virus (anti-HCV). In addition, hepatitis B e antigen (HBeAg) was tested for the HBsAg-positive individuals. Histories of alcohol consumption and cigarette smoking were collected from participants using in-person questionnaires. Univariate analysis and multiple logistic regression analysis were conducted to determine the epidemiological correlates for impaired liver function, as defined by a combination of an ALT level of ≧45 IU/L and an AST level of ≧40 IU/L. **Results:** The prevalence of impaired liver function was 2.6% (95% confidence interval [CI], 2.3%-2.9%). Multiple logistic regression analysis showed that acquisition of HCV infection (adjusted odds ratio [OR], 13.5; 95% CI, 9.8-18.6) and active replication of HBV in HBsAg carriers (OR, 10.7; 95% CI, 7.3-15.7) were the predominant factors for an increased risk of impaired liver function. There was a significant additive interaction between HCV infection and a history of alcohol intake and cigarette smoking, for the risk of impaired liver function. **Conclusions:** Hepatitis C and hepatitis B virus infections were the dominant factors that signaled the risk of liver injury. In addition, the presence of HCV showed an additive synergistic effect for alcohol- and smoking-related impaired liver function among these Taiwanese.

Key words: hepatitis B virus, hepatitis C virus, impaired liver function

INTRODUCTION

In Taiwan, chronic liver disease and cirrhosis are the 6th leading cause of death, and liver cancer is the leading cause of cancer[1]. Thus, Taiwan is an area endemic for chronic liver disease[2]. This is often identified by asymptomatic elevations in serum levels of aminotransferases, including alanine aminotransferase (ALT) and aspartate aminotransferase (AST), as these are commonly included in health checkup serum biochemistry panels. Increasing evidence indicates that histologically advanced liver disease (i.e., cirrhosis) may accompany normal or minimally elevated aminotransferase levels[3-5]. Further compounding this issue is the common detection of abnormal ALT and AST values in apparently healthy persons[6].

The prevalence and correlates of elevated aminotransferase levels have been documented in previous studies of certain population groups (i.e., blood donors and obese adolescents)[7-9]. However, data on the prevalence of aminotransferase elevation in the general population in areas of endemic chronic liver disease is limited. To gain a better understanding of the burden of liver disease in Taiwan, we conducted a cross-sectional study to determine the prevalence and etiology of elevated aminotransferase levels in the general Taiwanese adult population. In this study, we defined the presence of elevated levels of aminotransferases as ALT ≧ 45 IU/L and AST ≧ 40 IU/L, and this definition was considered to indicate impaired liver function or advanced liver disease on the basis of routine diagnosis criteria in Taiwan[10].

Received: October 15, 2004; Revised: November 11, 2004; Accepted: November 23, 2004.
*Corresponding author: Chien-An Sun, School of Public Health, National Defense Medical Center, 161, Min-Chuan East Road Section 6, Taipei 114, Taiwan, Republic of China. Tel: +886-2-87910380; Fax: +886-2-87923147; E-mail: sunca@mail.ndmctsgh.edu.tw