

A PRELIMINARY STUDY ON SEROPREVALENCE OF HEPATITIS C VIRUS INFECTION IN TAIWAN

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A total of 200 study subjects including 100 hepatitis B surface antigen (HBsAg) carriers and 100 non-carriers were randomly selected from a cohort of 7282 residents in 20 townships in Taiwan. Antibodies against the hepatitis C virus (anti-HCV) in serum samples were examined by an enzyme immunoassay using commercial kits. The overall anti-HCV positive rate was 3.5%. HBsAg carriers had a lower rate (2%) than non-carriers (5%), but the difference was not statistically significant. The anti-HCV positive rate in aboriginal, rural and urban townships were 10%, 0.9% and 2.5%, respectively. The geographical variation in anti-HCV prevalence was statistically significant. Weighted by the proportion of population in various townships, the anti-HCV prevalence was estimated as 1.8% for the general population in Taiwan. Males and females had a similar positive rate of 3.3% and 3.7%, respectively. The positive rate was 1.9%, 3.9% and 4.3%, respectively, for age groups of less than 26, 26-45 and 46 or more years old. Subjects with a higher educational level had a lower positive rate than those with a lower educational level (0% vs. 4.7%), and married individuals had a higher rate than unmarried individuals (5.1% vs. 0%). Due to the small sample size and low prevalence, differences by age, sex, educational level and marital status were not statistically significant. (J Natl Public Health Assoc (ROC): 1992;11 (3):214-220)

Key words: Hepatitis C virus, seroprevalence, Taiwan

INTRODUCTION

Although post-transfusional non-A non-B hepatitis has been documented for years (1), HCV was recently identified as one major agent of the disease (2). Several studies have shown the association of HCV infection with the development of chronic liver disease, liver cirrhosis as well as hepatocellular carcinoma, especially among HBsAg non-carriers (3-9). The anti-HCV positive rate has been reported as 1-3% among healthy adult blood donors in Taiwan (10-11). However, there was no community-based survey on anti-HCV positivity among the general population in Taiwan. The geo-

graphical variation in anti-HCV positivity has never been examined either. This study was carried out to examine anti-HCV prevalence among residents of townships in Taiwan, and to elucidate possible risk factors associated with anti-HCV positivity.

MATERIALS AND METHODS

Due to the limitation of financial support, only 200 study subjects were randomly selected from a cohort of 7282 residents in twenty townships who were recruited previously for an island-wide serological survey of human T-cell leukemia virus type I infection in Taiwan (12). Figure 1 shows the map of Taiwan indicating

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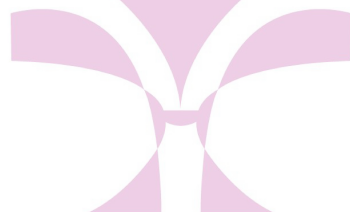




Figure 1: Map of Taiwan showing tenty townships included in the study.

locations of 20 randomly-selected townships. They included 5 aboriginal townships, 11 rural townships and 4 urban townships. In order to examine the difference in anti-HCV positivity between HBsAg carriers and non-carriers, 5 carriers and 5 non-carriers were randomly selected for this study. Serum samples collected in 1985-1986 and stored at -70°C were retrieved from serum bank. HBsAg carrier status was

determined by a radioimmunoassay and anti-HCV by an enzyme-linked immunoassay using commercial kits (Abbott Laboratories, North Chicago, USA).

Sociodemographic characteristics were obtained through standardized interviews based on a structured questionnaire in the initial survey. The association between anti-HCV positivity and these factors were examined for their

statistical significance by chi-square tests. The prevalence of anti-HCV among general population in Taiwan was estimated by the weighted average prevalence calculated from the anti-HCV positivity obtained in this study and total population size abstracted from demographic statistics (13).

RESULTS

The overall anti-HCV positive rate was 3.5% (7/200). Although HBsAg carriers had a lower anti-HCV prevalence (2%) than non-carriers (5%), the difference was not statistically significant. Data of carriers and non-carriers were thus pooled together in the following analysis. The anti-HCV positive rate in aboriginal, rural and urban townships were 10%, 0.9% and 2.5%, respectively, as shown in Table 1. The geographical variation of anti-HCV prevalence was statistically significant. The proportion of population in aboriginal, rural and urban townships was 1.0%, 47.9% and 51.1%, respectively, in Taiwan. Weighted by the population proportion in various township levels, anti-HCV prevalence among the general population in Taiwan was estimated as 1.8%.

As shown in Tables 2, males and females had a similar anti-HCV positive rate of 3.3% and 3.7%, respectively. The positive rate was 1.9%, 3.9% and 4.3%, respectively, for age groups of less than 26, 26-45 and 46 or more years old. Subjects with an educational level of high school or above had a lower positive rate than those with an educational level of junior

high school or below (0% vs. 4.7%). Married subjects also had a higher rate than the unmarried (5.1 vs. 0%). Due to the small sample size and low prevalence, the difference by age, sex, educational level and marital status were not statistically significant.

DISCUSSION

The seroprevalence of anti-HCV was estimated as 1.8% for the general population in Taiwan. It was consistent with those reported previously (10,11) indicating a low HCV infection rate in the general population of Taiwan where hepatitis B virus is hyperendemic. However, a high HCV infection rate was observed among parenteral drug abuser, hemophiliacs, and prostitutes in Taiwan (10). It was significantly associated with non-A non-B post-transfusional hepatitis in Taiwan (10) as in other countries. HCV infection has also been documented as an important risk factor of chronic liver diseases, liver cirrhosis and hepatocellular carcinoma in Taiwan (10). Furthermore, a synergistic effect was found between HBsAg carrier status and anti-HCV positivity (3). In order to prevent the transmission of HCV from the high risk groups into the general population and the occurrence of related liver diseases, the screening of donated blood in blood banks becomes crucial.

In this study, a significantly higher seroprevalence of HCV was observed in aboriginal townships. High HBsAg carrier rate has also been documented among aborigines in Taiwan.

Table 1. Prevalence of antibodies against hepatitis C virus (anti-HCV) by township level in Taiwan

Township level	Number tested	Anti-HCV prevalence	
		Positive No.	Prevalence
Aboriginal	50	5	10.0%*
Rural	110	1	0.9%
Urban	40	1	2.5%

* $P < 0.05$ based on the chi-square test for the statistical significance of the difference in anti-HCV prevalence among different township levels.

Table 2. Prevalence of antibodies against hepatitis C virus (anti-HCV) by sociodemographic characteristics

Sociodemographic characteristics	Number tested	Anti-HCV prevalence	
		Positive No.	Prevalence
Sex			
Male	91	3	3.3%
Female	109	4	3.7%
Age			
<26	54	1	1.9%
26-45	76	3	3.9%
46+	70	3	4.3%
Educational level			
Junior high & below	147	7	4.7%
High school & above	53	0	0.0%
Marital status			
Married	136	7	5.1%
Unmarried	64	0	0.0%

As hepatitis B virus is transmitted through body fluids similar to HCV, it is important to examine whether the high infection prevalence of these two viruses in aboriginal townships was attributable to same transmission routes. A more comprehensive survey of HCV infection among aborigines is suggested.

While no gender difference in HCV infection was observed, the HCV seroprevalence was found to increase with age. Although the increasing prevalence with age was not statistically significant due to the small sample size, the results showing no anti-HCV positivity under age of 16 years old suggested the HCV infection in Taiwan mostly occurs after young adulthood. Intensive health education program on the prevention of HCV propagation is in urgent need. An epidemiological study aimed at the elucidation of risk factors associated with the HCV transmission in the general population is also highly recommended.

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台灣地區 C 型肝炎病毒感染之血清盛行 狀況初探

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本研究係自台灣地區 20 個鄉鎮區 7282 名居民研究世代中，隨機選取 100 名 B 型肝炎表面抗原帶原者，100 名非帶原者為研究對象。利用酵素免疫法之商用試劑測定血清樣本中的 C 型肝炎病毒抗體(anti-HCV)。結果顯示 anti-HCV 陽性率為 2.5%，在帶原者中為 2.0%，非帶原者中為 5.0%，但其差異未達統計上顯著意義。山地鄉、平地鄉鎮及都市的陽性率分別為 10.0%、0.9%、2.5%，在都市化程度上有顯著差異，

經過人口比例加權後的台灣地區一般人口之 anti-HCV 陽性率約為 1.8%。男性和女性之抗體陽性率則頗相近，分別為 3.3% 和 3.7%；高中以上教育程度者(0.0%)低於國中以下程度者(4.7%)；已婚者(5.1%)則高於未婚者(0.0%)，但是年齡、性別、教育程度及婚姻狀況別的陽性率，由於樣本數太小和陽率偏低，所以未達統計顯著意義。

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