Hepatitis C Virus Antibody and Hepatitis C Viremia in Pediatric Dialysis Patients in Taiwan

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Dear Sir,

Hepatitis C virus (HCV), a main cause of post-transfusion non-A, non-B hepatitis, may result in chronic liver disease and hepatocellular carcinoma. Current evidence suggests that the patients receiving multiple blood transfusions have a high positive rate of anti-HCV.

However, the conventional recombinant C100-3-based assay has a limited value clinically [1-3]. In a study, we evaluated HCV infection in pediatric dialysis patients in Taiwan, compared diagnostic values between the HCV C-100 enzyme immunoassay (EIA) test and the recombinant immunoblot assay (RIBA) EIA test-II and evaluated the prevalence of HCV viremia in these patients.

Thirty-two children with end-stage renal disease (ESRD) treated with hemodialysis (HD) from January 1985 to November 1992, 15 boys and 17 girls from 3 to 14 years old, were included in the study. Continuous ambulatory peritoneal dialysis (CAPD) was later given to 6 of them due to symptomatic HD and to another 17 due to self preference. Since February 1991, the treatment of ESRD with anemia was converted from multiple blood transfusions to erythropoietin therapy.

HCV antibody was detected by 1st-generation anti-HCV immunoassay which includes the nonstructural region of the HCV genome (C100-3; Ortho Diagnostic Systems, Raritan, N.J., USA). A supplementary test was done in those who were positive for anti-C100 by using RIBA-1 with a commercial kit (RIBA C100, Ortho Diagnostic System) that included superoxide dismutase, HCV fusion polypeptide 5-1-1 and C100-3. All serum samples were tested by a 2nd-generation anti-HCV EIA to detect antibody reactive to a core region and a fusion of the C100-3 and 33c antigens of HCV (EIA II; Abbott HCV 2.0 EIA, Abbott Laboratories, USA). HCV viremia was detected by nested polymerase chain reaction (PCR) [4].

The results showed that the diagnostic yield in detecting HCV infection was 9.37% (3/32 cases) by 1st-generation anti-C100 assay (EIA I) and 15.62% (5/32) by 2nd-generation anti-HCV immunoassay (EIA II). Three cases positive for EIA I were all positive for EIA II. The difference in the diagnostic yields between these two methods was statistically significant. HCV RNA was detected by PCR in 2 of the 32 patients. Both were positive for EIA II, but

only 1 for EIA I. The patients with increased serum transaminase were all positive for HCV RNA and had a higher positive rate of anti-HCV (4/5 cases = 80%) than those with normal levels (6/27 = 22.2%). There were 24 and 8 patients, respectively, who received HD before or after February 1991. Of the 24 patients, 15 were changed to CAPD later. HCV infection was found in 4 of those who received HD before February 1991 (4/5 = 80%, 4/24 = 17%). Three of them (3/9 = 33%) were on continuous HD and only 1 (1/15 = 7%) changed to CAPD. Only 1 of the 15 patients (1/8 = 12%) treated with HD after February 1991 was found to have HCV infection.

In this study, we demonstrated that EIA II was more useful than EIA I in detecting HCV infection in pediatric dialysis patients. Three patients with HCV infection proved by EIA I were all positive for EIA II. EIA II provided a diagnosis in an additional 2 cases.

The patients with elevated serum transaminase had a higher rate of HCV infection (80 versus 22%) and HCV viremia (100 versus 0%) than those with normal levels. In addition, our results showed that a higher positive rate of HCV infection was found in the patients with longer history of dialysis treatment. These findings suggest that HCV infection might be highly related to the dialysis procedure or multiple blood transfusions.

HCV infection was found in only 1 of 15 patients (7%) who received HD initially and converted to CAPD later. The incidence is relatively low compared to 33% of those receiving continuous HD and adult HD patients. In Taiwan, the prevalence of anti-HCV in adult HD patients by the 2nd-generation test was around 40-52% [5, 6].

In summary, our results suggest that this new anti-HCV test and PCR is more sensitive in detecting HCV infection than the old one. Blood screening for anti-HCV and early change from HD to CAPD may play an important role in decreasing the incidence of HCV infection in pediatric dialysis patients.

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