Nosocomial Transmission of Hepatitis C Virus to Hemodialysis Patients: Molecular Epidemiology by Polymerase Chain Reaction

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Dear Sir,

We had suggested that hepatitis C virus (HCV) may be a nosocomial pathogen for hemodialysis patients, since we had observed acute hepatitis C in newly admitted cases who denied blood transfusions and other risk factors involved in the transmission of HCV [1]. A later study in our transplant population also disclosed a very high prevalence of HCV antibody positivity in this particular patient group [2]. In order to find the incidence of hepatitis C viremia in hemodialysis patients and to gather concrete evidence about the nosocomial transmission of HCV, we conducted a study in 146 regular hemodialysis patients who were anti-HCV-antibody-positive with a second-generation ELISA test or had chronic ALT elevations.

Their sera were initially screened with a recombinant immunoblot assay (RIBA) de-
Table 1. Results of PCR analysis in 75 samples

tecting antibodies against 5-1-1, c100, c33c and c22 antigens. Only 2 (1.37%) samples were RIBA-negative while 27 (18.49%) were indeterminate and 117 (80.17%) were positive. Seventy-five of these samples were analyzed with PCR tests using primers for the 5'-NCR part of the genome. The results are shown in table 1.

Fifteen of the RIBA indeterminate group were PCR-positive while the viral genome could not be detected in 11 samples which were RIBA-positive. Typing of the PCR-positive samples revealed the following data: 95% of the PCR-positive samples were type 1 and there were no type 3 HCV, contrary to the more even distribution of HCV types in infected populations [3]. The conclusions derived from these analyses are summarized as follows. (1) The RIBA-2 test, which is accepted as a 'confirmatory test', verifies our previous results about the high rate of anti-HCV antibody positivity in our patients and also delineates an extremely high rate of infection suggesting transmission routes other than blood transfusions. (2) PCR analysis revealed an even higher rate of patients infected with HCV. Comparable to other studies it was seen that HCV viremia could be detected in a significant number of patients who were anti-HCV-negative. It also confirmed that anti-HCV-antibody-positive patients were not necessarily viremic [4]. (3) Viral typing provided inval-

able epidemiologic data confirming nosocomial transmission of HCV in this particular patient group, since more than 95% of cases were infected with the same HCV type. (4) PCR analysis not only provides data about the viremic status of anti-HCV-positive patients, but is also a very useful molecular epidemiologic tool in the investigation of nosocomial epidemics of HCV infection.

References

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