Hepatitis C in Dialysis Patients

Brian Pereira, MD

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Non-A, non-B hepatitis is an important cause of morbidity and mortality in patients on chronic hemodialysis and in renal transplant recipients. In 1989, the hepatitis C virus (HCV) was cloned and identified as the major cause of parenterally transmitted NANBH. Since then, the development of tests for detection of antibodies to HCV (anti-HCV), and HCV RNA have opened avenues to study the prevalence, transmission and natural course of HCV infection. The prevalence of anti-HCV among patients on hemodialysis (HD) is consistently higher than that in the healthy population. Using first generation ELISA (ELISA 1), the prevalence of anti-HCV antibody among HD patients ranges from 8-36% in North America, 39% in South America, 1-31% in Europe, 17-51% in Asia and 1-10% in New Zealand and Australia. The advent of the second generation anti-HCV tests have shown that the prevalence of anti-HCV in dialysis patients is 1.2 to 3.8 times higher than that by ELISA 1. Currently, the third generation tests are in use. The presence of anti- HCV does not accurately predict the presence of serum HCV RNA in dialysis patients. In fact, HCV RNA has been found only in 52 to 93% of anti-HCV positive dialysis patients. On the contrary, HCV RNA can be present in the absence of anti-HCV. Indeed, 2.5% to 12% of anti-HCV negative dialysis patients test positive for HCV RNA and only 83% of HCV RNA-positive cases have circulating anti-HCV. A possible explanation is the fact that the anti-HCV test might not be sensitive enough, either due to the low titer of antibody or because the antigen used in the assay system cannot detect the serum antibody. Finally, serum ALT levels are elevated in only 24% to 67% of dialysis patients who test positive for anti-HCV. Further, elevated serum transaminases were present only in 31 % of the HCV RNA positive hemodialyzed patients and only in 30% of those who had biopsy-proven hepatitis. Hence, serum ALT levels are a poor predictor of liver disease and HCV infection in hemodialysis patients.

The prevalence of anti-HCV correlates directly with the number units of blood transfused, and anti-HCV-positive HD patients have a history of receiving significantly more units of blood than anti-HCV negative HD patients. In addition, time on HD is an independent risk factor for acquiring HCV infection. The advent of erythropoietin therapy for the treatment of anemia of chronic renal failure and the implementation of screening of blood products for anti- HCV would be expected to reduce the risk of acquiring HCV infection from blood transfusion. Nonetheless, patients in HD units continue to acquire HCV infection suggesting unique modes of transmission in this population.
The prevalence of anti-HCV antibodies in CAPD patients is lower than the prevalence in HD patients, and the prevalence of anti-HCV in patients receiving home-hemodialysis have been found lower than in patients receiving center-hemodialysis. Although the exact modes of transmission in HD units are still unclear, recent reports suggest that the following factors may have a role:

1) Breakdown in standard infection-control practices;
2) Physical proximity to an infected patient;
3) Sharing of dialysis machines; and
4) Reprocessing of dialyzers.

The high prevalence of HCV infection among patients on HD, the limitations of current tests in identifying these patients and uncertainty regarding the modes of transmission within HD units, has led to difficulty in formulating policies regarding HCV infection in HD units. Clearly, strict adherence to "universal precautions" and careful attention to hygiene is essential to reduce the transmission of HCV in dialysis units. However, more studies are required that could address the role of re-use of dialyzers, dedicated machines and patient isolation in the transmission of HCV. Until such data is available, the Center for Disease Control in the U.S. does not recommend dedicated machines, patient isolation or a ban on re-use in HD patients with HCV infection.

References

1. Pereira B]G, Levey AS. Hepatitis C virus infection in dialysis and renal transplantation. Kidney lnt 1997; 51:981-999.
2. Tokars], Alter M], Favero MS, et. al. National surveillance of hemodialysis associated diseases in the United

States, 1992. ASAIO journal1994; 40:1020-1031.