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Dialysis in Liver Failure and Liver Transplantation

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ACUTE renal failure requiring hemodialysis develops in 10% to 20% of liver transplant recipients.¹ This occurs most often in the setting of multiorgan failure and is usually complicated by sepsis. Previous reports have suggested that mortality in these patients may be near 100%.²⁻⁴ Most of these studies have included relatively small numbers of patients and were not specifically designed to address the contribution of dialysis to patient survival. We have conducted a prospective analysis of all potential candidates for liver transplantation and liver transplant recipients requiring dialysis support from May 1988 to June 1989 at the University of Pittsburgh Health Center. The purpose of this study is to more clearly define the long-term survival of these patients and to determine the factors important in predicting outcome.

PATIENTS AND METHODS

From May 1988 to June 1989, 141 patients with liver failure or liver transplant recipients required hemodialysis at the University of Pittsburgh. All transplanted patients received triple therapy (cyclosporine [CyA], azathioprine, and prednisone) or CyA and prednisone only (double therapy). The immunosuppressant protocols have been described in detail elsewhere.⁵ Hemodialysis was conducted using cellulose acetate dialysis membranes. When patients were hypotensive or otherwise unable to tolerate hemodialysis, continuous venovenous hemofiltration (CVVH) was used.

RESULTS

Fifty-three (37.6%) patients were potential candidates for liver transplantation but were not accepted or died before an organ was available. Eighty-eight patients received liver transplants; of these, 53 received one, 28 received two, 6 received three, and 1 patient received four transplants. In the transplanted patients, 3 were dialyzed before transplantation, 7 were receiving dialysis at the time of transplantation, and 78 were dialyzed after transplantation.

Actuarial patient survival was 51% after 18 months in the transplanted group. Only three of the liver failure patients survived the admission and none for 15 months. For both liver failure patients and liver transplant patients, gastrointestinal bleeding was the most important determinant of survival. An additional important factor for trans-

plant patients was number of transplants. Neither ventilator dependence nor the ability to clot hemodialysis filters were associated with survival. Most patients in both groups were ventilator dependent, on at least one vasopressor, and were relatively hypotensive at some time during the admission. Ischemic acute tubular necrosis (ATN) was the leading cause of acute renal failure. Hepatorenal syndrome was a relatively unusual cause of renal failure in both groups and never occurred after transplantation.

In summary, acute renal failure after liver transplantation typically occurs in the setting of multiorgan failure and is associated with high mortality rates. However, the mortality rates previously described in small case series probably overestimate the risk of death in these patients. The leading cause of renal failure was ischemic ATN and not hepatorenal syndrome or nephrotoxic immunosuppressants. Patients with liver failure evaluated at our center as potential transplant candidates universally died, unless a liver transplant could be performed. Uncontrolled sepsis or major gastrointestinal bleeding was the proximate cause of death in these patients.

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