Acute Renal Failure After Cadaveric Related Liver Transplantation


ABSTRACT

Acute renal failure (ARF) is a frequent medical complication after liver transplantation (LT). We analyzed cadaveric related liver transplant recipients who had developed ARF early in the postoperative course. Between January 1982 and August 2003, a total of 67 patients underwent cadaveric related LT. Their mean age was 28.64 years at LT. The 67 recipients had the following indications: biliary atresia (n = 17), Wilson’s disease (n = 15), hepatitis B–related liver cirrhosis (n = 14), hepatitis C–related liver cirrhosis (n = 4), primary biliary cirrhosis (n = 4), hepatitis B–related liver cirrhosis with hepatoma (n = 3), hepatitis C–related liver cirrhosis with hepatoma (n = 2), Budd-Chiari syndrome (n = 2), neonatal hepatitis (n = 1), choledochus cyst (n = 1), autoimmune cirrhosis (n = 1), neuroendocrine tumor (n = 1), and hemangioendothelioma (n = 1). Forty-nine patients received cyclosporine (CsA), azathioprine, and steroids and 18, a combination with tacrolimus (FK506). Eight (11.94%) patients developed ARF at a mean time of 17.25 days after LT. The mean peak serum creatinine was 2.24 mg%. Four of these patients had a diagnosis of hepatitis B–related liver cirrhosis; two, hepatitis C–related liver cirrhosis; one, primary biliary cirrhosis; and one, hepatitis B–related liver cirrhosis with hepatoma. The ARF etiology was multifactorial for the majority of patients. Eight ARF patients had a history of liver cirrhosis, which may be a risk factor for intraoperative ARF. ARF treatment included fluid replacement, decreased or altered immunosuppressive agents, avoiding exposure to nephrotoxic drugs, and adjusting antibiotic dosages. The majority of patients returned to normal renal function at 1 to 3 weeks after the diagnosis of ARF. No patient required dialysis and/or experienced a mortality. We conclude that the incidence of ARF is relatively low and with good outcomes. ARF etiology was multifactorial for the majority of patients, but eight patients had a history of liver cirrhosis, which may be a risk factor for intraoperative ARF. We suggest that in the early postoperative period of LT cases diagnosis and treatment of ARF are important.

MATERIALS AND METHODS

Between January 1982 and August 2003, 67 patients underwent LT including 41 males and 26 patients females. Their mean age was 28.64 ± 18.52 years at transplantation. The 67 recipients had the following indications: biliary atresia (n = 17), Wilson’s disease (n = 15), hepatitis B–related liver cirrhosis (n = 15), hepatitis C–related liver cirrhosis (n = 4), primary biliary cirrhosis (n = 4), hepatitis B–related liver cirrhosis with hepatoma (n = 3), hepatitis C–related liver cirrhosis with hepatoma (n = 2), Budd-Chiari syndrome (n = 2), neonatal hepatitis (n = 1), choledochus cyst (n = 1), autoimmune cirrhosis (n = 1), neuroendocrine tumor (n = 1), and hemangioendothelioma (n = 1). Forty-nine patients received CsA, azathioprine, and steroids and 18, a combination of FK506 and steroids. All data are presented as mean values ± SD.

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RESULTS

Eight (11.94%) patients developed ARF after the early postoperative period. Their clinical data are shown in Table 1. The mean age at the time of diagnosis of ARF was 46.63 ± 5.81 years. The mean time of ARF was 17.25 ± 29.99 days (range 2 to 90) after LT. The mean baseline serum creatinine was 0.80 ± 0.30 mg% (range 0.4 to 1.4). The mean peak serum creatinine was 2.24 ± 1.17 mg% (range 1.3 to 4.9). Four patients were diagnosed with hepatitis B–related liver cirrhosis; two with hepatitis C–related liver cirrhosis; one with primary biliary cirrhosis; and one hepatitis B–related liver cirrhosis with hepatoma. Five patients received FK 506 treatment and one, CsA. Two patients received Zenapax initially post-LT.

The ARF etiology was multifactorial for the majority of patients. Two patients had high FK 506 levels and one had severe intraoperative internal bleeding. Renal sonography was performed for eight ARF patients; none showed obstructive uropathy. Three of the eight patients had biopsy-proved rejection. ARF treatment included fluid replacement, decreased (eg, FK 506 or CsA) or altered immunosuppressive therapy (eg, Zenapax), avoiding exposure to nephrotoxic drugs, and adjusting antibiotic dosages. The majority of patients returned to normal renal function 1 to 3 weeks after the diagnosis of ARF. All eight patients showed intraoperative blood loss of about 6831.88 ± 14420.01 mL. All eight patients received intraoperative blood transfusion around 5790.73 ± 9967.78 mL. No patient required dialysis or experienced a mortality.

DISCUSSION AND CONCLUSION

The incidence of ARF is reported to range from 12.0% to 70% among LT patients. The incidence of ARF among our patients was 11.94%, a relatively low number. The etiology of ARF is multifactorial including preoperative, intraoperative, and postoperative factors. However, despite the significantly improved skill of LT in recent years, operative complications are unavoidable. Hypotension from massive blood loss, circulatory instability, duration of surgery, and many other intraoperative factors provide a well-recognized clinical environment for ischemic renal damage. Postoperative volume depletion, severe infections, the use of many potentially nephrotoxic drugs (FK 506, CsA, antibiotics, and antifungals etc), and repeated rejections episodes are some of the many predisposing factors for ARF after surgery. In our study, the ARF etiology was multifactorial including intraoperative blood loss, FK 506 or CsA nephrotoxicity, massive ascites loss, antibiotics, antifungals, and gastrointestinal bleeding. Eight patients with ARF had a history of liver cirrhosis suggesting that it may be a risk factor for ARF. Eight patients with ARF received intraoperative blood transfusions. Therefore, intraoperative blood loss was an important risk factor for ARF. Fluid replacement therapy was the
first choice for the majority of patients when ARF occurred in the early postoperative period after LT. Transient high blood levels of FK 506 or CsA may be also a risk factor for ARF. All eight patients were adults, no child experienced ARF.

Between 8.2% and 18% of patients require dialysis after LT.1–10,15–17 Associated mortality in this group of patients is high, namely 39% to 90%.1–3,18 In our studies, no patient received temporary hemodialysis. All eight patients survived with four patients returning to normal renal function and four showing partial recovery of renal function. No mortality of the eight patients with ARF was experienced.

We concluded that the incidence of ARF is relatively low and this complication is associated with a good outcome. The ARF etiology was multifactorial for the majority of patients. Eight ARF patients had a history of liver cirrhosis, which may be a risk factor for intraoperative ARF. We suggest early diagnosis and treatment of ARF are important among LT cases in the early postoperative period.

REFERENCES