



Long-Term Lipid Metabolism in Combined Kidney-Pancreas Transplant Recipients Under Tacrolimus Immunosuppression

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SIMULTANEOUS pancreas and kidney transplantation (SPK) has become a highly successful procedure that routinely allows patients to become insulin free and corrects many of the metabolic complications of long-standing diabetes. Previous studies of lipid metabolism with SPK patients have largely been conducted under cyclosporine immunosuppression.^{1,2} In these studies, SPK patients have enjoyed improvement of the prevailing pretransplant hyperlipidemia. Most studies, however, have been relatively short term and have not demonstrated that the improvement in total cholesterol after SPK can be sustained. Since CYA may cause hyperlipidemia, the advantage due to the SPK could be counteracted by the adverse effects of CYA. Tacrolimus (TAC) has experienced increasing use in pancreatic transplantation. Tacrolimus has a more beneficial effect on serum lipids and therefore would be likely to allow sustained normalization of total cholesterol over the long term. We report our experience with serum lipid metabolism over a 5-year period in SPK patients under TAC.

METHODS

A retrospective review of serum total cholesterol and triglyceride was performed in combined kidney and pancreas transplant recipients from July 1994 to December 1998. There were 150 patients transplanted during this period. All patients were transplanted under TAC and prednisone. Some patients also received cellcept or azathioprine. The immunosuppressant protocols have been published previously.³ Drainage of the pancreas (bladder vs enteric) was at the discretion of the surgeon.

Comparison of mean values for total cholesterol and triglyceride was performed for each time point using Student's *t* test when two values were considered, and ANOVA with Bonferroni correction when more than two continuous variables were considered. Statistical significance was set at $P < .05$.

RESULTS

The baseline serum cholesterol for all patients was 208.4 ± 67.5 (range 90 to 458) (Fig 1). At 1 year serum cholesterol was 175.2 ± 42.8 (range 106 to 406); 2 years, 177.7 ± 35.5 (73 to 120); 3 years, 170 ± 37.2 (range 125 to 249); 4 years, 175.7 ± 27.6 (125 to 249); and 5 years, 186.9 ± 30.6 (138 to 256). Cholesterol values were significantly different from baseline values until year 5. At year 5 total cholesterol was not different compared to the general population. Baseline

serum triglyceride was 165.8 ± 110.4 (range 35 to 872). At 1 year triglyceride was 104.6 ± 58.5 (range 21 to 334); two years, 99.7 ± 58.8 (36 to 305); 3 years, 87.9 ± 33.9 (range 34 to 180); 4 years 82.1 ± 35.3 (42 to 162); and 5 years, 87.7 ± 47 . Triglyceride values were lower than baseline values until year 5 but were similar to the general population. There was no difference in cholesterol or triglyceride between patients with bladder or enteric drainage. There was also no difference in lipids in those treated with azathioprine or cellcept.

DISCUSSION

The present study describes a long-term sustained reduction in total serum and cholesterol for SPK. Previous short-term studies under CYA therapy have found similar results.^{1,2} This is the first study that documents sustained normalization of total cholesterol and triglyceride with up to 5 years of follow-up. Burke et al have reported on the lack of impaired glycemic or lipid metabolism in SPK recipients initially treated with CYA and converted to TAC.⁴ Total cholesterol fell from baseline of 256 ± 12 to 187 ± 6 after a mean follow-up of 15 months. The SPK transplant recipients may have an advantage over kidney transplant alone recipients since the latter have been well demonstrated to experience an increase in total cholesterol and triglyceride.⁵ In addition, only patients with successful pancreatic transplants appeared to obtain the benefit of improving lipid metabolism. Smith et al demonstrated that only patients with normoglycemia with a normally function pancreas after SPK had an improvement in total cholesterol and triglyceride.⁶ One study of pancreas transplant alone recipients did not observe an improvement in lipid metabolism up to 1 year posttransplant.⁷

The findings of the present study suggest that lipid metabolism remains in the ideal range at least to 5 years posttransplant in SPK patients treated under TAC. Nor-

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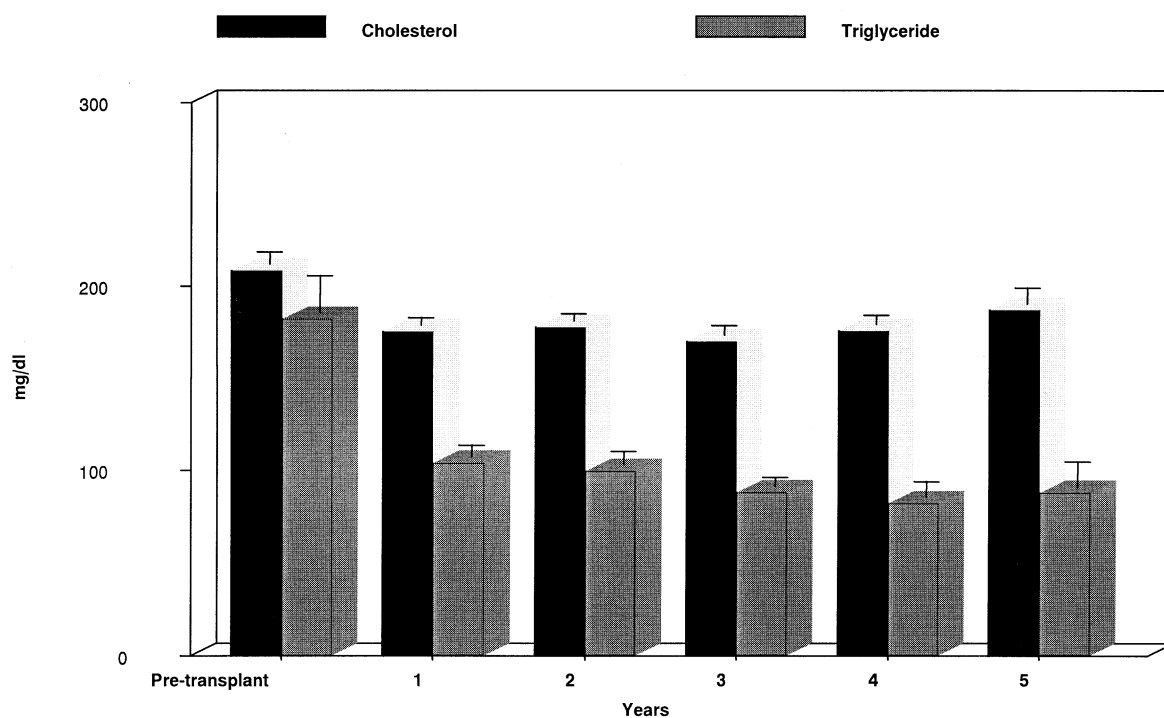


Fig 1. Cholesterol and triglyceride in all patients.

malization of lipid metabolism in these patients may aid in reducing the accelerated atherosclerosis of type I diabetic after pancreas transplantation. Given the advantageous effects of TAC on lipid metabolism, this agent may be preferred in SPK recipients, which potentiates the beneficial effect on lipid metabolism achieved by normalization of carbohydrate metabolism after successful pancreas transplantation.

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