Turk J Med Sci
32 (2002) 251-253

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A Simple Comparison Between Simultaneous Kidney-Pancreas (SKPtx) and Kidney-Alone (Ktx) Transplants in Type I Diabetic Nephropaty

Received: November 08, 2001

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Abstract: Simultaneous kidney-pancreas transplantation (SKPtx) is an established procedure at many transplant centres for the treatment of end-stage renal disease from type I diabetes mellitus.

A successful transplant normalises glucose metabolism and may prevent or reverse some of the complications of diabetes. Concerning graft survival and morbidity rates, the usefulness of this procedure is still questioned by some authors (1,2). We undertook a retrospective study to investigate the differences between survival rates of SKPtx and kidney alone transplant (Ktx) recipients.We also evaluated morbidity rates and complications in both groups. There were no significant differences in 12 and 36 month survival rates. Due to the exocrine bladder drainage technique, urologic complications constitute a major part of morbidity after SKPtx (3,4) (87%), but these problems are usually treated conservatively. We conclude that SKPtx is a safe and effective method resulting in complete freedom from exogenous insulin, dialysis and strict dietary control.

Key Words: Simultaneous kidney-pancreas transplantation, Type I diabetic nephropathy

Introduction

SKPtx is currently the only known treatment procedure capable of establishing an insulin-free euglycaemic state with complete normalisation of glycohaemoglobin levels in type I diabetic nephropathy patients (5). The success rate of SKPtx has dramatically improved over the last decade. According to registry data, patient and kidney/pancreas graft survival rates were 92%, 86% and 78% at 1 year respectively (6). Although short-term results are promising, with the need for more potent immunosuppression and due to increased risk of surgical complications there is still controversy concerning graft and patient survival in SKPtx.

Materials and Methods

We retrospectively reviewed the records of 64 technically successful SKPtx operations performed between April 1996 and September 2000 in our department, and compared 12 and 36 month survival rates with the same number of cadaveric diabetic Ktx recipients. In the SKPtx group there were 35 females and 29 males with a mean age of 38 years. All patients received a kidney and pancreas from the same cadaveric donor. A careful pretransplant evaluation was performed in order to exclude patients with severe vascular and cardiac complications. The retrieval of pancreas and kidney was always from a multiorgan procurement using a standard surgical technique and preservation with Eurocollins solution. In all cases arterial reconstruction of the pancreas was performed with a donor iliac Y-graft. All patients received a whole pancreatic graft using the bladder drainage technique and they were also treated with a standard quadruple immunosuppressive regimen (antithymocyte globulin Merieux for 15 days post-transplant; cyclosporine introduced at day 0; steroids; and azathioprine introduced at day 45 post-transplant). No perfect HLA matching criteria were used to allocate the organs. Anti-cytomegalovirus prophylaxis with acylovir was routinely given and pancreas rejection was diagnosed when urinary amylase decreased more then 50% following confirmation on admision. In the Ktx group there were 39 males and 25 females with a mean age of 36 years. Immunosuppression consisted of cyclosporine A and steroids. Kidney rejection was considered for any increase in serum creatinine that was unresponsive to a decrease in the cyclosporine dose. A core needle biopsy was obtained in all cases to confirm histologically the clinical diagnosis of rejection. All data are expressed as mean ± standard deviation or as

percentages. Characteristics of patients in the two study groups were compared by paired t-test.

Results

Pre-transplant characteristic of patients in the Ktx and SKPtx groups are shown in Table 1. Compared with cadaveric diabetic Ktx recipents, SKPtx recipents had significantly fewer HLA matches and more HLA mismatches with their donors. There were no significant differences between 12 and 36 month survival rates of the SKPtx and Ktx groups (Table 2). Although rejection episodes are more common in the SKPtx group (75%, n = 48 versus 60%, n = 38), renal allograft survival rates were also similar. In SKPtx recipients, 7 pancreas grafts were lost. Three were lost as a result of early venous thrombosis, 2 irreversible rejection and 2 deaths with functioning graft. Six kidney losses were recorded. Three were a result of irreversible rejection, 1 multiorgan failure after thrombosis of the pancreas graft and 2 deaths with a functioning graft. During follow up there were no significant differences between the mean creatinine concentrations of the two groups (Table 3). Blood sugar levels fell from a mean of 191 –mg/dl pre-SKPtx to 92-mg/dl post-SKPtx and remained stable. Glycohaemoglobin levels were normal, ranging from a mean of 4.1% at month 12 to 5.7 % at month 36. Nine patiets died in both groups (Table 4). The most frequently observed comlication in SKPtx were recurrent urinary tract infections (84%) and dysuria (36%) due to pancreatic amylase irritation. In 2 patients recurrent episodes of graft pancreatisis persisted with pseudocyst formation and one of them was drained surgically because of superinfection.

Table 1. Pretransplant characteristics of kidney alone transplants (Ktx) (n = 64) and simultaneous kidney-pancreas transplant (SKPtx) (n = 64) recipients.

	Ktx	SKPtx	P
Age	38.1 ± 7.1	36.0 ± 7.4	0.19
HLA match (A,B,DR)	2.4 ± 1.8	1.3 ± 1.3	< 0.001
HLA mismatch	3.2 ± 1.8	4.3 + 1.3	< 0.001

Discussion

The results of our study suggest that renal allograft survival are comparable in diabetic patients receiving either Ktx or SKPtx. The recipients of combined kidney-pancreas transplants are rare because they receive two organs from the same donor simultaneously. This makes it diffucult to determine the cause of graft loss as well as complicating the allograft survival after SKPtx. The pancreas transplant registry includes data on technically unsuccessful pancreas allografts, which results in inferior SKPtx survival compared with the Ktx allograft (7,8). Our opinion is that large single-centre series provide more realistic results than the registry. Our results confirm those of other centres which have reported higher rates

Table 2. Simultaneous kidney-pancreas transplants (SKPtx) versus kidney-alone transplants (Ktx).

	SKPtx (n = 64)	Ktx (n = 64)
12 month and 36 month patient survival (%)	98/92	92/85
12 month and 36 month kidney survival (%)	92/85	87/79
12 month and 36 month pancreas survival (%)	82/77	–
Incidence of at least one renal rejection (%)	75	60

Table 3. Serum creatinine concentrations (mg/dl) after kidney alone transplants (Ktx) or simultaneous kidney-pancreas transplants (SKPtx).

Post-transplant months	1	3	6	12	18	24	36
SKPtx	2.2±0.8	1.8±0.5	1.9±0.6	2.0±0.7	2.2±1.1	2.3±1.4	2.7±1.8
Ktx	2.1±0.6	1.8±0.6	1.7±0.7	1.9±0.9	2.0±1.2	2.1±1.9	2.2±1.6
P	0.66	0.61	0.55	0.30	0.28	0.39	0.17

Table 4. Causes of death in patients in simultaneous kidney pancreas transplants (SKPtx) and kidney-alone transplant (Ktx) series.

Recipients	n
1. SKPtx	
Myocardial infarction	2
Sudden cardiac arrest	2
Sepsis	1
Lymphoma	1
2. Ktx	
Sudden cardiac arrest	1
Myocardial infarction	1
Pneumonia	1

of renal allograft rejection in SKPtx recipients compared to Ktx recipients (9,10). Our data are parallel to those of Douzdjian et al., who reported lesser degrees of HLA matching in SKPtx recipients (11). Pancreas transplants provide a normal beta cell mass and presumably normally functioning beta cells. The potential effect of poorer HLA matching and higher rates of renal allograft rejection are balanced by the beneficial effects of euglyceamia in preventing recurrent diabetic nephropathy and positively affects the evolution of neuropathy (12,!3). On the other hand, retinopathy, and micro- macro-angiopathy do not clearly benefit from the transplanted pancreas (14). Higher costs and higher morbidity are the counterpart of this success. Finally, our preliminary results showed that SKPtx is a safe and effective method to treat Type I diabetic nephropathy.

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