ELSEVIER

Preemptive Kidney Transplantation: Experience in Two Centers

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ABSTRACT

Introduction. End–stage renal disease (ESRD) is a prevalent, important cause of death. Transplantation increases survival and improves the quality of life of patients with ESRD while long-term dialysis is related to poor outcomes even among patients who undergo subsequent transplantations.

Objectives. To compare the advantages of preemptive procedures with kidney transplants among patients on renal replacement therapy.

Methods. This retrospective study was performed in two Córdoba city transplantation centers. Patients were divided into three groups: preemptive kidney transplant (PKT), patients on hemodialysis who received living donor kidney transplants (LDT), and subjects who received grafts from deceased donors (DDT). Serum creatinine, delayed graft function (DGF), subclinical rejection, and interstitial fibrosis/tubular atrophy (IF/TA) were evaluated at 6 months.

Results. Eighty patients were included: PKT ($n = 28$), LDT ($n = 27$), DDT ($n = 25$) mean age 29, 30, and 35 years, respectively. Women predominated among PKT and men in the other groups. In all groups, cyclosporine was the calcineurin inhibitor mostly used. Creatinine at 6 months was lower in the living donor groups (1.26 mg/dL PKT and 1.32 mg/dL LDT; P = NS) in relation to the deceased donor group (1.96 mg/dL; $P < .05$). DDT had the highest rate of DGF: 44% DDT versus 11.5% LDT vs 0% PKT ($P < .05$). Subclinical rejection was significantly lower among preemptive transplantations: PKT 7.6% versus LDT 18.5% versus DDT 24% ($P < .05$). IF/TA was higher in transplants from deceased donors: PKT 11.1%; LDT 11.5%; DDT 32%.

Conclusions. Preemptive kidney transplantation offered the advantages of a lower creatinine, no DGF, as well as a reduced incidence of subclinical rejection and chronic allograft nephropathy at 6 months posttransplantation.

CHRONIC RENAL FAILURE a condition whose prevalence is increasing every year, is a major cause of morbidity and mortality. Recent data indicate that in our country there are nearly 25,000 patients on dialysis with 16% of them on the waiting list for kidney transplants.[1] Today, kidney transplantation is the treatment of choice for patients with end-stage renal disease (ESRD). However, because there is a growing number of patients on the waiting list, many of them enter renal replacement therapy on either hemodialysis or peritoneal dialysis.[2]

These different forms of dialysis are associated with increased long-term morbidity and mortality. They are also associated with poor outcomes related to transplantation, which shows a linear relationship to the time on this treatment modality.

Kidney transplantation increases survival and significantly improves quality of life among patients regardless of the previous treatment modality.[3,4] Several studies, many of

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Table 1. Baseline Characteristics

	PKT (n = 28)	LDT (n = 27)	DDT (n = 25)
Age (y)	29	30	35
Male (%)	48	57	68
Cause ESRD			
1*	Uropathies	Unknown	Uropathies
2*	Glomerular diseases	Glomerular diseases	Unknown
Hemoglobin (g %)	9.6	10.7	11.3
P × Ca product (%)			
>60	18.6	20	16.6
50–60	29.6	20	12.6
<50	51.8	60	70.8
Cyclosporine (%)	55.5	57.7	64
Tacrolimus (%)	33.3	26.9	32
Sirolimus (%)	7.4	11.5	8
Everolimus (%)	11.1	7.6	0

Results are expressed as mean. P, phosphorus; Ca, calcium; PKT, preemptive kidney transplantation; LDT, living donor transplantation; DDT, deceased donor transplantation.

them retrospective, have shown greater benefits for patients who receive kidney transplants before admission to dialysis,[5] while other studies show no major difference when comparing preemptive transplants in relation to the pretransplant glomerular filtration rate.[6] To evaluate these results in our population, we performed this descriptive study in two Córdoba city transplantation centers, assessing the evolution and prognosis of renal transplantation prior to admission to dialysis with patients who received living donor or deceased donor grafts after a stay on dialysis.

METHODS

This retrospective, descriptive study included patients 18 years or older who underwent kidney transplantations. The living donor kidney cohort was divided into those receiving the transplant prior to versus those after dialysis. Time on dialysis of patients who were subsequently transplanted was not less than 6 months. All patients receiving renal replacement therapy were on hemodialysis. We excluded patients who received a kidney from an expanded criteria donor, namely age ≥ 60 years or 50 to 59 years with one of the following conditions: hypertension, creatinine > 1.5 mg/dL, or death from stroke. We also were excluded retransplantations.

We collected demographic data (age, sex) and evaluated several variables: cause of kidney failure, anemia, calcium phosphorus product, delayed graft function (DGF), serum creatinine, protocol biopsy at 6 months, and immunosuppressive therapy. Hemoglobin levels and calcium phosphorus product were collected before transplantation. We analyzed the serum creatinine levels 1 and 6 months after transplantation. DGF was defined as need for hemodialysis within the first week after transplantation.

All transplant patients underwent a protocol biopsy at 6 months. These patients showed no clinical suspicion of graft damage, for example, elevated creatinine or proteinuria. Biopsy results were collected from each patient to assess the presence of subclinical rejection and chronic allograft nephropathy, the latter defined by the presence of interstitial fibrosis/tubular atrophy (IF/TA).

Statistical Analysis

We employed the chi-square test for categorical variables and Student t test for continuous variables. P values were considered significant when less than 0.05. Statistical analysis was performed with PASW Statistics 18.

RESULTS

The patients were divided into three groups: preemptive kidney transplantation (PKT; n = 28), patients on hemodialysis who received kidney transplantation from a living donor (LDT; n = 27) versus a deceased donor (DDT; n = 25). There mean ages were 29, 30, and 35 years respectively. Women predominated in the preemptive group, while men, in the other groups. Uropathies were the leading cause of ESRD among the PKT and DDT groups, while an unknown etiology predominated among the LDT group. The average hemoglobin level was 9.6 g %, 10.7 g %, and 11.3 g % in PKT, LDT, and DDT, respectively (Table 1) .

In all groups cyclosporine was the calcineurin inhibitor mostly prescribed followed by tacrolimus. In the three groups, some patients changed immunosuppression: in preemptive (n = 5), LDT group (n = 5), DDT group (n = 2) group. All patients received either mofetil mycophenolate or sodium mycophenolate and all were given steroids as part of immunosuppressive therapy (Table 1).

The mean serum creatinine at 6 months was 1.26 mg/dL in the preemptive group and 1.96 mg/dL in the DDT group (P < .05). There was no significant difference between serum creatinine values among patients who received kidney transplantations from living donors: PKT 1.26 mg/dL LDT 1.32 mg/dL (P = NS; Fig 1).

Patients who underwent preemptive transplantation showed no DGF (0%), while the rate was 11.5% for the LDT and 44% in the DDT group (PKT vs LDT P < .05; PKT vs DDT, P < .05; Fig 2).

We evaluated graft survival by protocol biopsies at 6 months. The rate of subclinical rejection was 7.6%, 18.5%, and 24% in PKT, LDT, and DDT groups, respectively (Fig 3) There was a significant difference between PKT and the other groups (PKT vs LDT [P < .05]; PKT vs DDT [P < .05]).

Regarding the presence of chronic allograft nephropathy, we observed 11.1% among the preemptive, 11.5% for the

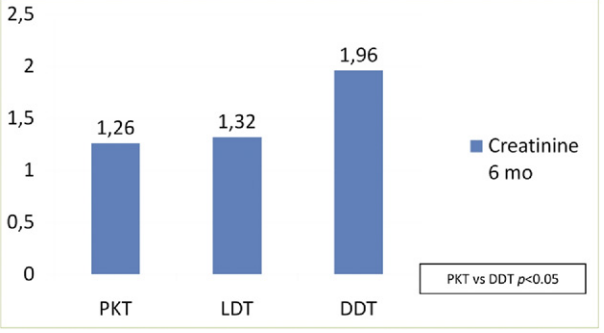

Fig 1. Creatinine (mg/dL) at 6 months.