

Spousal and Living Related Kidney Transplantation: Our Center Experience

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Abstract

Objectives: Kidney transplantation is the most preferred type of renal displacement therapy for ESRD patients. More patients developed end stage renal disease (ESRD). The most important source is the donations from unrelated spouses. In this study, we aimed to compare the transplantation data obtained from the spouses of the patients with the transplantation data obtained from other relatives.

Material and Methods: The data including 167 living kidney transplantations performed between January 2006 and December 2019 were retrospectively collected. The patients were divided into two groups; spousal donor group (n: 53) and living-related donor group (n: 114).

Results: There was no significant difference in delayed graft function in both groups. There were no patients with acute rejection proven by biopsy or considered biochemically in the spousal donor group. With regard to 3-year results in the living-related donor group the patient survival rate was 100%, while it was 98.2% in terms of graft survival.

Conclusion: In conclusion, similar patient and graft survival rates between spousal donor kidney transplantation and living-related kidney transplantation has made spousal donor kidney transplantation, with possible problems in terms of tissue compatibility, an acceptable alternative to donor supply.

Introduction

The number of patients diagnosed with end-stage renal disease (ESRD) is gradually increasing. Kidney transplantation is the most preferred type of renal displacement therapy for ESRD patients. More patients developed end stage renal disease (ESRD) [1]. However, organ donation-related problems lead to increases in the number of cadaveric transplantation problems. Living donors are the most important contributors of organ donation in many countries. There, living-related donors (LRDs) remain to be the main source of kidney transplantation. In our country, donation schemes up to 4th degree relatives can be arranged without the permission by ethics committee. In this regard, the most important source is the donations from unrelated spouses. In this study, we aimed to compare the transplantation data obtained from the spouses of the patients with the transplantation data obtained from other relatives.

Patients And Methods

The data including 167 living kidney transplantations performed between January 2006 and December 2019 were retrospectively collected. The patients were divided into two groups; spousal donor group (n: 53) and living-related donor group (n: 114). Demographic data such as age, gender, HLA incompatibilities, preoperative dialysis duration, and body mass index (BMI), and medical data such as post-transplantation graft and patient survival, serum creatinine levels, delayed graft function, and the presence of biopsy-proven acute rejection were evaluated. Immunosuppressive treatment protocol of the study was the preoperative administration of corticosteroid and mycophenolate mofetil, and basiliximab induction during surgery. The recipients were intravenously administered methylprednisolone 500 mg

before reperfusion. Standard dose of tacrolimus treatment was administered to the recipients when creatinine level falls below 3 in living transplantation. The standard treatment continued in the same way in maintenance treatment protocol of the patients. For tacrolimus, it was targeted to maintain FK 506 trough levels of 8 to 10 ng/mL. Prednisolone was started at a dose level of 100 mg on the 1st postoperative day and the dose level reduced 10 mg per day until a dose level of 20 mg/day. A written informed consent was obtained from the patients and from healthy participants. The study protocol was approved by the Pamukkale University Ethics Committee. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

SPSS 22.0(IBM Corp. Armonk, NY, USA) was used for performing istatistical analysis. Analytical characteristics were given as percentage, mean and SD, or median. The Chi-Square test was used for univariate analysis of categorical variables. Values of $p < 0.05$ were considered to be statistically significant.

Results

Demographic data, immunosuppressive treatments, follow-up periods, HLA incompatibility rates, function and rejection rates, body mass indexes, graft and patient survival rates of 53 patients in the spousal donor group and 114 patients in the living-related donor group are summarized in Table 1. The mean age of the patients was 49.73 years in the spousal donor group and 31.45 years in the living-related group. The transplantations performed in all recipients were the first transplantation surgery that the patients had, except one patient. The transplantation performed in only one of the patients was the third transplantation, the first two of which was from the mother and the father, respectively, and both graft functions was maintained for 12 years. For the third transplantation, the patient's spouse was the donor. Our patient with 5/6 mismatch did not experience any immunological complications during and after the transplantation. The creatinine level of the patient in the postoperative second year was 0.96 mg/dl, and is currently being followed up. HLA mismatch rate in the spousal donor group was 5.06, while it was 3.086 in the living-related donor group. A total of 19 (35.8%) patients were full mismatch patients. There was no significant difference in delayed graft function in both groups. There were no patients with acute rejection proven by biopsy or considered biochemically in the spousal donor group. Acute rejection, which was proven by biopsy during the transplantation, was observed in one relative only and the relative was treated. Creatinine level was 1.8 mg / dl and it is still maintained in a healthy way despite 2 years after the follow-up. The follow-up periods of the patients varied between 6 months and 14 years. In our 14-year experience, cumulative patient and graft survival rates were 96.3% and 96.3% for the spousal donor group and 97.5% and 91.6% for the living-related donor group, respectively. As a more cross-sectional data with the 3-year rates of the present study, the patient and graft survival rates in the spousal donor group were 100% and 98.1%, respectively. The reason for graft loss in this group was the first case of renal artery thrombosis encountered in the series. With regard to 3-year results in the living-related donor group the patient survival rate was 100%, while it was 98.2% in terms of graft survival. None of the losses were due

to surgical or nephrological follow-up complications that might be observed during and after transplantation surgery, but cardiovascular and cerebrovascular causes. 80 (70.1%) of our donors are 1st degree relatives and 28 (24.5%) of them are 2nd degree relatives. Serum creatinine levels at different times following the transplantation in recipients with functional grafts, and there was no significant difference in serum creatinine values between the two groups. No minor or major complications were noted in the follow-up of all donors in both groups.

Table 1
Clinical Characteristics of Transplants From Spousal Donors and Living-related Donors

	SD group (n:53) median	LR Group (n:114) median	P value
Recipient age(yrs)	49.73	31.45	< .001
Donor age(yrs)	44.36	56.14	< .001
Follow-up period(mo)	59.18	71.12	ns
Recipients' BMI(kg/m ²)	27.12	28.96	< .001
HLA mismatches	5.06	3.08	< .001
Pre-tx dialysis period(mo)	24.17	10.91	< .001
Acute rejection	0	1(0.8%)	ns
DGF	3(5.6%)	5(4.3%)	ns
Patient death (cumulative)	2(3.7%)	3(2.6%)	ns
Graft loss (cumulative)	2(3.7%)	11(9.6%)	< .001
Patient death (first 3 year)	0	0	ns
Graft loss (first 3 year)	1(1.8%)	2(1.7%)	ns
SD: Spousal Donor, LR: Living Related			

Discussion

Success rates in kidney transplantation have increased rapidly due to advanced immunosuppressive treatment approaches used in the last two decades [2]. However, there is no significant increase in the number of cadaveric transplantation, while the number of transplant candidates is rapidly increasing. This resulted in an increased need for organs [3] and prolonged waiting times for transplantation [4]. In many transplantation centers, especially in centers where cross transplantation is frequently performed, both tissue compatibility and blood group compatibility problems have made spousal transplantations be the preferred method of organ transplantation centers [5, 6]. This group, with both tissue compatibility

and blood group compatibility problems, has become a preferred alternative, especially due to the high rate of consanguineous marriages in our country. Many centers around the world reported that graft survival rates were equivalent to the transplantations from single haplotype-matched living donor, and that the graft and patient survival rates were better than cadaveric transplantations [7].

In the present study, the children who received kidneys donated by their parents constituted the majority of transplantations in the living-related donor group. This explains the lower mean age of the recipients and the higher mean age of the donors in this group. Younger age is considered to be a risk factor for higher incidence of transplantation rejection for young people with stronger immunological structure compared to the others [8]. Gjertson et al. [9] compared spousal and other genetically unrelated transplantations and found that graft survival rates between the two groups were almost the same. Recent publications in the literature have shown that HLA group mismatches do not have much effect on the result of transplantation [10]. However, many single-center studies showed that the graft survival rates were similar in both living-related and spousal donor groups, but there were more HLA mismatches in the spousal donor group [11]. In our study, although the spousal donor group had a significantly higher HLA mismatch compared to the living-related group, it was observed that HLA mismatches did not have a negative effect on the results. In both groups, postoperative serum creatinine levels decreased to stable levels. There was no statistically significant difference although the spousal donor group was generally higher than the living-related group at each different time point after the transplantation.

The results of our study showed that the 3-year patient and graft survival rates were quite high in both groups. The most important factors here are that our center has a serious decision-making mechanism with marginal criteria regarding transplantations, and the stability of our immunosuppressive treatment protocol which includes induction with basiliximab, which is not used in many centers. Similar patient and graft results between spousal and living-related allografts were also reported in Caucasian [12] and Japanese [13] subjects. The most important reasons for this similarity between these two groups are considered to be strong immunosuppression, high-quality living grafts, and better compliance with the drug regimen as spouses of similar age and the donor and the recipient lived together [14].

Conclusion

In conclusion, similar patient and graft survival rates between spousal donor kidney transplantation and living-related kidney transplantation has made spousal donor kidney transplantation, with possible problems in terms of tissue compatibility, an acceptable alternative to donor supply.

Declarations

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Study conception and design: MO

Acquisition of data: UO, OB

Analysis and interpretation of data: BD, CA

Drafting of manuscript: MC, ME

Critical revision: MO, CA

“All authors read and approved the final version of the manuscript”.

COI statement:

There is no conflict of interest.

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