



Kidney Transplantation in Old Recipients From Old Donors: A Single-Center Experience

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ABSTRACT

Purpose. The program Old for Old or European Senior Program (ESP), allocates donors aged ≥ 65 years to recipients of ≥ 65 , within a narrow geographic area in order to minimize cold ischemia time, decrease the waiting time for elderly patients listed for kidney transplantation and expand the transplant resource in this group. The ESP is not officially applied in Greece. In our center, the Old for Old criteria have been used since 2003 for elderly patients who are candidates for kidney transplantation.

Methods. We aimed to retrospectively evaluate the results of kidney transplantation from donors ≥ 65 years to recipients ≥ 65 years (Old for Old group), by examining a 5-year actual survival of the recipient and the graft. Ten Old for Old transplantations were performed at our center and the graft and patient survival was estimated during a 5-year follow-up. This group was compared to a control group of 10 recipients under the age of 65, who received grafts from deceased donors aged ≥ 65 years; it was found that graft and patient survival was significantly lower in the Old for Old group (50% and 58% respectively), compared to the control group, with graft and patient survival 72% and 80%, respectively ($P < .05$). The main cause of death was cardiovascular disease.

Conclusions. More studies with higher number of patients are needed for the assessment of survival outcome between the elderly transplanted patient and those on dialysis listed for renal allografts to conclude whether Old for Old transplantation is beneficial. It is also important to consider a better pre-transplant medical evaluation with attention to cardiovascular status of the candidates and modification of the immunosuppression protocol in order to avoid serious infections and long hospital stays.

THE NUMBER of patients on renal replacement therapy in the form of dialysis or transplantation for end stage renal disease has grown rapidly over the last decades, especially those over 65 years of age. Currently patients with age over 60 years account for approximately 65% of the incident renal replacement therapy and those of 70 years for about 40% [1,2]. At the same time, the number of elderly people waiting for transplantation are steadily growing, due to better quality of life and good patient survival rate compared to patients on dialysis [3–5]. Because of organ shortage in Europe, the criteria of donor acceptability has expanded, promoting the use of old kidneys, formerly considered unacceptable, with a consequent dramatic

increase in donor age [5]. Eurotransplant, for example, reports an increase of median deceased donor age from 36 years in 1990 to 53 years in 2013 [6]. At the same time, there is a rise in the median age of deceased donor transplant recipients from 45 years in 1990 to 55 years in 2013 [6].

To meet the needs of growing kidney transplant elderly candidates and considering the shortage of available organs,

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Table 1. Characteristics of the Study Groups

	Old for Old	Control	P
Age (y)	66.00 ± 0.94	50.00 ± 8.41	<.001
Male (n)	7 (70)	4 (40)	
Donor age (y)	70.80 ± 4.42	68.00 ± 2.40	NS
Duration of dialysis (mo)	78.70 ± 45.37	80.00 ± 24.18	NS
CIT (h)	17.90 ± 3.07	17.10 ± 3.18	NS
HLA-mm (n)	3.20 ± 1.03	3.20 ± 0.92	NS
DGF (n)	3 (30)	5 (50)	NS
Acute rejection (n)	0.38 ± 0.74	0.50 ± 0.53	NS
Infections (n)	0.67 ± 0.50	0.67 ± 0.50	NS
Graft survival (mo)	32.90 ± 28.72	54.00 ± 10.20	<.05
Patient survival (mo)	34.50 ± 27.30	58.20 ± 5.69	<.05
Number of patient deaths (n)	5 (50%)	2 (20%)	<.05

Abbreviations: CIT, cold ischemia time; DGF, delayed graft function; mm, mismatch; NS, not significant.

on January 4, 1999 the Eurotransplant Senior Program (ESP) or also called Old for Old program was applied, which allocates donors of 65 years or more to recipients of ≥ 65 years, using a variety of criteria [6].

ESP is not officially applied in Greece. However, in our center, the Old for Old ESP criteria are used since 2003, and transplantations were carried out based on these criteria. We herein assess the 5-year kidney and patient survival in recipients over 65 and younger than 65 years who received an over 65 years cadaveric kidney.

PATIENTS AND METHODS

Since 2003 all elderly recipients of deceased kidney transplants, from donors of ≥ 65 years (mean age 69.40 ± 3.75 years), were included in the study and divided into 2 groups. The first ($n = 10$), listed as Old for Old, consisted of recipients ≥ 65 years (mean age 66 ± 0.94 years) with mean donor age of 70.8 ± 4.42 . The second group listed as control group of 10 recipients under 65 years (mean age 50 ± 8.40 years) with a mean donor age of 68 ± 2.4 years. Demographic, clinical data from donors and recipients, HLA mismatches, cold ischemia time, delayed graft function, acute rejection episodes, infections, and hospitalization time were recorded and analyzed for 5 years (Table 1). Immunosuppression for both groups consisted of IL-2 monoclonal antibodies, calcineurin inhibitors, mycophenolate mofetil, and steroids. Acute rejection episodes were treated with steroid boluses and antithymoglobulin. The study includes only cadaveric kidney transplants in both groups. The pre-operative cardiovascular evaluation of the recipients was performed with resting echocardiography, echocardiography, and exercise echocardiography testing. Coronary angiography was performed in recipients with ischemia signs and/or abnormal valvular function. Only recipients with good cardiovascular status were transplanted.

The unpaired *t*-test for continuous variables and the χ^2 test for categorical variables were used to compare data between the 2 groups. All data were expressed as the mean and standard deviation. The Kaplan-Meier method was used to compare patient and graft survival rates. Statistical significance was defined as $P < .05$. All statistical analyses were carried out with IBM SPSS version 23.0 software (IBM, Armonk, NY).

RESULTS

The overall 5-year survival rate of all recipients was 69% and graft survival 62%. More analytically, the 5-year survival of recipients >65 years was 50% and was significantly inferior ($P < .05$) compared to recipients <65 years (80%). The kidney transplant survival after 5 years was better in the younger recipients (72%), control group, compared to 58% in the Old for Old group ($P < .05$). The main cause of death in the patients over 65 years old was cardiovascular disease.

DISCUSSION

In this study we have examined the outcome of old deceased donor kidney transplantation in recipients over and younger than 65 years. We found a significantly inferior graft and patient survival in recipients >65 years from deceased donors >65 years compared to patients <65 years who received a cadaveric kidney older than 65 years ($P < .05$). Cardiovascular disease was the main cause of death. Worse patient outcome in kidney transplantation with expanded criteria donors versus standard criteria donors were also confirmed in all available multicenter or registry reports as was reviewed by Pascual et al [7].

Given that older recipients have a shorter life expectancy, longer time on dialysis and probable co-morbidities, death with a functioning allograft accounts for at least 50% of graft losses [8,9]. Furthermore, old donor kidneys have decreased nephron mass and present vascular and glomerular senescence together with atherosclerosis, which justify higher incidence of delayed graft function, ischemia/reperfusion lesions, and rejection episodes [10,11].

Since the Wolfe study in 1999, the patient survival after transplantation has been reevaluated [11,12]. According to Pippas et al, although there is a 10% lower probability of patient survival at 10 years, transplantation is beneficial compared to dialysis. In the case of shorter follow-up periods the results are more encouraging [12].

In conclusion, more studies with higher numbers of patients than our center treats have to be carried out for better assessment of survival outcome between the elderly transplanted patients and those on dialysis listed for renal allografts to conclude whether Old for Old transplantation is beneficial. It is also important to consider a better pre-transplant medical evaluation with attention to cardiovascular status of the candidates probable improvement of the immunosuppression to avoid serious infections, long hospital stays, and malignancies.

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