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Outcome Analysis of Renal Transplantation from Living Related Elderly Donor

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Abstract **A retrospective analysis of our living related renal transplant program (from May 1988 to August 1998) revealed 8 of donors were above 50 years of age (range 50-60 year). One recipient died at one and a half year after renal transplantation. Seven recipients have been followed up for more than 3 year. These patients were compared with a cohort of 12 patients (recipients of grafts from donor age 40-49 year) with similar HLA match, immunosuppressive protocol and follow-up period more than one year. Graft survival at one year was 100 per cent in all recipients. Allograft function was evaluated by serum creatinine determination. Serum creatinine levels (mg%) were 2.47 ± 1.98, 2.37 ± 0.82 and 2.15 ± 0.21 recipients from in donor age below 50 and 1.58 ± 0.32, 2.48 ± 1.65 and 2.00 ± 0.17 in recipients from donors of age above 50 years old at 1, 3 and 5 years, respectively. There were no added morbidity in older donors in comparison to younger donor. In veiw of acute organ shortage, it can be concluded that if elderly donors are properly screened, they can be accepted for donation without increasing risks to donor or graft outcome.**

The age associated decline in renal function is generally attributed to the anatomical and functional changes observed in human kidney.[1,2] With advanced age, there is atherosclerotic occlusion of renal vessels, progressive glomerular sclerosis and hyalinization causing a reduction in the number of functioning nephrons.[3,4] Consequent to these anatomic changes, alteration in glomerular blood flow and intracapillary hydrostatic pressure may occur in the remaining nephrons and lead to further glomerular damage and progressive deterioration in renal function.[5,6]

When the age kidney is transplanted into uremic patient, the combined effect of compensatory renal hemodynamic injury and the postransplant exposure to noxious events such as acute tubular necrosis, graft rejection, sepsis and nephrotoxic drugs may cause a rapid deterioration in graft function and shorten the survival of the transplanted kidney. To determine whether transplantation of an aged kidney into the uremic recipient has a deleterious effect on postransplant renal function and graft survival, we analyzed our clinical results in 20 consecutive patients who received elderly donor living related renal transplant at our center.

Patients and Methods

Between May 1988 and August 1998, there were 126 cases of living related renal transplantation performed in our medical center. Of these 126 living related donors, 20 donors were in the age of 40 years and over and were divided into two groups according to their ages (Table 1). Group I comprised of 12 donors younger than 50 years, ranging 40-49 years (average 45.4 years). Group II comprised of 8 donors older than 49 years, ranging 50-60 years (average 54.2 years). Preoperative evaluation included thorough clinical assessment and exhaustive investigation i.e. hematological and biochemical screening, chest x-rays, electrocardiogram, intravenous urography, arteriography, tissue typing and matching. Echocardiogram and cardiac exercise test were performed when indicated to rule out cardiac disease. The living related kidney graft was flushed with Eurocollin solution at time of donor nephrectomy. All recipients received immunosuppression with cyclosporin A and prednisolone postoperatively.

To assess the effects of donor age on post transplant renal function and graft survival, the clinical outcome of recipients receiving kidney from donors in Group I and Group II were studied and compared. The duration of graft function was measured as the time elapsed in months from the day of transplantation to the day of graft failure. Cumulative patient and graft survivals were calculated by the standard life-table. Statistical comparison between the two groups was made with student's T test and chi square analysis.

The short term renal function in the recipients was accessed by measuring serum creatinine level at one year post transplant.[1,3,5] Serum creatinine level determined at the last follow-up or the most recent clinical visit prior to the resumption of chromic dialysis represented the long term graft function in the recipients.

Table 1 Demographic characterstic of donors.

	Group I (40-49) Younger donor	Group II (50-60) Elderly donor
Number	12	8
Average age	45.4	54.2
BUN (mg%)	11.2 ± 2.7	10.6 ± 3.1
Creatinine (mg%)	1.2 ± 0.2	1.0 ± 0.3

Table 2 Mean serum creatinine with standard diviation.

	Post transplant period		
	1 year	3 years	5 years
Group I	2.47 ± 1.98	2.37 ± 0.82	2.15 ± 0.21
Group II	1.58 ± 0.32	2.48 ± 1.65	2.5 ± 0.17
P	NS	NS	NS

Table 3 Cause of death in recipient in both groups.

Cause of Death	Group I	Group II
Hepatic failure	1	
Sepsis		1
Myocardial Infarction		1
Total	**1**	**2**

Results

There was no loss of donor in either group. One donor older than 50 years had intraoperative bleeding due to incidental slippage of renal vein stump which was immediately brought under control. All donors have been closely followed up since the time of their kidney donation. It has been no deterioration of renal function in the donors and no antihypertensive medication is required by any one of the donors.

All recipients receiving grafts from both donor groups have a minimum follow-up of one year. The mean follow-up in recipients receiving grafts from Group I and Group II donors were 28.1 and 39.1 months respectively. Early post transplant complications were comparable in recipients receiving grafts of both donor groups. Serum creatinine reached basal level by 2.3 and 2.8 days post transplant in the recipients receiving grafts from Groups I and II donors respectively. The long term follow-up serum creatinines in recipients receiving grafts from both donor groups was shown in Table 2. The difference between the two groups was statistically insignificant ($p=0.05$) at all periods of time. At one year, a patient receiving graft from group I donor had elevated serum creatinine from chronic rejection and succumbed in hepatic failure at 16 months. Two patients receiving

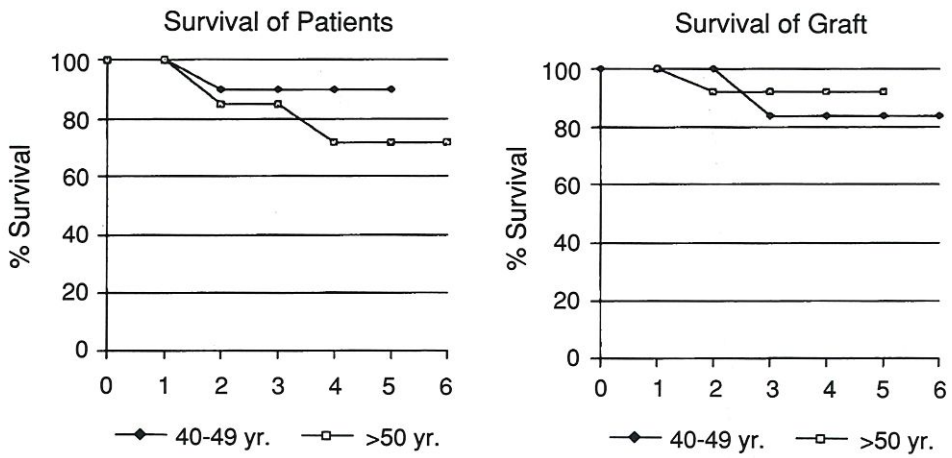


Fig. 1 Cumulative patient and graft survival rates in recipients receiving transplants from donors group I and group II.

grafts of donor group II died at 1.5 years and 5 years due to acute myocardial infarction and sepsis (Table 3). The cumulative survival of patients and kidney grafts was depicted in Figure 1. The 1-year, 3-year, and 5-year survivals for recipients receiving grafts from Group I and Group II donors were 100, 90, 90 and 100, 87, 75 percent respectively. Their survival rate was not significantly different regardless of their donors' ages. However, the corresponding 1-year, 3-year, 4-year graft survivals from Group I and Group II donors were 90, 90, 90 and 100, 82, 82 percent respectively. The older donor group had significant lower graft survival at 3 years when compared with younger donor group (Figure 1).

Discussion

In a developing country like Thailand, parents form the main source of donor kidney in a living related transplantation because of emotional ties. However, they are often refused because of their ages (above 50 yrs). The factor responsible for this rejection are two - fold : first, the increased risk of donor related complication secondary to surgery/anesthesia in geriatric population and second, the structural and functional alteration in the aging kidney.

Merx et al have computed the risk of death within 7 day of anesthesia and surgery in various age group.[7] Death rates rose progressively with age 1 per cent (21 to 20 years) to 4.4 per cent (61 to 70 years), 6.8 per cent (71-80 years) and 8.2 per cent (above 80 years). There was no mortality after donor nephrectomy in our living related transplants. Current advances in anesthetic management and perioperative care have made this surgical procedure very safe.

Despite all available evidence, no difference in graft survival or function was found in recipients of kidneys from elderly living donor.[8-10] Other authors have contested this observation and showed a deleterious effect of donor age be it living related or cadaveric or graft survival.[11-13] Retrospective analysis of our living related renal transplant program show comparable graft function and survival whether the kidney is obtained from donor age between 40-49 or older. Although serum creatinine levels in recipients of older donor group were marginally higher, they were within normal range in lower age donor group (40-49 year). All grafts function remained stable at one year. A similar observation was reported previously by other.[10]

There is a concern that kidneys from older donors might give inferior results within time. This study followed patients for at least 12 month and longest at 5 year revealing no difference of graft function in both groups. In Thailand, an elderly donor graft may often mean difference between life and death for a patient in ESRD who would otherwise exhaust his financial and physical resources if condemned to a maintenance dialysis program. Exhaustive candidate should be allowed to accept a graft from appropriate living related donor of elderly group. Age of donor alone should not be held as a reason to exclude them from making kidney donation.

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