

An observational study of voluntary live kidney donors-post transplant in tertiary care centre from South India

S Manoharan¹, B Lalith Narayan², M Natesh Prabhu^{3*}

{¹Professor, Department of Medicine} {³Associate Professor, Department of Pharmacology} Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur -621 113, Tamil Nadu, INDIA.

²Consultant Physician, Department of Medicine, Tanjore Medical College, Thanjavur, Tamil Nadu, INDIA.

Email: drnateshprabhu@gmail.com

Abstract

Kidney transplantation is best choice in the treatment of chronic kidney disease (CKD). An observational study was conducted at Thanjavur Medical College Hospital to study impact of renal donation by assessing systemic disease, renal function and their psychosocial functioning in the donors. 50 live kidney donors were enrolled and females (78%) were the single major group of donors. Female donors had a mean age (24 years) at donation less than the males. The prevalence of hypertension and Diabetes mellitus (20%) among the donors was similar to the population based studies. None of the donors had proteinuria. Only one donor had elevation of urea and creatinine. The mean time taken by the donors to return to normal life was 4.08 weeks. All the donors had a positive attitude towards donation.

Key Word: kidney transplantation, live kidney donor, quality of life, transplant outcome.

*Address for Correspondence:

Dr. M Natesh Prabhu, Associate Professor, Department of Pharmacology, Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur -621 113, Tamil Nadu, INDIA.

Email: drnateshprabhu@gmail.com

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INTRODUCTION

Kidney transplantation is best choice in the treatment of chronic kidney disease (CKD). The transplantation may increase the survival and maximize quality of life¹. However there is an increasing mismatch between the demand and supply of kidneys for transplantation. This led to the increase in living donor transplantations over deceased donor transplants. Living related kidney donor transplantation is no longer controversial². Kidney transplantation ensure recipient survival, but also to offer

patients much the same state of health as they enjoyed before the disease, achieving a balance between the functional efficacy of the graft and patient's psychological and physical integrity but the clinical benefits for the donor are less clear. In the US, one study revealed that live-kidney donors have similar or higher scores in all quality of life domains compared with the healthy US population and this observation was independent of the time since donation³. Hence this study aims to assess the effects of renal donation by assessing the systemic disease and renal function in the donors and the impact of renal donation on their psychosocial functioning.

SUBJECTS AND METHODS

Study site and design: This study was an observational study conducted from February –October 2012 at Thanjavur Medical College Hospital, Thanjavur.

Subjects: 50 live kidney donors were selected from Department of Nephrology - Out patient department, Thanjavur Medical College and Hospital based on the inclusion criteria: Related and unrelated Voluntary kidney

donors of both genders were included. There was no set limit for age and the time period since donation for donors. Pre-existing diseases or current co-morbid illnesses were accepted. No major exclusion criteria were fixed. All the donors in our study had undergone conventional surgical nephrectomy.

METHOD

This study was performed in accordance with ethical standards laid down by the ethics committee of the hospital. All donors gave their informed consent prior to their inclusion in this study. The clinical examination and laboratory investigations were done. The name, age and sex, relationship to the recipient, date of transplant, blood pressure, blood urea, serum creatinine, urine protein, urine spot protein creatinine ratio were documented. The quality of life of the donors was assessed by the time taken to return to normal day to day activities after surgery and their attitude towards kidney donation. Donors who had a post donation period ranging from few months up to 27 years were studied.

Statistical analysis: Data were presented as mean or number (percentage) as appropriate.

RESULTS

From February-October 2012, 50 live donors were consented to participate; all donors underwent conventional surgical nephrectomy. Among 50, 11 were males and 39 were females. The least age at donation – 24 years and Oldest age at donation – 62 years. The majority of the donors were wives 18/39 (36%). There were 9 mothers (18%) and 8 sisters (16%) among the donors studied.

Table 1: The demographic details of the study population are given in Table 1.

Demographic data	N= 50	Percentage
Sex		
Male	11	22%
Female	39	78%
Age at time of donation		
20-30	6	12 %
30-40	16	32 %
40-50	14	28 %
50-60	13	26 %
60-70	01	2 %
Relationship with patients		
Mother	9	18%
Father	3	6%
Brother	6	12%
Sister	8	16%
Wife	18	36%
Mother in law	2	4%
Father in law	1	2%
Sister in law	2	4%
Friend	1	2%

Table 2: Systemic diseases present in donors prior and after the donation

Number of donors with pre-existent diseases : 3	1. Systemic hypertension : 2
	2. Hypothyroidism : 1
Number of donors who developed systemic diseases after donation: 10 (20%)	1. Systemic hypertension : 5
	2. Diabetes mellitus : 4
	3. Stroke : 1

10 out of the 50 donors studied (i.e. 20%) had presented medical ailments. 7 donors had hypertension with mean systolic blood pressure: 122.32 ± 13.65 mmHg and mean diastolic blood pressure: 79.16 ± 9.85 mmHg. The male hypertensive donor had developed stroke and had a residual hemiparesis with power 4+ and was ambulant. 4 had diabetes were on treatment for the same mellitus whose blood sugar was under control with no complications and one donor with hypothyroidism continued to take thyroxine and was in euthyroid state.

Table 3: Renal function details in

Test	Number of donors	Mean Value obtained
Serum urea >40mg/dl	4	32.12 ± 5.35 mg/dl
Serum creatinine >1.2mg/dl	1	0.91 ± 0.18 mg/dl
Proteinuria was not noted in any of the donors.		
Mean value of spot urine protein creatinine ratio: 0.18 ± 0.08		

The normal range for serum urea values in our lab is 10 to 40 mg/dl, and for serum creatinine it is 0.6 to 1.2 mg/dl. Concordant higher values for both urea and creatinine in a donor were found in 1 donor, who was the hypertensive donor without regular follow up. None of the donors had demonstrable proteinuria by the standard heat coagulation test. The mean protein creatinine ratio 0.18 ± 0.08 (Range 0.04 – 0.35), this is well within the normal of 0.5 for protein creatinine ratio.

Time taken to return to normal life after donation

- Minimum time taken to return to normal life: 2 weeks
- Maximum time taken to return to normal life: 6 weeks
- Mean time taken by male donors to return to normal life: 3.63 weeks
- Mean time taken by female donors to return to normal life: 4.20 weeks
- Overall mean time taken by donors to return to normal life: 4.08 weeks

DISCUSSION

Chronic kidney disease is a worldwide public health problem with an increasing incidence and prevalence. An increasing number of patients are treated with renal replacement therapy (RRT) - dialysis or transplantation. The annual incidence of end-stage kidney disease (ESRD) has doubled over the past decade to reach about 135 per million in Europe and a similar rate is seen in USA. It is expected to continue to rise at an annual rate of around 5-8%. In India, the annual incidence is 34-240 per million populations⁴. The burden of CKD is growing and this can be attributed to the pandemic of diabetes and hypertension, as India is expected to become the diabetic capital of the world. Thus age at donation appears to be important at present as younger donors are at a greater risk of developing CKD for the reason that they are expected to live longer. Among the 50 donors enrolled in the study, 11 were male and 39 were females, constituting 22% and 78% of the study population respectively. Related donors were 26/50 (52%). unrelated donors were 24/50 (48%). Muthusethupathi *et al.* studied renal donors in a state funded hospital in Tamil Nadu and found that females constituted up to two thirds of the donor study population⁵. The finding of a majority of donors being females was also substantiated by Guleria S, in whose study women outnumbered men by a ratio of 6:1⁶. The average age of female and male donors in the study was 47.74 and 41.74 years. Thus the mean age at donation for female donor was nearly 4 years less, compared to male kidney donors. 14/39 (35.89%) of female donors had donated between 30 to 39 years of age and constituted the majority group. 4/39 (10.25%) had donated between 20 to 29 years of age. Thus around 10% of the female donors were in their third decade of their life at the time of donation. There were no male donors in that age group. The majority of the donors were wives 18/39 (36%). There were 9 mothers (18%) and 8 sisters (16%) among the donors studied. Thus it is evident that 80% of the donors in the study were females who were emotionally attached to the recipients in the closest order. In India, spousal donations are predominantly wife to husband donations rather than vice versa [7]. A study showed that men took longer to make the decision to donate and that more men than women expected 'negative repercussions' if they changed their minds once they had offered to donate⁸. 15 The finding of lesser male donors in our study is comparable to the findings of Veerappan *et al.*⁴. The mean age of the donors studied was 49 years. The youngest donor was 32 years old and the oldest 74 years old. This finding is similar to other studies on donors from India by Guleria *et al* and Sahay *et al.*^{9,10}. There has been a recent surge to include donors with chronic diseases like hypertension and diabetes which are well

controlled and whose kidneys do not show evidence of injury from the systemic diseases. 'Expanded criteria donors' or 'marginal donors' explains inclusion of donors with chronic diseases like hypertension and diabetes which are well controlled and whose kidneys do not show evidence of injury from the systemic diseases. In our study, three of the donors enrolled in the study had systemic diseases prior to donation. Two of them had systemic hypertension and one had hypothyroidism. 10 out of the 50 donors studied (i.e. 20%) had presented medical ailments post transplant. 7 donors had hypertension. 4 had diabetes mellitus. None of the donors with hypertension had visited a Nephrologist after the immediate post transplant follow up. 5 out of the 7 hypertensive donors had already been diagnosed with hypertension and were on treatment for the same and were aged more than 55 years. 4 donors diagnosed with Diabetes mellitus were undergoing appropriate treatment under their family physicians. There is a higher prevalence of hypertension in women aged more than 60 years as compared to men¹¹. Watnick *et al* showed an increase in the occurrence of hypertension in 1988. They also had observed an increase in glomerular proteinuria without a decrement in GFR after up to 18 years post uninephrectomy for renal donation¹². Talseth T *et al.* observed a 15% occurrence of hypertension in the post donation follow up study. Manisha Sahay *et al.*⁷ observed that 46% of renal donors had developed hypertension. The occurrence of hypertension in donors enrolled in our study appears to be similar to the general population. All hypertensive donors had a good quality of life and none had proteinuria¹³. Proteinuria has been linked to both increased risk of renal and cardiovascular diseases. It is used as a marker of endothelial dysfunction. None of the donors in our study had demonstrable proteinuria by the standard heat coagulation test. Concordant higher values for both urea and creatinine in a donor were found in 1 donor, who was the hypertensive donor without regular follow up. Fehrman- Ekholm *et al.* concluded that renal donors did not have any long term risk compared to the general population and that kidney donors appear to live longer due the fact that only healthy persons are chosen for kidney donation in majority of the circumstances¹⁴. Risks to the donor are low (0.005% mortality and, 0.3% serious complications) but not absent¹⁵. The donors in our study had undergone conventional surgical nephrectomy. The average time taken for return to normal life was 4.08 weeks. Most donors were back to their normal life within a month of donation and no major health deterioration was noted. Donors had a positive attitude toward donation. They were happy to have been able to help their near ones get a better life. Most of them were unaware of the need for

proper medical follow up. All the donors had a positive attitude about donation and would reassure prospective donors in the future. On average, relatives now donate one of every four kidneys transplanted in the United States, but the use of living unrelated donors (LUDs) has only recently been widely accepted. The number of unrelated donor transplants has grown from 64 (1% of kidney transplants) in 1988 to nearly 600 (5% of kidney transplants) in 1997¹⁶.we recommend that living related and unrelated renal donation be considered whenever possible to help reduce the disparity in numbers between potential renal transplant recipients and kidneys from cadaveric donors.

Limitations Of The Study: The small number of donors studied limits extrapolation of this study into safety profile of donors. A prospective study would have addressed the donor follow up better. There had not been any graft rejection in any of the recipients. Therefore the attitude of all the donors was naturally positive. This may have caused a skewed result.

CONCLUSION

The successful renal transplants are an example of how health services can go well with affirmative act of voluntary live donation whilst accepting that death is an inevitable part of life. Continued efforts are needed to overcome the barriers to improve donation rates and integrate current knowledge into donors and recipients through multidisciplinary educational initiatives and clinician resources. There were more female donors than males. The apprehensions about complications of the renal transplant surgery among the donors to allayed both for donors and the public. The prospective recipients with male donors are at increased risk of leaving the program in the evaluation phase.

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