

## Renal Outcome and Health Related Quality of Life of Living Related Donors In Pediatric Kidney Transplantation

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To assess the health related quality of life of living related donors after kidney transplantation and to evaluate clinical, social and psychological condition post donation. This is an observational cross sectional study that included fifty living related donors of kidney transplant. All donors were assessed after at least one year of kidney donation. Data of the study was collected between April, 2019 and March, 2020. The study included 50 living related donors; All donors were assessed after at least one year of kidney donation. WHOQOL-bref questionnaire (world health organization quality of life) was used to assess quality of life of donors. The mean age at time of transplantation was  $35.4 \pm 7.89$  years. Eight cases developed hypertension after transplantation. There was no significant difference between serum creatinine before and after transplantation while there was significant decrease in glomerular filtration rate post transplantation. There was significant increase in fasting blood glucose and cholesterol in female donors compared to males. The results of the WHOQOL-bref questionnaire showed significant difference in results of psychological, social and environmental domains pre and post donation. Proper selection of donors is very important to avoid complications post transplantation. Follow-up of donors should be maintained after donation.

**Keywords:** Donor; follow up Transplantation.

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Renal transplantation provides a better prognosis and long-term benefit to chronic kidney diseases patients<sup>1</sup>. Kidney transplantation using grafts from living donors has increased along with the need for renal transplantation. Living-donor transplants provide more satisfying graft function and survival compared with deceased-donors<sup>2</sup>. Many studies have been done to check the risks. The results have showed that risks and benefits

are present in living donation. Kidney donation doesn't cause physical benefit for the donor, but psychologic benefit are present (a sense of gratification). It is important to clarify the risks to make informed and adequate decisions<sup>3,4</sup>. The inclusion criteria of the living donation have been extended and older donors and donors with minor problems such as hypertension have been accepted for donation<sup>5</sup>. However, it must be noted that live

donor nephrectomy is performed on healthy people who do not need any intervention. So, donor safety and close follow up remains important point in living kidney donation. It has been found that kidney function might be impaired immediately after donation and recovers within the first year. Previous studies suggest that renal function reached at 1 year postdonation remains stable at least for over the next decade but then impaired with ageing<sup>6</sup>.

Previous studies showed that survival and quality of life (Qol) in living kidney donors are nearly similar to the general population<sup>7</sup>. However according to recent studies kidney donors suffered from proteinuria, hypertension, and ESRD<sup>8,9</sup>

An excellent method for QOL assessment in living donor transplantations has not been agreed upon. There are new studies discussing living donor transplant in different countries, most of them using the Medical Outcomes Study Questionnaire 36-Item Short-form Health Survey (SF-36) or, the WHOQOL-bref Questionnaire (World Health Organization Quality of Life-brief)<sup>10, 11</sup>

The WHOQOL-bref includes 26 items; the first two questions evaluate overall quality of life health satisfaction. The other 24 questions represent each of the 24 facets of which the original instrument is composed (WHOQOL-100), divided into four domains: physical, psychological, social relationships and environment. The mean score in each domain measures donor satisfaction with each aspect of their life, relating it with quality of life. The higher the score, the better this is perceived to be<sup>12</sup>

## METHODS

This is an observational cross sectional study that included fifty living related donors of kidney transplant for pediatric recipients. Included donors were randomly recruited during follow up of their related pediatric transplant recipients in Kidney Transplantation Outpatient Clinic, Cairo University Children Hospital. All donors were assessed after at least one year of kidney donation. Data of the study was collected between April, 2019 and March, 2020.

The study was ethically reviewed and approved by Pediatric Nephrology Unit,

Department of Pediatrics, Faculty of Medicine, Cairo University and medical research ethical committee in the National Research Center. All procedures followed were in accordance with the Helsinki Declaration of 1964.

For all donors, kidney transplantation (KT) operation was performed in Cairo University Children Hospital, in which only living related donor transplants (LRDT) are allowed. Donors were followed up for at least 3 months post-transplant medically and surgically in our unit, then were referred for long-term follow-up in adult Nephrology department, Kasr Al Ainy Hospital.

Pre-transplantation medical data (as diabetes and hypertension), intraoperative details (as time of the operation, side of donor nephrectomy, number of renal transplant vessels) and early post-operative complications (as pneumothorax or chest/wound infection) were obtained by reviewing the medical records. Late complications (as wound incisional hernia) were also reported.

Donor clinical and laboratory assessment was performed during their recruitment in the study. Blood pressure, fasting blood glucose, serum albumin, uric acid, cholesterol and triglycerides were measured. Kidney function was assessed by serum creatinine and quantitative urine protein assessment. GFR was calculated by modified Schwartz formula. Health Related Quality of Life (HRQOL) was evaluated for all donors using WHOQOL-bref questionnaire pre and post donation.

Statistical Package for Social Sciences version 15 (SPSS, Chicago, Ill) was used to analyze collected data. Nominal data were expressed as frequencies and percentage, parametric data as means and standard deviations (SD) and non-parametric data as median and range or interquartile range (IQR). Associations between the outcome measures and different components were tested for significance by using Chi-square test for categorical variables and the paired student t- test for continuous variables with normally distributed data. P value less than 0.05 was considered statistically significant.

## RESULTS

As seen in table 1 The study included Fifty living donors 24 males and 26 females. The mean

age at time of transplantation was 35.4±7.89 years. The mean follow up duration post transplantation was 4.9±2.78 years. Rt donor nephrectomy was done in 31 donor while Lt was in 19. Single renal artery was in 40 cases while double renal artery was found in 9 cases and triple renal artery was found in one donor. The mean systolic blood pressure was 139 and diastolic blood pressure was 77. Five donors were already hypertensive and controlled on Ca channel blockers and remained controlled post transplantation, while 8 cases developed hypertension after transplantation and received treatment. Only one case developed diabetes mellitus and started treatment.

Four cases developed incisional hernia post transplantation and were treated conservatively. The mean protiens in urine was 41.58 mg ptn/gm creatnine. Three donors developed microalbuminuria due to development of diabetes and hypertension.

There was no significant difference between serum creatinine before and after transplantation (p value 0.1161), while there was significant decrease in glomerular filtration rate post transplantation as seen in figure 1 (p value 0.0001). While comparing results of males and female donors There was significant increase in fasting blood glucose(FBG) and cholesterol in female donors compared to males (Pvalue 0.023, 0.0019). While there was significant increase in serum uric acid in male donors as seen in table 2.

The WHOQOL-bref questionnaire were used and the donors were subjected to the questionnaire before and after the transplantation.

The results of the WHOQOL-bref questionnaire was shown in table 3 and figure 2. There was significant difference in results of psychological, social and environmental domains of WHOQOL-bref questionnaire

**Table 1.** Demographic and clinical data of donors (n= 50)

Gender (Male/Female)	24/26
Weight (kg)	91± 33.874
Duration post-transplantation in years	4.9±2.78
Mean age at time of transplantation in years	35.4±7.89
Nephrectomy (Rt/Lt)	31/19
Smoker	21
Systolic BP (mm hg)	139±18.88
Diastolic BP (mm hg)	77.12±12.15
Fasting blood glucose (mg/dl)	101±19.8
Serum Cholesterol (mg/dl)	213±98.8
Serum Albumin (mg/dl)	4.1±1.1
Mean Hb (g/dl)	12.8±1.2
Mean Protein in urine	41.58±12.25
Serum Uric acid (mg/dl)	5.9± 2.214
Serum Calcium (mg/dl)	9.5±2.21
Serum Triglycerides (mg/dl)	115±62.5

**Table 2.** Comparison between males and females donors

	M (24)	F (26)	P value
FBG (mg/dl)	89 ±41.25	122 ±54.45	0.023
Serum Cholesterol(mg/dl)	189±85.12	288±122.87	0.0019
Serum uric acid (mg/dl)	5.9±1.9	4.1±1.5	0.0005
Hb (g/dl)	13.9±7.9	11.8±7.5	0.3398
Protiens in urine	56.5±27.9	45.125±17.5	0.0880
Serum Albumin (mg/dl)	4.5±1.5	4.3± 1.4	0.628
Serum Triglycerides (mg/dl)	142±45	160±52	0.1985

**DISCUSSION**

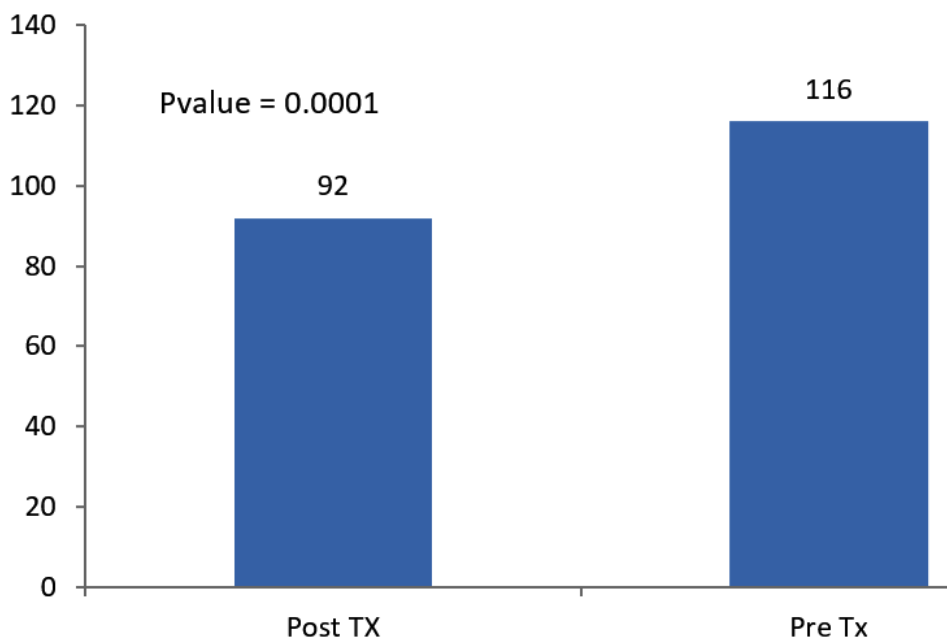
Donor safety and close follow up remains important point in living kidney donation after transplantation. The study was conducted on 50 living donors with nearly same percentage of males and females . These results were nearly similar to Chatzikyrkou results which showed that male percentage of donors was 35%<sup>13</sup>. The male percentage was higher in Dienemann et al study on donor hypertension which was 69%.<sup>14</sup>. The mean age at time of transplantation was 35.4±7.89. The

age was younger than age of donors in many studies like Jankietal where the mean age of donors was 53 years<sup>15</sup>.

The mean systolic blood pressure was 139 and diastolic blood pressure was 77. While 8 cases developed hypertension after transplantation. These results were higher than study done by Kasiske et al and studing 3 years follow up of donors where mean systolic and diastolic blood pressure were 120.7,74.5 respectively<sup>16</sup>. while discussing long term consequences of live kidney donation Gossman et al found that systolic

**Table 3.** Results of different domains of WHOQOL-bref questionnaire

Qol Items	Mean	Median
Physical domain (before donation)	27.6±5.334	28.5
Physical domain (after donation)	27.94±6.179	30
Psychological domain (before donation)	18.84±2.985	18
Psychological domain (After donation)	28.7±2.323	29
social domain (before donation)	10.12±1.649	10
social domain (after donation)	14.1±1.669	14
Environmental domain (before donation)	32.48±1.432	32
Environmental domain(After donation)	33.64±1.758	36
Overall Qol before Donation	2.26±0.6642	2
Overall Qol after Donation	4.9±0.4629	5
Overall general health before donation	2.42±0.702	2
Overall general health after donation	4.72±0.5729	5

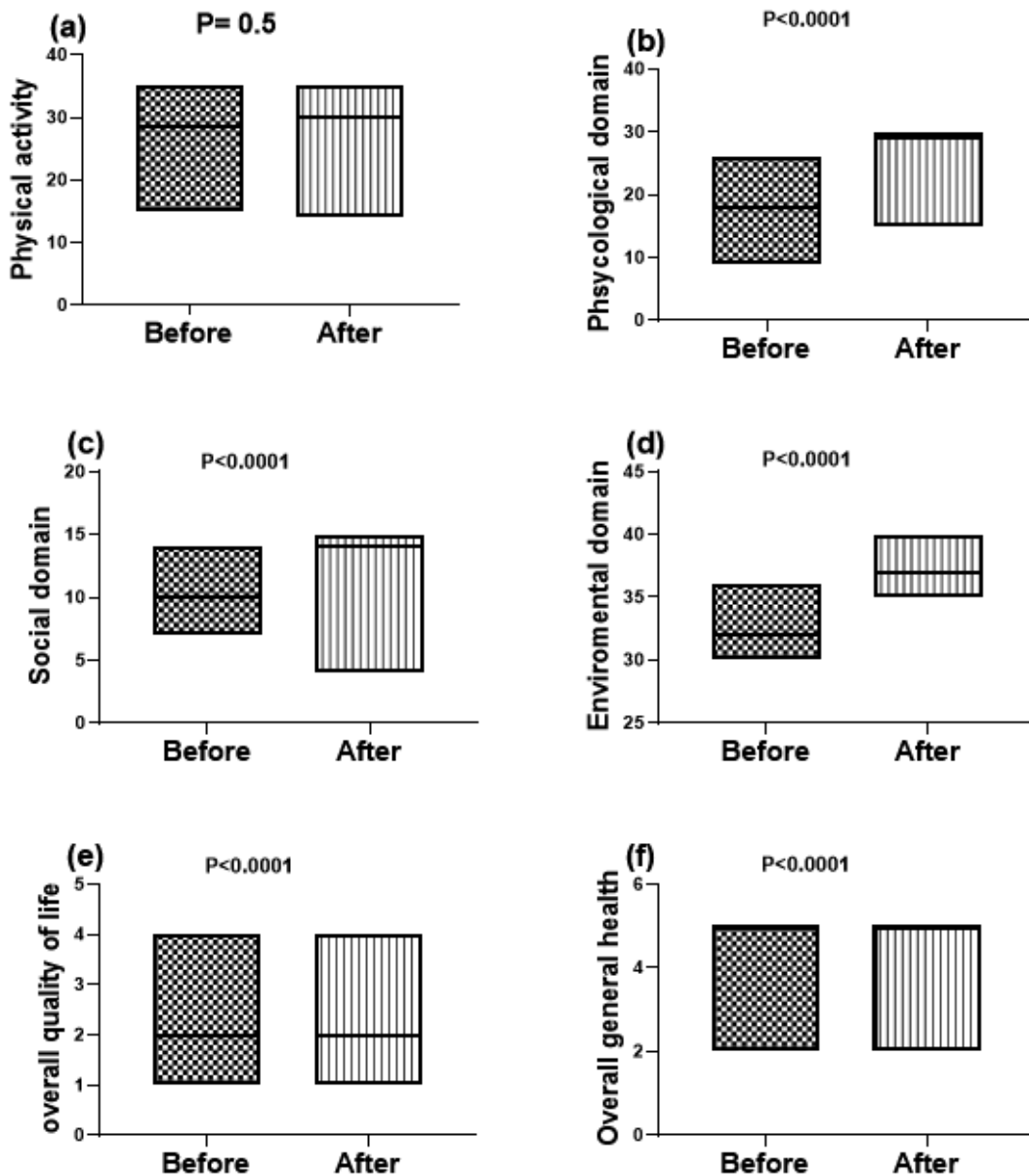


**Fig. 1.** Comparison between mean donor GFR pre and post transplantation

and diastolic blood pressure were 134 and 81 respectively which was quite similar to our study ,they also noticed increase in the percentage of donors developed hypertension from 7 to 30 %<sup>17</sup>.

There was significant decrease in glomerular filtration rate post transplantation

,similar to Gossmann et al where GFR decreased from  $119 \pm 30$  to  $99 \pm 30$  mL/min/1.73 m<sup>2</sup><sup>17</sup>. These results were also similar to Park et al who were trying to find tools to Predict Chronic Kidney Disease Risk in Living Kidney Donors post transplantation and found decline in GFR <60



Horizontal lines inside the box plots represent the median, The boxes mark the interval between the Minimum and Maximum. Statistical differences were analyzed using Wilcoxon matched pairs-signed rank test Significant difference at P<0.05.

**Fig. 2.** Comparison of the quality of life of the living kidney donors before and after transplantation by WHOQOL-bref questionnaires

mL/min/1.73 m<sup>2</sup> 1 year post transplantation. This was correlated with old age, hypertension, serum uric acid, and creatinine levels, and lower serum calcium levels.

The results of the multivariate analysis found that older patients and those with higher serum creatinine levels and lower serum calcium levels had a significantly greater risk of developing CKD (18). Chatzikyrkou *et al* also reported decline in GFR after 1 year donation when compared to that pre donation and found that decline in GFR was correlated with older age<sup>13</sup>.

Our results were also similar to Janki *et al* in 5 years follow up of donors where they find that half of donors developed low GFR < 60 mL/min/1.73 m<sup>2</sup>. and found that decline may be due to older age at time of donation or having a lower eGFR before transplantation<sup>19</sup>.

The WHOQOL-bref questionnaire was used and the donors were subjected to the questionnaire before and after the transplantation.

The results showed no significant changes in the physical domain while there were significant changes and improvement in the social, psychological and environmental domains and in the overall QOL and general health before and after donation. These results were due to the type of donors in our study who are related either mother, father, brother or uncle. These donors were ready to donate and even to loss their lives to keep their children transplanted and stop suffering of their kids that make the donation an altruistic behavior and made them satisfied. Our results was similar to Padrao and Sens results which discussed Quality of life of kidney donors in Brazil by using short form-36 questionnaires and WHO QOL brief questionnaire comparing donors with control group –unlike our study- and found no significant changes regarding physical domain but showed significant increase in remaining domains when compared to control group<sup>20</sup>. Our results were also similar to Vemuru Reddy SK *et al* Where donors showed significant improvement in the QOL in the physical, Psychological and environmental domain before and after organ donation and non-significant improvement in the social relationship<sup>21</sup>.

On contrast Lumsdaine *et al* assessed the donor QOL before, six weeks and one year after donation, and found declined QOL six weeks after the donation, but results improved one year after

donation. These results may be due to the early time of assessment after donation<sup>22</sup>. Erim *et al* also found significant decline in quality of life 3 months post transplantation while assessing quality of life in more than 150 living kidney donors before and after donation and assuming that cause may be due to the early time point of assessment<sup>23</sup>. Nejatiasfa *et al* reported low QOL after donation while discussing QOL in unrelated donors post donation and found the reason that most of kidney donors in Iran are unrelated whose main motivation is “a financial gain”<sup>22</sup>.

## CONCLUSION

This study has concluded that related living kidney donation does not negatively affect the lives of donors and may improve many social, psychological and environmental aspects of their lives. Careful donor selection is very important point to provide good physical quality of life post donation. The majority of living related donors would donate again and again to protect their children.

## ACKNOWLEDGMENT

To all our heroes who donated for their children to have better life not afraid of having health problems post donation, just sacrificing their life for their children.

### Conflict of interest

The authors declare no conflicts of interest.

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