# DIFFERENCES IN CARDIAC STRUCTURE ASSESSED BY ECHOCARDIOGRAPHY BETWEEN RENAL TRANSPLANT RECIPIENTS AND CHRONIC KIDNEY DISEASE PATIENTS

[1]Dounousi E, [1]Mitsis M, [2]Naka KK, [1]Pappas H, [2]Lakkas L, [1]Harisis C, [2]Pappas K, [1]Koutlas V, [1]Tzalavra I, [1]Spanos G, [1]Pappas E, [2]Michalis LK, [1]Siamopoulos KC

*[1]Renal Transplant Unit and [2]Cardiology Department, University Hospital of Ioannina, Greece*

## Objectives:

Cardiovascular disease (CVD) is the leading cause of death in predialysis chronic kidney disease (CKD) and dialysis patients as well as in renal transplant recipients (RTRs)

Left ventricular hypertrophy (LVH) starts early during the course of CKD and is a strong predictor of CVD in this population

Regression of LVH after a successful renal transplantation remains a debatable issue among investigators, whereas there is little data comparing echocardiographic measurements between patients with predialysis CKD and RTRs

The ***aim*** of this study was to compare echo-cardiographic measurements of LV structure and function between predialysis CKD patients and RTRs of similar renal function level

## Methods:

- ✓ We conducted a case control study with individual (1:2) matching from the Renal Transplant and the predialysis CKD Outpatient Clinic
- ✓ For each of the 36 RTRs (Group 1), two matched for gender, age and estimated glomerular filtration rate (eGFR) predialysis CKD outpatients (72 patients) (Group 2) were included
- ✓ All patients underwent transthoracic echocardiography and left ventricular mass, LV mass index [LVM and LVMI=LVM/BSA g/m$^2$) and indices of systolic function were measured
- ✓ Normal values: LVM: Female = 67-162g, Male =88-224 g
  LVMI: Female ≤95 g/m$^2$, Male ≤ 115 g/m$^2$
- ✓ Simultaneously we evaluated clinical, laboratory parameters and medication
- ✓ In a subgroup of 12 RTRs we retrospectively assessed and compared the LVMI measurements at three different time points, during predialysis, dialysis and post transplant period

## Results:

1. Baseline demographic, clinical and laboratory features of the 36 RTRs (Group 1) and 72 CKD patients (Group 2) are summarized in ***Table 1***
2. RTRs had significantly lower 24h urine protein and significantly higher serum calcium in comparison with CKD patients (p=0.002, p=0.001, respectively) ***(Table 1)***
3. With regards to medication, a significant higher percentage of RTRs were receiving β-blockers, vitamin-D, statin and Erythropoietin Stimulating Agents (ESAs) compared to the CKD group (p<0.001, p<0.001, p=0.03 and p=0.035, respectively) ***(Table 2)***
4. The prevalence of LVH was 33% in RTRs and 52% in CKD patients (ns) ***(Table 3)***
5. RTRs had significantly lower LVM and LVMI levels compared with predialysis CKD patients (p=0.006 and p=0.008, respectively)
6. In RTRs, LVMI was significantly correlated with Diastolic BP (r=0.42, p=0.01), whereas in predialysis CKD patients a significant positive correlation was found between LVMI and age (r=0.388, p=0.001) and a significant negative correlation between LVMI and eGFR (r= -0.313, p=0.009)
7. In the subgroup of 12 RTRs, post transplant LVMI levels (105±25g/m$^2$) were significantly lower in comparison with predialysis (147±57 g/m$^2$) and dialysis LVMI levels (169±72 g/m$^2$) (p=0.01, p=0.01, respectively)
8. In the subgroup of 12 RTRs, post transplant eGFR (55.6±11.5 ml/min/1.73m$^2$) was significantly higher compared with predialysis eGFR (32.1±8.7 ml/min/1.73m$^2$)

***Table 1***

| Variables | Group 1 (36) | Group 2 (72) | p |
|---|---|---|---|
| Gender (M/F) | 27/9 | 40/30 | - |
| Age | 49.5±9.8 | 53.6±11.7 | - |
| Diabetes Mellitus (no,%) | 7 (19%) | 14 (19%) | - |
| Hypertension (no,%) | 33(91%) | 61 (85%) | - |
| CVD (no,%) | 8 (22%) | 12 (17%) | - |
| CKD-EPI (ml/min/1,73m²) | 51.6±15.6 | 52.6±26.9 | - |
| Urine Protein (mg/24h) | 219 (66-506) | 392 (156-1896) | 0.002 |
| Systolic BP (mmHg) | 136±17 | 138±21 | - |
| Diastolic BP (mmHg) | 82±8 | 84±10 | - |
| Hb (g/dL) | 13.3±1.5 | 13.7±1.7 | - |
| Calcium (mg/dL) | 9.9±0.5 | 9.4±0.5 | 0.001 |
| Phosphorus (mg/dL) | 3.2±0.6 | 3.4±0.8 | - |
| PTH (ng/mL) | 98 (56-137 | 68 (47-120) | - |
| Cholosterol (mg/dL) | 210±38 | 220±50 | - |
| Triglicerides (mg/dL) | 144 (110-174) | 140 (105-191) | - |
| CRP (mg/dL) | 3 (2-6) | 1 (2-5) | - |

***Table 2***

| Variables | Group 1 (36) | Group 2 (72) | p |
|---|---|---|---|
| Diuretic (no,%) | 9 (25%) | 24 (33%) | - |
| B-blocker (no,%) | 34 (94%) | 19 (26%) | <0.001 |
| Calcium channel blocker (no,%) | 20 (56%) | 31 (43%) | - |
| Anti-RAAs (no,%) | 17 (47%) | 42 (58%) | - |
| Statin (no,%) | 22 (61%) | 24 (33%) | 0.03 |
| Vitamin-D (no,%) | 20 (56%) | 4 (6%) | <0.001 |
| ESAs (no,%) | 9 (25%) | 6 (8%) | 0.035 |

***Table 3***

| Variables | Group 1 (36) | Group 2 (72) | p |
|---|---|---|---|
| LVH (no,%) | 12 (33%) | 36 (52%) | - |
| EF (%) | 68±8 | 70±9 | - |
| FS (%) | 37±7 | 39±9 | - |
| LVM (g) | 190±64 | 234±83 | 0.006 |
| LVMI (g/m²) | 103±32 | 125±42 | 0.008 |

## Conclusion:

RTRs had significantly lower LVMI compared with predialysis CKD patients of similar age, renal function, hemoglobin and blood pressure level

We also showed a reversal of LVH after renal transplantation. Our data might imply that both LVM level before ESRD and during dialysis may substantially influence post transplant LVM

There is compelling need for large, prospective studies in order to assess the course of LVH at initiation and during the progression of CKD

## References:

1. Levin A, et al. Prevalent left ventricular hypertrophy in the predialysis population: identifying opportunities for intervention. Am J Kidney Dis 1996;27:347-54
2. Montanaro D, Gropuzzo M, Tulissi P, et al. Effects of successful renal transplantation on left ventricular mass. *Transplant Proc* 2005;37: 2485–2487
3. Vaidya OU, House JA, Coggins TR, et al. Effect of renal transplantation for chronic renal disease on left ventricular mass. Am J Cardiol 2012;110:254-257
4. Liefeldt L and Budde K. Risk factors for cardiovascular disease in renal transplant recipients and strategies to minimize risk. Transplant Int 2010;23:1191–1204
5. McQuarrie EP, et al. Association between proteinuria and left ventricular mass index: a cardiac MRI study in patients with chronic kidney disease. NDT 2011;26: 933–938

51ERA-EDTA

751--SP

N) Renal Transplantation. N2) Clinical epidemiology of renal transplantation.

Evangelia Dounousi

DOI: 10.3252/pso.eu.51era.2014

Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014

PosterSessionOnline.com