

BACKGROUND

- Cardiovascular events and mortality increases with declining kidney function which improves following kidney transplantation (KTx). (1,2)
- We have previously shown an association of vascular endothelial function with LV hypertrophy in non-transplant CKD patients. (3-5)
- However this association has never been studied prospectively, particularly in transplant recipients

AIM

- This study investigated cardiac and vascular, structural and functional changes in CKD patients with kidney transplantation.

METHODS

- 10 patients (3 predialysis, 7 dialysis) were included in this study.
- Cardiac structure & function using echocardiogram, endothelial function using brachial artery flow mediated dilatation techniques established in our lab (see figures 1 and 2), were assessed within 7 days before and 6 - 12 months after kidney transplantation.
- Left ventricular mass (LVM) was calculated using the Penn formula and further indexed to height and corrected for body surface area to give the left ventricular mass index (LVMI).
- Data were analysed using "Statistical Package for Social Sciences" (SPSSv.21).

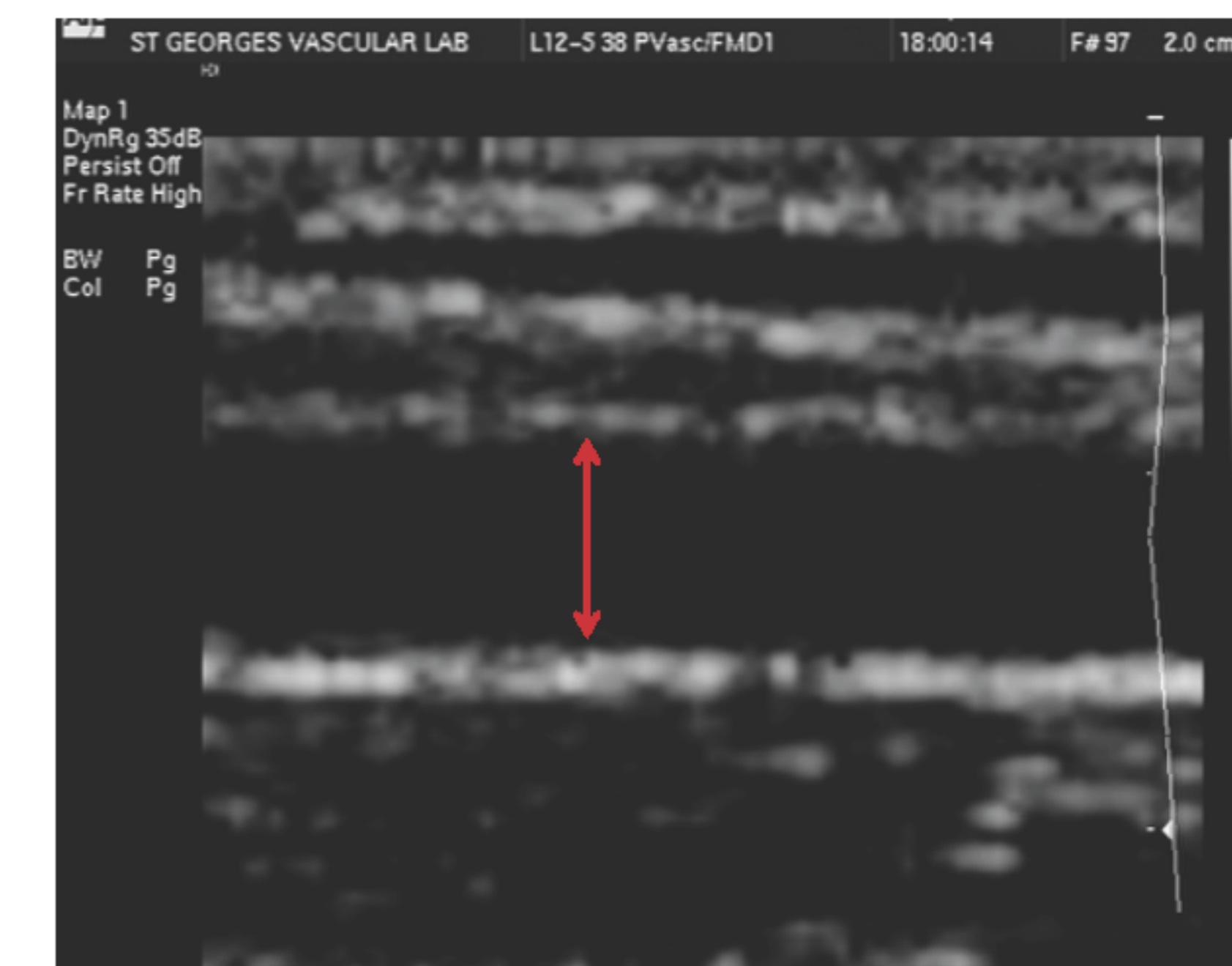


Figure 1: A longitudinal ultrasound image of the brachial artery. The red arrow shows the diameter.

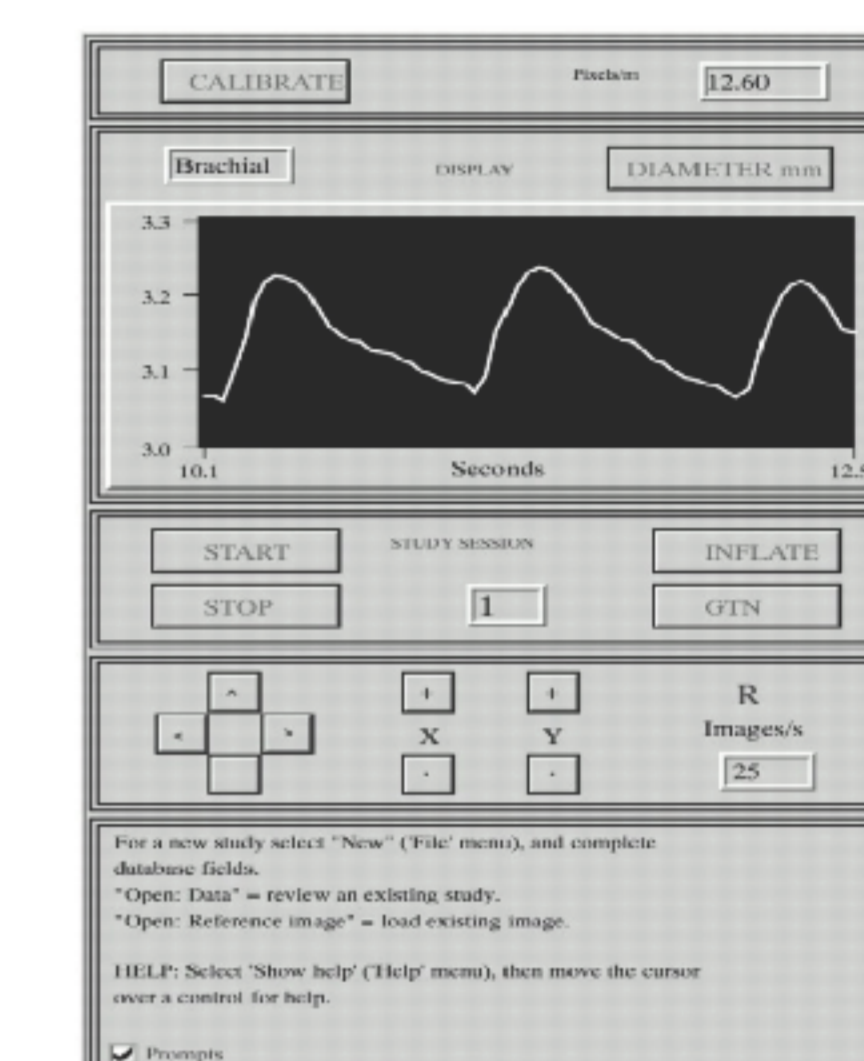


Figure 2: Wall tracking software used to measure the diameter of the artery.

RESULTS

The baseline characteristics are as follows:

Table 1: Baseline Clinical Characteristics

Variable	Mean ± 2SD or n (%)
Age (years)	51±13
Time for Follow Up (days)	244 ± 25
BMI (kg/m ²)	24.9±5.3
Women	2 (20%)
Hypertension	8 (80%)
Dyslipidaemia	3 (30%)
Current Smokers	0 (0%)
Myocardial Infarction	1 (10%)
TIA/Stroke	1 (10%)

The changes in cardiac and vascular structure are as follows :

Table 2: Cardiac and Vascular Structure and Function

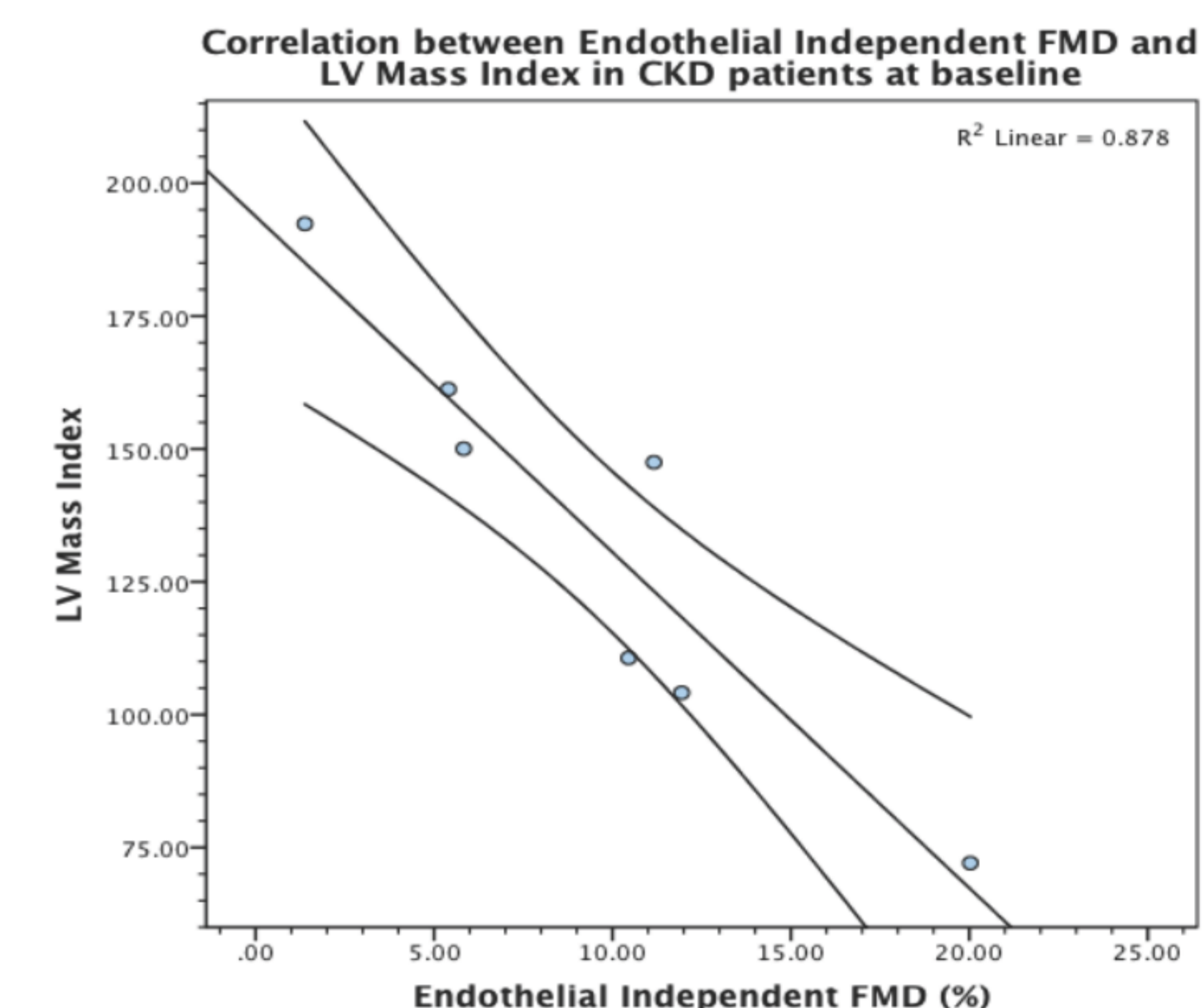
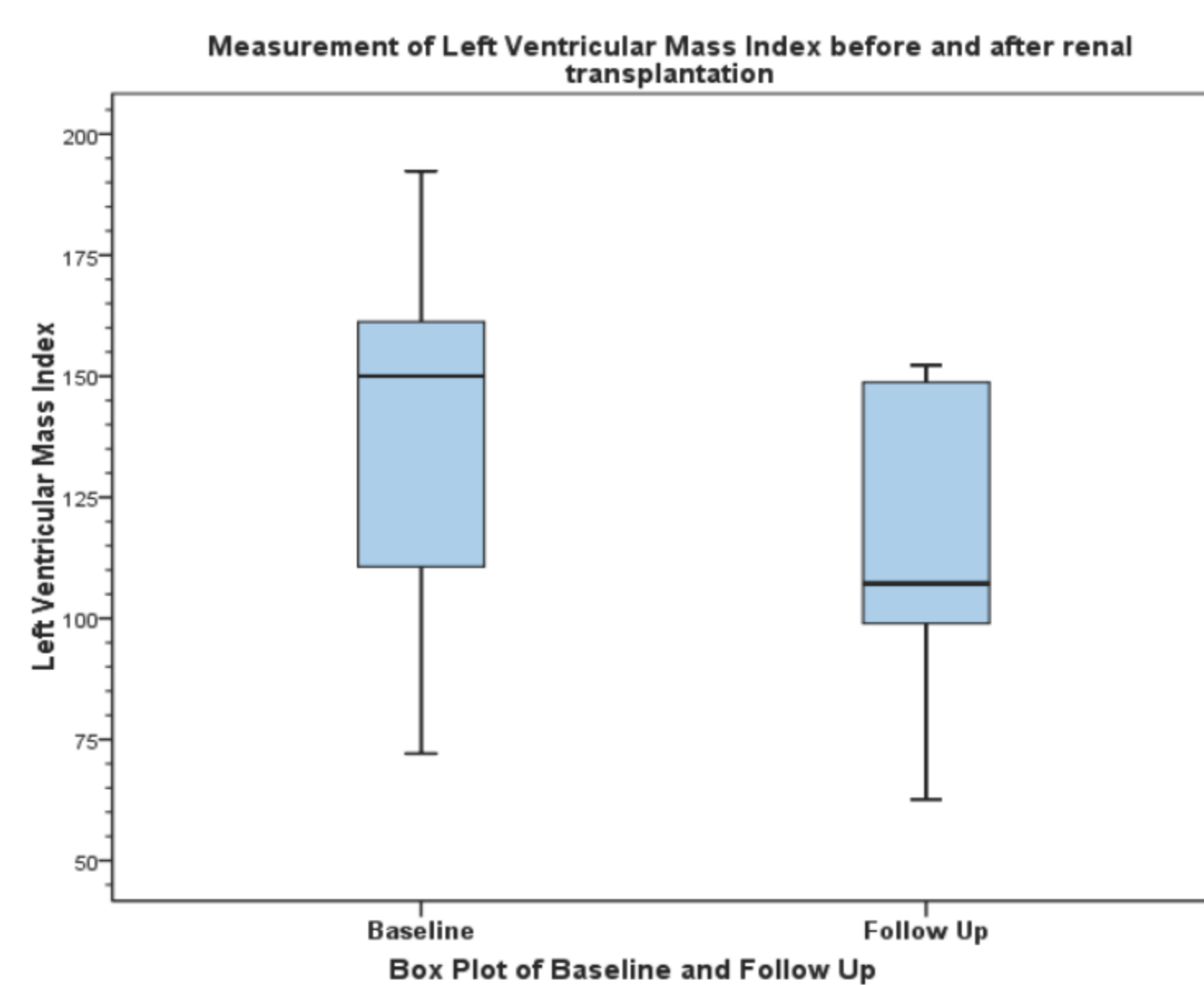
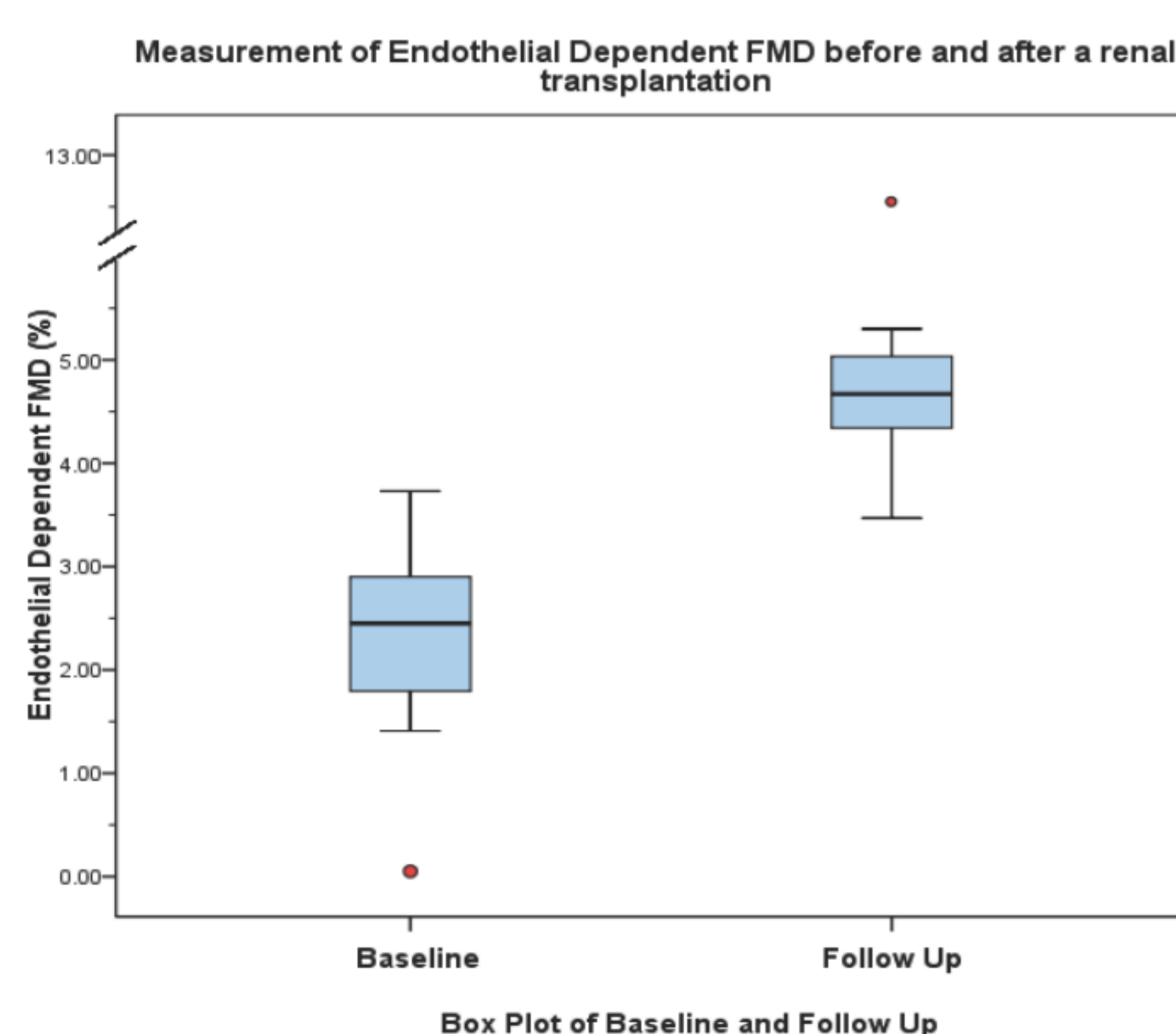
Variables	Baseline	Follow Up	P value
LA (mm) †	35.1 ± 4.7	34.8 ± 5.7	0.906
LA Area (cm ²)	21 ± 4	19 ± 4	0.173
LA Volume (ml)	61 ± 18	51 ± 16	0.144
LV Mass (g)	261 ± 87	212 ± 61	0.020*
LV Mass Index (g/m ²)	140 ± 37	115 ± 30	0.020*
EF Single Chamber† (%)	59 ± 9	62 ± 5	0.370
Fractional Shortening (%)	33.2±4.9	34.9±4.8	0.5
FMD† (%)	2.45 ± 1.67	4.67 ± 1.23	0.018*
FMD (Post GTN) (%)	10.13 ± 6.28	13.90 ± 6.21	0.357

The changes in blood investigation results are as follows:

Table 3: Blood Investigation Characteristics

Variable	Baseline	Follow Up	P Value
Total Cholesterol (mmol/L)	4.9±1.4	4.53±1.41	0.4
Systolic BP (mmHg)	138±22	137±15	0.4
Diastolic BP (mmHg)	78±12	75±12	0.5
Haemoglobin (g/L)	111±190	132±21	0.01
Phosphate (mmol/L)	1.66±0.48	1.10±0.27	0.04*
Corrected Calcium (mmol/L)	2.32±0.14	2.39±0.07	0.2

The relationship of LVMI and GTN induced FMD is as follows:



CONCLUSION

- This study demonstrates an improvement in vascular endothelial function and cardiac structure in kidney transplant recipients.
- We have also illustrated an association between LVMI and GTN induced FMD. We propose that improvement of vascular function may be the mechanism of improvement in left ventricular mass with kidney transplantation.
- We propose that the improvement in the vascular and cardiac function and structure may explain the improved atherosclerotic events and heart failure rates with kidney transplantation.

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