DETERMINANTS OF LEFT VENTRICULAR MASS IN RENAL TRANSPLANT RECIPIENTS

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INTRODUCTION

- Chronic kidney disease (CKD) has been associated with increased cardiovascular risk, mostly due to arterial hypertension, left ventricular hypertrophy (LVH) and coronary artery disease

- Renal transplantation (RT) has been associated with a decrease in left ventricular mass (LVM) compared to pre-transplantation

Aim of the study

- Identification of the independent determinants (among clinical characteristics, laboratory findings, echocardiographic characteristics) of LVM index (LVM adjusted to body surface area) in RT recipients (RTR)

METHODS

Population

- 45 RTR, mean age 50±9 years, 30 men (67%)
- Mean time since transplantation 59 months

Echocardiographic study

- **Conventional 2D and tissue Doppler echocardiography**
  - left ventricular hypertrophy : LVMI >90 g/m^2 for women and >115 g/m^2 for men
  - novel indices of systolic and diastolic function
- **Coronary flow reserve (CFR) in the left anterior descending (LAD) artery using dipyridamole.**
  - index of coronary microcirculatory function
  - normal values >2

RESULTS

Clinical characteristics of RTR (n=45)

- Diabetes   7 (16%)
- Hypertension   30 (67%)
- LVH   22 (49%)
- Medications
  - Diuretics   9 (20%)
  - ACE inhibitors 19 (42%)
  - CCB   23 (51%)
  - β–Blockers   32 (71%)
  - EPO   13 (29%)
  - Vitamin D   23 (51%)
  - Statins   25 (56%)

- Dialysis Modality before RT:
  Hemodialysis   31 (69%)

Laboratory and clinical findings in RTR (n=45)

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eGFR ml/min/1.73m^2	51±16
Urea, mg/dl	50 (30, 157)
Hemoglobin, g/dl	13.2±1.9
Calcium, mg/dl	9.9±0.5
Phosphorus, mg/dl	3.2±0.6
PTH, pg/dl	113±63
Total cholesterol, mg/dl	209±36
HDL-c, mg/dl	56±14
Triglycerides, mg/dl	146±55
LDL-c, mg/dl	120±32
Glucose, mg/dl	98±24
HbA1c, %	5.8±0.7
Urine protein, mg/24h	204 (26, 2572)
Body mass index, kg/m^2	25.5±4.4
Systolic BP, mmHg	143±13
Diastolic BP, mmHg	90 (70, 100)
Pulse pressure, mmHg	57±13

Echocardiographic findings in RTR (n=45)

CFR	2.6±0.8
LAVI ml/m^2 BSA	32±11
LVMI gr/m^2 BSA	104±31
LVEDV, ml	79±21
LVESV, ml	22±10
EF, %	70±7
SV, ml	85±25
TAPSE, mm	23±4
MAPSE, mm	13.7±1.8
S average, cm/s	0.09±0.02
E, m/s	0.85±0.28
A, m/s	0.87±0.29
MPI	0.51±0.14
IVRT, ms	90±22
RWT,	0.48±0.17
E/E'	7.6 (3.9, 29.7)

CFR LAD BEFORE (upper image) AND AFTER (lower image) DIPYRIDAMOLE
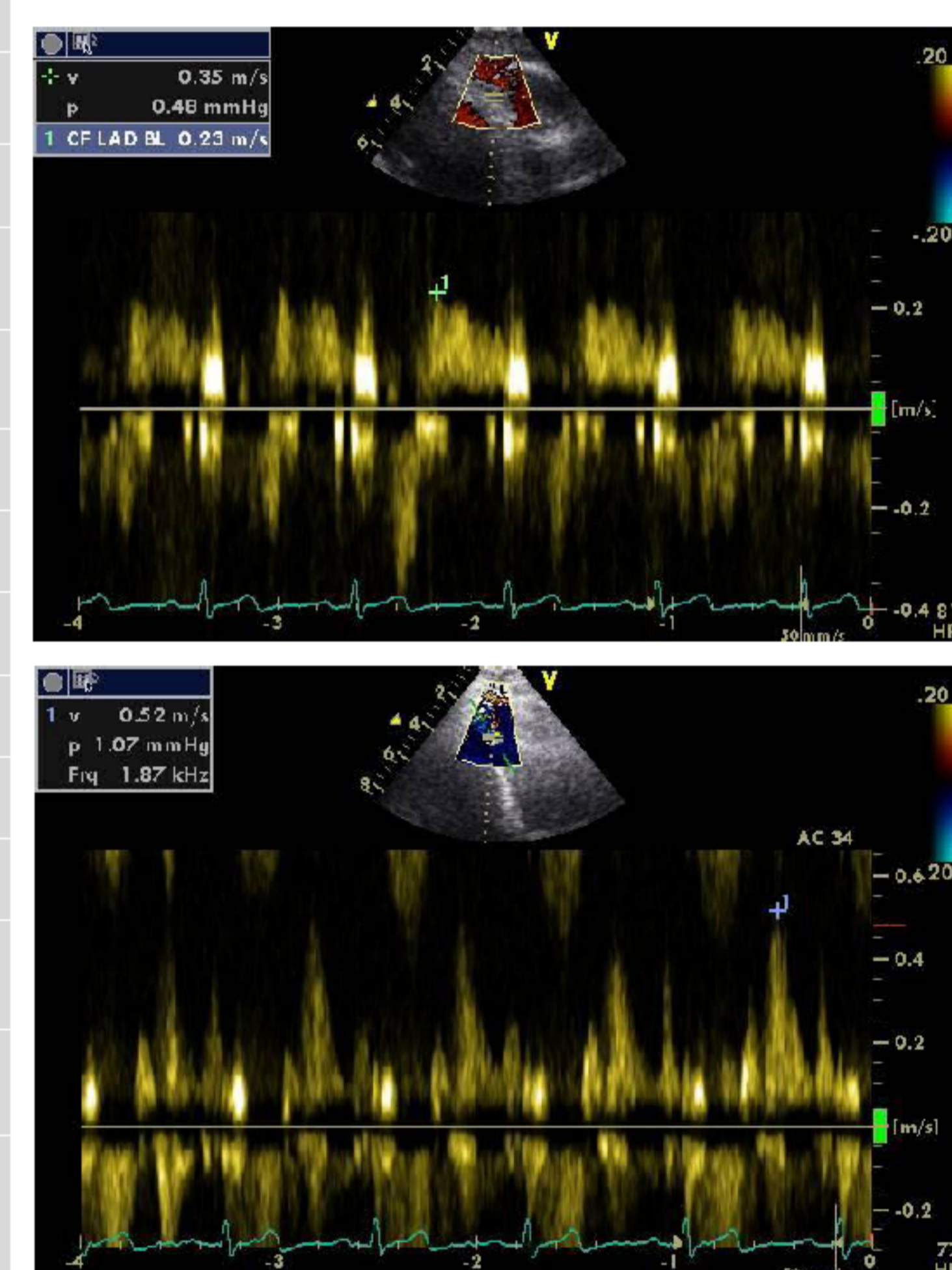
LVMI WAS ASSOCIATED WITH:

- **Left ventricular end diastolic volume (LVEDV)**
- **Stroke volume (SV)**
- **Left atrial volume index (LAVI)**
- **Systolic blood pressure and pulse pressure**
- **Time since transplantation**
- **Diabetes**
- **Hemodialysis before transplantation**
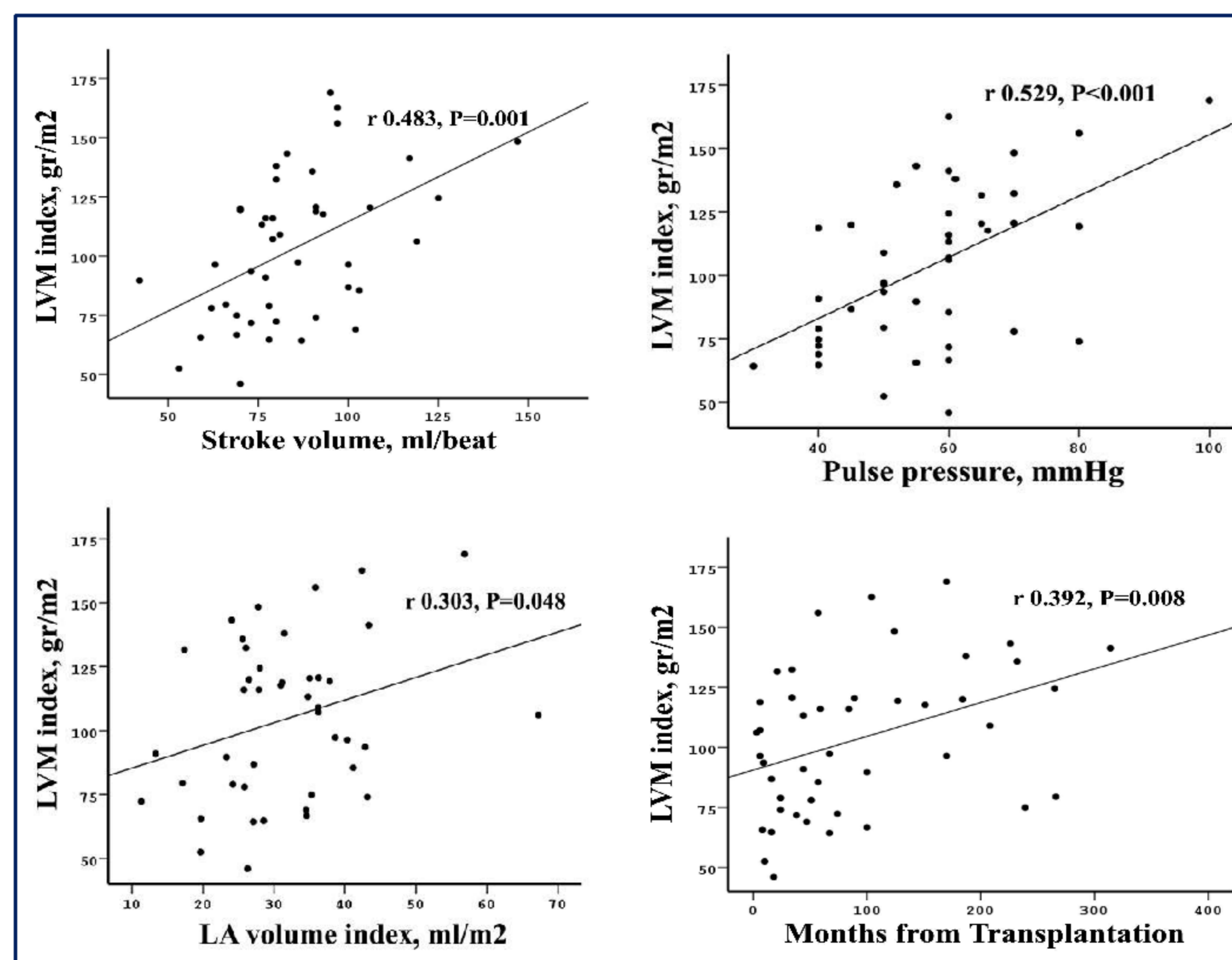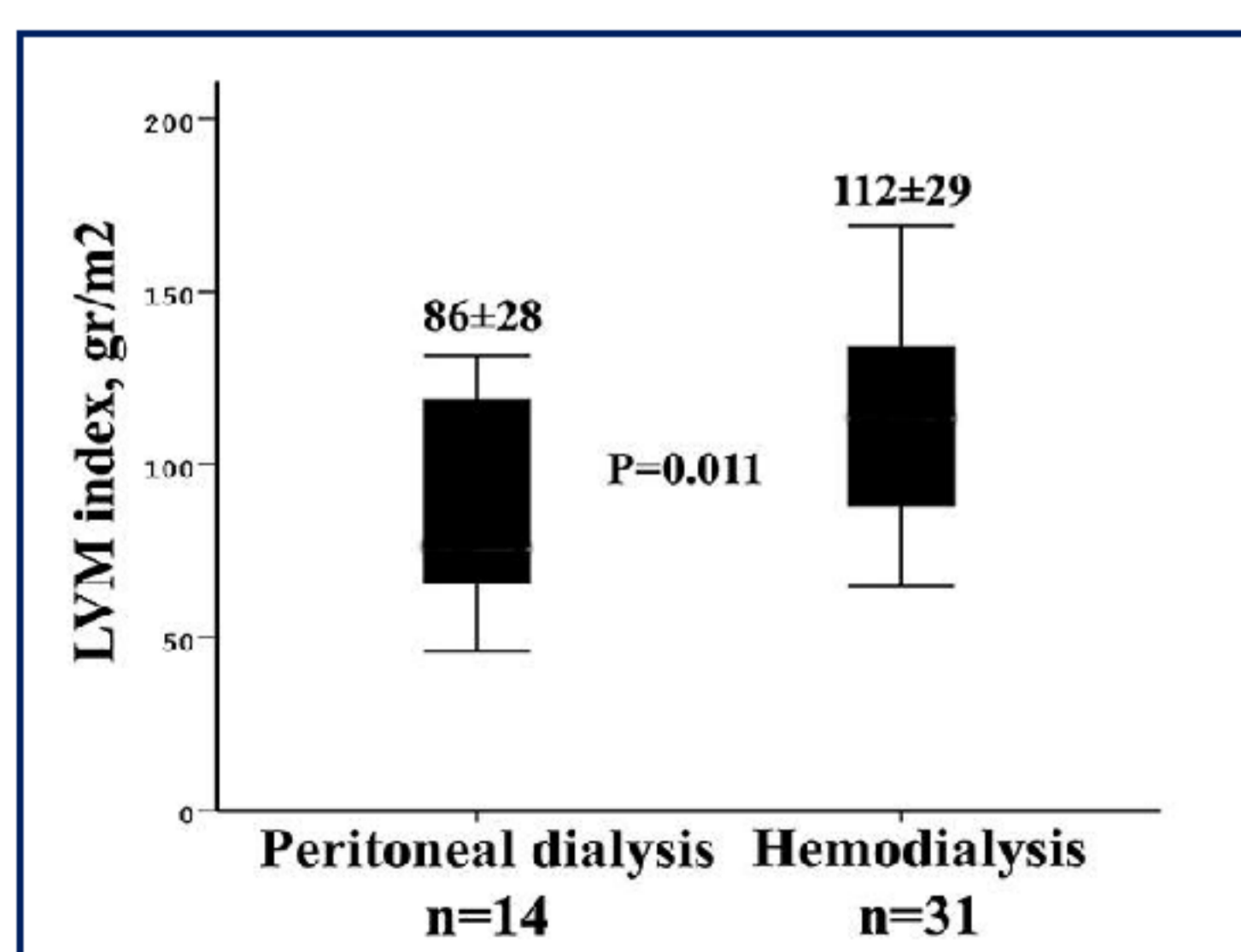
In multivariate analysis, higher pulse pressure (B=1,16 p<0.001) and increasing time since transplantation (p=0.004), were independent predictors of LVMI (R^2=0.41 p<0.001)

CFR in the LAD was not associated with LVMI

CONCLUSIONS

- ❖ In RTR, LVMI index was associated with higher pulse pressure, indicating the role of increased arterial stiffness
- ❖ Increasing time from the transplantation procedure also predicted increased LVM