

CIRCULATING ANGIOTENSIN-CONVERTING ENZYME 2 IN CHRONIC KIDNEY DISEASE PATIENTS WITHOUT HISTORY OF CARDIOVASCULAR DISEASE

Lidia Anguiano, Marta Riera, Julio Pascual, Clara Barrios, Angels Betriu*, Jose M Valdivielso*,
Elvira Fernández* and María José Soler

Department of Nephrology, Hospital del Mar-IMIM, Barcelona, Spain;

*Department of Nephrology, Hospital Arnau de Vilanova, Lleida, Spain.

IMIM
Institut
de Recerca
Hospital
del Mar

Parc
de Salut
MAR
Barcelona

INTRODUCTION & AIM

- Circulating ACE2 activity is increased in patients with cardiovascular (CV) disease^(1,2) and in experimental models of diabetes mellitus (DM)⁽³⁾.
- We aim to study circulating ACE2 activity in patients with Chronic Kidney Disease (CKD) without history of CV disease.

PATIENTS & METHODS

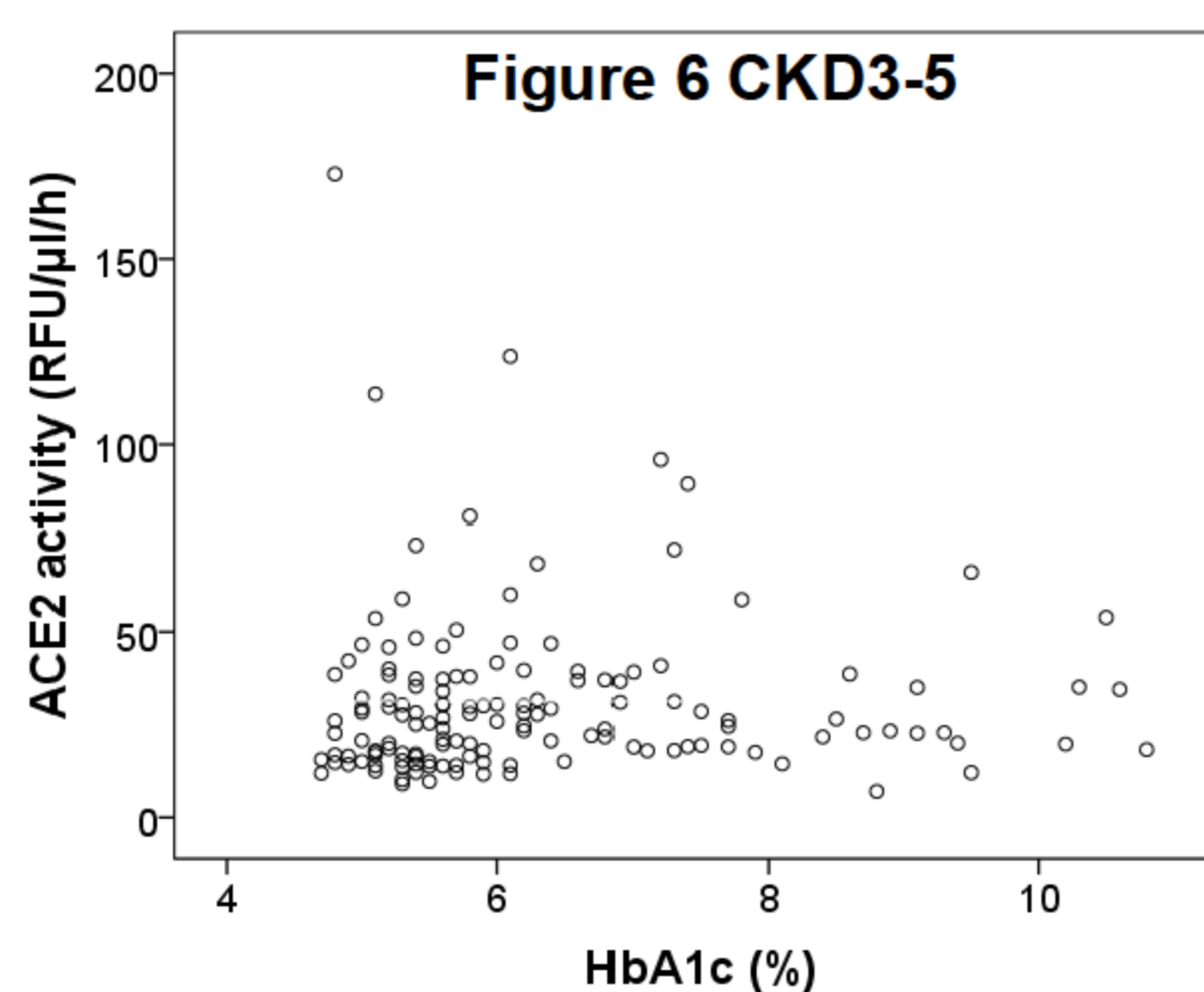
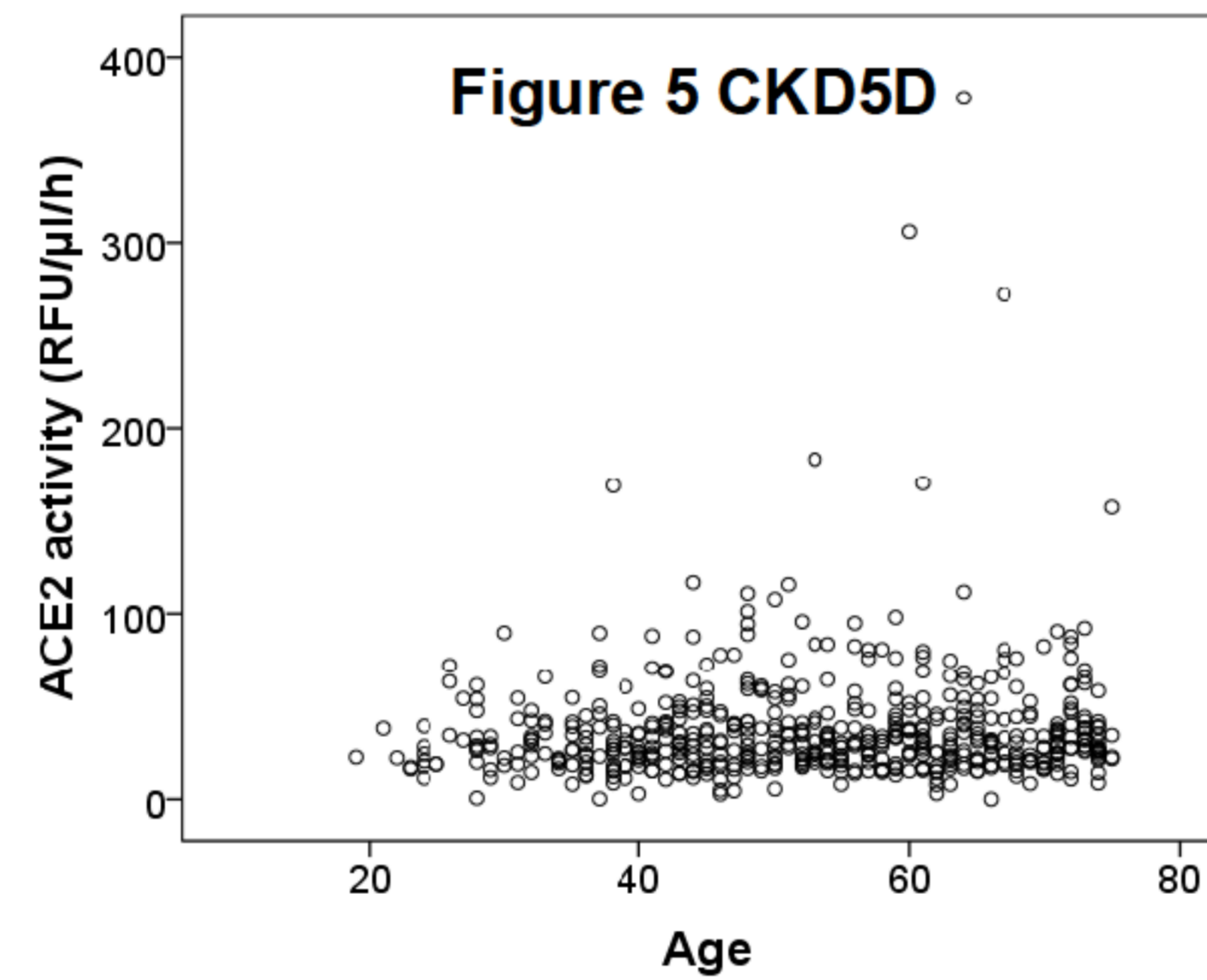
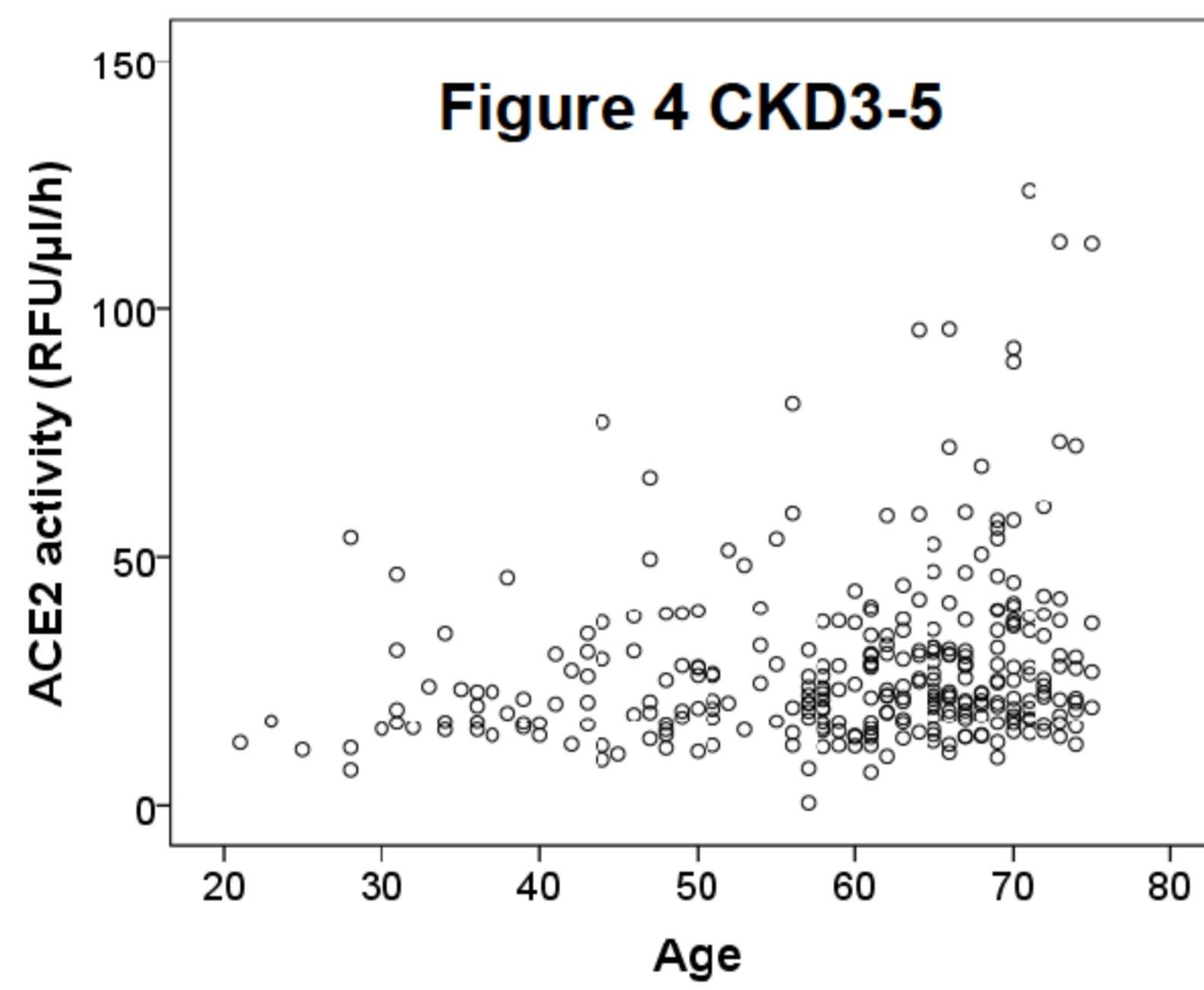
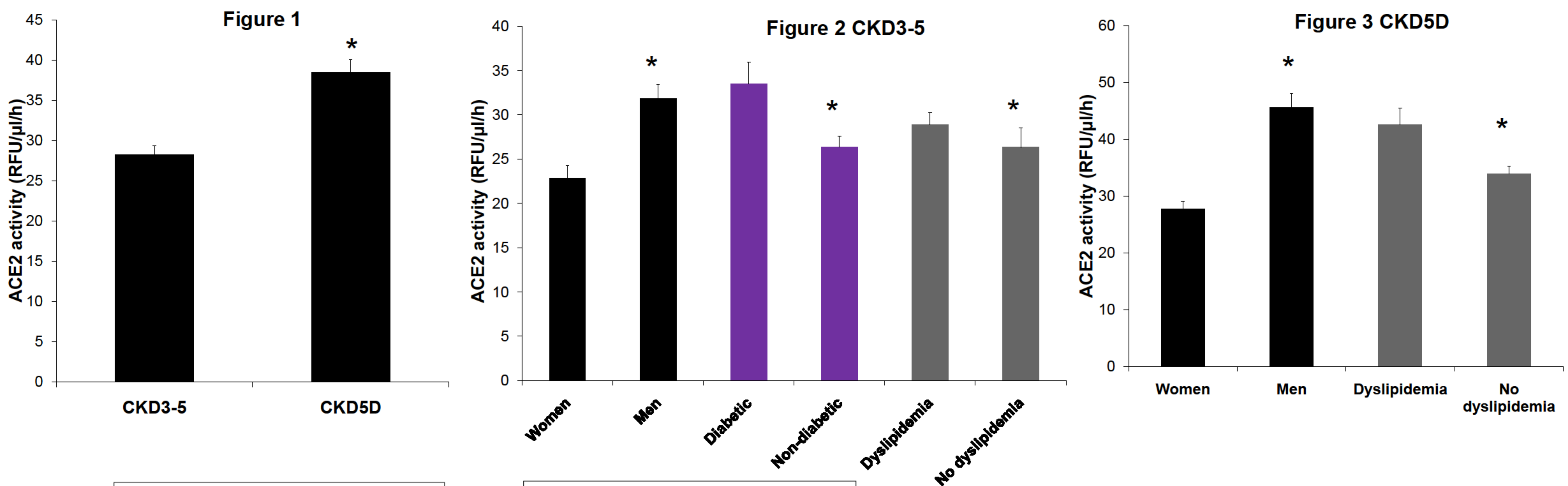
- 834 patients without history of CV disease from the NEFRONA study in two groups:
 - non-dialysis CKD stage 3-5 patients (CKD3-5, n=288)
 - haemodialysis or peritoneal dialysis patients (CKD5D, n=546)
- Variables analysed: gender, age, DM, dyslipidemia, hypertension, glycemia, renal, nutritional, lipid and anemia profiles, phosphorus-calcium metabolism and treatment with ACE inhibitors or angiotensin II receptor blockers (ARBs).
- Circulating ACE2 activity was measured using a modified fluorimetric assay for plasma samples⁽⁴⁾.

RESULTS

Patients on dialysis had higher levels of ACE2 activity compared to CKD3-5 patients ($p<0.05$) (Figure 1).

Assessing only CKD3-5, an increased ACE2 activity was observed in men compared to women, DM patients and dyslipidemic patients ($p<0.05$) (Figure 2).

In concordance, limiting the analyses to CKD5D, ACE2 activity was increased in men and in those with dyslipidemia ($p<0.05$) (Figure 3).



A direct correlation between age and ACE2 activity ($p<0.05$) was found in both CKD3-5 (Figure 4) and CKD5D patients (Figure 5), but only in CKD3-5 patients HbA1c directly correlated with ACE2 activity ($p<0.05$) (Figure 6).

Predictors of circulating ACE2	Standardized coefficient (β)	p value
CKD3-5 patients		
Male	0.30	<0.001
Age	0.17	0,002
DM	0.14	0,001
CKD5D patients		
Male	0.32	<0.001
Age	0.12	0.003
ARBs treatment	0.09	0.03
All included in the model		
Male	0.32	<0.001
Age	0.14	<0.001
ARBs treatment	0.08	0.011
CKD5D (vs CKD3-5)	0.21	<0.001

Multiple regression analysis of independent predictors of neperian logarithm of circulating ACE2 activity (\ln ACE2) was assessed in CKD3-5 and CKD5D patients.

CONCLUSIONS

- In CKD patients without history of CV disease, old age and male gender are significant predictors for elevated circulating ACE2 activity.
- Independent additional predictors are DM in CKD stages 3-5 and treatment with ARBs in CKD5D.
- Increased circulating ACE2 activity in CKD might indicate the CKD patients at risk for developing CV disease.

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