

CIRCULATING ACE AND ACE2 IN PATIENTS WITH CHRONIC KIDNEY DISEASE WITHOUT HISTORY OF CARDIOVASCULAR DISEASE

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INTRODUCTION & AIM

- Circulating angiotensin converting enzyme (ACE)2 activity is increased in patients with cardiovascular (CV) disease^(1,2,3) and in experimental models of diabetes⁽⁴⁾.
- Our aim is to study the circulating ACE2 and ACE activity in patients with Chronic Kidney Disease (CKD) without history of CV disease.

PATIENTS & METHODS

- Patients from NEFRONA study without history of CV disease.
- Groups analyzed:
 - CKD 3-5 stages without dialysis (CKD3-5, n=1458)
 - Patients undergoing dialysis (CKD5D, n=546)
 - Patients without CKD (CONT, n=568)
- Circulating ACE2 and ACE activity were measured using two modified fluorimetric assays for plasma samples⁽⁵⁾.
- Statistics: paired case-control studies, bivariate analysis and multiple regression analysis.

RESULTS

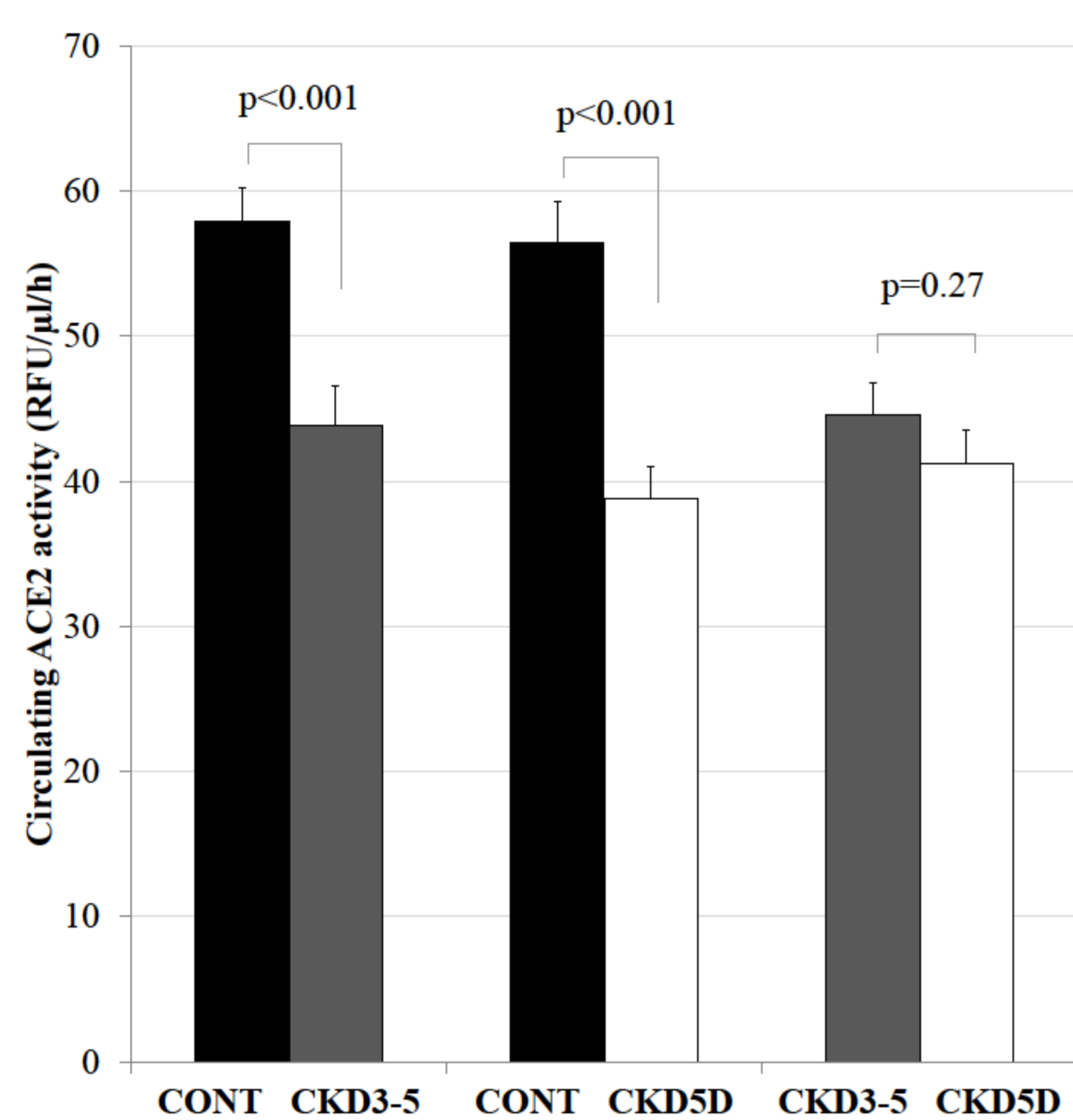


Figure 1-Paired case-control study for circulating ACE2 activity. Three paired case-control studies were performed (CONT vs CKD3-5; CONT vs CKD5D; and CKD3-5 vs CKD5D). Samples were matched by gender, diabetes, hypertension, dyslipidemia, smoking habits, weight and age. No differences were found between CKD3-5 and CKD5D (p=0.27). Circulating ACE2 activity was significantly decreased in CKD 3-5 (p<0.01) and CKD5D (p<0.001) as compared to CONT group.

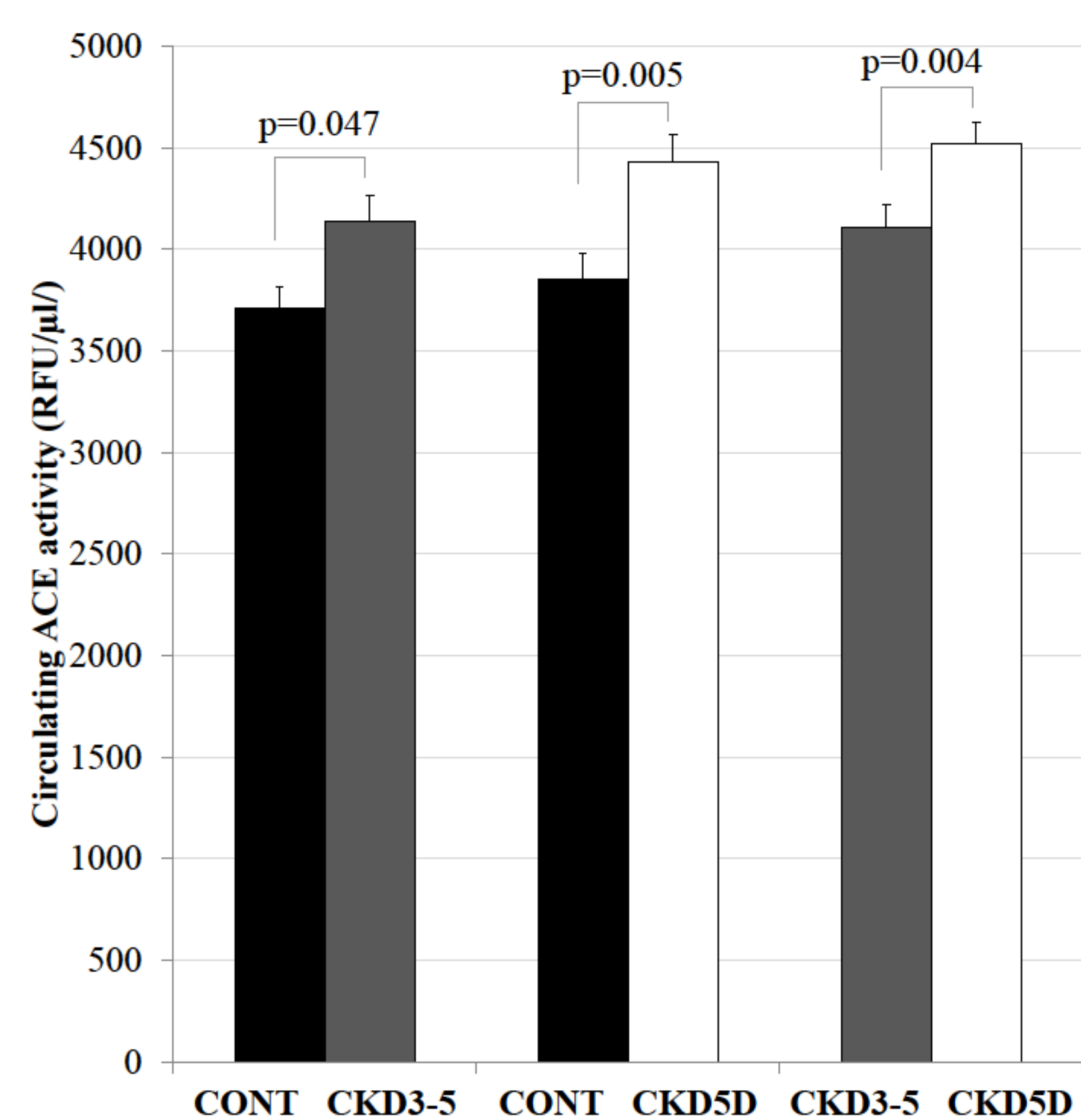


Figure 2-Paired case-control study for circulating ACE activity. Three paired case-control studies were performed (CONT vs CKD3-5; CONT vs CKD5D; and CKD3-5 vs CKD5D). Samples were matched by gender, diabetes, hypertension, dyslipidemia, smoking habits, weight and age. Circulating ACE activity was significantly increased in CKD3-5 (p=0.047) and CKD5D (p=0.005) as compared to CONT group. Significant differences were found between CKD3-5 and CKD5D (p=0.004).

	Standardized coefficient (β)	p-value
CONT		
Male gender	0.243	<0.001
Age	0.148	<0.001
MRC3-5		
Male gender	0.224	<0.001
Age	0.060	0.020
Diabetes	0.074	0.004
MRC5D		
Male gender	0.318	<0.001
Age	0.119	0.003
ARB treatment	0.095	0.020
Colecalciferol treatment	-0.095	0.018

Table 1-Multiple regression analysis for ACE2. Independent predictors for circulating ACE2 activity were analyzed in the studied groups (CONT, CKD3-5 and CKD5D).

	Standardized coefficient (β)	p-value
CONT		
Male gender	-0.182	<0.001
Age	-0.087	0.035
ACEi treatment	-0.152	<0.001
ARB treatment	0.124	0.003
MRC3-5		
Male gender	-0.062	0.004
Age	-0.069	0.001
Diabetes	0.071	0.001
ACEi treatment	-0.562	<0.001
Colecalciferol treatment	-0.074	0.001
MRC5D		
ACEi treatment	-0.580	<0.001
Colecalciferol treatment	-0.087	0.012

Table 2-Multiple regression analysis for ACE. Independent predictors for circulating ACE activity were analyzed in the studied groups (CONT, CKD3-5 and CKD5D).

CONCLUSIONS

- In CKD3-5 patients without history of CV disease, advanced age and male gender were predictors for an increased ACE2 activity and a decreased ACE activity.
- Diabetes was found as a predictor for an increased ACE2 and ACE activity.
- In CKD5D patients, additional predictors were ARBs treatment for ACE2 and ACEi treatment for ACE.

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