Introduction

- ESRD and cardiovascular disease
- The importance of early detection of coronary artery calcification
- Electron beam computed tomography (EBCT), a method for evaluating coronary artery calcification

Materials and methods

- 81 patients with CRF
- Three group 1. Predialysis, n=35
  2. Hemodialysis, n=31
  3. Peritoneal dialysis, n=15
- EBCT for screening of coronary artery calcification

Table 1. Characteristics of the 81 patients

	Group I (n=35)	Group II (n=31)	Group III (n=15)
Sex (M/F)	21/14	20/11	7/8
Age (yr)	51.9±12.0	57.0±14.0*,‡	47.9±11.0
Duration of dialysis (month)	-	13.4±21.8	31.7±37.0†
Primary disease			
CGN	17	11	10
DM	11	10	4
HTN	5	6	1
Others	2	4	0
Cardiovascular complication			
Present	5	5	5
Absent	30	26	10
Hemoglobin (g/dL)	9.55±2.02	8.98±1.43	9.16±1.78
Albumin (g/dL)	3.97±0.57	3.66±0.71	3.70±0.40*
Total cholesterol (mg/dL)	179.3±46.0	174.2±57.4	176.2±44.9
BUN (mg/dL)	55.3±23.0	69.8±24.9*	56.1±25.6
Cr (mg/dL)	5.38±2.78	9.28±3.52*	9.68±3.54*
Ca (mg/dL)	8.37±1.19	8.44±1.42	9.37±0.78*,†
P (mg/dL)	4.48±1.96	5.23±1.63	5.61±1.91
Ca×P (mg²/dL²)	236.7±9.4	43.0±12.7*	53.8±17.8*
PTH (pg/mL)	200.3±188.4	231.1±196.2	227.4±177.9
Calcium score	84.6±199.0	211.8±325.5	655.7±1009.8

CGN, chronic glomerulonephritis; DM, diabetes mellitus; HTN, hypertension; Ca×P, serum calcium-phosphorus product; PTH, serum parathyroid hormone.

*, $p<0.05$ vs. Group I; †, $p<0.05$ vs. Group II; ‡, $p<0.05$ vs. Group III.

Table 2. Laboratory data according to the presence or absence of dialysis

	Group I (n=35)	Group II and III (n=46)	*p* value
Hemoglobin (g/dL)	9.55±2.02	9.04±1.54	NS
Albumin (g/dL)	3.97±0.57	3.67±0.62	<0.05
Total cholesterol (mg/dL)	179.3±46.0	174.9±53.1	NS
BUN (mg/dL)	55.3±23.0	65.3±25.7	<0.05
Cr (mg/dL)	5.38±2.78	9.40±3.50	<0.01
Ca (mg/dL)	8.37±1.19	8.74±1.31	NS
P (mg/dL)	4.48±1.36	5.35±1.71	<0.05
Ca×P (mg^2/dL^2)	236.7±9.4	46.6±15.3	<0.01
PTH (pg/mL)	200.3±188.4	229.8±188.1	NS
Calcium score	84.6±199.0	356.6±657.4	NS*

Ca×P, serum calcium-phosphorus product; PTH, serum parathyroid hormone. *p=0.089.

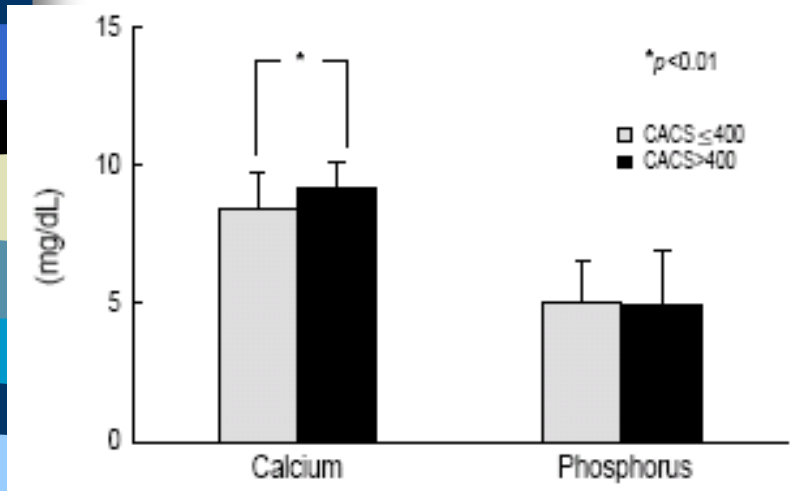

Fig. 1. Serum calcium and phosphorus levels according to coronary-artery calcium score (CACS).

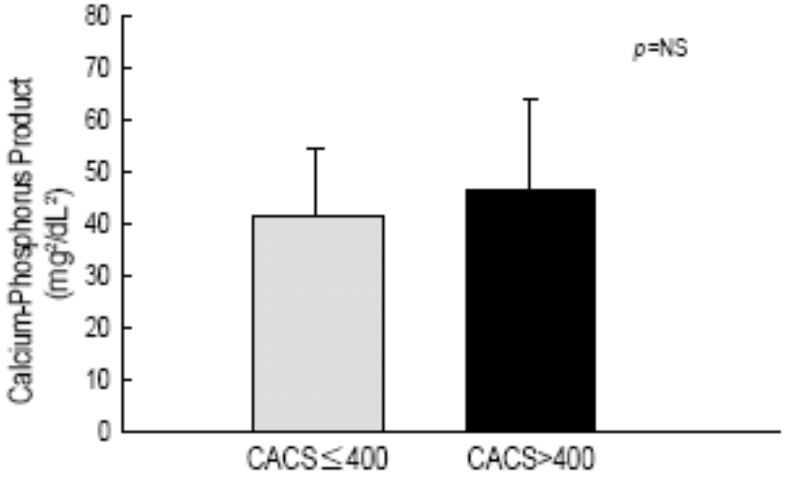

Fig. 2. Serum calcium-phosphorus product according to coronary-artery calcium soore (CACS).

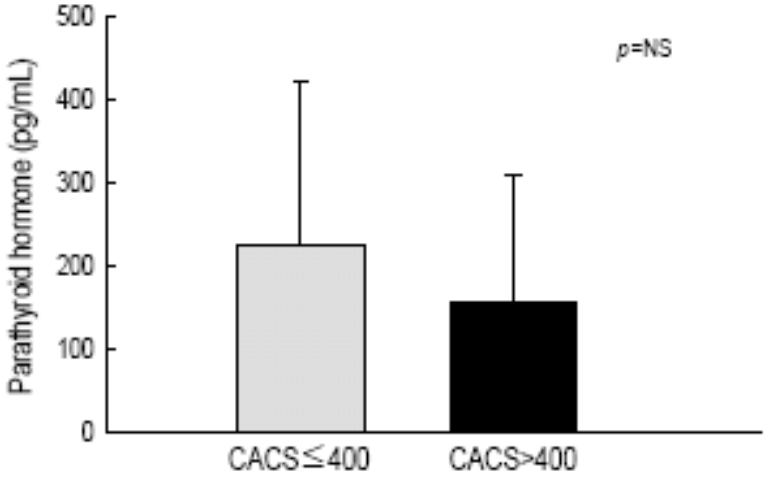

Fig. 3. Serum parathyroid hormone according to coronary-artery calcium score (CACS).

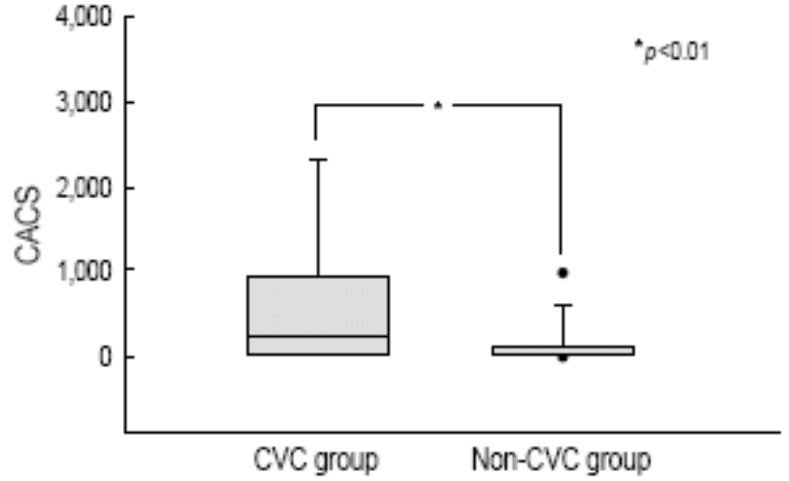

Fig. 4. Distribution of the coronary-artery calcium score (CACS) level according to presence or absence of cardiovascular complications (CVC).

Discussion

- Severe calcification begins long before renal insufficiency is severe enough to require dialysis.
- Patients with ESRD on HD vs non-dialysis patients with coronary artery disease
- Nondialyzed individuals with DM vs non-DMs.

- PD group should be controlled more strictly in Ca,P and the Ca*P product.
- If calcium scores>400, an exam on ischemic heart disease through a pharmacological or exercise stress test should be done.

- In conclusion, this study suggests that EBCT a good diagnostic tool for evaluating the risk of coronary artery disease “non-invasively.”