AORTIC ARCH CALCIFICATION AND ATRIAL FIBRILLATION IN HEMODIALYSIS PATIENTS

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Introduction and Aims

The relationship between aortic arch calcification (AAC) and atrial fibrillation (AF) has not been examined enough in dialysis patients, although coronary artery calcification has been shown as a risk factor for AF. (*Am J Cardiol.* 2014 December 1; 114(11): 1707–1712)
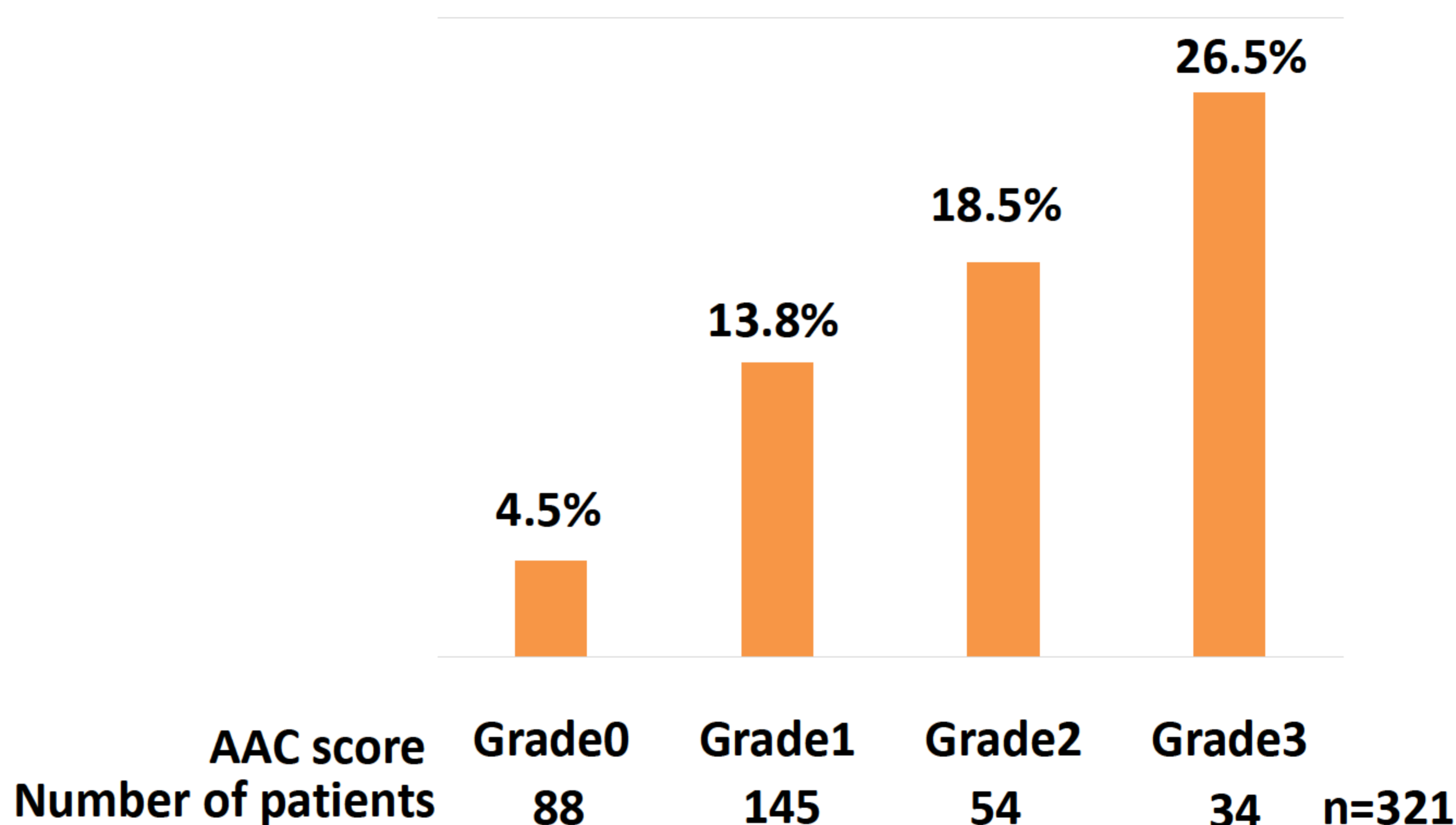
Methods

In this cross-sectional study, we investigated risk factors for AF among 321 chronic hemodialysis patients. The degree of AAC in chest X-ray was classified into 4 categories as follows: Grade 0, no visible calcification; Grade 1, small spots of calcification or single thin calcification of the aortic knob; Grade 2, one or more areas of thick calcification; and Grade 3, circular calcification of the aortic knob. (*Int Angiol* 2002; 21: 233-6)

Baseline Characteristics

	All (n=321)
AF	43 (13%)
Age (year)	64.0±11.2
Dialysis vintage (year)	9.7±8.2
Male	211 (66%)
Diabetes Mellitus	131 (41%)
Hypertension	177 (55%)
Ischemic Heart Disease	65 (20%)
Cerebral vascular Disease	84 (26%)
Hemoglobin (g/dL)	10.0±0.9
C-reactive protein (mg/dL)	0.4±0.8
Albumin (g/dL)	3.7±0.3
corrected Calcium (mg/dL)	9.2±0.5
Phosphorus (mg/dL)	5.9±1.3
intact PTH (pg/ml)	177.2±128.5
Use of CaCO3	209 (65%)
Use of Non-Ca Phosphorus binders	179 (56%)
Use of active Vitamin D	117 (36%)
Use of Cinacalcet	99 (31%)
Use of RAS inhibitors	115 (36%)

Prevalence of AF

AAC score	Grade0	Grade1	Grade2	Grade3	
Number of patients	88	145	54	34	n=321

Grade0: 4.5%, Grade1: 13.8%, Grade2: 18.5%, Grade3: 26.5%

- AF was present in 43 patients (13%).
- The prevalence of AF was higher in patients with higher AAC grade.

Risk Factor for AF

Risk Factors For AF	Univariate Analysis			Multivariate Analysis*		
	OR	95% C.I.	p value	OR	95% C.I.	p value
AAC Grade 1 vs.Grade 0	3.36	1.22-11.86	0.02*	2.71	0.94-9.86	0.07
Grade 2 vs. Grade 0	4.77	1.50-18.20	<0.01*	3.44	1.02-13.79	0.05*
Grade 3 vs. Grade 0	7.56	2.26-29.86	<0.001*	5.08	1.33-22.37	0.02*
Age (year)	1.03	1.00-1.06	<0.01*	1.02	0.98-1.06	0.40
Dialysis vintage (year)	1.04	1.00-1.08	0.04*	1.03	0.99-1.07	0.12
Male	0.97	0.50-1.94	0.93			
Diabetes	0.66	0.33-1.29	0.23			
Hypertension	0.75	0.39-1.42	0.37			
Ischemic Heart Disease	1.43	0.65-2.93	0.36			
Cerebral Vascular Disease	0.84	0.37-1.72	0.64			
Hemoglobin (g/dL)	0.80	0.56-1.16	0.40			
C-reactive protein (mg/dL)	1.45	1.06-1.99	0.02*	1.33	0.94-1.87	0.10
Albumin (g/dL)	0.36	0.13-1.00	0.05*	0.99	0.28-3.43	0.98
Corrected Calcium (mg/dL)	0.90	0.48-1.66	0.73			
Phosphorus (mg/dL)	0.92	0.71-1.17	0.50			
intact PTH (pg/mL)	1.00	1.00-1.00	0.40			
Use of CaCO3	0.99	0.51-1.99	0.98			
Use of Non-Ca Phosphorus binders	0.80	0.42-1.53	0.50			
Use of active Vitamin D	0.63	0.30-1.26	0.20			
Use of Cinacalcet	1.35	0.66-2.65	0.40			
Use of RAS inhibitors	0.57	0.27-1.15	0.12			

OR: Odds ratio, CI: confidence interval
* adjusted for age, dialysis vintage, C-reactive protein and albumin

- Univariate analysis: AAC, age, dialysis vintage, C-reactive protein and albumin were significantly associated with AF.
- Multivariate analysis: Grade 2 to 3 AAC was an independent risk factor of AF.

Conclusions

In our dialysis patients, AAC was independently associated with the prevalence of AF.