CALCIFICATION OF THE ASCENDING AND DESCENDING THORACIC AORTA IDENTIFIES TWO DISTINCT PHENOTYPES IN TYPE 2 DIABETES

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Sunday, March 25, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Prevention: Clinical: Beyond the Heart - What’s New in Vascular Disease
Abstract Category: 9. Prevention: Clinical
Presentation Number: 1186-382

Authors: Timothy Churchill, Hashmi Rafeek, Suraj Rasania, Claire Mulvey, Victor Ferrari, Saurabh Jha, Karen Terembula, Scott Lilly, Luis Eraso, Muredach Reilly, Atif Qasim, University of Pennsylvania, Philadelphia, PA, USA, Thomas Jefferson University, Philadelphia, PA, USA

Background: The evidence regarding thoracic aortic calcification (TAC) as a potential independent risk factor for cardiovascular disease (CVD) and mortality is mixed. However, many studies consider TAC as a single anatomic entity, when in fact the ascending and descending aorta are subject to different physiologic stresses. We hypothesized that ascending thoracic aortic calcification (ATAC) and descending thoracic aortic calcification (DTAC) may predict distinct clinical profiles of CVD. To test this hypothesis, we examined whether ATAC and DTAC have differential associations with CVD risk factors in diabetics.

Methods: Within the Penn Diabetes Heart Study, a cross-sectional study of individuals with type 2 diabetes without coronary or renal disease, we measured ATAC and DTAC Agatston calcium scores in all subjects with a baseline electron beam cardiac CT (N=1743, 63% male, 61% Caucasian). Multivariable logistic and tobit regression with stepwise backward elimination was used for analysis.

Results: The prevalence of ATAC and DTAC was 43.3% and 34.3% respectively, with 19.8% having only ATAC, 10.7% only DTAC, and 23.7% both. In multivariate analysis, the presence and extent of ATAC and DTAC were associated with age, Caucasian race, and hypertension. ATAC was also associated with dyslipidemia [OR 2.24 (95% CI 1.66-3.02), p<0.001] and tobacco use [OR 1.29 (1.03-1.61), p=0.03], whereas DTAC was associated with an ankle-brachial index of ≤0.9 [OR 1.62 (1.10-2.41), p=0.02]. Both ATAC and DTAC Agatston scores were associated independently of each other with increasing CAC scores in fully adjusted tobit regression models (p <0.04 for all groups of ATAC and DTAC scores 1-100, 100-500 and >500 vs. 0). Neither ATAC nor DTAC was associated with renal function, severity or duration of diabetes, BMI or CRP.

Conclusions: Within this diabetic population, ATAC appears to be associated more with cardinal CVD risk factors, whereas DTAC has a strong relationship with peripheral arterial disease. However, both are independently associated with CAC. Identification of these phenotypes should aid in determining whether these disease markers translate into meaningful differences in CVD risk prediction and mortality.