ASSOCIATION OF INFLAMMATORY, LIPID AND MINERAL METABOLISM MARKERS WITH VALVULAR AND ANNULAR CALCIFICATION: RESULTS FROM THE CARDIOVASCULAR HEALTH STUDY

Moderated Poster Contributions
Valvular Heart Disease Moderated Poster Theater, Poster Hall B1
Sunday, March 15, 2015, 10:00 a.m.-10:10 a.m.

Session Title: Markers and Predictors for Heart Valve Disease
Abstract Category: 40. Valvular Heart Disease: Clinical
Presentation Number: 1204M-05

Authors: Anna Bortnick, Traci Bartz, Joachim H. Ix, Michel Choncol, Alexander Reiner, Mary Cushman, David Owens, Eddy Barasch, David Siscovick, John Gottdiener, Jorge Kizer, Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, NY, USA, University of Washington, Seattle, WA, USA

Background: Calcification of the aortic valve and adjacent structures is associated with increased morbidity and mortality. Histopathological data support a pathogenetic role for inflammatory, lipid, and mineral metabolism pathways, but the correlations of plasma biomarkers are not well defined.

Methods: We evaluated in a population-based study of older adults several candidate biomarkers that have been implicated in the pathology of valvular/annular calcification, but whose associations with specific types of calcification have not been investigated fully or at all. Of various plasma biomarkers available, we selected analytes reflecting lipid (lipoprotein [Lp] (a), lipoprotein-associated phospholipase A2 [LpPLA2] mass and activity), inflammation (interleukin-6, soluble [s] CD14), and mineral metabolism (fetuin-A, fibroblast growth factor [FGF]-23) pathways that were measured within 5 years of the 1994-95 echocardiograms. Relations with aortic valve calcium (AVC), aortic annular calcium and mitral annular calcium (MAC) were assessed with relative risk regression.

Results: Of 3809 subjects with available Echo measures (age 72±5, 60% women), most had available biomarker measures. Calcification was prevalent: 41% had MAC, 45% aortic annular, and 59% AVC. After adjustment (age, sex, race, education, body mass index, systolic blood pressure, antihypertensives, diabetes, smoking, renal function, cardiovascular disease, lipids, C-reactive protein), Lp(a), LpPLA2 mass and activity, and sCD14 were significantly associated with AVC. RRs for AVC per SD increment (95% confidence interval) were: Lp(a), 1.05 (1.02-1.08); LpPLA2 mass, 1.04 (1.01-1.07) and activity, 1.04 (1.00-1.07); sCD14, 1.04 (1.01-1.07). FGF-23 was significantly associated with MAC (1.09 [1.02-1.17]).

Conclusion: This study demonstrates novel associations of plasma FGF-23 with MAC, and LpPLA2 and sCD14 with AVC, extending that previously reported for Lp(a). These findings are consistent with the proposed roles of oxidized lipid, macrophage, and phosphate regulation in valvular mineralization. Further study of these pathways may be fruitful for prevention of calcification and its complications.