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Association Between Direct Measures of Body Composition and Prognostic Factors in Chronic Heart Failure

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Authors

Oreopoulos, Antigone
Ezekowitz, Justin A
McAlister, Finlay A
et al.

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Author: Ahmadi, Naser; Rathod, Avinash; Zughaib, Hussein; Patel, Nichole; Hajsadeghi, Fereshteh; Shantouf, Ronney; Kalantar-Zadeh, Kamyar; Ebrahimi, Ramin; Mao, Song S; Budoff, Matthew

Institution: Harbor UCLA Med Cntr, Torrance, CA; Greater Los Angeles VA HCS, UCLA, Los Angeles, CA; Harbor UCLA Med Cntr, Torrance, CA

Title: Abstract 20832: Lower Levels of Bone Mineral Density is Associated with the Severity of Coronary Artery Calcium in Maintenance Hemodialysis Patients.

Abstract: Background: Osteoporosis and atherosclerosis are major public health problems that often coexist in both genders worldwide, particularly in patients with chronic renal insufficiency. Coronary artery calcium (CAC) is an anatomic marker of burden of atherosclerosis and correlates with the presence and extent of coronary artery disease (CAD) in maintenance hemodialysis patients (MHD). The current study investigates the association between CAC and thoracic bone mineral density (BMD) measured by computed tomography (CT) in an MHD population.

Methods: One hundred and sixty six MHD subjects, age 53 +/-13, 59% male, underwent CT and their thoracic BMD and CAC were measured. The mean bone mineral density [BMD (mg/cc)] of four consecutive thoracic vertebrae was measured starting at the left main coronary slice level using QCT 5000 software (Image analysis, Kentucky). CAC was defined 0, 1-100, 101-400 and 400+.

Results: CAC is inversely associated with BMD in MHD (r= -0.33, p=0.0001). BMD decreased proportionally with increasing CAC from CAC 0 (168+/-34) to CAC 1-100 (159+/-33) to CAC 101-400 (143+/-28) to CAC 400+ (138+/-29) (p=0.001).(Figure) After adjustment for age, gender and cardiovascular risk factors, the relative risk for each standard deviation decrease in BMD was 1.5 (95% CI 1.01-2.3, p=0.05) for CAC 1-100, 2.3 (95% CI 1.7-5.8, p=0.004) for CAC 101-400, and 3.1 (95% CI 1.9-6.9, p=0.002) for CAC 400+ as compared to CAC 0, respectively.

Conclusion: This study provides evidence that lower levels of bone mineral density is independently associated with the severity of subclinical atherosclerosis measured by CAC in MHD population.