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Impact of Coronary Artery Disease on Outcomes of Heart Failure with Preserved Ejection Fraction

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Objective: This study sought to determine whether or not the presence of coronary artery disease (CAD) influences survival in patients with heart failure with preserved ejection fraction (HFpEF).

Background: CAD is associated with worse prognosis in patients with heart failure with reduced ejection fraction (HFrEF). Its impact on the clinical outcome of HFpEF patients is not yet certain.

Methods: We conducted retrospective chart reviews of electronic medical records of patients from an echocardiogram database that included individuals who had echocardiograms at UCSD Medical Center from January 2009 to January 2014. A population of HFpEF patients was defined from the database using a clinical diagnosis of heart failure, normal or mildly abnormal systolic left ventricular function with ejection fraction > 50%, and established echocardiographic characteristics of diastolic left ventricular dysfunction. The presence of CAD was determined by a coronary angiogram with > 50% stenosis of a major epicardial coronary artery, a documented history of myocardial infarction, a positive stress test for myocardial ischemia, or a history of coronary artery bypass or stenting. Basic demographic information, presence of comorbidities, survival statuses, and causes of deaths were also collected.

Results: From the database, 449 patients met the inclusion criteria for HFpEF, and 189 of them (42.1%) had CAD. Amongst the entire HFpEF population, 62.1% were Caucasian, 12.5% African American, 6.0% Asian, 16.5% Other, and 2.7% Unknown. In comparison to the HFpEF patients without CAD, those with CAD had a slightly higher average age (74.4 years vs. 73.2 years), and a lower percentage of females (52.4% vs. 66.5%). The CAD population also had higher rates of atrial fibrillation (42.3% vs. 37.3%), hypertension (90.5% vs. 74.2%), renal disease (36.5% vs. 24.6%), and hyperlipidemia (67.2% vs. 42.7%), and a slightly lower rate of chronic obstructive pulmonary disease (18.0% vs. 18.9%). Although there were trends towards higher cardiovascular mortality in patients with COPD (p = 0.091) and lower cardiovascular mortality in hypertensive patients (p = 0.093), none of the associations between any of the comorbidities and cardiovascular death achieved statistical significance (p > 0.1 for other comorbidities). There were higher rates of deaths (16.4% vs. 11.2%) and cardiovascular deaths (4.2% vs. 3.1%) in the CAD population compared to the HFpEF patients without CAD, but the relationships between CAD and death, as well as between CAD and cardiovascular death, did not achieve statistical significance (both p > 0.1). We found, however, that amongst the entire HFpEF population, there was a significant relationship between race and cardiovascular death, with African Americans having a greater likelihood of cardiovascular mortality compared to the entire population (p = 0.037), and Caucasians having a lesser likelihood of cardiovascular death (p = 0.009).

Conclusion: This study showed that in our population, CAD had a modest impact on the survival
status of HFpEF patients that did not achieve statistical significance. However, our results indicated that race did influence the rate of cardiovascular death within this population, with a higher rate of mortality in African Americans and a lower rate of mortality in Caucasians. While the reason for these differences is not known at this time, the impact of race on outcomes in the HFpEF population is a topic that deserves further study.