

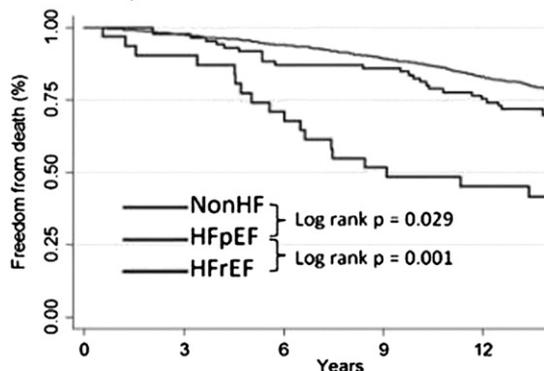
Epidemiology, Prevention

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Heart Failure and Preserved Ejection Fraction in African-Americans: The ARIC Study

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Introduction: African-Americans (AA) are at increased risk for heart failure (HF). Nevertheless, there are limited phenotypic and prognostic data in AA with HF and preserved ejection fraction (HFpEF) compared to those with HF and reduced ejection fraction (HFrEF) and those without HF. **Methods:** Middle-aged AA participants from the Jackson cohort of the Atherosclerosis Risk in Communities (ARIC) study (n=2445) underwent echocardiography between 1993-1996. HF status was available in 1,962 for whom left ventricular ejection fraction (LVEF) could be quantified. Participants with prevalent HF were categorized as HFpEF (LVEF \geq 50%) or HFrEF (LVEF < 50%). We compared clinical characteristics, cardiac structure and function, and all cause mortality between HFpEF and those without HF, and between HFpEF and HFrEF. **Results:** Prevalent HF was found in 116 participants at the time of echocardiography (73% HFpEF, 27% HFrEF). Compared to those without HF, those with HFpEF were older, female, had more frequent comorbidities, and concentric hypertrophy. In relation to HFrEF, those with HFpEF were more likely female, but less likely to have coronary heart disease, diabetes mellitus, chronic kidney disease, left atrial enlargement, and eccentric hypertrophy. Over a median 13.7 years of follow up, risk of death differed between these groups, with age and sex adjusted hazard ratios of 1.51 (95%CI 1.01-2.25) for HFpEF vs. those without HF, and 2.50 (95%CI 1.37-4.58) for HFrEF vs. HFpEF, Fig. 1. **Conclusion:** Among middle-aged AA, clinical characteristics as well as cardiac structure and function, significantly differed between HFpEF, HFrEF, and those without HF. HFpEF was more common than HFrEF and portended a worse prognosis than those without HF, but not as severe as HFrEF.

Kaplan-Meier survival estimates

| Number at risk | 0 | 3 | 6 | 9 | 12 |
|----------------|------|------|------|------|------|
| NonHF | 1846 | 1800 | 1734 | 1648 | 1531 |
| HFpEF | 85 | 83 | 74 | 73 | 64 |
| HFrEF | 31 | 28 | 22 | 16 | 14 |

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Cognitive Function in Older Heart Failure Patients Is Similar to Older Patients Following Stroke

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Introduction: Evidence suggests that older people with heart failure (HF) are at increased risk for cognitive impairment (CI); however, screening for CI in older HF patients is not part of usual care. Conversely, in patients following stroke or transient ischemic attack (TIA), patients are considered high risk for CI, and routine screening for CI is recommended in clinical guidelines. The purpose of this study was to compare Montreal Cognitive Assessment (MoCA) scores in older HF patients attending an outpatient heart function clinic (HFC) with MoCA scores in older patients following stroke or probable TIA attending a stroke prevention clinic (SPC). **Hypothesis:** We hypothesized that older patients attending the SPC would have significantly lower MoCA scores than older patients attending the HFC. **Method:** Secondary analysis comparing MoCA scores from a cohort of HF patients with ischemic cardiomyopathy

and no history of CI, stroke or TIA (n=45, mean age 73 yrs), with an age matched cohort of older patients attending a SPC following stroke (n=24, mean age 73 yrs) or TIA (n=25, mean age 74 yrs). **Results:** Total MoCA scores (mean SD) were similar in the HFC and SPC cohorts (HF: 22.3 SD 4.8 vs. stroke: 23.4 SD3.5 and TIA: 24.0 SD 2.9). The executive function median (Q1, Q3) subscore from the MoCA was significantly worse in the HFC vs. SPC cohort (HF: 5 (4, 6) vs. stroke: 5 (4, 7) and TIA: 7 (6, 7); p<0.05). **Conclusions:** CI, as identified by the MoCA, was as common in older HF patients with no documented history of CI, stroke, or TIA and attending a HFC, as age matched patients attending a SPC following stroke or TIA. In fact, the profile of MoCA scores in older HF patients appeared to more closely resemble the profile in age-matched patients in the SPC cohort following stroke versus TIA. These findings underscore the possibility that vascular risk factors alone may play a more important role in prevalence of CI than the end-organ (brain or heart) that is clinically affected. The majority of minor infarcts are subclinical, and it is quite possible that older HF patients harbor them as well. Clinicians need to maintain a high index of suspicion for underlying CI and strongly consider formal screening for CI in older HF patients. Future research needs to provide further insight into the mechanisms for CI in older HF patients and the clinical management of this association.

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Relationship between Diabetic Control and Diastolic Dysfunction in Elderly Patients with Type 2 Diabetes; Is Better Control Associated With Lower Risk of Diastolic Dysfunction?

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Objectives: To determine if diabetic control is associated with presence and severity of diastolic dysfunction (DD) in type 2 diabetics older than 65. **Design:** Retrospective cross-sectional study. **Participants:** Patients who had an echocardiogram between Jan 2008- Nov 2011 at MetroHealth Medical Center, affiliated with Case Western University, Cleveland, OH. Patients with EF > 50 were included, regardless of heart failure diagnosis. Patients with mechanical valve, severe mitral/ aortic dysfunction, and uncontrolled atrial fibrillation were excluded. **Measurements:** Data collected included demographics, chronic cardiovascular diseases, cardiovascular medications, blood pressures, LVH, wall motion abnormalities, presence and severity of diastolic dysfunction, HgA1c levels within 3 months of the echocardiogram. Severity of diastolic dysfunction was graded 0-III: grade 0 normal, grade I abnormal relaxation, grade II pseudonormal, grade III restrictive. **Results:** 654 patients were included. Median age was 72, 70% women, 50% Caucasian; nearly 60% were obese or morbidly obese, 90% had HTN, 80% hyperlipidemia, 35% CAD and ¼ of patients had renal insufficiency, stroke/TIA and heart failure. Diastolic dysfunction was present in 43% of women and 30% of men. Half of the patients with DD had grade I dysfunction. Patients with diastolic dysfunction were more likely to be female, to have diagnosis of stroke/TIA and PVD and had higher LDL and total cholesterol levels. They also had a higher number of medications and chronic cardiovascular diseases. Compared with no DD or type I DD, patients with type II and III DD had higher prevalence of CAD, renal insufficiency, CVA/TIA and PVD. The median number of cardiovascular medications was 3, with twice as many DD patients receiving hydralazine and long acting nitrates, especially in Type II and III DD. A logistic regression model of presence of diastolic dysfunction did not show a statistically significant correlation with HgA1c, however when severity of DD was evaluated, higher HgA1c was associated with type I DD, but not with type II and III. **Conclusion:** In our cohort of elderly patients with type 2 DM, the baseline characteristics and comorbidities of patients with type I DD differed significantly compared with patients with type II and III DD. Patients with type I DD had higher HgA1c levels, suggesting that good diabetic control, along with other risk factor modification, has the potential to decrease the incidence of DD in this patient population.

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The ANP Genetic Variant RS5068 is Associated With a Favorable Cardiometabolic Phenotype in a Mediterranean Population

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Introduction: Atrial natriuretic peptide (ANP) possesses cardio-renal protective properties including natriuresis, aldosterone suppression and vasodilation. Importantly, ANP also exerts lipolytic effects in vitro and in vivo. Previous studies reported that the ANP genetic variant rs5068 is associated with increased plasma levels of ANP, lower blood pressure values, and reduced risk of hypertension. We recently reported that in a random sample of the general population from Olmsted County, MN the G allele of rs5068 was associated with increased levels of ANP, lower blood pressure and BMI, waist circumference, reduced prevalence of obesity and metabolic syndrome. To date, these associations have not been replicated. **Hypothesis:** The minor allele of rs5068 is associated with a favorable cardiometabolic phenotype in

a randomly selected Mediterranean population. **Methods:** We genotyped a well characterized random sample of the residents of Ventimiglia di Sicilia, a small town in Sicily. **Results:** Genotype frequencies of rs5068 were AA: 93.5%, AG: 6.4%, and GG: 0.1%. All subsequent analyses are AA vs AG+GG. After adjusting for age and gender, the minor G allele was associated with lower systolic (120 ± 24 vs 126 ± 21 mmHg, $p=0.003$) and diastolic (72 ± 10 vs 76 ± 10 mmHg, $p=0.03$) blood pressure and lower BMI (26.7 ± 4.9 vs 28.2 ± 5.7 kg/m², $p=0.04$). Male subjects presenting HDL cholesterol plasma levels <40 mg/dL were less frequent in the AG+GG group (17% vs 27%, $p=0.05$). Importantly, the G allele was significantly associated with a lower prevalence of metabolic syndrome (19% vs 32%, $p=0.02$). **Conclusions:** The association between the minor allele of rs5068 and a favorable cardiometabolic phenotype, that we previously showed in a US population, is now replicated in a Mediterranean population in which the G allele of rs5068 is associated with lower blood pressure values, BMI, and prevalence of metabolic syndrome. These findings may lead to a diagnostic strategy to assess cardiometabolic risk and also lay the foundation for future development of an ANP or ANP-like therapy for metabolic syndrome.

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Right Ventricular Dysfunction in HIV

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Background: HIV-infected individuals are at increased risk for pulmonary hypertension and cardiomyopathy, portending poor prognosis in the setting of right ventricular (RV) dysfunction. The purpose of the study was to determine the prevalence of RV dysfunction in a healthy outpatient HIV cohort. **Methods:** We performed echocardiography in 104 adult HIV-infected individuals recruited from a research registry. Measurements included: estimated pulmonary arterial systolic pressure (PAP), RV fractional area of change (RVFAC), tricuspid annular planar systolic excursion (TAPSE), myocardial performance index (MPI) and mid RV free wall longitudinal myocardial strain (RV LMS) via speckle tracking. **Results:** Sixteen subjects (15%) had PAP >35 mm Hg, yet RV function (RVFAC, TAPSE, MPI) did not differ significantly. Eleven subjects had RVFAC $<35\%$, as well as lower TAPSE, RVLMS and LVEF (2.2 ± 0.5 vs 2.6 ± 0.5 cm, -23.9 ± 4.3 vs $-27.3 \pm 5.5\%$, 55 ± 8 vs 61 ± 7 , respectively, all $P < 0.05$). The lowest TAPSE quartile (<2.2 cm) had no other significant differences. Seventeen subjects (16%) had RV LMS $\geq -21.6\%$ (i.e., between 0 and -21.6% , previously shown to be associated with decreased regional function) and lower TAPSE (2.3 ± 0.5 vs 2.6 ± 0.5 cm, $P=0.02$; RV LMS $-18.2 \pm 1.6\%$ vs $-28.7 \pm 4.1\%$, $P < 0.001$), but no differences in other measures. There were 23 subjects with LVEF $<55\%$ and these had lower TAPSE (2.4 ± 0.5 vs 2.6 ± 0.5 cm, $P=0.03$). There was no relationship of CD4 count or viral load to any echocardiographic measures. **Conclusions:** The prevalence of global RV dysfunction in this outpatient HIV cohort is 11% defined by RVFAC $<35\%$; however, regional RV dysfunction defined by RVLMS $\geq -21.6\%$ is 16%. LVEF $<55\%$ co-segregated with a mild decrease in TAPSE (known to decrease LV dysfunction), but not RVLMS. The prevalence of elevated PAP was 15%, similar to previous reports, but was not associated with global or regional RV dysfunction. Regional RV dysfunction in asymptomatic HIV may be a separate entity from LV/global cardiomyopathy or pulmonary hypertension and deserves further study.

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Role of Obstructive Sleep Apnea in the Incidence of Atrial Fibrillation in Elderly Heart Failure Patients

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Introduction: Heart Failure (HF) and Obstructive Sleep Apnea (OSA) are risk factors for Atrial Fibrillation (AF) in the general population. Advancing age is an independent risk factor for AF. The incidence of AF in elderly HF patients with OSA is unclear. **Hypothesis:** Elderly HF patients with OSA have higher incidence of AF when compared to elderly HF patients without OSA. **Methods:** A total of 3410 elderly patients aged between 65 to 89 years (mean 76.81, median 78, SD 6.73), who presented to a single community medical center, were included in this cross-sectional study. Patients were divided to HF ($n=663$) and No HF ($n=2747$) groups. The HF and No HF groups were further divided based on gender and history of OSA. The HF group had 345 males ($n=47$ with OSA) and 318 female ($n=24$ with OSA) subjects. The No HF group had 1250 males ($n=60$ with OSA) and 1497 ($n=25$ with OSA) females. We studied the incidence of AF in these subjects. We used Cochran-Mantel-Haenszel statistics test for testing association of OSA with AF stratified by HF and gender groups. Logistic regression analysis was performed to examine correlation of OSA and AF within individual subgroups. **Results:** In elderly male patients with HF, the incidence of AF in those with OSA is 49% as compared to 48% in those without OSA ($P=0.87$). In elderly female patients with HF, the incidence of AF in those with OSA is 63% as compared to 42% in those without OSA ($p=0.06$). In elderly male patients without HF, the incidence of AF in those with OSA is 42% as

compared to 19% in those without OSA ($P < 0.0001$). In elderly female patients without HF, the incidence of AF in those with OSA is 28% compared to 14% in those without OSA ($P=0.06$). **Conclusion:** In both male and female elderly patients with HF, the presence of OSA does not significantly affect the incidence of AF.

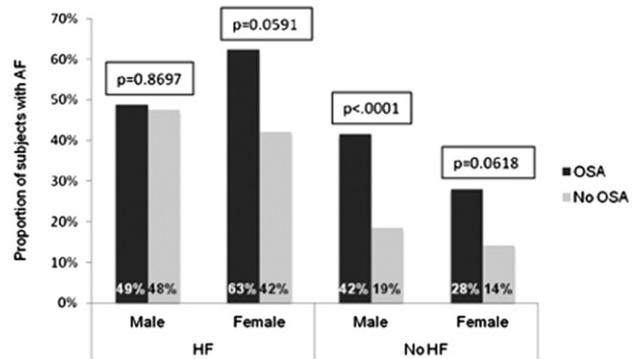


Fig. 1. Incidence of AF based on HF, Gender and OSA.

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Characteristics, Management and Outcomes of Patients Hospitalized for Acute Heart Failure in Korea: Preliminary Results of the Korean Acute Heart Failure Registry (KorAHF)

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Introduction: The prevalence of heart failure is increasing rapidly in Korea and its influence on health burden is growing fast. **Objectives:** This prospective nation-wide multicenter cohort study is being performed to investigate the clinical characteristics, management and outcomes of patients hospitalized for acute heart failure (AHF) in Korea. **Methods:** The patients admitted for AHF in ten tertiary care hospitals in Korea have been consecutively enrolled in this study. The cohort is planned to enroll 4,000 subjects till 2013 and to follow up till 2016 to collect data on long-term outcomes. The data collected by review of medical records was entered into a web-based database of National Institute of Health. **Results:** 1529 consecutive patients hospitalized for AHF between Dec. 2010 and Feb. 2012 were included in this analysis. The mean age of the patients was 69 years; 54% were male, 48% were de novo HF, 36% had DM. Mean LVEF was 39%. Ischemia was both the leading cause of HF (37%) and the most frequent aggravating factor (25%). Parenteral diuretics were used in 70% and 50% and 75% of patients received BBs and ARBs or ACEI, respectively. The median length of hospital stay was 8 days and mean cost for an admission was 7,400 U.S. dollars. In hospital mortality was 5.0% and 0.9% of patients received heart transplantation. Post-discharge 90-day mortality was 3%. **Conclusions:** This preliminary analysis demonstrates unfavorable short-term outcome of AHF in Korea. It also describes the similarities and differences in the baseline characteristics and management as well as outcome with those of other registries from US and Europe. Ongoing registry work will provide further information on long-term outcome and its determinants.

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Low Disease Prevalence May Influence the Diagnostic Accuracy of Cardiac Magnetic Resonance Imaging in Detecting Cardiac Sarcoidosis

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Background: Clinical diagnosis for cardiac sarcoidosis (CS) is challenging as definitive histologic proof is often lacking. Cardiac magnetic resonance imaging (cMRI) holds promise in the detection of regional interstitial edema or scarring consistent with cardiac sarcoidosis, but investigations in its clinical utility as a diagnostic test has been limited to relatively small study cohorts. **Methods:** We searched MEDLINE (PubMed/Ovid) and 4 other online electronic databases (1985-2011) to identify diagnostic accuracy studies that compared MRI with Japanese Ministry for Health and