Traditional Risk Factors Are Associated With Regional Left Ventricular Dysfunction in Asymptomatic Individuals: The Multi-Ethnic Study of Atherosclerosis (MESA)

Boaz D. Rosen, Mohammed Saad, Steve Shea, Khurram Nasir, Thor Edvardsen, Michael Jeremich-Ensrud, Shengnan Lai, David A. Bluemke, Joao AC Lima, Johns Hopkins Hospital, Baltimore, MD

Background: Coronary artery disease (CAD) is the main cause of LV dysfunction in USA and Europe. Hence, LV dysfunction may begin as a regional process that eventually progresses to global dysfunction. We hypothesized that different risk factors for CAD would be related to regional LV dysfunction in asymptomatic individuals.

Methods: MESA is a large multicenter study focused on subclinical cardiovascular disease among individuals aged 45-84 years. We evaluated global and regional LV function by MRI tagging in 841 participants. Peak midwall systolic circumferential strain (Ecc) was analyzed by Harmonic Phase Imaging (HARP). Ecc below the 5th percentile was used as an index of regional dysfunction in three coronary territories: left anterior descending (LAD), circumflex (LCX) and right (RCA). Logistic regression was used to study the relationship between Ecc and traditional risk factors.

Results: After adjustment for age and gender, significant associations were noted between elevated diastolic blood pressure (DBP), and presence of abnormal Ecc. Odds ratios of having abnormal Ecc in the presence of DBP > 90 mmHg were 3.5-5.2 in each of the coronary regions, (p < 0.05). Percentage of individuals with abnormal Ecc in RCA region was 4.3%, patients aged 66-77 years in individuals with DBP > 85, 86-90 and >90 mmHg (p < 0.01). A similar pattern was observed in other coronary territories, and in the presence of increased total and LDL cholesterol. Existence of more than one risk factor was associated with a substantially higher proportion of participants with abnormal Ecc. In individuals with DBP > 90 mmHg and cholesterol levels > 4.0 mmol/L the individuals had abnormal Ecc-RCA, in the presence of either increased cholesterol or DBP, corresponding percentages were 3.9% and 7.8%, respectively. When both risk factors existed, the percentage of individuals with abnormal Ecc increased to 24.4% (p < 0.01). Similar findings were seen in other regions. A similar pattern was noted when increased DBP and other risk factors.

Conclusions: Classic risk factors, especially increased DBP are associated with regional LV dysfunction in asymptomatic individuals. This association is stronger when more than one risk factor is involved.

Neurohormones but Not Adrenomedullin Correlate With Left Ventricular Structure in Patients With Heart Failure: Results From an EARTH Substudy

Jens P. Heiermann, Tatsu Shimosawa, Frank Ruschitzka, Kurt Quizau, Inder Anand, Thomas F. Luescher, University Hospital Zurich, Zurich, Switzerland

Background: Adrenomedullin (ADM), mainly produced in cardiovascular tissue in response to shear stress and stretch, has been proposed as marker for left ventricular (LV) dysfunction in patients with heart failure (HF). Yet, data on longitudinal changes in ADM serum concentrations and their relation to changes in LV-volume and function in patients with HF are scarce.

Methods: 891 patients (349 moderate to severe HF, 542 mild HF) were enrolled. Levels of ADM and BNP were measured at baseline and after 6 months follow-up. We measured LV-enddiastolic volume index (LVEDVI), ejection fraction (EF), LV mass index and wall stress were assessed with MRI. Spearman’s rho correlations were performed to determine longitudinal changes in the relationship between ADM and LV-volume and function changes as well as clinical variables.

Results: There was no association between ADM and clinical variables like BMI, sex or NYHA class at baseline. ADM was highly correlated with age (rho = -0.5133). Conclusions: In this so far largest dataset of longitudinal follow-up measurements in HF, the correlation between ADM and LV-enddiastolic volume index was stronger than the correlation between ADM and LV-ejection fraction. ADM was associated with LV-wall stress, but not with LV mass index. There was no correlation between ADM and LV-enddiastolic volume index at baseline and after follow-up. ADM and BNP were significantly and positively correlated with changes in LVEDVI, LV- Mass Index and LV-Wall Stress but not ADM. In patients treated with darusentan, an endothelium antagonist and an ACE-inhibitor or ARB, a negative correlation between ADM and LV-Wall Stress was observed (Rho = -0.1753, P = 0.0241) compared to patients without ACE inhibitor or ARB (Rho = 0.1693, P = 0.5133). Conclusions: In this so far largest dataset of longitudinal follow-up patients with HF, ADM appears not to be correlated with clinical variables except age and LV-volume or function. Neurohormones BNP and ANP are best related to changes in LV-volumes, but not LV function. ACE inhibitors and endothelin receptor antagonist neutralized their effect on ADM serum concentration. Thus, ADM is not a useful marker for monitoring HF.

Prognostic Value of Development of Atrial Fibrillation in Outpatients With Heart Failure: Data From the Italian Network on Congestive Heart Failure (IN-CHF Registry)

Gianni Fabbri, Samuele Baldasseroni, Maurizio Marini, Francesca Coppi, Anna Gentile, Lucio Gonzini, Marco Gorini, Franco Ingrillì, Aldo P. Maggioni, The IN-CHF Investigators, ANMCO Research Center, Florence, Italy

BACKGROUND: Atrial fibrillation (AF) is the most frequent arrhythmia in patients (pts) with heart failure (HF) and is related with an adverse prognosis. The development of AF in HF may worsen clinical profile. However, it is not completely understood whether new onset of AF is a more severe prognostic determinant than the presence of chronic AF.

AIM: To examine whether HF pts with presence, or occurrence of AF, have a poorer prognosis compared to pts without atrial arrhythmie.

METHODS: We studied 4710 HF pts from the IN-CHF registry, followed for two years. Pts were stratified in three groups: A) synchron rhythm at baseline and at 1 year (3776 pts, 80.2%), B) pts with atrial fibrillation at baseline and AF at 1 year (159 pts, 3.4%), C) AF at baseline and at 1 year (775 pts,16.4%). Two year mortality and hospitalization rates were assessed for all pts.

RESULTS: Table shows the characteristics of groups at entry.

Two years mortality (A=0.3%, B=17.8%, C=7.2%) and hospitalisation rates (A=32.1%, B=61.0%, C=36.9%) were higher in B than in C and A, p<0.001. Adjustment analysis confirms that development of AF in pts with HF is independently related to an adverse outcome both in terms of mortality (B group HR: 3.0, CI 95% 1.9-4.3; C group: HR 1.4, CI 95% 0.9-1.9 vs A) and hospital admissions (B group: HR 3.0, CI 95% 2.1-4.2, C group: HR 1.1, CI 95% 0.9-1.3 vs A).

CONCLUSIONS: Pts with new onset AF have a markedly reduced survival compared with those with chronic or without AF. These findings suggest that AF is associated with a worse outcome early after its development.

Alcohol Consumption and Cardiac Structure and Function in American Indians: The Strong Heart Study

Marcello Chinali, Giovanni de Simone, Thomas K. Welty, Elisa T. Lee, Lyle G. Best, Barbara V. Howard, Richard B. Devereux, Weill Medical College of Cornell University, New York, NY

Background: Chronic alcohol intake has been considered as a possible cause of cardiomyopathy. However, it has been recently reported that alcohol consumption is not associated with increased risk for congestive heart failure, even among heavy drinkers. This study was designed to assess the relation between alcohol intake and preclinical cardiac abnormalities in the population of the Strong Heart Study.

Methods: We studied 3,310 middle-aged to elderly participants of the study (age 59.6 ± 7.8 years, 63.8% women, 54.5% obese, 45.6% hypertensive, 47.5% diabetics), without prevalent cardiovascular disease. Participants were divided into groups according to the amount of self-reported alcohol intake. Quantities of alcoholic beverages were converted to number of drinks (1 drink = 12oz of beer, 4 oz of wine or 1 shot of hard liquor). All participants underwent clinical, laboratory and echocardiographic examination.

Results: Participants were divided in 1,147 never drinkers (N), 1,387 former drinkers (FD; defined as no alcohol for at least 12 months), and 776 drinkers (404 were light drinkers (LD)=4 drinks/week, 220 were moderate drinkers (MD) 4 to 12 drinks/week, and 157 were heavy drinkers (HD)=12 drinks/week). Drinking was more frequently associated with male gender, younger age, and higher diastolic blood pressure (p for trend all <0.01). Similar prevalence of diabetes, hypertension and obesity was found in all five groups (for all p=ns). All three drinking groups showed higher values of left ventricular diameter, cardiac output and aortic root diameter as compared with both the never and the former drinkers (all p<0.05). After controlling for clinical covariates there was no significant difference in left ventricular structure among the five groups. However, HD was still associated with increased aortic root diameter and higher cardiac output compared to both never and former drinkers (p for both <0.01). Conclusion: Alcohol consumption is not associated with preclinical cardiac abnormalities. However, heavy drinking is independently associated with increased aortic root diameter and increased cardiac output.

Changes of Inflammatory Cytokines and Uric Acid in Patients With Severe Chronic Heart Failure: A COPERNICUS Substudy

Stefan D. Anker, Aidan P. Bolger, Andrew JS Coats, Hugo A. Katus, Michael B. Fowler, Milton Packer, for the COPERNICUS Study Group, NHLI, London, United Kingdom, Applied Cachexia Research, Berlin, Germany

It is not known, whether changes in inflammatory cytokines and serum uric acid (UA) relate to prognosis in patients chronic heart failure (CHF), and whether the prognostic benefits of carbidopa are related to such changes.

Methods: In 204 randomly selected patients (age 62±1y, LVFE: all <25%, BMI 26.6±3.0 kg/m², female: 22%) participating in the European arm of the COPERNICUS study, we evaluated plasma levels of tumor necrosis factor alpha (TNF), soluble TNF receptor-1 (sTNFR1), interleukin-6 (IL-6), IL-1 receptor antagonist (IL-1ra) and serum UA at baseline (BL) and after 115±6 days follow-up (FU, n=185). During FLI, 29 deaths were observed in this cohort (12-month mortality 15.4%). Adjusting for age, BMI, and treatment, UA (p=0.03), but none of the cytokines predicted prognosis. Considering changes of parameters vs subsequent survival, only increases in IL-1ra (p for trend related to poor prognosis) and decrease of UA by 1 mg/dL (i.e. 60 μmOL/L) related to 39% higher mortality (95% CI 4-87%).

Conclusion: The beneficial effects of carbidopa in CHF are not dependent on plasma...