Poster Session 1 (P1)

Sunday, June 24, 2018

partial segment of rapid filling phase and atrial systolic phase. And the vortex area and circulation intensity had a good correlation with E/e´ during reduced filling period and atrial systolic phase. **Conclusions:** VFM can effectively evaluate the flow field characteristics of left ventricle in patients with coronary heart disease. The quantitative parameters of VFM can reflect the extent of coronary artery stenosis to some extent.

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Differentiating Pre-Capillary and Post-Capillary Pulmonary Hypertension by Doppler Echocardiography in a Large Real-World Database

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Background: Pulmonary hypertension is common, dangerous and has multiple causes. Vasodilator therapy has significantly improved the prognosis of patients with pulmonary arterial hypertension, but the diagnosis can be challenging, requiring right heart catheterisation (RHC). Differentiating pre-capillary pulmonary hypertension (prePH) and post-capillary pulmonary hypertension (postPH) and measuring pulmonary vascular resistance are key steps for diagnosing pulmonary arterial hypertension. A novel echocardiographic parameter, the pulmonary to left atrial ratio (ePLAR), which is derived from the tricuspid regurgitation velocity (TRV) divided by the ratio between the early diastolic filling velocity and the early mitral annulus velocity (E/e'), i.e., ePLAR=TRV/E/e', has been described as a surrogate for RHC. This retrospective cohort study tests the ability of ePLAR to differentiate prePH and postPH, in a large real world database. **Methods:** The data from all RHCs performed within 5 years' period (January 2010 to February 2015) was extracted from the hospital's database. The closest corresponding echocardiograms were searched in the national echo database Australia (NEDA) using the identifiers from RHC data. **Results:** 887 pairs of echos and RHCs were merged and analysed in our study. The median time difference between RHC and echocardiography was 7 (IQR 1-62) days. The ePLAR was calculable in 184 cases (21%). Median (IQR) ePLAR values were significantly different between prePH and postPH groups: 0.35 (0.13-0.50) m/s vs 0.17 (0.12-0.23) m/s (P=0.003), despite both groups having similar mean pulmonary artery pressures. The optimal ePLAR cut-off of 0.28m/s had a positive predictive value of 94% for postPH, with sensitivity of 83% and specificity of 67%. **Conclusions:** ePLAR helps to discriminate postPH from prePH and may be useful in evaluating these patients.

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Heart Failure with Reduced Ejection Fraction (HFrEF) in Young Patients Has Unique Clinical and Sociodemographic Features: An Urban and Multiracial Observation

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Background: Young patients with HFrEF might present distinctive clinical phenotypes due to different etiologies and other age-related comorbidities comparing with older patients. Studies of HFrEF in young individuals remain scant, especially in racial-ethnically diverse communities. **Methods:** Patients with HF diagnosis upon inpatient discharge at Montefiore Medical Center, Bronx, New York between 2000-2016, with an EF <40% were included. Patients were divided into three age groups: young (18-39 years), middle-age (40-64 years), and elderly (> 64 years). Socioeconomic score (SES) was a summary Z-score that combined wealth and income and displayed as above (positive) or below (negative) mean SES in New York state. All cause mortality was obtained until December 31st, 2017. Clinical characteristics were compared among groups using chi-square and ANOVA tests. Unadjusted and sex-adjusted Cox proportional models were performed to evaluate risk of mortality and 1-year readmission among different age groups. **Results:** A total of 1,032, 8,336 and 13,315 young, middle-age and elderly patients were included in the study. Median follow-up was 36 (14-69) months. Young patients were predominantly Blacks, and had significantly lower SES compared with middle-age and elderly patients. Young individuals had significantly lower proportions of ischemic heart disease and atrial fibrillation, but higher proportions of dilated, alcoholic and peripartum cardiomyopathies. They had larger left ventricular chamber size but lower pro-NT-BNP levels (Table). Young patients had 78% and 31% lower risk of mortality and 1-year readmission rates, respectively, than those of elderly groups ($p < 0.001$) (Figure). **Conclusion:** Young patients with HFrEF have distinct baseline characteristics, racial distribution, lower SES and worse LV dilatation but a better survival outcome than older patients. Age-specific preventive and therapeutic interventions should therefore be explored.

Table 1. Baseline characteristics of the young HFrEF patients comparing to older age groups.

	Young (N = 1032)	Mid-age (N = 8336)	Elderly (N = 13,315)	P-value
Age (mean±SD)	32.5±5.5	54.9±6.5	77.8±8.3	<0.001
Male, n(%)	624 (60.5)	5,323 (63.9)	6,848 (51.4)	<0.001
Race, n(%)				< 0.001
Caucasian	72 (8.0%)	228 (13.2%)	666 (31.4%)	
Non-Hispanic Black	107 (43.7%)	583 (37.1%)	586 (27.5%)	
Hispanic	59 (26.0%)	383 (24.4%)	467 (20.0%)	
Other races	37 (23.3%)	307 (24.5%)	361 (21.1%)	
SES, mean (SD)	-3.63 (2.83)	-3.32 (2.88)	-2.64 (2.89)	< 0.001
IHD, n(%)	146(14.2%)	3,648 (43.8%)	7,868 (59.1%)	< 0.001
DCM, n(%)	14 (6.45%)	138 (9.19%)	316 (15.0%)	< 0.001
VHD, n(%)	191 (18.5%)	1,659 (19.9%)	3,682 (27.7%)	
Alcoholic CM, n(%)	17 (1.65%)	121 (1.45%)	44 (0.33%)	< 0.001
Peripartum CM, n(%)	32 (3.1%)	3 (0.04%)	0 (0%)	< 0.001
Cocaine abuse, n(%)	1032 (5.5%)	728 (8.7%)	131 (1.0%)	< 0.001
AF, n(%)	114 (11.0%)	1844 (22.1%)	5,322 (40.0%)	< 0.001
HTN, n(%)	422 (40.9%)	5,290 (63.5%)	9,765 (73.3%)	< 0.001
DM, n(%)	171 (16.6%)	3,400 (40.8%)	5,646 (42.4%)	< 0.001
CKD, n(%)	199 (19.3%)	2,170 (26.0%)	4,445 (33.4%)	< 0.001
***HF therapies*, n(%)**				
Beta-blockers	621 (60.2%)	5,097 (61.1%)	6,712 (50.1%)	< 0.001
ACEI/ARB	531 (51.5%)	4,265 (51.2%)	5,196 (39.0%)	< 0.001
H/I	158 (15.3%)	1,127 (13.5%)	1,293 (9.7%)	< 0.001
MRA	233 (22.6%)	800 (16.8%)	1,177 (8.8%)	< 0.001
AICD	196 (19.0%)	1795 (21.5%)	1,892 (14.2%)	< 0.001
Heart Transplant	55 (5.3%)	200 (2.4%)	49 (0.37%)	< 0.001
***Echocardiography*, mean±SD**				
EF (%)	28.0±8.7	29.4±8.2	30.6±7.5	< 0.001
LVESD (mm)	48.6±12.8	45.2±11.8	40.4±13.0	< 0.001
LVEDD (mm)	59.0±11.6	57.0±56.1	51.9±10.5	< 0.001
LAV (ml)	82.5±38.0	78.0±33.1	77.0±32.2	< 0.001
Pro-NT-BNP (ng/ml), mean (IQR)	2,840 (888-7436)	3,137 (1,109-9,173)	5,616 (2,074-14,890)	< 0.001

SES, socioeconomic status; **IHD**, ischemic heart disease; **DCM**, dilated cardiomyopathy; **VHD**, valvular heart disease; **CM**, cardiomyopathy; **AF**, atrial fibrillation; **HTN**, hypertension; **DM**, diabetes; **CKD**, chronic kidney disease; **ACEI**, angiotensinogen converter enzyme inhibitor; **ARB**: angiotensin receptor blocker; **H/I**, hydralazine/isosorbide dinitrate; **MRA**, mineralocorticoid receptor antagonist; **AICD**, automatic implantable cardioverter-defibrillator; **EF**, ejection fraction; **LVESD**, left ventricular end-systolic diameter; **LVEDD**, left ventricular end-diastolic diameter. **LAV**, left atrial volume; IQR, interquartile range.