Indiana-ACC Poster Competition Abstract

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Do **NOT** alter this form by deleting parts of it (including this text) or adding new boxes.
Please structure your clinical research abstract using the following headings: * Background * Objective * Methods * Results (if relevant) * Conclusion
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Title:

Multi-View Right Ventricular Strain is a Better Predictor of Cardiovascular Events Compared with Right Ventricular Free Wall Longitudinal Strain

Abstract: (Your abstract must use Normal style and must fit into the box. You may not alter the size of this)

Background: Right ventricular (RV) free wall longitudinal strain has achieved significant popularity in recent literature as a tool to assess RV systolic function in various cardiac pathologies. Numerous studies have demonstrated the prognostic value of RV free wall longitudinal strain (FWS) assessed by 2D speckle tracking, but evaluation remains mostly limited to one apical 4-chamber view. We have shown that RV strain can be acquired using multiple 2D-views and has greater prognostic value when compared with RV-FWS.

Methods: GE Vivid echocardiographs were used to acquire images in 3 views of the RV in 106 subjects (mean age 56 yrs, 60 % male) with variable RV systolic function and EF>40%. The RV focused apical 4-chamber (4C) view imaged the septum and RV free wall, the apically tilted medially angulated long axis (LAX) view imaged the anterior and inferior walls and the short axis (SAX) view at the aortic valve level imaged the RV outflow tract. 2D strain was processed using a semi-automated software program. For each subject, RV-FWS was calculated as the average of the basal, mid and apical free wall segments and global RV strain was calculated as the weighted average of the 3 views (4C and LAX with 6 segments, SAX with 4 segments). Subjects were followed for cardiovascular (CV) events (cardiac death, cardiac arrest, cardiogenic shock, heart failure and malignant arrhythmias). SPSS was used perform cox regression and ROC analysis.

Results: 106 subjects with mean global RV strain of -17.9 ± 4.6 and RV-FWS of -20.2 ± 7 were followed for 19 + 17 mos. On cox regression analysis, significant univariate predictors of events were history of coronary artery disease ($p = 0.01$), hypertension ($p = 0.01$), right atrial area ($p<0.001$), RV outflow tract diameter ($p = 0.03$), RV basal diameter ($p<0.001$), global RV strain ($p <0.001$) and RV-FWS ($p<0.001$). Age, gender, ejection fraction and type 2 diabetes mellitus were not predictors. On subsequent multivariate analysis, RV basal diameter ($\chi2 = 30$), global RV strain ($\chi2 = 24.7$) and h/o CAD ($\chi2 = 7.9$) emerged as independent predictor of events. RV-FWS ($\chi2 = 10.8$) was not an independent predictor of events. ROC analysis revealed that global RV strain had an area under the curve of 0.801 (95% CI: 0.708 – 0.894) with optimal cutoff value of -17.5% (Sensitivity 81%, Specificity 67%), while RV-FWS had an area under the curve of 0.729 (95% CI: 0.627 – 0.832) with optimal cutoff value of -19.3 % (Sensitivity 69%, Specificity 65%).

Conclusion: Global RV strain derived from multiple views is an independent predictor of cardiovascular events while RV free wall longitudinal strain is not. Global RV strain is better at risk stratifying subjects with various levels of RV systolic function when compared to RV-FWS.

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