THE IMPACT OF APICAL IMAGING LEVEL ON ECHOCARDIOGRAPHIC MEASUREMENT OF LEFT VENTRICULAR TORSION: THE NEED FOR STANDARDIZATION

ACC Poster Contributions
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Background: Left ventricular torsion (LVT), the net difference between apical and basal rotation, is an important determinant of overall LV function. Previously reported LVT values in healthy individuals are highly variable and reasons for this are incompletely understood. We hypothesized that the location of apical image acquisition is an important cause of LVT measurement variability.

Methods: Healthy participants (n=10) underwent speckle-tracking echocardiography to measure LVT. End-systolic LVT was calculated using images at a single basal level (mitral valve at end-systole) and three pre-specified apical levels (Figure 1A). Apical levels were defined in the short-axis view by the ratio of LV cavity diameter to total LV diameter (low apex < 0.6, mid apex = 0.6 to 0.7, and high apex > 0.7).

Results: Subjects were 18.7±2.1 years old, had systolic blood pressure = 115±12 mmHg, and heart rate = 59±11 beats/min. End-systolic apical rotation differed significantly across the three apical imaging levels (low = 11.3±3.7 vs. mid = 6.6±3.1 vs. high = 2.6±1.5 degrees, p <0.001). End-systolic LVT calculated using a low apex rotation value differed by 126% from that calculated using a high apex rotation value (Figure 1B).

Conclusions: LVT values are highly dependent on the level of apical imaging acquisition. Precise apical standardization is required for accurate LVT assessment and should be a requisite methodological step for future studies examining LVT.