P8.3: AORTIC FLOW ALTERATIONS IN DILATED AND HYPERTROPHIC CARDIOMYOPATHY: NEW INSIGHT FROM QUANTITATIVE FLOW MRI


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maladaptive remodeling, suggesting lower efficacy of conventional treatment on this vascular feature.

P8.3 AORTIC FLOW ALTERATIONS IN DILATED AND HYPERTROPHIC CARDIOMYOPATHY: NEW INSIGHT FROM QUANTITATIVE FLOW MRI

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Aims: Aortic structural and hemodynamic alterations have deleterious effects on the left ventricle (LV). Our aims were to: 1) define indices of ascending aorta (AA) flow from MRI data and 2) assess changes in such indices in dilated (DCM) and hypertrophic (HCM) cardiomyopathies.

Methods: We studied 17 DCM (53±11years) and 15 HCM patients (56±16years) matched for age with 34 controls (53±10years). MRI AA through-plane velocities were automatically segmented to estimate flow curves throughout the cardiac cycle. Then, indices reflecting flow curves changes during the late systolic deceleration time interval (DT) were derived: a) T1/2: the time interval required for flow deceleration to reach half of its systolic peak, in percentage of DT, and b) DR1/2: the decrease in flow during half of DT, in percentage of systolic peak.

Results: T1/2 was 56.3±6.65% and DR1/2 was 43.5±6.5% in controls. AA flow waveform during late-systole changes significantly in cardiomyopathies. Indeed, while it tends to be steeper in HCM as reflected by significant (p<0.001) decrease in T1/2 (43.1±17.3%) and increase in DR1/2 (54.9±16.1%), it tends to be flat in DCM as reflected by significant (p>0.001) increase in T1/2 (68.2±6.7%) and decrease in DR1/2 (31.6±7.8%). Furthermore, such differences remained significant while accounting for gender, BMI and heart-rate (MANOVA).

Conclusion: We found significant changes in AA flow patterns in the presence of cardiomyopathies, reflecting changes in both LV contractility capacity and aortic cushioning. Such aortic indices might be of major usefulness in pathologies associating aortic stiffening with LV hypertrophy such as hypertension.

P8.4 NON-INVASIVE ASSESSMENT OF LOCAL PULSE WAVE VELOCITY USING ELECTROMECHANICAL SENSORS: FEASIBILITY STUDY IN A HEALTHY POPULATION

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Pulse wave velocity (PWV) has been shown to be a reliable marker for arterial stiffness. Its accuracy depends heavily on the estimation of the transit time (TT) between proximally and distally measured pulse waveforms. Several methods of determining TT exist, but no consensus for the standardization of one of them has been reached yet. In this work, various state-of-the-art TT estimation methods and the resulting PWV values are examined. In total, 118 pair-wise measurements using applanation tonometry on the carotid and femoral arteries from 59 patients over a wide age range (21-88 years), recorded by the SphygmoCor system, were examined. For the TT estimation, two traditional methods based on intersecting tangents (IT) and the standard temporal arterial characteristic impedance (Zc) concept of measurements to estimate Zva were used. Furthermore, the two recently proposed methods "distal-pitching" (DP) and "Zva-MR inspection" were examined. The resulting PWVs differed significantly (p<0.05). Bonferroni corrected pair T-test) between the various methods, with exception of MSU vs. DP. The means ± standard deviations were 8.2±1.8m/s using IT, 7.6±1.9m/s for the MSU, 7.8±2.2m/s using DP, and 9.9±6.7m/s by calculation of the CC. Comparisons of single measurements lead to differences of even more than 6m/s. Although the 2013 ESH/ESC Guidelines for the management of arterial hypertension suggest a threshold of 10m/s as an estimate of alterations of arterial function, no evaluation method is mentioned. Our results suggest that an agreement on the optimal TT estimation may be useful.