IMAGING AND DIAGNOSTIC TESTING

NORMAL VALUES OF LEFT VENTRICULAR FILLING INDICES BY MULTI-DETECTOR COMPUTED TOMOGRAPHY

ACC Poster Contributions

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Background: In contrast to its well recognized value in the assessment of left ventricular (LV) systolic function, little is known about the role of Multi-detector CT (MDCT) in the evaluation of left ventricular diastolic function. This study aimed to determine the normal reference values for various LV filling indices in patients with normal systolic function and no evidence of significant coronary atherosclerosis, hypertension or diabetes.

Methods: In a cohort of 620 patients that underwent 64-slice MDCT, 83 patients (mean age 58.1±12.1 years, 36% women) fulfilled the enrollment criteria. LV volume curves were generated based on ten images acquired throughout the cardiac cycle in 10% increments (from 5% to 95% of RR interval). Numerous LV filling indices were calculated, including early (peak (Ep) and mean (Em)), late (peak (Ap) and mean) filling volumes, rates, fractions, and Ep/Ap rate ratio.

Results: Normal values for some LV filling indices are presented in the Table. Significant variation with age was noted for Ep and diastasis filling rate. Heart rate and gender mostly affected Ap filling rate and fraction. However, no significant interaction with any of these three factors was noted for Em filling rate and Ep filling fraction.

Left Ventricular Filling Indices by Age, Gender and Heart Rate.

Variable	All patients (n=83)	Age (years)		Gender		Heart Rate (bpm)	
		<65 (n=56)	≥65 (n=27)	Women (n=30)	Men (n=53)	<60 (n=60)	≥60 (n=23)
Peak early (Ep) rate (ml/10%RR)	26.4±8.6	28.4±8.0*	22.4±8.7*	25.7±7.7	26.8±9.1	26.8±8.6	25.3±8.7
Diastasis rate (ml/10%RR)	2.6±2.6	2.2±2.4*	3.5±2.7*	2.9±2.2	2.5±2.7	2.6±2.6	2.7±2.6
Peak late (Ap) rate (ml/10%RR)	15.3±7.8	16.1±8.8	13.4±4.9	12.1±4.0*	17.0±8.9*	14.2±5.0*	18.0±12.2*
Ep/Ap rate ratio	2.0±0.8	2.0±0.8	1.8±0.8	2.3±0.8*	1.8±0.8*	2.1±0.9	1.7±0.8
Mean early (Em) rate (ml/10%RR)	12.3±3.6	12.9±3.3	11.4±4.1	12.2±3.2	12.5±3.8	12.5±3.8	12.0±3.3
Ep filling fraction (%)	37.8±8.1	38.0±7.5	37.3±9.2	38.6±8.5	37.3±7.9	38.2±7.9	36.5±8.7
Ap filling fraction (%)	14.3±5.1	14.1±5.4	14.7±4.4	12.5±3.5*	15.3±5.5*	13.6±4.5*	16.1±6.0*
Ep/Ap filling fraction ratio	2.9±1.1	3.0±1.1	2.8±1.2	3.3±1.1*	2.7±1.1*	3.1±1.1	2.6±1.0

*P <0.05

Conclusion: The current study presents the reference normal values for MDCT LV filling indices by age, gender and heart rate. Further research is needed for determination of corresponding abnormal values.