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Non Invasive Imaging

ELECTROCARDIOGRAPHIC PREDICTORS OF LEFT ATRIAL STRUCTURE AND FUNCTION DEFINED BY CARDIAC MAGNETIC RESONANCE FEATURE TRACKING: THE CTRIP STUDY

Poster Contributions

Hall C

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Background: Deep terminal negativity of P wave in V1 (PPV1) is a measure of interatrial conduction. The relationship of LA volume and function with PPV1 morphology has not been defined. Our goal was to explore associations of LA structural and functional parameters with ECG measures of LA electric activity.

Methods: 74 patients (mean age 58, 64% men, 63% Caucasian) with structural heart disease (wide spatial QRS-T angle $\geq 105^\circ \pm$ Selvester QRS score ≥ 5 on ECG) but left ventricular ejection fraction $> 35\%$ underwent clinical evaluation, cardiac magnetic resonance and resting ECG. LA indices - maximum volume (Vmax), maximum strain (Smax) and ejection fraction (LAEF) were obtained by multimodality tissue tracking using 2 and 4 chamber long-axis images. Amplitude, duration of PPV1, and PR interval were automatically measured using 12SL TM algorithm by Magellan ECG Research Workstation. Multivariate regression was used to assess associations between LA indices and PPV1, adjusting for demographics, BMI and heart rate.

Results: (Table) Mean Vmax: 68 ± 21 ml; LAEF: $53 \pm 9\%$; Smax: $27 \pm 9\%$. Vmax was related to PPV1 amplitude both independently and after adjustment ($r^2=0.28$). In multivariate regression, Smax was associated with PPV1 duration ($r^2=0.25$); Smax ($r^2=0.21$) and Vmax ($r^2 = 0.32$) were associated with PR interval.

Conclusion: In patients with preserved LVEF, larger LA volume is associated with deeper terminal PPV1 negativity and PR prolongation. Lower LA strain is related to PR prolongation and wider PPV1 duration.

Table: Associations of LA structural and functional indices with ECG Characteristics

Parameters	PPV1 duration				PPV1 amplitude				PR Interval			
	Univariate		Multivariate		Univariate		Multivariate		Univariate		Multivariate	
	B co-efficient	P-value	B co-efficient	P-value	B co-efficient	P-value	B co-efficient	P-value	B co-efficient	P-value	B co-efficient	P-value
Vmax (ml)	.14	.11	.09	.32	.21	.032	.18	.047	.201	<.0001	.16	.003
LAvimax (ml/m2)	-.0002	.84	.0004	.67	.0011	.32	.0018	.041	.0013	.048	.0014	.01
LAEF (%)	-.03	.44	-.02	.57	-.07	.08	-.06	.15	-.05	.045	-.04	.08
Smax (%)	-.61	.09	-.77	.04	-.07	.09	-.06	.13	-.06	.011	-.06	.012

Values stated as B co-efficient. PPV1, P Prime in V1; Vmax, maximum LA volume; LAvimax, maximum indexed LA volume; LAEF, LA ejection fraction; Smax, maximum LA strain; LVEF, left ventricular ejection fraction; Uni, univariate regression co-efficient; Multi, multivariate regression co-efficient after adjusting age, gender, race, BMI and heart rate.