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LEFT ATRIAL VOLUME AND THE BENEFIT OF CARDIAC RESYNCHRONIZATION THERAPY IN MADIT-CRT

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Conflict of Interests

Drs. Moss, Solomon, and Zareba have received research support for the conduct of the MADIT-CRT trial from Boston Scientific through a grant to the University of Rochester. Dr. Goldenberg receives research grant support from Boston Scientific and the Mirowski Foundation

Background

- Left atrial volume (LAV) is a reliable predictor of CV outcomes in HF and following MI
- LAV often reflects the cumulative effects of filling pressure over time and provides a more sensitive expression of the severity of diastolic dysfunction than the LV
- CRT-D has emerged as an important therapeutic modality for patients with HF
- The clinical benefits of CRT are related to the reverse remodeling effects of the device on the LV and improvement in systolic and in diastolic function
- However the role of LAV as an independent predictor of clinical outcome has not been established

Study Objectives and Methods

- To evaluate the impact of baseline LAV on the risk of HF and death in mildly symptomatic HF. To evaluate the relation between LAV and the clinical benefits of CRT-D . To evaluate the association between the reverse remodeling effects of CRT-D on LAV and subsequent clinical outcomes

Study population:

- 1820 pts, ICM/NICM, NYHA class I/II, QRS ≥ 130 msec
- Echos were obtained at baseline for 1783 (98%) pts. Paired echos from baseline and after 12 months were available for 1372 pts
- LA and LV volumes were analyzed by an independent core lab blinded to treatment assignment or clinical outcome

Primary Endpoints

- Time to the occurrence of heart failure, hospitalization or death whichever occurred first. All cause mortality
- Landmark analysis was utilized in order to assess the risk of CHF or death in the CRT-D group subsequent to the 1 year echo by LAV change at one year (both as continuous measure and categorized into approximate quartiles)

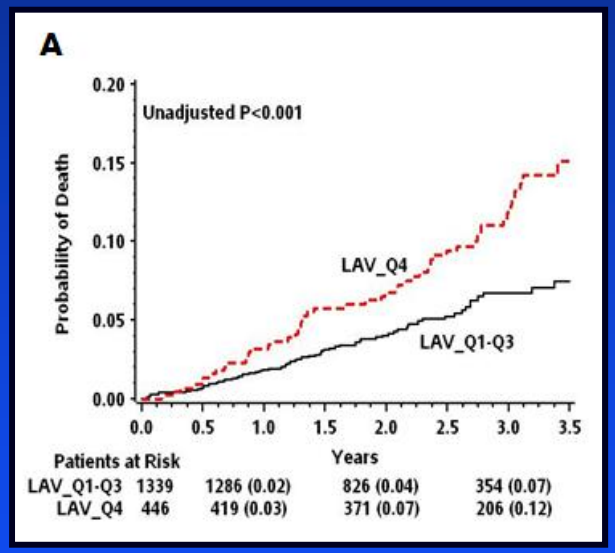
Baseline Clinical Characteristics

	LAVi Q1-Q3(≤52ml/m^2) (n=1339)	LAVi Q4(>52ml/m^2) (n=446)	p
LAVi (ml/m^2)	42 ± 6	60 ± 7	
Age(years)	64 ± 11	65 ± 11	0.52
Ischemic NYHA CLASS I	15	14	0.70
Ischemic NYHA CLASS II	40	42	0.48
Diabetes Mellitus	31	29	0.65
Hypertension	65	60	0.05
Prior atrial arrhythmias	10	16	<0.001
Prior Ventricular arrhythmias	7	9	0.07
SBP(mmHg)	123 ± 17	120 ± 18	0.001
QRS (ms)	157 ± 19	162 ± 22	<0.001
CLBBB	69	74	0.05
LVEDVi (ml/m^2)	116 ± 21	145 ± 36	<0.001
LVESVi (ml/m^2)	89 ± 16	107 ± 29	<0.001
LVEF %	30 ± 3	27 ± 3	<0.001

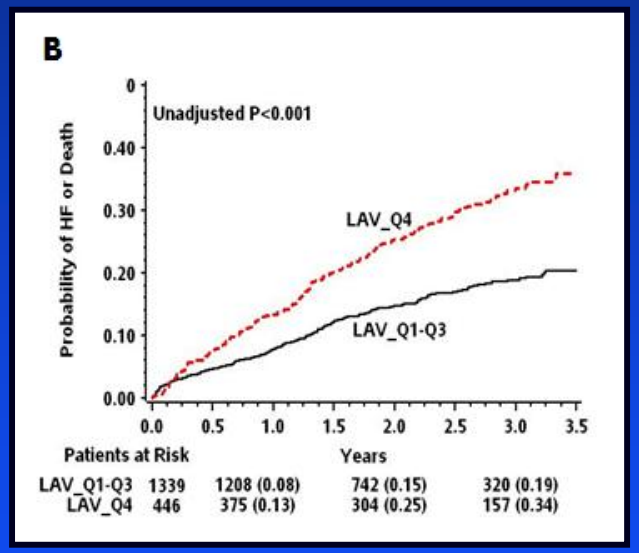
Data are presented as percentage or mean ± standard deviation

Results

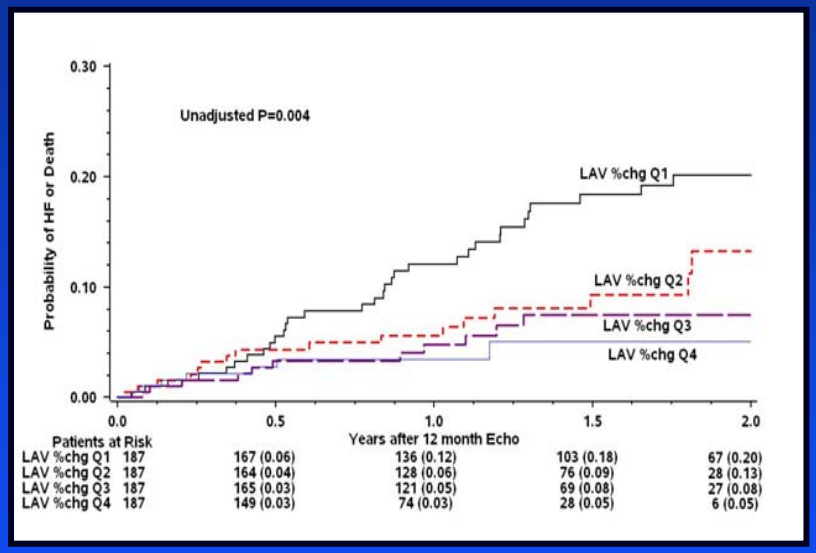
Cumulative Probability of Death by LAVi



Cumulative Probability of Heart Failure or Death by LAVi



Cumulative Probability of HF or Death following the 12 months Echo in the CRT-D group by LAV response, Divided in Quartiles



Every 1ml ↑ in LAVi is associated with 3% ↑ in the risk of HF or death and with a 2% ↑ in the risk of death

Every 1%↓ in LAVi is associated with a 4% ↓ in the risk of HF or death

Conclusions

- LAV is an independent predictor of prognosis in patients mild heart failure treated with CRT-D
- CRT exerts pronounced reverse remodeling effects on the LA, which may provide improved assessment of the clinical response to CRT
- These findings suggest that baseline and follow up measures of LA should be routinely employed in patients who undergo CRT-D implantation