

Ido Goldenberg MD, Mehmet K. Aktas MD, Spencer Z. Rosero MD, Scott McNitt MSc, Rupinder Buttar MD, Valentina Kutiyfa MD PhD

University of Rochester Medical Center, Rochester, NY, USA
Clinical Cardiovascular Research Center University of Rochester

Background

Cardiac Resynchronization Therapy (CRT) improves heart failure outcomes, however, there are conflicting data on its effect on the risk of ventricular tachycardia or ventricular fibrillation (VT/VF)

Hypothesis

The effect of cardiac resynchronization therapy (CRT) on life threatening ventricular tachyarrhythmias (LT-VTA) is controversial. We hypothesized that this effect may be related to the underlying QRS morphology

Patient population

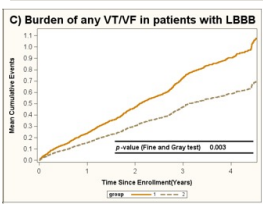
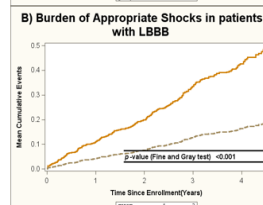
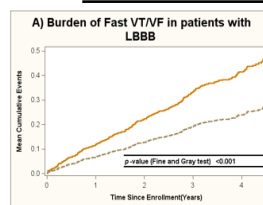
The study population comprised 2,862 patients with a QRS duration ≥ 130 ms who were implanted with an ICD or CRT and a defibrillator (CRT-D) for primary prevention in 5 landmark ICD trials (MADIT-II, MADIT-CRT, MADIT-RIT, MADIT-RISK, and RAID).

Methods

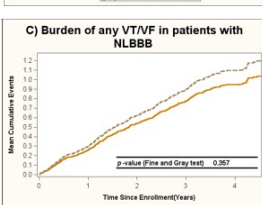
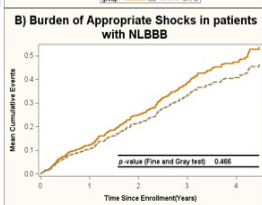
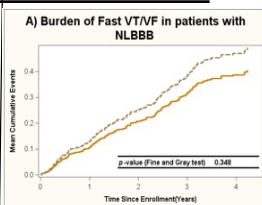
- We compared patients with ICD only vs those with CRT-D
- Analysis was performed separately in patients with LBBB and NLBBB
- The primary endpoint was the burden of Fast VT/VF event (defined as VT ≥ 200 bpm or VF) assessed in a recurrent event analysis
- Secondary endpoints:
 - Burden of appropriate ICD shocks
 - Burden of any VT/VF event
- Ghosh-Lin Curves were used to display the Mean Cumulative Incidence of recurrent arrhythmic events between the groups

Results: Burden of LT-VTAs

LBBB



NLBBB



Recurrent Event Models

LBBB

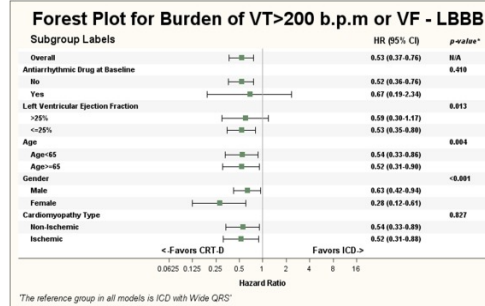
Endpoint	Group Comparison	Hazard Ratio	95% Confidence Interval	p-value
A) Burden Fast VT/VF	CRT-D VS ICD with Wide QRS	0.55	0.38 - 0.79	0.001
B) Burden of Appropriate Shocks	CRT-D VS ICD with Wide QRS	0.43	0.28 - 0.67	<0.001
C) Burden Any VT or VF	CRT-D VS ICD with Wide QRS	0.66	0.48 - 0.91	0.010

NLBBB

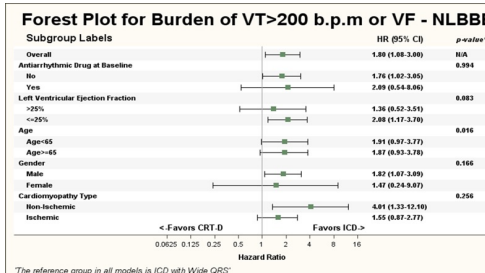
Endpoint	Group Comparison	Hazard Ratio	95% Confidence Interval	p-value
A) Burden of Fast VT/VF	CRT-D VS ICD with Wide QRS	1.94	1.15 - 3.28	0.014
B) Burden of Appropriate Shocks	CRT-D VS ICD with Wide QRS	1.56	0.91 - 2.67	0.105
C) Burden of any VT or VF	CRT-D VS ICD with Wide QRS	1.30	0.87 - 1.95	0.197

Subgroup Analysis

LBBB



NLBBB



Conclusions

- CRT-D is associated with a significant reduction in the risk of life threatening VT/VF events in patients with LBBB
- In contrast, among patients with NLBBB, treatment with CRT-D is associated with an increase in the burden of arrhythmic events
- These findings suggest that the arrhythmogenic effect of CRT is related to QRS morphology and should be considered when selecting patients for CRT implantation