KASR ALAINY
CAIRO UNIVERSITY - FACULTY OF MEDICINE

CRT In Narrow QRS and in RBBB

By
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ECRA Conference
2013

- Cardiac resynchronization therapy (CRT) is indicated in patients with HF with morbidity and mortality benefits
- The strength of CRT indications focus mainly on the presence of typical LBBB morphology.

Cleland JG et al, (CARE-HF trial) .Eur j Heart failure 2012
European Heart Journal,2013

- The longer the QRS duration > 150 ms ,the greater the benefit on the composite mortality/morbidity from the CRT (I-A)*
- CRT indications and benefits in HF pts with RBBB and narrow QRS is still subject to much debate.

* European Heart Journal,2013

RBBB patients do not respond to CRT

Fact or Myth?

CRT in RBBB morphology

- MIRACLE[1]
  - 313 patients with LBBB, 43 with RBBB
  - With CRT, RBBB patients improved NYHA class compared to control
  - With CRT, RBBB patients' improvements in exercise time and peak VO_2 did not reach statistical significance
- Pooled data from MIRACLE and CONTAK CD studies[2]
  - 61 patients with RBBB (34 CRT, 27 Control)
  - CRT improved NYHA Class compared to control
  - Trends toward improved QoL, 6 minute walk distance, with CRT compared to baseline, but with no difference compared to control

1. Aranda J, et al. Clin Cardiol 2004;27: 678–82. [MIRACLE was sponsored by Medtronic]
2. Egoavil CA, et al. Heart Rhythm 2005;2:611–615. [Contak CD was sponsored by Guidant]

CRT in RBBB morphology Predictors of long term benefits

Characteristic ± SD	RBBB (n = 89)	LBBB (n = 472)	P-value
QRS duration (ms)	161 ± 19	165 ± 22	0.1

Parameter ± SD	Baseline	Six months	P-value*	P-value for the group–time interaction
LVESV (mL)				
LBBB	174 ± 76	139 ± 69	<0.001	<0.001
RBBB	153 ± 58†	139 ± 55#	<0.001	
IVMD (ms)				
LBBB	46 ± 28	26 ± 20	<0.001	<0.001
RBBB	29 ± 20†	23 ± 19#	0.03	
Ventricular pre-ejection difference (ms)				
LBBB	43 ± 33	20 ± 26	<0.001	<0.001
RBBB	−21 ± 29†	7 ± 29†	<0.001	
Septal-to-lateral delay (ms)				
LBBB	74 ± 48	38 ± 36	<0.001	0.02
RBBB	55 ± 45†	35 ± 33#	<0.001	

Darryl P. Leong et al , European Heart Journal ,2012

Europace (2012) **14**, 1359–1362
doi:10.1093/europace/eus260

EP WIRE

Approach to cardiac resynchronization therapy

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Aims The purpose of this EP Wire is to compare indications, techniques, implant strategy, and follow-up regarding cardiac resynchronization therapy (CRT) in several countries across Europe.

Only 10% of the responding centres indicate CRT in all patients with LVEF < 35%, QRS complex width >120 ms, NYHA functional class III–IV on optimal medical therapy, and right bundle branch block (RBBB), while 39% never use CRT in such conditions. Fifty-one per cent of the responding centres demand additional criteria for indicating CRT in patients with RBBB; the preferred criterion is the presence of echocardiographic asynchrony parameters (con-

CRT in HF with RBBB

What do the recent guidelines say?

European Heart Journal (2013) 34, 2281–2329
doi:10.1093/eurheartj/eht150

ESC GUIDELINES

2013 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

The Task Force on cardiac pacing and resynchronization therapy of the European Society of Cardiology (ESC). Developed in collaboration with the European Heart Rhythm Association (EHRA).

Indications for cardiac resynchronization therapy in patients in sinus rhythm

3) Non-LBBB with QRS duration >150 ms. CRT should be considered in chronic HF patients and LVEF ≤35% who remain in NYHA functional class II, III and ambulatory IV despite adequate medical treatment.[d]	IIa	B
4) Non-LBBB with QRS duration 120–150 ms. CRT may be considered in chronic HF patients and LVEF ≤35% who remain in NYHA functional class II, III and ambulatory IV despite adequate medical treatment.[d]	IIb	B

CRT in RBBB morphology

Problems with RBBB

- Low numbers of pts in RCTs
- Weak evidence of clinical benefits (QRS < 150),NYHA I,II
- Less responders
- Worse disease outcomes(1-6)
- LV activation time?
- Un clarified Pathophysiological effect of BV pacing

1. Aldestein & Saba S, A J Cardiol 2009
2. Wokhlu et al, Heart Ryhthm 2009
3. Rickard et al, pacing Clin Electrophysiol 2010
4. Bilchick et al, Circulation 2010
5. Zabera et al, circulation 2011
6. Gervais et al, Eur J Heart fail 2009

CRT in HF with RBBB

Could we improve response?

Where we should look for answers?

CRT in RBBB morphology

- Limited data to offer guidance in this respect
- Patient selection may be important.
- The role of mechanical dyssynchrony in both RT and LV should be studied prospectively in this subgroup
- Device programming (? RV pacing preceding)*
- Resynch. Of RV (Multiple RV leads or alternate RV lead positioning)* may improve outcome. No data are currently available.

* Karoly k & kenneth A.Ellenbogen ,Circulation 2010

CRT in HF with narrow QRS

No more debate

CRT in HF with narrow QRS

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CRT in narrow QRS

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5) CRT in patients with chronic HF with QRS duration <120 ms is not recommended	III	B	65, 66

CRT in HF with narrow QRS

Do we have strong evidence?

Echocardiography Guided Cardiac Resynchronization Therapy in Patients with Symptomatic Heart Failure and Narrow QRS Complex

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on behalf of the EchoCRT Executive Committee and Investigators

Executive Committee — Johannes Holzmeister (Co-PI), Frank Ruschitzka (Co-PI), William Abraham (U.S. Co-PI), Jagmeet Singh (U.S. Co-PI) , Jeroen Bax, Jeffrey S. Borer, Josep Brugada, Kenneth Dickstein, John Gorcsan, III, Daniel Gras, Ian Ford, Henry Krum, Peter Søgaard
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Press Conference ESC Hotline Session, Sept 3rd 2013, Amsterdam

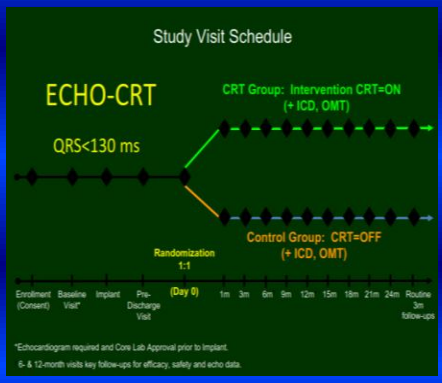
EchoCRT

Cardiac Resynchronization Therapy Offers No Benefit Beyond Implantable Cardioverter Defibrillator (ICD) Therapy in Narrow-QRS Heart Failure Patients

EchoCRT is the largest investigator-initiated, international, multi-centre, prospective, randomized, double-blind, clinical trial of its kind

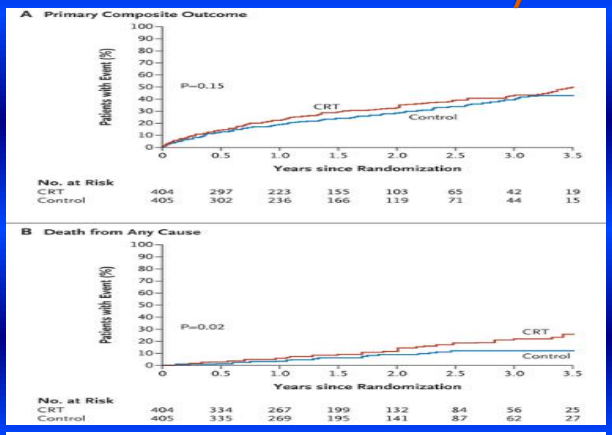
The Echo-CRT study

- 809 pts enrolled
- M A 58 ys
- LVEF < 35%
- NYHA III/IV
- QRS < 130 ms
- Echo evidence of LV dyssyn.
- Stable med. therapy
- Standard indications for ICD
- Duration of follow-up 19.4 m
- Pry EP all cause mortlity+hosp
- 2ry EP QOL, change in NYHA class, CHF hosp,and all cause mortality



Frank Ruschitzka et al, 2013]

The Echo-CRT study



CONCLUSIONS

In patients with systolic heart failure and a QRS duration of less than 130 msec, CRT does not reduce the rate of death or hospitalization for heart failure and may increase mortality. (Funded by Biotronik and GE Healthcare; EchoCRT ClinicalTrials.gov number, NCT00683696.)

Frank Ruschitzka et al, 2013

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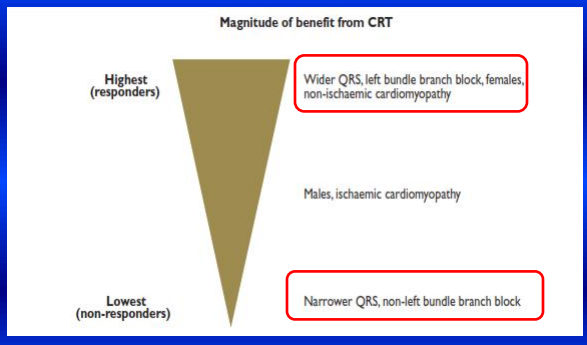

Conclusions

- RBBB most often imply a worse disease state and generally expected not to benefit from CRT
- The decision to implant CRT should be individualized based on other clinical and imaging criteria.
- CRT is not recommended in HF pts with QRS < 120 ms

Conclusions

- The physician should learn how to appropriately allocate available resources to the right pts

THANK YOU FOR ATTENTION