14:55 - 15:45 EC5 - Electrophysiology and Pacing Hall D

Chairs: **M. Glikson**
S. Rosenheck

14:55 **Does PREPARE – Based Programming Reduce ICD Therapies?**
A. Barsheshet [1], R. Abu Sham'a [1], D. Luria [1], O. Gurevitz [1], D. Bar Lev [1], N. Hayman [2], Y. Grinberg [3], Y. Takh [4], O. Levin [5], M. Eldar [1], M. Glikson [1]
[1] Ramat Gan, [2] Medtronic Israel, [3] Medlab Israel and Biotronik, [4] Gamida Medequip Inc, [5] Levant Inc

15:03 **Clinical and Echocardiographic Predictors of Clinical Response to Cardiac Resynchronization Therapy (CRT/D)**
A. Barsheshet, R. Abu Sham'a, A. Sandach, D. Luria, S. Carraso, O. Gurevitz, E. Nof, R. Beinart, S. Bachar, M. Eldar, M. Glikson
Ramat Gan

15:11 **Predictors of Clinical Deterioration Acutely After Cardiac Resynchronization Therapy (CRT)**
A. Barsheshet, R. Abu Sham'a, A. Sandach, D. Luria, S. Carasso, D. Bar Lev, E. Nof, O. Gurevitz, M. Eldar, M. Glikson
Ramat Gan

15:19 **Takotsubo Cardiomyopathy and QT Interval Prolongation: Who are the Patients at Risk for Torsades de Pointes?**
Y. Kogan, L. Samuelov-Kinori, M. Kinori, M. Swartzon, H. Shalev, D. Guy, N. Mashav, B. Sadeh, L. Atzmony, O. Kliuk-Ben-Basat, A. Steinvil, D. Justo
Tel-Aviv

15:27 **The Significance of Intraventricular and Interventricular Dyssynchrony Patterns in Patients with Cardiac Resynchronization Therapy (CRT) Device**
A. Barsheshet, R. Abu Sham'a, R. Kuperstein, M.S. Feinberg, A. Sandach, D. Luria, R. Beinart, S. Carasso, M. Eldar, M. Glikson
Ramat Gan

15:35 **Predictors of Echocardiographic Response to Cardiac Resynchronization Therapy**
A. Barsheshet, R. Abu Sham'a, M.S. Feinberg, R. Kuperstein, A. Sandach, D. Luria, S. Carasso, D. Bar Lev, C. Granit, M. Eldar, M. Glikson
Ramat Gan

Does PREPARE – Based Programming Reduce ICD Therapies?

Alon Barsheshet [1], Raed Abu Sham'a [1], David Luria [1], Osnat Gurevitz [1], David Bar Lev [1], Nadav Hayman [2], Yonit Grinberg [3], Yana Takh [4], Ofer Levin [5], Michael Eldar [1], Michael Glikson [1]

[1] The Leviev Heart Center, Sheba Medical Center, Ramat Gan, Israel, [2] Medtronic Israel, [3] Medlab Israel and Biotronik, [4] Gamida Medequip Inc, [5] Levant Inc

Background : The PREPARE trial determined a set of programming parameters that resulted in a decrease in appropriate and inappropriate ICD therapies in a particular manufacturer's devices.

Methods : We applied Prepare-like settings ("translated" to parameters of the various manufacturers) in most pts implanted for primary prevention indications over the last year. Records of all pts implanted for primary prevention since 1/2005 were reviewed. The amount of appropriate and inappropriate therapies were compared between pts programmed according to PREPARE settings (gr1) and those programmed traditionally (gr 2).

Results: 140 pts (38 gr. 1 and 102 gr. 2) were included. There were no differences between groups in mean age, left ventricular ejection fraction, permanent atrial fibrilation, type of device (VVI/DD/CRTD), gender, NYHA, and history of supraventricular arrhythmias. The duration of follow up to last visit and till today were103$\pm$104 and 167$\pm$ 119 days in gr 1 vs 596$\pm$ 344 and 690 $\pm$ 338 days in gr 2 ($P<0.05$) , More pts in gr 1 were implanted due to MADIT II – SCDHEFT indications than in gr 2 (27/36 vs 56/100 $P=0.04$).

Over the entire follow up period there were no episodes of appropriate or inappropriate therapies in gr 1 at all. In gr 2 there were 6, 8 and 20 combined episodes within 90 days, 180 days and 365 days of implantation respectively.

Conclusions : Prepare-like settings as adapted to ICDS of all major manufacturers demonstrated tendency to decrease the combined rate of inappropriate and appropriate therapies. Longer follow-up is needed to verify the clinical and statistical significance of these results.

Clinical and Echocardiographic Predictors of Clinical Response to Cardiac Resynchronization Therapy (CRT/D)

Alon Barsheshet, Raed Abu Sham'a, Amir Sandach, David Luria, Shemy Carraso, Osnat Gurevitz, Eyal Nof, Roy Beinart, Sharona Bachar, Michael Eldar, Michael Glikson

The Leviev Heart Center, Sheba Medical Center, Ramat Gan, Israel

Background: Up to 30 % of CRT/D recipients implanted according to guidelines do not respond to the therapy.

Methods: We reviewed our prospectively collected institutional CRT/D database of 435 pts implanted with CRT/D since 1998. Excluded were 26 (failed implantation), 10 (system malfunction), 74 (non guideline based), and 132 (incomplete data). In 193 pts analyzed, baseline and follow up data collected over a 3 month to 1 year post implantation period were collected. Response was defined by a combined score of NYHA class, quality of life and 6-minute walk (6MW) scores. Each component was classified as improved (+1), unchanged (0), or worsened (-1) and responders were defined as patients who had a combined score of ≥ 1 who did not die during follow-up.

Results: There was a 62.7% clinical response rate. Significant predictors of response are listed in the table:

	Responders	**Non responders**	**P value**
N =	121 (62.7%)	72 (37.3%)	
NYHA IV (vs. III)	27.30%	12.50%	0.02
6MW	265.9±115.1	309.6±103.8	0.05
Interventricular delay (ms)	49.2±26.6	39.6±24.0	0.06
Severe MR	78.30%	21.70%	0.04

There was no significant difference between groups in age, gender, QRS width, septal to lateral delay, lead location, etiology of cardiomyopathy, atrial fibrillation, LVEF, right ventricular function or pulmonary artery pressure.

Conclusions: In this large CRT pt cohort the only predictors of clinical response to CRT/D were worse NYHA functional class, low baseline 6MW distance, severe MR and increased interventricular mechanical delay. Other commonly used clinical and echocardiographic measures failed to predict clinical response.

Predictors of Clinical Deterioration Acutely After Cardiac Resynchronization Therapy (CRT)

Alon Barsheshet, Raed Abu Sham'a, Amir Sandach, David Luria, Shemy Carasso, David Bar Lev, Eyal Nof, Osnat Gurevitz, Michael Eldar, Michael Glikson

The Leviev Heart Center, Sheba Medical Center, Ramat Gan, Israel

Background: Cardiac Resynchronization Therapy is a state of art therapy for patients with advanced systolic heart failure refractory to medical therapy. Whereas 2/3 of pts respond to CRT, few pts actually deteriorate. We sought to analyze clinical and echocardiographic predictors for clinical deterioration after CRT implantation.

Patients and Methods:
Included in the study were 204 patients successfully implanted with CRT/CRTD systems according to guideline-based indications and had baseline and follow up data collected between 3 month to 1 year post implantation. Clinical deterioration was defined by a score combined of the change in NYHA class, quality of life score and 6-minute walk (6MW). Each component was classified as improved (+1), unchanged (0), or worsened (-1). Deterioration was defined as a combined score of $\leq$ -1 or who died during follow-up.

Results: Of the 204 patients studied in this cohort, 31 (15.2%) patients had deteriorated within the first year, of them 8 patients died. Significant predictors of deterioration are listed in the table:

N	Deteriorated 31 (15.2%)	Did Not Deteriorate 173 (84.8%)	*p* value
Females	25.8%	13.9%	0.09
SPAP (mmHg)	46 ± 11	41 ± 14	0.03
RV Fractional Area Change	32% ± 12 %	39% ± 11%	0.04
Baseline Yu-SD (ms)	29 ± 15	38 ± 14	0.048

There was no significant difference between groups in age, gender, QRS width, atrial fibrillation, etiology of cardiomyopathy, baseline 6 minute walk, QoL, septal to lateral delay, interventricular dyssynchrony or LVEF.

Conclusions: In this large cohort of CRT pts 15% deteriorated over the first year after implantation. The presence of elevated SPAP, impaired RV function and lower Yu score at baseline were the only predictors of deterioration, and female gender showed a tendency to predict deterioration. Further studies are needed to confirm these findings and to further characterize patients prone to deterioration on CRT.

Takotsubo Cardiomyopathy and QT Interval Prolongation: Who are the Patients at Risk for Torsades de Pointes?

Yevgeni Kogan [1], Liat Samuelov-Kinori [3], Michael Kinori [3], Michael Swartzon [3], Hadas Shalev [3], Daniel Guy [3], Noa Mashav [3], Ben Sadeh [3], Lihi Atzmony [3], Orit Kliuk-Ben-Basat [2], Arie Steinvil [2], Dan Justo [2]

[1] Cardiology Department, Sourasky Medical Center, [2] Internal Medicine D, Sourasky Medical Center, Tel-Aviv, [3] Sackler Medical School, Tel-Aviv University, Tel-Aviv, Israel

Objectives: QT interval prolongation is prevalent among patients with Takotsubo cardiomyopathy (TC), while Torsade de Pointes (TdP) has rarely been reported in these patients. We studied all reports on TC-associated QT interval prolongation and all reports on TC-associated TdP in order to characterize the clinical circumstances leading to TdP in patients with TC.

Methods: We studied 13 reports on TC-associated TdP and 86 reports on TC-associated QT interval prolongation. We systematically reviewed each report and recorded the risk factors for TdP other than female gender and systolic heart failure.

Results: The prevalence of the male gender was higher among patients with TC-associated TdP relative to patients with TC-associated QT interval prolongation (30.8% vs. 5.8%; p=0.005). There was a trend in the mean maximal corrected QT interval being longer among patients with TC-associated TdP relative to patients with TC-associated QT interval prolongation (646.2±160.3 vs. 555.9±63.8 msec; p=0.08). There were no differences between patients with TC-associated TdP and patients with TC-associated QT interval prolongation in terms of mean age, maximal Troponin levels, and lowest ejection fraction. Overall, 10 (76.9%) patients with TC-associated TdP had risk factors for TdP other than the female gender and systolic heart failure; including suspicion of congenital long QT syndrome, atrio-ventricular block, bradycardia, hypokalemia, recent conversion from atrial fibrillation to sinus rhythm, and using QT prolonging agents.

Conclusions: Men with TC-associated QT interval prolongation are at risk for TdP. Most patients with TC-associated TdP have risk factors for TdP other than the female gender and systolic heart failure.

The Significance of Intraventricular and Interventricular Dyssynchrony Patterns in Patients with Cardiac Resynchronization Therapy (CRT) Device

Alon Barsheshet, Raed Abu Sham'a, Rafael Kuperstein, Micha S Feinberg, Amir Sandach, David Luria, Roy Beinart, Shemy Carasso, Michael Eldar, Michael Glikson

The Leviev Heart Center, Sheba Medical Center, Ramat Gan, Israel

Background: Interventricular (interV) and intraventricular (intraV) dyssynchrony (D) have demonstrated variable ability to predict response to CRT. We sought to investigate the relationship between dyssynchrony patterns, baseline clinical, baseline echocardiographic and outcome measures.

Methods: Included in the study were 139 patients successfully implanted with CRT/CRTD systems according to guideline-based indications who had D data measured by echocardiography. IntraVD was defined as lateral to septal delay ≥60ms whereas interVD was defined as left- right ventricular pre-ejection intervals ≥ 40ms. Multiple clinical and echocardiographic variables at baseline and during follow up over the first year of follow up were compared to the pts with no dyssynchrony (ND).

Results: There were 77 pts (age mean±SD 70±10) with interVD, 69 pts (age 71±10) with intraVD and 28 pts with ND (age 73±9). Thirty five pts had both interVD and intraVD. Pts with interVD had a significant increased baseline QRS width (168±27 vs. 153±25, p=.008), more LBBB by ECG (85% vs 62%, p=.009) and less restrictive filling pattern by Doppler echocardiography (23% vs. 50%, p= .030) when compared with ND. Pts with intraVD compared with ND had a tendency towards increased baseline QRS width (mean±SD 163±31 vs. 153±25, p=.107) and lower incidence of deterioration following CRT (7.4% vs 23.5%, p=.066). Both interVD and intraVD improved with treatment. Neither interVD nor intraVD predicted clinical or echocardiographic response to CRT when compared to ND.

Conclusions: InterVD but not intraVD is associated with a significant increased baseline QRS width, LBBB and restrictive filling pattern. Neither interVD nor intraVD were predictors of clinical or echocardiographic response to CRT.

Predictors of Echocardiographic Response to Cardiac Resynchronization Therapy

Alon Barsheshet, Raed Abu Sham'a, Micha S Feinberg, Rafael Kuperstein, Amir Sandach, David Luria, Shemy Carasso, David Bar Lev, Chava Granit, Michael Eldar, Michael Glikson

The Leviev Heart Center, Sheba Medical Center, Ramat Gan, Israel

Background: Cardiac resynchronization therapy (CRT) has been demonstrated to improve ejection fraction and to reduce end systolic and end diastolic volumes. These parameters of reverse remodeling are regarded by some authors as the only objective measures of success.
Aim: We sought to determine predictors of reverse remodeling with CRT.
Methods: We studied 145 pts successfully implanted with CRT/D systems according to guideline-based indications. Baseline and follow up data were collected over a 3 month to 1 year post implantation period. Response was defined by a combined score including the following two parameters ≥5% absolute increase in LVEF and ≥10% relative increase LV end systolic volume.
Results: In this cohort of patients we observed a 45.5% echocardiographic response rate. Predictors of response are listed in the table:

	Responders (n= 66)	Non-Responders (n= 79)	p value
NYHA Class III (vs. IV)	89.4%	75.9%	0.04
Previous Pacemaker	42.4%	22.7%	0.01
RBBB or IVCD (vs. LBBB)	11.5%	26.0%	0.056
Yu SD ≥ 32 ms	66.7%	83.0%	0.075
LV End Diastolic Diameter, mm	61.5 ± 8.1	64.5 ± 9.8	0.03
LV End Systolic Diameter, mm	51.0 ± 9.4	55.1 ± 9.0	0.009
Systolic Pulmonary Artery Pressure (mmHg)	42 ± 16	47 ± 17	0.03

There were no significant differences between groups in mean age, gender, etiology of cardiomyopathy, QRS width, LVEF, right ventricular function, septal to lateral delay or interventricular dyssynchrony.
Conclusions: The only predictors of echocardiographic reverse remodeling included higher NYHA functional class, upgrading of a previous pacemaker, smaller LV diameters and lower systolic pulmonary pressure. Other commonly used clinical and echocardiographic measures failed to predict reverse remodeling.