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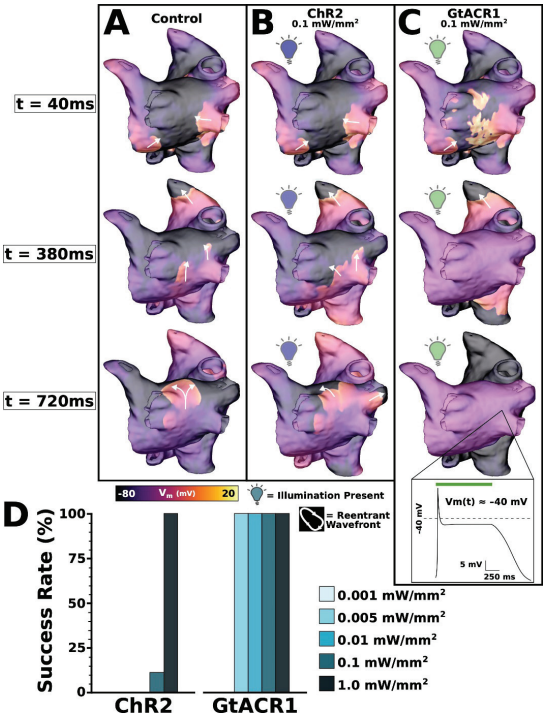
region to near the channel reversal potential of -40 mV (Fig C inset). GtACR1-based termination was reliable for irradiance values as low as 5 μW/mm2 (Fig D).
Conclusion: Our findings suggest GtACR1-based optogenetic defibrillation of atrial reentry is feasible, with ~200-fold lower energy requirements than ChR2.



MODERATED EPOSTER D-MP02: Newer technologies in managing and predicting outcomes in HF and AF patients

Thursday, May 7, 2020
10:45 AM - 11:45 AM

D-MP02-01

COST-IMPACT ANALYSIS OF BAROREFLEX ACTIVATION THERAPY IN PATIENTS WITH CHRONIC HEART FAILURE IN THE UNITED STATES

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Background: Chronic heart failure (CHF) affects roughly 5.7 million adults in the United States, accounting for $30.7 billion in medical spending each year. One approved therapy for CHF symptomatic treatment in these patients is baroreflex activation therapy (BAT). BAT is delivered by an implantable device designed to modulate the body's natural blood flow by sending signals to the brain by an electrode attached to the outside of the carotid artery, which activates the process of balancing the body's sympathetic and parasympathetic activities to regain homeostasis. The BeAT-HF trial evaluated the safety and effectiveness of BAT, resulting in FDA approval in August 2019.
Objective: The study evaluated the cost of BAT + Optimal Medical Therapy (OMT) compared to OMT alone for CHF patients with reduced ejection fraction and New York Heart Association Class II or III.
Methods: A Cost Impact Model was developed from a U.S. health care payer perspective over a 3-year period, comparing BAT + OMT to OMT alone. The expected costs associated with each group were calculated by utilizing data from BeAT-HF trial and existing literature. Rates of serious BAT related adverse events, cardiovascular (non-HF) hospitalizations, progression to LVAD and heart transplantation, and medication utilization were based on BeAT-HF 6-month results and extrapolated beyond 6-months. HF hospitalization rates throughout the model were extrapolated based on observed baseline to 6-month changes in NT-proBNP levels.
Results: At 6 months, BAT + OMT is $37,726/patient more expensive than OMT alone, reflecting initial BAT device and implantation costs. The treatments have equal predicted costs starting between years 2 and 3. At 3 years, predicted costs are $9,008 lower in the BAT+ OMT arm versus OMT-only arm. This stems from an offset of higher short-term BAT+ OMT arm costs with lower rates of significant CV events, hospitalizations, HF hospitalizations, and resource-intensive late-stage procedures (LVADs and heart transplants) as compared to the OMT-only arm.
Conclusion: BAT+OMT starts to become less costly than OMT alone between years 2 and 3 and provides significant savings over time. Results are robust to a variety of sensitivity tests and comparisons to the literature.

D-MP02-02

DRUGS, BAROREFLEX ACTIVATION THERAPY AND OUTCOME: DO PATIENTS BENEFIT FROM ON TOP BAROREFLEX ACTIVATION THERAPY?

Denise Guckel, MD, Klaus-Juergen Gutleben, MD, Philipp Sommer, MD, FHRS, Volker Rudolph, MD, Dieter Horstkotte, MD and Georg Nölker, MD. Clinic for General and Interventional Cardiology/Angiology, Herz- und Diabeteszentrum NRW, Ruhr-Universität Bochum, Bad Oeynhausen, Germany, Klinikum Herford, Herford, Germany, Clinic for Electrophysiology, Herz- und Diabeteszentrum NRW, Ruhr-Universität Bochum, Bad Oeynhausen, Germany, Katharinen-Hospital Unna, Unna, Germany

Background: Baroreflex Activation Therapy (BAT) is a new treatment option for patients (pts) suffering from advanced heart failure (HF) with reduced left ventricular ejection fraction (HFrEF). Data on the outcome of additional BAT is scarce.
Objective: Our aim was to evaluate the outcome of BAT pts in comparison to HFrEF pts solely treated with a guideline directed medical therapy (GDMT) in particular regarding effects of Sacubitril/Valsartan (ARNI) on the BAT response.
Methods: In this single center prospective study 40 HFrEF pts (67 ± 1.8 years) eligible for BAT (EF 27 ± 1%, NYHA class III, NT-proBNP 2302 ± 460pg/mL, 6-minute hall walk distances (6MHWD) 281 ± 23m) were included. 10 of these pts were implanted with a BAT device. Follow-up visits (FU) were performed after 3, 6 and 12 months. Primary efficacy endpoints included an improvement in quality of life (EQ-5D-5L), NYHA class, left ventricular ejection fraction (LVEF), HF hospitalization rate, NT-proBNP levels and 6MHWD.
Results: BAT as well as BAT+ARNI treated pts showed a significant increase in LVEF (BATLVEF BL 23 ± 2%to 12mFU 33 ± 2%, + 10%, p-value=0.01; BAT+ARNILVEF BL 23 ± 1%to 12mFU 32 ± 2%, + 9%, p-value=0.05). No changes could be observed in the control group (noBATLVEF BL29 ± 1%to 12mFU 31 ± 1%, + 3%, p-value =0.09). BAT pts presented with a significant improvement in NYHA class (BATNYHA class III BL 10 pts (100%) to 12mFU 2 pts (20%), - 80%, p-value=0.01) as

well as a significant increase in QoL points (BATQoL BL44 ± 6 to 12mFU 65 ± 5, + 21%, p-value =0.02). Control group pts showed no changes but developed a significant increase in NT-proBNP levels (noBATNT-proBNP BL 2044 ± 359pg/mLto 12mFU 2749 ± 756pg/mL, + 35%, p-value =0.04) in comparison to BAT pts (BATNT-proBNP BL 2532 ± 258pg/mLto 12mFU 2999 ± 819pg/mL, + 18%, p-value=0.83). BAT+ARNI treated pts presented with reduced NT-proBNP levels (BAT + ARNINT-proBNP BL 3043 ± 339pg/mL to 12mFU 1922 ± 342pg/mL, - 37%, p-value =0.49). HF hospitalization rates of BAT pts (50%) were significantly lower compared to control group pts (83 %) (p-value=0.02).
Conclusion: BAT as well as BAT+ARNI improves outcome with regard to LVEF, NYHA class, QoL and NT-proBNP levels. Concerning these results BAT seems to be a helpful and promising therapeutic tool in the treatment of pts with HFrEF.

D-MP02-03

PROSPECTIVE EVALUATION OF THE MULTISENSOR ICD ALGORITHM FOR HEART FAILURE MONITORING

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Background: The HeartLogic algorithm measures data from multiple implantable cardioverter-defibrillator-based sensors and combines them into a single index. The associated alert has proved to be a sensitive and timely predictor of impending heart failure (HF) decompensation.
Objective: To describe a multicenter experience of remote HF management by means of HeartLogic and appraise the value of an alert-based follow-up strategy.
Methods: HeartLogic was activated in 104 patients. All patients were followed up according to a standardized protocol that included remote data reviews and patient phone contacts every month and at the time of HeartLogic alerts. In-office examinations were performed every 6 months or when deemed necessary.
Results: During a median follow-up of 13 [10-16] months, the overall number of HF hospitalizations was 16 (rate 0.15 hospitalizations/patient-year) and 100 HeartLogic alerts were reported in 53 patients. Sixty alerts were judged clinically meaningful, and were associated with multiple HF-related conditions. In 48 of the 60 alerts, the clinician was not previously aware of the condition. Of these 48 alerts, 43 triggered clinical actions. The rate of alerts judged non-clinically meaningful was 0.37/patient-year, and the rate of hospitalizations not associated with an alert was 0.05/patient-year. Centers performed remote follow-up assessments of 1113 scheduled monthly transmissions (10.3/patient-year) and 100 alerts (0.93/patient-year). Monthly remote data review allowed to detect 11 (1%) HF events requiring clinical actions (versus 43% actionable alerts, p<0.001).
Conclusion: HeartLogic allowed relevant HF-related clinical conditions to be identified remotely and enabled effective clinical actions to be taken; the rates of unexplained alerts and undetected HF events were low. An alert-based management strategy seemed more efficient than a scheduled monthly remote follow-up scheme.

D-MP02-04

ELECTROCARDIOGRAPHIC PREDICTORS OF COMPLETE CONDUCTION BLOCK IN PATIENTS WITH LEFT BUNDLE BRANCH BLOCK (LBBB): IMPLICATIONS FOR CORRECTIVE CONDUCTION SYSTEM PACING

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Background: Recent investigation of patients with LBBB pattern has shown that some patients do not demonstrate complete conduction system (CCB) and are unlikely to benefit from corrective conduction system pacing.
Objective: We sought to assess surface ECG predictors of complete conduction block (CCB) and response to His bundle pacing (HBP) in patients with LBBB.
Methods: Patients who underwent detailed intracardiac left septal mapping and HBP were analyzed. ECGs were reanalyzed utilizing CardioLab EP (GE Healthcare, Milwaukee, WI) and three conventional definitions of LBBB were applied: the ACCF/AHA/HRS definition (2009), Strauss criteria, and European Society of Cardiology criteria (2013). Additionally, novel criteria were assessed (time-to-notch ≥ 60ms in I, aVL, V5, or V6 plus absence of S-wave in V6 or R>S in V6).
Results: Seventy-five patients were studied: age 60 ± 14 years, 29% female, 48 (64%) patients demonstrated CCB, and 41 (54%) exhibited QRS correction with HBP. Average QRS was 164 ± 23 ms. The performance of ACCF/AHA/HRS, Strauss, ESC, and novel criteria are summarized in Table. The Strauss criteria demonstrated the greatest ability to include patients with CCB (OR 11.50, p= 0.003). Presence of time-to-notch ≥ 60 ms in I, aVL, V5, or V6 meaningfully predicted the favorable response to HBP more than other known criteria (OR 9.33, p= 0.002).
Conclusion: To our knowledge, this is the first investigation on the performance of commonly used LBBB definitions based on left septal activation mapping. The Strauss criteria reasonably identified CCB and assessment of time-to-mid QRS notching may better identify response to corrective HBP.

	Complete Conduction Block (n=48)			QRS Correction with HBP (n=41)		
	Odds Ratio	95% CI	*p value*	Odds Ratio	95% CI	*p value*
LBBB Definition						
ACCF/AHA/HRS Criteria for LBBB 2009[a]	--	--	--	--	--	--
Strauss Criteria for LBBB[b]	**11.50**	**2.26-58.47**	**0.003**	**7.02**	**1.40-35.20**	**0.02**
ESC Criteria for LBBB 2013[c]	**10.68**	**1.18-96.98**	**0.04**	6.9	0.76-62.22	0.09
Novel Criteria[d]	**6.30**	**2.19-18.12**	**0.001**	**4.13**	**1.48-11.49**	**0.007**
Individual Criteria						
QRS ≥ 120 ms*	--	--	--	--	--	--
♀QRS ≥130 ms and ♂ QRS ≥140	**8.05**	**(1.54-42.20)**	**0.01**	5.06	0.97-26.23	0.054
QRS notching in ≥ 2 consecutive leads V_1, V_2, V_5, V_6, I, aVL	**13.93**	**3.46-55.99**	**<0.001**	**13.65**	**2.82-66.05**	**0.001**
QRS notching *OR* slurring in ≥ 2 consecutive leads V1, V2, V5, V6, I, aVL*	--	--	--	--	--	--
Absence Q-wave in leads I, V_5, and V_6*	--	--	--	--	--	--
QS or rS pattern in leads V_1 and V_2*	--	--	--	--	--	--
Novel Criteria						
Time-to-notch ≥ 60 ms in I, aVL, V_5, or V_6	**8.82**	**2.16-35.99**	**0.002**	**9.33**	**1.90-45.84**	**0.006**
No S-wave in V_6 or R-wave > S-wave in V_6	2.93	0.94-9.09	0.06	**2.59**	**1.01-6.62**	**0.047**

*All patients included in analysis met this individual criterion and therefore odds ratios could not be calculated.
[a] QRS ≥ 120 ms + notched or slurred R in I, aVL, V_5, V_6 + absence Q-wave in leads I, V_5, and V_6 + R-wave peak time greater than 60 ms in V_5 and V_6; All patients met the ACCF/AHA/HRS criteria which was used as a reference
[b] ♀QRS ≥ 130 ms in and ♂QRS ≥ 140 + QS or rS pattern in leads V_1 and V_2 + mid QRS notching in ≥ 2 consecutive leads V_1, V_2, V_5, V_6, I, aVL
[c] QRS ≥ 120 ms + QS or rS pattern in V_1 + notched or slurred R-wave in I, aVL, V_5, V_6 + absent Q-wave in V_5 and V_6
[d] Time-to-notch ≥ 60 ms in I, aVL, V_5, or V_6 + no S-wave in V_6 or R-wave > S-wave in V_6

D-MP02-05

EXERCISE INDUCED QRSD PROLONGATION OCCURS IN 50% OF PATIENTS WITH CARDIAC RESYNCHRONIZATION THERAPY-DEFIBRILLATORS

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Background: Many patients continue to experience symptoms of heart failure (HF) during physical exertion after cardiac