PO-632-08

REDUCTION OF SUBCUTANEOUS DEFIBRILLATION THRESHOLDS WITH A DUAL-COIL ELECTRODE SYSTEM IN SWINE

Stephen Hahn PhD; Megan Fine DVM; Michelle Curtis; Andres Belalcazar PhD and Wyatt K. Stahl BS, BSE, BSEE, CCDS

Background: S-ICD systems deliver 80 J shocks from a left-parasternal coil to a left lateral PG. A system that defibrillates with lower energy could enable a significant reduction in PG size. Computer models of shock fields in human torsos suggest dual parallel coils lower shock impedance and may reduce DFTs by ~50%.

Objective: Compare defibrillation efficacy of single (S) and dual (D) coil shock configurations in isoflurane-anesthetized swine.

Methods: Two 8 cm long coil electrodes were inserted subcutaneously (SQ) and/or intermuscularly (IM), ~1 cm apart, along the sternal margin. The PG was placed IM in a left posterolateral pocket caudal to the scapula. DFTs of S and D were randomly determined using an up-down process with 10% voltage steps. VF was induced and continued for 10 s prior to test shock. Testing continued until at least three reversals in outcome occurred. DFT was computed by averaging the tested values. Results were compared via t-tests.

Results: Shock impedance was lower than in humans and IM vs SQ coil placement significantly affected results, likely due to layers of sternal muscle that are not present in humans. Impedance was always lower with D vs S, but SQ had higher to layers of sternal muscle that are not present in humans. vs SQ coil placement significantly affected results, likely due to computer models of human torsos. Use of dual coils to reduce DFT appears promising, but swine may not be a good model for S-ICD. This requires study in humans.

Conclusion: Parasternal electrode configurations that reduced shock impedance (intramuscular placement or dual coils) also reduced DFT in swine, but to a lesser extent than predicted by computer models of human torsos. Use of dual coils to reduce DFT appears promising, but swine may not be a good model for S-ICD. This requires study in humans.

<table>
<thead>
<tr>
<th></th>
<th>Single-Coil SQ</th>
<th>Dual-Coil SQ</th>
<th>Single-Coil IM</th>
<th>Dual-Coil IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>N tested</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Impedance (Ω)</td>
<td>48.6 ± 9.6</td>
<td>39.3 ± 6.4*</td>
<td>34.4 ± 2.4+</td>
<td>29.7 ± 2.4+</td>
</tr>
<tr>
<td>Energy (J)</td>
<td>73.1 ± 29.2</td>
<td>61.7 ± 27.6*</td>
<td>44.3 ± 16.3</td>
<td>39.5 ± 18.3</td>
</tr>
</tbody>
</table>

* indicates p<0.05 vs single, † vs SQ

POSTER PO-633:
Posters: CIED at Pod 5

Friday, April 29, 2022
3:00 PM - 5:00 PM

PO-633-01

THE EFFECT OF DEFIBRILLATOR ON MORTALITY IN NON-ISCHEMIC CARDIOMYOPATHY WITH RESYNCHRONIZATION THERAPY

mohammed al-sadawi MBChB; Faisal Aslam MD; Saadat Aleem MD, PhD; Ibrahim O. Almasry MD; Abhijeet Singh MD; Roger Fan MD, FHRS and Eric J. Rashba MD, FHRS

Background: Recent studies have questioned the role of defibrillators in non-ischemic cardiomyopathy (NICM). This meta-analysis assessed the long-term outcomes of cardiac resynchronization therapy (CRT) with or without defibrillation in patients with NICM.

Objective: To evaluate effect of defibrillator on mortality in non-ischemic cardiomyopathy with resynchronization therapy

Methods: Databases were searched for studies reporting the effect of CRT with or without defibrillation on all-cause mortality in patients with NICM (Ovid MEDLINE, EMBASE, Scopus, Web of Science, Google Scholar, and EBSCO CINAHL). The primary endpoint was all-cause mortality. The minimum duration of follow-up required for inclusion was one year. The search was not restricted to time or publication status.

Results: The literature search identified 955 candidate studies, of which 15 studies and 22,763 patients were included. Mean follow up was 53 months (17-100 months). CRT-D in NICM was associated with lower all-cause mortality (log HR -0.169, SE 0.055; p = 0.002) compared to CRT-P. Heterogeneity: df = 15 (P 0.03), I² = 43; Test for overall effect: Z = -3.043 (P = 0.002).

Conclusion: CRT-D in NICM was associated with lower all-cause mortality compared to CRT-P.

Figure 1: Forest plot showing the effect of CRT-D vs. CRT-P in patients with non-ischemic cardiomyopathy that was associated with lower all-cause mortality (log HR -0.169, SE 0.055; p=0.002) compared to CRT-P. Heterogeneity: df= 15 (P 0.03), I² = 43; Test for overall effect: Z = -3.043 (P = 0.002).

PO-633-02

THE IMPACT OF INCISION TECHNIQUE ON INAPPROPRIATE SHOCK RATES IN THE UNTouched STUDY

Mikhael F, El-Chami MD, FHRS; Johan D. Aasbo DO, FHRS; Reinoud Knops MD, PhD; Pier D. Lambiase BCH, BM, MBChB, PhD, FHRS; Maria Grazia Bongiorni MD; JEAN-CLAUDE DEHARO MD; Andrea M. Russo MD, FHRS; Martin C. Burke DO; Alic H. Shakir MD; Ricky A. Henderson MD, FHRS; David T. Huang MD, FHRS; Ursula Appl BSBME; Amy Brisben CCDS; Nathan Carter MS; Michael R. Gold MD, PhD, FHRS and Lucas V.A. Boersma MD, PhD

Background: Subcutaneous implantable cardioverter defibrillators (S-ICDs) implant practice has evolved from the 3-incision (3IT) to the 2-incision technique (2IT). In the UNTouched trial the 2IT was found to reduce implant time by almost 15% but be an independent predictor of inappropriate shocks (IAS). The 2IT relies on tunneling the S-ICD lead vertically from the supra-Xiphoid incision, thus the superior electrode is not secured to the underlying muscle or fascia. Whether the association between the 2IT and IAS is related to the technique itself or confounding variables is unclear.

Objective: To investigate the association between 2IT and IAS in the UNTouched trial.

Methods: Primary prevention patients (pts) with ejection fraction ≤35% and no pacing indication were prospectively