9:15 a.m.

873-4 **Prospective Randomized Comparison of Rectilinear Biphasic Waveform Shock Versus Truncated Exponential Biphasic Waveform Shock for Transthoracic Cardioversion of Atrial Fibrillation**

Soo G. Kim, Maureen Kim, David Park, Jay N. Gross, Kevin J. Ferrick, Eugen Palma, John D. Fisher, Montefiore Medical Center, Bronx, NY, Albert Einstein College of Medicine, Bronx, NY

Background: A defibrillator using rectilinear biphasic waveform (Zoll) reportedly requires lower energy for defibrillation than a device using truncated exponential biphasic waveform (Physio). Success rates for cardioversion of atrial fibrillation (AF) were compared between Zoll (with a maximum energy of 200J) and Physio (with a maximum energy of 360J).
Methods: Patients (pts) undergoing transthoracic cardioversion for AF were randomly assigned to Zoll or Physio. Shock energy was increased stepwise (50J, 100J, 150J, 200J) until cardioversion or to the maximum level of the device. If AF persisted despite the maximum energy shock, pts were crossed over and received the maximum energy shock by the other device.
Results: Of 134 pts (76 males, age 64+/-15), 63 were assigned to Zoll and 71 to Physio. The 2 groups were similar with regard to height, weight, body surface area, and duration of AF. Cummulative conversion rates at each energy level are compared in the Table. Two pts in Zoll group who did not convert with a 200J shock crossed over and converted after a 360J shock by Physio. Two in Physio group who did not convert with a 360J shock crossed over but did not convert with a 200J shock by Zoll.
Conclusions: Using biphasic defibrillators, AF could be converted in 97% of pts by transthoracic method. At energy levels tested, success rates were not significantly different between the 2 devices. In rare cases, a 360J shock with Physio may be successful when a 200J shock with Zoll (the maximum energy) fails to restore sinus rhythm.

	50J	100J	150J	200J	360J
Physio (n=71)	55%(39 of 71)	83%(59 of 71)	92%(65 of 71)	97%(69 of 71)	97%(69 of 71)
Zoll (n=63)	59%(37 of 63)	76%(48 of 63)	92%(58 of 63)	97%(61 of 63)	not available
p-value	0.70	0.29	0.94	0.89	

9:30 a.m.

873-5 **Cost Analysis of Implantable Cardioverter Defibrillators in Patients With Ischemic Heart Disease, Decreased Left Ventricular Function, and Nonsustained Ventricular Tachycardia: Selective or Widespread Use?**

Jeffrey D. Simmons, M. Diaz, K. McCollister, P. Salgueiro, L. Marquez, S. Chakko, A. Interian, R. Myerburg, Veterans Affairs Medical Center, Miami, FL, University of Miami School of Medicine, Miami, FL

Costs of evaluation, therapy and follow-up were analyzed for 29 asymptomatic patients with nonsustained ventricular tachycardia (NS-VT), ischemic heart disease (IHD), and decreased left ventricular ejection fraction (LVEF) who were undergoing electrophysiologic (EP) testing for ventricular arrhythmia risk stratification. Only patients with inducible sustained ventricular tachycardia (VT) were treated with an implantable cardioverter defibrillator (ICD). Mortality data and initial costs of evaluation and therapy were recorded. Patients with inducible VT were then compared with "noninducible" patients in reference to cost of therapy and health status.
Seventeen patients were "noninducible" and 11 patients were inducible for VT. "Noninducible" patient follow-up included 239 patient-months and inducible VT patient follow-up included 232 patient-months (p=0.12). Initial costs for "noninducible" patients included $19,805 for EP testing ($1165/patient). Two "noninducible" patients died during the follow-up period, both within 8 months of the EP testing. The 11 inducible VT patients accrued costs of $12,815 for EP testing, $236,500 for ICDs, and $515 for follow-up device interrogations. Two inducible VT patients died during the follow-up period (p>0.05) at 18 months and 21 months post-ICD implant. Only 1 other patient in the inducible VT group received ICD therapy (antitachycardia pacing) and remains asymptomatic. Total cost for the inducible VT group was $249,830 ($22,712/patient). Incremental (additional over "noninducible" patients) cost for inducible VT patients was $240,015 ($21,819 per patient).
The inducible VT group did not experience improved survival for the increase in incremental cost per patient. Widespread application of ICD therapy to patients with NS-VT, IHD and decreased LVEF without screening EP testing would result in at least an incremental cost of $21,819 per patient. Therefore, EP testing for arrhythmic risk stratification appears to be justified, at least on the basis of health care cost considerations in our patient population.

9:45 a.m.

873-6 **The Impact of Dual-Versus Single-Chamber Implantable Cardioverter-Defibrillator Implantation on Survival**

Michael Gold, Roger Freedman, David Breiter, Yunlong Zhang, Mark Schwartz, Medical University of South Carolina, Charleston, SC, Guidant, St. Paul, MN

Background: Prospective studies have failed to demonstrate a survival benefit with dual chamber (DC) pacing compared with single chamber (SC) pacing, although such a benefit has been postulated for cohorts with advanced structural heart disease. Methods: The LESS Study is a multicenter study evaluating low shock energy safety margins in ICD patients. Investigators were free to choose SC or DC ICDs. 720 patients were enrolled at 32 investigational sites. Of 636 successfully implanted patients, 299 (47%) received DC ICDs and 337 (53%) received SC ICDs. There have been 65 deaths in the DC population during a mean follow-up of 34±13 months, and 75 deaths in the SC population during 39±15 months. Multivariate survival analysis was performed using proportional hazards models to determine predictors of survival. Results: DC and SC patients differed with respect to age, NYHA class, the presence of atrial tachyarrhythmias, and sinus node dysfunction or AV block (see table). When survival is modeled vs. device type (SC or DC) alone, DC patients had a lower rate of survival (p<0.01, HR=1.6). However, when the demographic covariates are included in the model, Age (p<0.0001) and NYHA classification (p<0.0001) were the only covariates found to be significant predictors of survival, and type of device (DC or SC, p=0.43) was not significant. Conclusions: There were no significant differences in mortality between SC and DC patients when differences in demographic factors are adjusted for.

	SC (n=337)	DC (n=299)	p-value
Age	64.5±12	66.7±11	0.02
Male	78%	77%	NS
NYHA (III/IV)	19%	31%	<0.001
LVEF	35±14	35±14	NS
Sinus Node Dysfunction / AV Block	11%	39%	<0.001
Atrial Tachyarrhythmias	22%	41%	<0.001

ORAL CONTRIBUTIONS

882 Cardiac Pacing 2003: Newer Techniques-Indications and Outcomes

Wednesday, April 02, 2003, 10:30 a.m.-Noon
McCormick Place, Room S102

10:30 a.m.

882-1 **Clinical Profile and Intermediate-Term Follow-Up of Transvenous Pacing Leads Placed Through Intravascular Stents in the Young With Congenital Heart Disease**

Kavitha Chintala, Paul Webster, Thomas J. Forbes, Peter P. Karpawich, Children's Hospital of Michigan, Wayne State University, Detroit, MI

Background: Intravascular stent (IS) relief of venous obstruction (obst) allows transvenous pacemaker leads (PL) insertion. The purpose of this study was to review the intermediate follow-up of this IS/PL interaction, which remains largely unknown. Methods: 8 patients (pts) underwent IS implant (Palmaz 308 in 7 and Intrastent MF 1052 in 1) followed by 10 PL (Medtronic models 4003, 4012, 4068, 4568, 5068, 5079) inserted 0-65 days later. Pt age ranged 9-39 years (median 17.8) and weight 27-89 kg (median 60.5). IS was required for baffle obst in 6 pts after Mustard repair for D-transposition of great arteries and for innominate vein obst in 2 pts following a previous PL. Pacing was indicated for sinus node dysfunction in 6 pts and complete heart block in 2 pts. All pts received heparin during the IS implant followed by aspirin therapy for 6 months. Follow-up ranged from 1.3-6.3 years (median 3) and included PL assessment, catheterization, angiography and intravascular ultrasound. Results: There were no complications associated with concomitant IS and PL placement. IS reduced pressure gradients across the obst segment from 5.13 ± 2.7 to 0.88 ± 1.3 mm Hg (p= 0.001) and increased vessel diameters from 6.2 ± 3.01 to 13.7 ± 1.9 mm (p= 0.001). On follow-up, all pts were asymptomatic for venous obst. None had fracture or dislodgement of the PL or IS. The pressure gradients were not significantly different from immediate post-implant values (2.57 ± 3.5 vs. 0.88 ± 1.3 mm Hg; p= 0.3). However, IS lumens decreased from 13.7 ± 1.9 to 9.2 ± 4.8 mm; p=0 .03) due to neointimal growth. One pt had complete IS occlusion at 2.3 years. In the remaining pts the mean IS intimal thickness was 1.3 ± 1.03 mm and the intimal index was 0.19 ± 0.17. Mean stent lumen patency among all pts was 70% at 3 years. IS with two PL and those with direct IS/PL contact were more likely to be narrowed. Pacing energy thresholds (1.38 ± 1.7 μJ vs. 1.35 ± 2.0 μJ; p= 0.9) and impedances (638 ± 195 vs. 616 ± 146 O; p=0.7) remained unchanged from implant to follow-up. Conclusions: PL can be safely inserted through IS without adverse PL performance. However direct IS/PL contact or two PL may contribute to increased neointimal growth and cause IS lumen narrowing and obstruction.