

# Best of the HRS Scientific Sessions 2006

*Highlights from the Heart Rhythm Society Scientific Sessions  
May 17-20, 2006, Boston, MA*

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**Key words:** Antiarrhythmic drugs • Atrial fibrillation • Catheter ablation therapy • Dual-chamber pacing • Implantable cardioverter defibrillator • Pulmonary vein isolation

**T**his year's Heart Rhythm Society meeting in Boston presented exciting new data regarding surgical and medical approaches to cardiovascular disease. Here are some highlights.

### **Atrial Fibrillation Ablation or Antiarrhythmic Drugs**

Data from the Atrial Fibrillation Ablation vs Antiarrhythmic Drugs (A-4) trial suggest that patients with symptomatic atrial fibrillation who had previously failed treatment with at least 1 antiarrhythmic drug will benefit more from atrial fibrillation ablation than from treatment with another antiarrhythmic drug.<sup>1</sup> The results of this study were presented by Pierre Jais, MD, of Hôpital Cardiologique Haut-Leveque in Bordeaux-Pessac, France.

Study subjects had at least 2 episodes of paroxysmal atrial fibrillation per month for 6 months or longer. Most of the subjects (85%) were male, and the average age was 51 years. At baseline, the mean duration of atrial fibrillation episodes was  $9 \pm 9$  hours, and 80% of subjects were taking anticoagulant drugs. Patients were randomized to the antiarrhythmic drug group ( $n = 59$ ), in which they could receive up to 3 different antiarrhythmic drugs (alone or in combination), or to the ablation group ( $n = 53$ ), in which they could undergo up to 3 procedures. Study authors defined the primary endpoint—recurrence of atrial fibrillation—as an episode of arrhythmia that lasted more than 3 minutes after the third month. Quality-of-life scores, withdrawal of anticoagulation

at 1 year, and adverse events/mortality were secondary endpoints. After 3 months, the researchers assessed primary and secondary endpoints and permitted crossovers when needed.

The average number of ablation procedures per patient was 1.8, with a mean procedure duration time of 168 minutes. Crossovers were common in the drug group: by study end, 37 patients who had failed drug therapy crossed over to the ablation group.

At 1 year, arrhythmia no longer occurred in 75% of the ablation group and 7% of the medical therapy group ( $P < .05$ ). Quality-of-life parameters also seemed to improve more with ablation than with medical treatment. The A-4 trial results suggest that ablation seems to be a very reasonable option in patients with

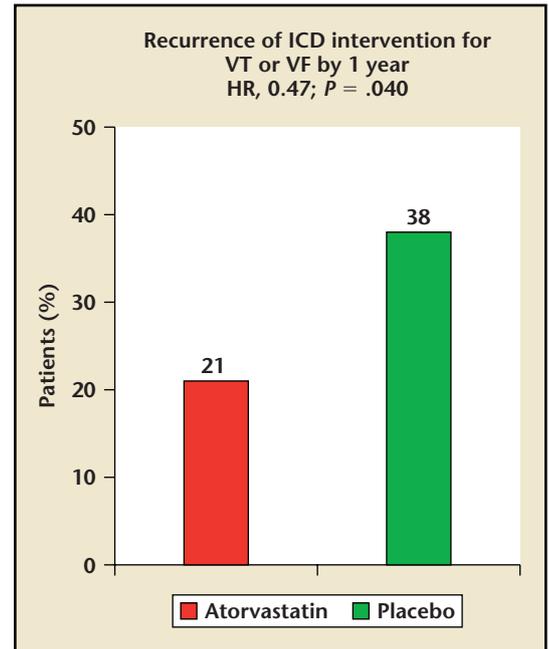
symptomatic atrial fibrillation who have failed medical therapy.

### Statins Reduce Ventricular Arrhythmias

Patients with coronary artery disease and implantable cardioverter defibrillator (ICD) devices can take intensive lipid-lowering statin therapy to reduce recurrences of ventricular arrhythmias. In the Cholesterol Lowering and Arrhythmia Recurrences after Internal Defibrillator Implantation (CLARIDI) trial, 1 year of treatment with atorvastatin (80 mg) reduced the need for ICD intervention as compared with placebo.<sup>2</sup> Johan De Sutter, MD, PhD, of the University Hospital in Ghent, Belgium, presented the study results.

The 106 subjects had coronary artery disease with a history of life-threatening ventricular arrhythmias that necessitated ICD implantation. Most of the subjects were men (94%), the mean age was 67 years, and the mean left ventricular ejection fraction was 39%. Almost half (45%) had congestive heart failure, and most (85%) had a history of acute myocardial infarction. In 69% of subjects, ICDs had been implanted within a month before the study. The ICDs were indicated for sustained ventricular tachycardia

**Figure 1.** In the Cholesterol Lowering and Arrhythmia Recurrences after Internal Defibrillator Implantation (CLARIDI) trial, treatment with atorvastatin reduced the need for an appropriate implantable cardioverter defibrillator intervention by about half. ICD, implantable cardioverter defibrillator; VT, ventricular tachycardia; VF, ventricular fibrillation; HR, hazard ratio. Adapted with permission from De Sutter J, et al.<sup>2</sup>



between the 2 groups. In the statin patients, average low-density lipoprotein levels dropped from 130 mg/dL at baseline to 65 mg/dL at follow-up, whereas levels in the placebo patients did not change. Neither group experienced a change in high-density lipoprotein levels. In the statin group, triglyceride levels dropped from 120 mg/dL to 90 mg/dL. This study demonstrated the ability of statin therapy to reduce the incidence of

ICDs programmed to dual chamber rate responsive pacing (DDDR) than with ICDs programmed only to backup single-chamber (VVI) pacing.<sup>3</sup> More recently, however, the use of DDDR atrioventricular search hysteresis (AVSH) pacing was non-inferior to VVI pacing for death or HF hospitalization in the Inhibition of Unnecessary RV Pacing with AV Search Hysteresis in ICDs (INTRINSIC RV) trial.<sup>4</sup> Brian Olshansky, MD, of the University of Iowa in Iowa City presented the results.

The study tested whether use of ICDs programmed to DDDR pacing using an AVSH algorithm between 60 bpm and 130 bpm was noninferior to backup VVI pacing at 40 bpm, with regard to the primary endpoints of all-cause mortality and HF hospitalization. Pacing was set at a lower threshold in this trial (60 bpm) than in the DAVID trial (70 bpm).

The 988 subjects were randomized to DDDR AVSH 60 to 130 programming or to VVI-40 backup pacing.

*Treatment with atorvastatin reduced the need for an appropriate implantable cardioverter defibrillator intervention by about half.*

(VT) in 65%. Patients were randomized to 80 mg/d of atorvastatin or placebo.

Treatment with atorvastatin reduced the need for an appropriate ICD intervention by about half at 1 year (Figure 1). At 1 year, the composite endpoint of death, myocardial infarction, revascularization, or stroke did not significantly differ

sustained ventricular arrhythmias in patients with coronary artery disease and an ICD implant.

### New Data on Dual-Chamber Pacing

In the landmark Dual Chamber and VVI Implantable Defibrillator (DAVID) trial, the risk of death and heart failure (HF) hospitalization was higher with

The subjects' mean age was 64 years, 79% were male, 67% had a history of coronary artery disease, and most had symptomatic HF. Patients were followed for a mean of 10.4 months.

By the study's end, 6.4% of the DDDR AVSH group had died or had been hospitalized for HF, compared with 9.5% of the VVI group. All-cause mortality was 30% lower in the DDDR AVSH group, an association that trended toward DDDR AVSH, but did not reach statistical significance for superiority ( $P = .23$ ).

*ICD With Ablation for Sustained VT/VF*

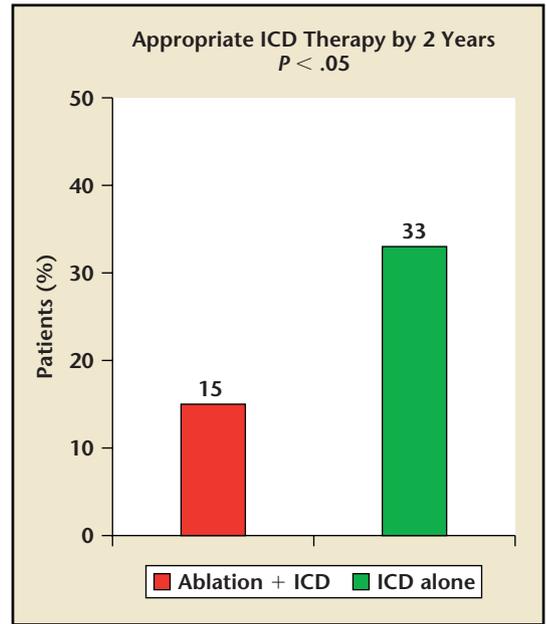
ICD implantation with substrate-based catheter ablation therapy is used primarily in patients with multiple ICD therapies. A new prospective, randomized, controlled trial suggests that this technique might also be useful for post-MI patients with sustained VT/ventricular fibrillation (VF).

Vivek Y. Reddy, MD, of Massachusetts General Hospital in Boston discussed data from the Substrate Mapping and Ablation in Sinus Rhythm to Halt Ventricular Tachycardia (SMASH VT) study.<sup>5</sup> The trial randomized subjects to receive substrate-based catheter ablation ( $n = 62$ ) or ICD alone ( $n = 64$ ). Study subjects had a history of VF arrest (18%), unstable VT (52%), syncope and inducible VT (21%), or prior ICD and single appropriate shock (9%).

The primary endpoint, appropriate ICD therapy, was less frequent in the ablation group than in the control group (Figure 2). Appropriate ICD shock was also less frequent in the ablation group (10% vs 31%,  $P = .073$ ). Although mortality trended downward in the ablation group, the difference was not significant.

Patients in the ablation group experienced the following adverse events: 1 pericardial effusion without

**Figure 2.** In the Substrate Mapping and Ablation in Sinus Rhythm to Halt Ventricular Tachycardia (SMASH VT) study, appropriate implantable cardioverter defibrillator therapy was less frequent in the ablation group than in the control group. ICD, implantable cardioverter defibrillator. Reprinted with permission from Reddy VY, et al.<sup>5</sup>



tamponade, 1 deep vein thrombosis, and 1 coronary HF exacerbation. It was noted that the ablative procedure is difficult to perform and its use as prophylactic therapy should be undertaken with caution and only in experienced centers.

**Cryoblation for Sinus Rhythm**

Among patients with permanent atrial fibrillation and mitral valve disease, mitral valve surgery with pulmonary vein isolation that utilized cryoablation was associated with higher rates of sinus rhythm than this procedure without cryoablation. Per Blomstrom, MD, of the University Hospital in Uppsala, Sweden presented data from the randomized, double-blind, multicenter Swedish Mitral Valve Surgery and Atrial Fibrillation (SWEDMAF) trial.<sup>6</sup>

In the ablation procedure ( $n = 30$ ), surgeons applied epicardial cryoablation linear lesions on the beating heart during cardiopulmonary bypass before aortic cross-clamp and cardioplegic arrest. These patients were kept on the cardiopulmonary

**Table 1**  
Independent Predictors of Outcome in the SWEDMAF Study

Variable	P Value
AF duration (ECG-verified permanent AF)	.0002
Surgical method	.008
Coronary artery disease	.01
NYHA class	.53
Left ventricular ejection fraction	.73
Left atrial diameter	.97

SWEDMAF, Swedish Mitral Valve Surgery and Atrial Fibrillation; AF, atrial fibrillation; ECG, electrocardiogram; NYHA, New York Heart Association. Adapted with permission from Blomstrom P, et al.<sup>6</sup>

bypass machine 27 minutes longer than were the patients treated with mitral valve surgery alone ( $n = 35$ ), an increase driven by the extra time required to perform the ablation procedure (which averaged 21 minutes).

Patients in the cryoablation group achieved sinus rhythm more

frequently than did patients in the mitral valve surgery alone group at both 6 months (73% vs 46%;  $P = .024$ ) and 12 months (73% vs 49%;  $P = .042$ ). In a regression analysis, independent predictors of outcome included atrial fibrillation duration, surgical method, and coronary artery disease (Table 1). ■

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### Main Points

- Patients with symptomatic atrial fibrillation who had previously failed treatment with at least 1 antiarrhythmic drug will benefit more from atrial fibrillation ablation than from treatment with another antiarrhythmic drug.
- Patients with coronary artery disease and an implantable cardioverter defibrillator (ICD) device can take intensive lipid-lowering statin therapy to reduce recurrences of ventricular arrhythmias.
- The use of dual chamber rate responsive pacing atrioventricular search hysteresis pacing was non-inferior to single chamber pacing for death or heart failure hospitalization.
- ICD implantation with substrate-based catheter ablation therapy might be useful for post-myocardial infarction patients with sustained ventricular tachycardia/ventricular fibrillation.
- Mitral valve surgery with pulmonary vein isolation that utilized cryoablation was associated with higher rates of sinus rhythm than this procedure without cryoablation.