ICD Programming Safely Slashes Needless Shocks

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DENVER — Implantable cardioverter defibrillators can be programmed to safely eliminate three-quarters of unnecessary shocks in patients with a primary prevention indication for the device, according to a study presented at the annual scientific sessions of the Heart Rhythm Society.

The Primary Prevention Parameters Evaluation (PREPARE) was a prospective, nonrandomized, 38-center study of 700 primary prevention patients with an implantable cardioverter defibrillator (ICD). Their single-chamber, dual-chamber, or biventricular ICDs were programmed to disregard supraventricular tachycardias and slow or nonsustained ventricular tachycardias (VTs) while aggressively expanding preferential use of antitachycardia pacing (ATP) to painlessly terminate fast VTs before resorting to maximum-energy shocks.

The 691 historic controls drawn from two major clinical trials were primary prevention ICD patients for whom VT/VF (ventricular fibrillation) detection and treatment programming wasn't controlled, explained Dr. Bruce L. Wilkoff, lead investigator of PREPARE and director of cardiac pacing and tachyarrhythmia devices at the Cleveland Clinic Foundation.

The primary end point in PREPARE was the morbidity index, a composite of all spontaneous arrhythmias treated with shocks, instances of arrhythmic syncope, and untreated sustained symptomatic VT/VF episodes. During the first year of follow-up, the morbidity index was 0.18 events per patient-year in the PREPARE cohort and 0.69 events per patient-year in controls, for a highly significant 74% relative risk reduction. Of patients in the PREPARE cohort, 8% received a shock in the first year, compared with 18% of controls. Nine cases of arrhythmic syncope occurred in eight patients, with no injuries.

One-year mortality was 4.8% in the PREPARE group and 8.7% in controls, a difference that was nonsignificant in a multivariate analysis that controlled for potential confounders.

"I wasn't surprised to see we could reduce shocks. I was very pleased to see that there really was no big trade-off" in terms of morbidity due to untreated arrhythmias, he said. The majority of ICDs are implanted for primary prevention indications, he said, noting that "most of our ICD patients receive far too many shocks."

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DR. WILKOFF

"To me, every tachycardia terminated by ATP is a success, and those would all be inappropriate shocks [with conventional programming]. I can't see a reason not to do [the PREPARE programming]," he added.

PREPARE programming included using the ICD's built-in supraventricular tachycardia discrimination feature and detection of only those rhythms with a rate of at least 182 beats per minute and a duration of at least 30 of 40 ventricular beats. Pacing with ATP was programmed for episodes with a rate of 182-250 beats per minute, with a shock reserved for arrhythmias in excess of 250 beats per minute and episodes not terminated by ATP.

Dr. Wilkoff is a consultant to Medtronic, which sponsored PREPARE. ■

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