ICD Therapies in Patients Receiving an ICD for Primary Vs. Secondary Prevention Indications

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Introduction: Data regarding the distribution of implantable cardioverter defibrillator (ICD) therapies in patients receiving an ICD for primary vs. secondary prophylaxis indications are limited.
Objectives: To compare the characteristics, ICD therapies and predictors of appropriate vs. inappropriate therapies in patients receiving ICDs for primary vs. secondary prevention of sudden cardiac death.
Methods: Retrospective analysis of 601 patients receiving ICDs for primary (65%) or secondary (35%) implant indications in a single tertiary medical center between the years 1996-2009 was performed. Baseline characteristics, ICD therapies, and predictors of appropriate vs. inappropriate therapies were analyzed.
Results: Of 210 implants for secondary prevention, 21.4% patients received appropriate ICD therapy for VT/VF whereas only 10.5% of 391 implants for primary prevention received appropriate ICD therapy during median follow-up of 4.3 years ($p<0.001$). In addition, 6.4% of patient with primary prevention indication and 8.6% of patients with secondary prevention indication received ≥ 1 inappropriate shocks ($p=0.335$). Primary implants had more diabetes, more coronary artery disease and higher prevalence of left ventricular ejection fraction (LVEF) < 35%. LVEF < 35% was found to predict appropriate ICD shocks both on univariate (OR 2.03, 95% CI 1.1-3.76; P=0.024) and multivariate analysis (OR 2.37, 95% CI 1.3-5.73; P=0.008). Interestingly, pacing mode (VVI vs. DDD vs. CRT) was not predictive of inappropriate ICD therapy. Mortality was significantly higher in the secondary prevention group (39% vs. 27.4%; $p=0.03$).
Conclusions: Mortality and appropriate ICD shocks for VT/VF were more common among patients who received an ICD for secondary prevention of sudden cardiac death, whereas inappropriate shocks were relatively uncommon without a significant difference between the two groups.