Impact of Accelerated Ventricular Tachyarrhythmias on Mortality in Patients with Implantable Cardioverter-Defibrillator

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Background: Anti-tachycardia pacing (ATP) and shock delivery may induce or accelerate tachyarrhythmias in patients with implantable cardioverter defibrillator (ICD). Methods: We investigated the triggers and the clinical outcome of ventricular tachyarrhythmias accelerated by ATP or shock.

Results: ICD were implanted in 1275 patients (age at implantation 59.7 ±14.0 years). Within a mean follow-up of 5.3±4.0 years, intracardiac electrograms were available in 1170 patients (91.8%). Overall 157 episodes of accelerated ventricular tachyarrhythmias were found in 100 of 1170 patients (8.5%). Termination of tachyarrhythmias was achieved by shock delivery in 153 episodes (96.8%). Triggers of accelerated tachyarrhythmias were appropriate ATP in 139 (88.5%) and inappropriate ATP in 14 (8.9%), as well as appropriate and inappropriate shocks in 2 (1.3%) episodes, respectively. Patients with accelerated ventricular tachyarrhythmia and shock therapy revealed higher all-cause mortality (47% versus 29.9%; p<0.001), and higher cardiac mortality (16% versus 6.5%; p<0.001), irrespectively of left ventricular function (LVF). Moreover, a trend was found towards a higher mortality in patients with preserved LVF and acceleration than in patients with reduced LVF without acceleration (p=0.070).

Conclusions: ATP with arrhythmia acceleration and shock delivery is a frequent and serious complication of ICD therapy that predominantly occurs in patients with reduced LVF. Our data support the hypothesis that ICD shocks damage the heart and even may increase mortality.

Keywords: accelerated arrhythmia, ICD