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Frequency and patterns of implantable cardiac defibrillator therapies in patients with ventricular assist devices

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Purpose: Durable ventricular assist devices (VADs) use is a life-saving therapy in patients with end-stage heart failure. These patients are at high risk for ventricular arrhythmias. The pattern of ICD therapies in these patients is not well characterized.

Methods: Our single-center retrospective cohort included 86 patients with ICDs and VADs followed at our Centre. Data collected included frequency of ICD therapies, type of therapy (appropriate vs. inappropriate; shocks vs. anti-tachycardia pacing (ATP)), and time-course of therapies.

Results: 36 patients (42%) received ICD therapy during a mean follow-up period of 13.6 months. There were 105 episodes (2.9 episodes/patient) during which ICD therapies were delivered, with a total of 379 individual arrhythmias treated (3.6 arrhythmias per episode of therapy). 61.4% of therapies were appropriate, 8.4% were inappropriate, and 31.6% were unknown. Of the 79 episodes treated with appropriate therapy, 36 episodes

(46%) required ICD shocks, whereas 43 episodes (54%) were treated with ATP alone. Overall, 33% of the total cohort and 81% of patients who received therapy received at least one ICD shock. Twenty-two patients (61%) received therapy between 1–3 times, while the remainder (14 patients, 39%) received therapy 3–10 times. Eighteen (17%) episodes occurred within the first month after LVAD implantation, with 10 (10%) occurring between 1–3 months, 53 (50%) occurring between 3–12 months, and 24 (23%) occurring more than one year after VAD implantation.

Conclusion: Analysis of our VAD cohort revealed three important findings: 1. ICD therapy is very common (42%) in the first year especially after LVAD implantation; 2. Ventricular arrhythmias are highly clustered in this cohort; 3. ATP is frequently effective. These findings have important implications on device follow-up and programming for this expanding patient population.