Incidence, predictors and clinical impact of electrical storm in patients with left ventricular assist devices: new insights from the ASSIST-ICD study

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Aims: Ventricular arrhythmias (VAs) can occur after continuous-flow left ventricular assist devices (LVAD) implantation, as a single arrhythmic event, or as an electrical storm (ES) with multiple repetitive VAs episodes. We aimed at analyzing the incidence, predictors and clinical impact of ES in LVAD recipients.

Methods: Patients analyzed were those included in the multicenter ASSIST-ICD observational study. ES was consensually defined as occurrence of ≥3 separate episodes of sustained VAs within a 24-hour interval.

Results: Among 652 LVAD patients, 61 (9.4%) presented an ES during a follow-up period of 9.1 (2.5-22.1) months. First ES occurred after 17 (4.0-56.2) days after LVAD implantation, most of them during the first month after the device implantation. The incidence then tended to decrease and re-increasing after few years of follow-up (Figure). A history of VAs prior to LVAD implantation and heart failure duration > 84 months were independent predictors of ES. The occurrence of ES was associated with an increased early mortality since 20 patients (32.8%) died within the first two weeks after ES. Twenty-two patients (36.1%) presented at least one recurrence of ES, occurring 43.0 (8.0-69.0) days after the initial ES. Overall, the survival of patients presenting or not an ES was similar, although a trend towards higher mortality was observed in ES patients.

Conclusion: Almost 10% of the patients implanted with an LVAD will present an ES after mid-term follow-up. A history of VAs prior to LVAD and long heart failure duration are predictors of the occurrence of an ES during follow-up. The short-term mortality after ES is high, and one-third of the patients will die within 15 days. Whether radiofrequency ablation of arrhythmias improves outcomes would require further studies.

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