Effect of Right Ventricular Pacing on Mortality in a Real-World Population

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Introduction: The implantable cardioverter defibrillator (ICD) is a proven lifesaving therapy. Chronic right ventricular (RV) pacing may lead to dyssynchrony that may be detrimental for ICD recipients with left ventricular systolic dysfunction, leading to increased mortality. Long term outcomes among ICD patients with a high degree of RV pacing in the real-world have not been examined. Aim: To estimate the 5-year survival probability for patients receiving the ICD therapy stratified by >40% RV pacing (High RVP%) vs. ≤40% RV pacing (Low RVP%) based on prior studies.

Methods: Patients prospectively enrolled in the Medtronic Product Surveillance Registry (PSR) implanted with an ICD from 2010-2019 with a minimum of 30 days of device data were included. The medians of the first year RV pacing were used to determine patient cohort assignment (High RVP% vs. Low RVP%). The Kaplan-Meier method was used to assess the 5-year survival probability. Hazard ratios (HR) were estimated adjusting for clinical covariables using the Cox-regression method.

Result: A total of 4969 patients with ICD implanted between 2010 to 2019 were included in the analysis with a mean age of 63.1 ± 13.3 years. Baseline characteristics are shown in Table 1. As of April 2019, among 4969 patients, 283 (5.7%) had a High RVP%. The 5-year survival probability for those with High RVP% was 63.3%, vs. 80.4% for Low RVP% (p<0.0001, Figure 2). The Cox regression analysis was conducted to adjust for clinical covariables including age. This difference remained statistically significant in the Cox model (adjusted HR 0.71; 95% CI 0.56 to 0.91, p = 0.007).

Conclusion: In this real-world cohort of ICD patients, high RV pacing percentage was independently associated with higher mortality. Patients with more frequent RV pacing may derive benefit from more aggressive treatments, including resynchronization therapy.