Association between cardiac implantable electronic device infection and mortality: long-term follow up of a complete, state-wide cohort in Australia

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Introduction: The number of individuals with Cardiac Implantable Electronic Devices (CIEDs) is rising globally, and infection is a serious procedure-related complication. Only a limited number of studies based on population data have quantified the association between CIED infection and mortality, with inconsistent results.

Purpose: To assess the association between CIED infection and all-cause mortality in a large population-wide, contemporary cohort.

Methods: This retrospective cohort study used linked hospital and mortality data for New South Wales (NSW) residents. We studied all patients aged >18 years who underwent a CIED procedure in NSW public or private hospitals between January 2016 and June 2021. CIED infection was defined by the presence of relevant diagnosis codes in any hospitalisation following a CIED procedure. We followed the patients until their death or end of follow-up, whichever occurred first. Adjusted hazard ratios (aHR) with 95% confidence intervals (CIs) for associations of CIED infection with mortality were estimated using Cox regression at 1-year and end of follow-up, with CIED infection as a time-dependent variable.

Results: We followed 37,625 patients with CIED procedures (36% female, mean age (standard deviation [SD]) 75.4 [12.8] years) for an average [SD] of 2.3 [1.5] years. Of these patients, 500 (1.3%) had CIED infection, and 6,224 (16.5%) died during the study period. The overall mortality rate was 24.2% among those with an infection and 16.4% among those without an infection. Compared to other CIED patients, patients with CIED infection had a higher Kaplan-Meier mortality rate (17.0% vs. 7.1%) and adjusted hazard of mortality (aHR 2.43, 95%CI 1.84-3.21) at 12 months post-procedure. These differences were attenuated, but still remained significant at the end of follow-up (mortality rate 43.6% vs. 33.3%; aHR 1.66, 95%CI 1.39-1.99) (Figure 1).

Conclusions: In a complete, state-wide cohort of CIED patients, infection was associated with higher risks of both short- and medium-term mortality.

Kaplan-Meier mortality by CIED infection