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

M. Shawon1, O. Sotade1, J. Li2, M. Hill3, L. Strachan3, G. Challis3, K. King3, S. Ooi2, L. Jorm1

1University of New South Wales, Centre for Big Data Research in Health, Sydney, Australia
2Prince of Wales Hospital, Department of Cardiology, Sydney, Australia
3Medtronic Australasia Pty Ltd, Sydney, 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