Rates of implantable cardioverter defibrillator implantation and outcomes in octogenarians or older compared to non-octogenarians in a statewide cohort from 2009 to 2018

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Funding Acknowledgement: Type of funding sources: None.

Background: Octogenarians are underrepresented or excluded in major implantable cardioverter defibrillator (ICD) trials. The deployment of ICDs and their real-world outcomes in octogenarians is unclear.

Purpose: To investigate the prevalence and outcomes of ICD implantation in octogenarian or older vs non-octogenarian.

Methods: We extracted details of all ICD implanted statewide from 2009–2018 including patient’s characteristics, in-hospital complications and mortality using the Centre-for-Health-Record-Linkage administrative datasets. Implantation rates were adjusted for the population size by sex, age-groups in decade and calendar-year. Analysis was stratified by age <80 vs ≥80yo.

Results: There were 9304 admissions (12.1% ≥80yo) for de novo ICD implantation (mean±SD implantation: 1163±122 cases per-annum). The mean age for ≥80 vs <80yo groups was 83.5±2.9yo vs 66.2±12.1yo respectively (overall cohort mean age 66.1±13.1yo). Total ICD implantations increased by 8.4±12.4% vs 1.8±8.4% per-annum for ≥80 vs <80yo groups. The mean implantation rates were 52.7±10.8 vs 22.0±2.8 per-100,000-persons in ≥80yo compared to <80yo, respectively, with rates increasing at 7.7±18.3% per-100,000-persons-per-annum in ≥80yo. In contrast, implantation rates declined slightly by 0.2±12.4% per-100,000-persons-per-annum in <80yo groups. There was a non-significant trend towards more in-hospital non-fatal complications in ≥80yo compared to <80yo (10.8% vs 9.0% respectively, p=0.054), with no difference in in-hospital mortality (0.6% vs 0.4% respectively, p=0.32). The 1-year mortality was 10.7% in ≥80yo compared to 4.7% in <80yo (p<0.001), and 2-year mortality was 20.2% vs 8.8% respectively (p<0.001). The 1-yr and 2-yr mortality hazard ratio for ≥80yo was 2.0 (95% confidence interval [CI] 1.6–2.5, p<0.001) and 2.2 (95% CI 1.8–2.5, p<0.001) respectively after adjusting for sex, year of implantation, referral source, indications for ICD, and comorbidities. Overall, the annual rates of total in-hospital non-fatal complications and mortality did not alter significantly during the study period.

Conclusion: Despite limited clinical trials data on efficacy of ICD use in octogenarians or older, implantation rate was more than double that of <80yo age-groups, with the implantation rate observed to be increasing in ≥80yo. There was no significant difference in in-hospital mortality between the two age-groups, however the 1-year and 2-year mortality rates were significantly higher in the ≥80yo.