Two-year outcomes of primary prophylactic use of defibrillators with ischemic and non-ischemic cardiomyopathy: propensity score-matched analysis from NIPPON STORM Study

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Background: In 2016, the DANISH study showed negative results regarding the efficacy of implantable cardioverter defibrillators (ICDs) for patients with non-ischemic cardiomyopathy (NICM) and reduced left ventricular ejection fraction (LVEF). Thus, the ESC guidelines downgraded the indication for primary ICD prophylaxis for NICM patients with reduced LVEF from Class I to IIa. However, the change might be felt somewhat improper in the real world ICD therapy and decided to use the Nippon storm study, a prospective registry study in Japan, to determine whether the DANISH results are of equal value in the clinical setting.

Objective: To determine the efficacy of ICDs as primary prevention in patients with NICM, the incidence of ICD appropriate therapy in patients with NICM was compared with that in patients with ischemic cardiomyopathy (ICM) for which primary ICD efficacy is generally recognized as a Class I indication.

Methods: We selected 1274 patients with underlying cardiac disease from a total of 1548 patients enrolled in the Nippon storm study. We analyzed data of 451 patients with LVEF ≤35% owing to NICM or ICM who underwent ICD implantation of primary prophylaxis (men, 78%; age, 65±12 years; LVEF, 25±1.4%; cardiac resynchronization therapy, 20%; ICM, 33%). All patients were followed up for at least 2 years. Patient selection was performed by employing the propensity score matching method with a digit-matching algorithm for clinical factors, ie, age, sex, cardiac resynchronization therapy with a defibrillator, LVEF. After all propensity score matches had been performed, we compared baseline covariates between the 2 groups: 132 patients with NICM and 132 with ICM. The cumulative incidences of ICD therapies (including both anti-tachycardia pacing and shock therapies) were calculated using competing risk analysis, because death is a competing risk for loss to follow-up.

Results: In the matched cohort, the 2-year appropriate ICD therapy risks were 27.7% and 12.2% in NICM and ICM groups, respectively (HR = 0.390 [95% CI, 0.218–0.701; P = 0.002] (Figure A). Two-year appropriate ATP therapy risks were 25.5% and 11.4% in NICM and ICM groups, respectively (HR = 0.417 [95% CI, 0.226–0.776; P = .005]) (Figure B), and appropriate shock therapy risks were 6.3% and 1.6% in NICM and ICM groups, respectively (HR = 0.230 [95% CI, 0.049–1.085; P = .063]) (Figure C).

Conclusion: The present subanalysis of the Nippon Storm Study revealed that the risk for appropriate ICD therapy was significantly higher in the patients with NICM than in those with ICM based on our propensity score–matching method.