Sex-differences in ventricular tachyarrhythmia events in patients with implantable cardioverter defibrillator and prior ventricular tachyarrhythmias


1University of Rochester Medical Center, Clinical Cardiovascular Research Center, Rochester, United States of America
2Saint Alphonsus Health System, Boise, United States of America
3The Valley Hospital, Ridgewood, United States of America
4University of Massachusetts, Worcester, United States of America
5University of Minnesota, Minneapolis, United States of America
6Henry Ford Hospital, Detroit, United States of America
7Duke University, Durham, United States of America

On behalf of RAID investigators

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Background: Women have been previously shown to be at a lower risk of ventricular tachyarrhythmia (VT) events in ICD trials, however, more contemporary data on the risk of VT/VF and death by sex in patients with prior VT/VF are lacking.

Objective: We aimed to assess sex-differences in ICD-treated VT/VF events and all-cause mortality in patients in the Ranolazine in High-Risk ICD Patients (RAID) trial. Patients were either implanted for secondary prevention or primary prevention ICD indications but experienced VT/VF before enrolment.

Methods: The RAID trial enrolled high-risk ICD patients with ischemic or non-ischemic cardiomyopathy, randomized to ranolazine or placebo. This analysis focused on patients with prior VT/VF. Sex-differences in VT/VF requiring ATP or shock were evaluated using Kaplan-Meier analysis, Fine and Grey, and Cox models in an intention to treat analysis. All VT/VF episodes were centrally adjudicated.

Results: There were 124 women (17%) out of 714 subjects analysed. Women were younger (60 vs. 65 years, p < 0.001), more often non-ischemic (70% vs. 37%, p < 0.001), less often had hypertension (69% vs. 78%, p = 0.045) and diabetes (19% vs. 34%, p = 0.002). Compared to men, women were at a significantly lower risk of VT/VF/Death (HR = 0.67, [95% CI, 0.46-0.96], p = 0.029), lower risk of VT/VF (HR = 0.68, [95% CI, 0.46-1.00], p = 0.049), lower risk of VT/VF treated with ATP (HR = 0.59, [95% CI, 0.38-0.92], p = 0.019), and lower risk of VT/VF treated with ICD shock (HR = 0.54, [95% CI, 0.31-0.96], p = 0.035). The risk of recurrent VT/VF was also significantly lower in women (HR = 0.35 [95% CI, 0.26-0.48], p < 0.001). Hazard ratio for death was similar to the other endpoints, (HR = 0.61, [95% CI 0.30-1.22] p = 0.162) but did not reach statistical significance, most probably related to low statistical power due the relatively small number of death events among women. The effect of ranolazine on endpoints did not differ by sex.

Conclusions: Women with a history of prior VT/VF and managed with an ICD/CRT-D experienced a lower risk recurrent VT/VF requiring device therapy as compared with men. The risk of mortality showed a similar trend although did not reach significance.
The graph shows the probability of death over follow-up years, comparing males and females. The log-rank test indicates a significant difference between the two groups (Log-Rank P=0.014).

- **Follow-up Years**
  - 0: 580 (Males: 124, Females: 124)
  - 1: 498 (Males: 113, Females: 113)
  - 2: 304 (Males: 72, Females: 72)
  - 3: 144 (Males: 25, Females: 25)
  - 4: 63 (Males: 13, Females: 13)

The line graph illustrates the increasing probability of death over time, with males showing a higher trend compared to females.