

Non-fatal cardiovascular events preceding sudden cardiac death in patients with an acute myocardial infarction complicated by heart failure: insights from the High-Risk-Myocardial-Infarction database

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Background: Sudden cardiac death (SCD) is responsible for 20–40% of mortality following acute myocardial infarction (AMI). The risk of SCD is even higher among patients with AMI complicated by heart failure (HF) (either clinically apparent HF or left ventricular dysfunction). The temporal relationship between an AMI complicated by HF and subsequent SCD and the association of non-fatal cardiovascular (CV) events following AMI with SCD has yet to be described.

Purpose: Among patients with AMI complicated by HF, we evaluated the probability and temporal association of subsequent non-fatal cardiovascular (CV) events (HF hospitalization, recurrent MI, or stroke) and SCD.

Methods: The High-Risk Myocardial Infarction (HRMI) database contains 28,771 patients with signs of HF or reduced LV ejection fraction (<40%) after AMI. Among patients with an AMI complicated by HF, we used adjudicated cause of death from the HRMI Database to identify: 1) the temporal distribution of SCD among patients following an index AMI; 2) the probability of having SCD following a non-fatal CV event following the index AMI.

Results: Median follow-up was 1.9 years. Mean age was 65.0±11.5 years and 70% were male. The incidence of CV death was 7.9 per 100 patient-year [py] and for SCD was 3.1 per 100py (40% of CV deaths). SCD rates were highest in the early period (<90 days) after AMI and decreased over time. Recurrent MI preceded 9.6% of SCD after a median time of 145 days; HF hospitalization preceded 17.0% of SCD after a median 144 days; and stroke preceded 2.7% of SCD after a median of 138 days (vs. non-sudden CV death: MI 46.6% at 1 days, HF hospitalization: 30.9% at 67 days, stroke 12.9% at 9 days). The incidence of SCD preceded by HF hospitalization was significantly higher than SCD without preceding HF hospitalization.

Conclusion: Among patients with AMI complicated by HF, SCD predominantly occurred in the early “high-risk” period after AMI; SCD rates decreased afterwards. Patients with non-fatal HF hospitalizations during follow-up may have a higher subsequent SCD risk. Preventing HF onset after MI may help decreasing SCD.

