

Relation between sex and mortality after myocardial infarction in high-income and middle-income European countries

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Background: The relationship between female sex and cardiovascular mortality in myocardial infarction (MI) is controversial. Most available data are from high-income countries (HIC) where baseline risk is lower and revascularization procedures are more likely, so the generalizability to other populations is unclear.

Purpose: The main goal of this study was to unravel the relation between patient-specific revascularization through percutaneous coronary intervention (PCI) and mortality among women and men.

Methods: Data were drawn from the ISACS-Archives (NCT04008173) which includes a large cohort of patients enrolled in 6 European HIC (Croatia, Italy, Lithuania, Hungary, Romania, and United Kingdom) and 7 middle-income countries (MIC; Bosnia & Herzegovina, Kosovo, Macedonia, Moldova, Montenegro, and Serbia). Participants were stratified by MI subtypes: STEMI and NSTEMI. The primary outcome was 30-day mortality. To yield unbiased sex estimates of the effects of MI on mortality we modeled covariates and outcomes by propensity score-based analytic methods. We calculated the women to men risk ratios (RRs) using weighting with estimates compared by test of interaction on the log scale.

Results: The cohort consisted of 22,087 patients with MI (30.2% women).

Patient outcomes varied according to the subtype of MI. Females was associated with a greater excess risk of 30-day mortality in STEMI (RR: 1.94; 95% CI: 1.71–2.21) compared with NSTEMI (RR: 1.12; 95% CI: 0.95–1.50; P interaction <0.001). Coronary revascularization reduced the incidence of death among women and men in the overall population. Despite this, the primary outcome of 30-day mortality remained higher in women than men with STEMI (RR: 2.38; 95% CI: 2.00–2.82) whereas it was comparable across sexes in patients with NSTEMI (RR: 1.21; 95% CI: 0.79–1.83; P interaction=0.002). Sex differences in mortality from STEMI were more significant in MIC compared with HIC (RRs: 2.30; 95% CI: 1.98–2.68 vs. 1.36; 95% CI: 1.05–1.75; P interaction <0.001). The sex gap in mortality was mitigated by the use of revascularization therapy (RRs: 2.05; 95% CI: 1.68–2.50 in MIC vs. 2.17; 95% CI: 1.48–3.18 in HIC; P interaction=0.40)

Conclusion: Women presenting with STEMI have worse early mortality rates than their male counterparts in both HIC and MIC even in patients undergoing revascularization. By contrast, sex differences are attenuated or no longer apparent in NSTEMI. With no information on the type of MI on admission, sex differences in early outcomes are difficult to be fully understood.