

Temporal trends, sex-differences and outcomes of patients hospitalized for heart failure in Germany

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Background: Despite remarkable improvements in treatment of cardiovascular disease, heart failure (HF) is still characterized by a high mortality rate. Sex-specific differences in HF have been described, but underlying reasons are widely unexplored. Thus, we aimed to investigate sex differences of patients hospitalized for HF in a nationwide cohort.

Methods: The nationwide German inpatient sample (2005–2016) was used for this sex-specific analyses. Temporal trends on hospitalizations, mortality, and treatments were analyzed and independent predictors of adverse outcomes identified.

Results: The present analysis comprises 4,538,977 hospitalizations due to HF (52.0% women) in Germany (2005–2016). Although women were older (median 82 (IQR 75–87) vs. 76 (69–82), $P < 0.001$), coronary artery disease (CAD, 50.3% vs. 30.7%, $P < 0.001$) was more prevalent in men, who were more often treated with PCI (3.4% vs. 1.4%, $P < 0.001$) and implantable cardioverter-defibrillator (2.2% vs. 0.5%, $P < 0.001$). In-hospital

mortality was significantly lower in men than in women (8.9% vs. 10.2, $P = 0.001$) and was reduced in patients who received PCI or implantation of an ICD.

While total numbers of hospitalizations between 2005 and 2016 increased in both men (β -estimate 7185.71 (95% CI 6502.23 to 7869.18), $P < 0.001$) and women (β -estimate 5297.60 (95% CI 4557.37 to 6037.83), $P < 0.001$) as well as almost all comorbid co-conditions, in-hospital mortality rate decreased more distinctly in women (β -estimate -0.41 (95% CI: -0.42 to -0.39), $P < 0.001$) compared to men (β -estimate -0.29 (95% CI: -0.30 to -0.27), $P < 0.001$).

Conclusions: Interventional treatments of HF were associated with improved outcomes and equally beneficial for both sexes. However, they were more often used in male HF patients, in which CAD is significantly more frequent than in female HF patients. This may explain the higher case fatality rate of HF in females.