TITLE: Assessing the effectiveness of cardiac rehabilitation in patients after myocardial infarction using national-level case-mix data

Introduction

National-level healthcare administrative data generated at every encounter with the public healthcare system are widely recognized as an underutilized resource for building knowledge to address macro, mezzo and micro-level challenges in healthcare. Data collected and curated by third-party public payers capture a wide range of variables with unique individual-level identifiers over a prolonged period of time. In countries with a single payer healthcare system like Slovenia such data are available for the entire population, hence representing rich sources of information about the real-world practice at a provider, regional, or population level that may be leveraged for diverse purposes. In this paper they are used to appraise the effectiveness of comprehensive outpatient cardiac rehabilitation (CR) programmes for patients after myocardial infarction that were initiated in Slovenia in 2017 to complement short-term residential CR. The results of this study can be used to inform the decision on the extension of the existing network of comprehensive outpatient CR centres.

Methods

Data on all patients hospitalised for myocardial infarction (ICD I20.0 and I21.x) in Slovenia between 2015 and 2021 were collected by linking (using unique patient identifiers) hospital, cardiac rehabilitation, medication, and survival status databases of the Health Insurance Institute of Slovenia. Propensity scores were calculated using logistic regression (for CR vs. no CR participation) with covariates plausibly associated with CR allocation and mortality — demographic characteristics (age and sex), hospital episode intensity, recorded co-morbidities, and medication prescription at discharge. Survival time was analysed using double-robust Cox proportional hazards regression (with propensity score weighting and covariates adjustment) to estimate hazard ratios (HR) and 95% confidence intervals (CI, from robust standard errors).

Results

Of the 11,815 eligible patients (75.6% of all hospitalized myocardial infarction patients, 66.7% men, median age 66, interquartile range 57-77), 3,819 (32.3%) attended CR. Participation to CR was associated with a significant risk reduction for cardiovascular rehospitaisation and all-cause mortality (HR 0.61, 95%CI 0.52-0.72, p<0.001).

Discussion

Our analysis seems to provide robust inference on the benefits of CR participation for patients after myocardial infarction as well as a useful framework for appraising real-life effectiveness of healthcare interventions from available datasets. The result indicate that CR is associated with improved outcomes suggesting that CR should be promoted and facilitated through the extension of the existing network of comprehensive outpatient CR centres.