Decreasing incidence of cardio-vascular events or deaths in CAD patient cohorts 2004–2011

Results from the disease management program (DMP) for coronary artery disease (CAD) in the North Rhine region, Germany

Bernd Hagen • Sabine Groß • Jens Kretschmann • Arne Weber • Lutz Altenhofen
Central Research Institute of Ambulatory Health Care in Germany (ZI)

Purpose: In 2004 the DMP CAD was initiated in Germany primarily to improve secondary prevention among patients with CAD which was characterized as insufficient at the DMP’s beginning. Principally the DMP CAD should help to improve quality of care but it was also intended to reduce morbidity and mortality of the inscribed patients. The purpose of this study was to analyse differences in the incidence of myocardial infarction (MI), acute coronary syndrome (ACS), stroke or death (composite endpoint) in cohorts of CAD patients inscribed in the DMP between 2004 and 2011.

Population and Methods: Data from all patients who have been inscribed in the DMP 2004–2011 were analysed retrospectively (n = 302 390, 63.3% male, mean age 68.5 ± 10.7 yrs.). Composite endpoint was documented until 2013 in 50 442 (16.7%) patients. Total incidence (first occurrence) and incidence of the composite endpoint within the first two years after inscription in the DMP was calculated for the patient cohorts 2004/05, 2006/07, 2008/09, and 2010/11. To establish the effect of selective inscription and selective drop out the cohorts’ composition was analysed taking age, sex, and comorbidities into account. Odds ratios (OR) were calculated using separate logistic regression models of composite endpoints’ total incidence and incidence within first two years. OR and 95% confidence intervals are given.

Results: From the beginning of the DMP CAD in contrast to the total number of patients numbers of newly inscribed patients are falling (Fig. 1). While prevalence of MI decreased rates of ACS and heart failure remained rather stable, however rates of COPD, stroke and especially diabetes mellitus increased (Fig. 2). In newly inscribed patients rates of MI / ACS increased (Fig. 3). Mean age of patients who are inscribed later is lower (2004/05 vs. 2010/11: 69.2 vs. 67.8 yrs., Fig. 4). Differences in rates of male vs. female patients between the cohorts are insignificant. Correlations between drop out from the DMP and age, sex, and comorbidities are only weak. Death of patients, being the final form of drop out, correlates strongly with patients’ age (Fig. 5) and a number of comorbidities, especially heart failure, COPD, and diabetes mellitus (Fig. 6).

Between 2004/05 and 2010/11 incidence of composite endpoint decreased over the total observation period from 2 284 to 619 cases as well as incidence within the first two years in the DMP from 911 to 505 cases per 10 000 patients (2006/07: 1 388, 2008/09: 653, Fig. 7). Decrease in incidence of ACS (881 to 389) and stroke (397 to 121) within the first two years is particularly pronounced. Most significant predictors of the composite endpoints’ incidence are high age and COPD (Fig. 8, R). Risk of incidence over total observation period as well as within the first two years was strongly reduced in the later cohorts, with the exception of the 2006/07 cohort, which demonstrated a higher risk than the 2004/05 cohort.

Conclusion: Since the start of the DMP CAD incidence of MI, ACS, stroke or death showed a continuous decrease (apart from the patients inscribed 2006/07), even over a short observation period of only two years. Certainly a selection bias of the patients inscribed in the DMP and who are differently affected by comorbidities cannot be completely excluded, as well as a selective drop out especially caused by dying of older patients. On the other hand in later years there is a tendency to inscribe more patients with MI / ACS, diabetes, and COPD. Nevertheless there is a strong decrease in incidence of CV events or death. This effect might be caused by better secondary prevention as demonstrated with regard to evidence-based medicine, larger rates of patients’ education, and a more intensive collaboration of general practitioners and specialists. Beyond that this effect mirrors a tendency of decreasing death rates of patients suffering from CAD or heart failure which has been demonstrated for the last 10 to 15 years in Germany and worldwide.

Declaration of interest: None declared.