Better treatment and improved prognosis in elderly patients with AMI: but do registers tell the whole truth?

Annika Rosengren*

Department of Medicine, Sahlgrenska University Hospital at Östra, Göteborg University (Östra Sjukhuset), Göteborg SE-416 85, Sweden

Online publish-ahead-of-print 26 January 2012

This editorial refers to ‘Resolving inequalities in care? Reduced mortality in the elderly after acute coronary syndromes. The Myocardial Ischaemia National Audit Project 2003–2010†, by C.P. Gale et al., on page 630

After the introduction of modern treatment for acute myocardial infarction (AMI) and acute coronary syndromes (ACS) in the late 1980s, prognosis, both short term and in the longer run, has improved in a striking manner. Among both younger and older patients there has been a marked reduction in short-term case fatality. Even so, it would seem that the potential for further improvement among the elderly is worth looking into, not only because their prognosis is worse, but also because there are so many elderly patients.

Life expectancy has increased in a spectacular manner during the last century. A large part of this improvement is due to lower mortality in the young, but older persons are also living longer. In many Western countries an increasing number of people reaching the age of 65 will continue to live for an extended period. For example, in the short period between 2000 and 2008, life expectancy at age 65 in the UK increased from 16 to 17.5 years among men and from 19.1 to 20.1 years among women (http://www.statistics.gov.uk/statbase). Among the very old, life expectancy is obviously much shorter than for younger people. Still, surviving to age 85, as exemplified by Swedish statistics, now means a mean estimated life expectancy of 5.4 years for men and 6.6 years for women. Accordingly, surviving an AMI at an advanced age, in a previously reasonably healthy person, can mean additional years of living a good life.

The proportion of all AMI patients who are very old is increasing. As an example, statistics from Sweden (http://www.socialstyrelsen.se/statistik/statistikdatabas) show that in 1987, with altogether 26 568 individual patients discharged with AMI as a principal diagnosis during that single year, 5.4% of the men and 14.7% of the women were aged 85 years or older. In 2009, among the 21 960 AMI patients discharged that year, 16.9% and 33.8% among men and women, respectively, were 85 or older (Figure 1). However, the mortality burden is disproportionately high among the elderly, with almost half of all victims of fatal coronary heart disease 85 years or older.

It is important to understand that AMI patients who are older differ substantially from those who are younger. Older patients have more co-morbidities, present with more delay, less often have typical chest pain and less likelihood of presenting with ST elevation, but more often develop heart failure, and may have more bleeding complications when treated aggressively. Accordingly, the care of elderly patients presents with more challenges than that of younger patients.

National and international registries have been introduced to improve quality of care and improve the adherence to current guidelines by continuously providing information on given therapies and outcome. With the now 10-year-old but still new definition of AMI, the burden of disease and early outcomes has most certainly changed but the net effects of these changes have not yet been widely described. Additionally, it is not known whether the effects of reported improvements in ACS care have occurred equally across the spectrum of ACS ages.

The fate of elderly patients in a contemporary setting has recently been examined within the framework of the Myocardial Ischaemia National Audit Project (MINAP), using data from 616 011 ACS events in England and Wales recorded between 2003 and 2010. Of all patients, one in six (17%) was aged <55 years and almost one in eight (12%) ≥85 years. During the 8 years between 2003 and 2010 there were overall very marked changes in therapy. For patients with an admission diagnosis of ST-elevation myocardial infarction (STEMI), rates of primary percutaneous coronary intervention (PCI) increased from 1.6% in 2003 to 60.9% in 2010 for patients aged <55 years, but even more, from 0.2% to 48.5%, in patients aged ≥85 years. For all patients with AMI, there were significant increases in the rates of use of evidence-based pharmacological therapies.

Despite these improvements, the authors found that the elderly hospitalized with an ACS continued to be disadvantaged. For those

The opinions expressed in this article are not necessarily those of the Editors of the European Heart Journal or of the European Society of Cardiology.

* Corresponding author: Tel: +46 31 343 4000, Fax: +46 31 259 254, Email: annika.rosengren@hjl.gu.se
† doi:10.1093/eurheartj/ehr364

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2012. For permissions please email: journals.permissions@oup.com
with an initial diagnosis of STEMI, older patients were less likely to receive primary PCI, and pre-hospital thrombolysis. For patients with any AMI [STEMI or non-STEMI (NSTEMI)], the chance of being prescribed aspirin, clopidogrel, β-blockers, statins, or angiotensin-converting enzyme (ACE) inhibitors was also lower. The elderly were less likely to undergo further investigations, to be admitted to the Coronary Care Unit or a cardiology ward, and to be under the care of a consultant cardiologist. Still, it must be noted that all patients with STEMI who were ≥85 years, almost half were treated with PCI in 2010, and the uptake of evidence-based medications on discharge among elderly patients with AMI was altogether ~90%.

In spite of these disadvantages, all age groups including the old and very old displayed substantial reductions in in-hospital mortality, similar for males and females, and for STEMI and NSTEMI. For STEMI ≥85 years, in-hospital mortality decreased from 30.1% in 2003 to 19.4% in 2010 [relative risk (RR) = 0.54], and for NSTEMI ≥85 years from 31.5% in 2003 to 20.4% in 2010 (RR = 0.56). These benefits among patients aged 75 and older translates into ~100 fewer deaths per 1000 patients in just 8 years, contrasting with 5–10 fewer deaths among the youngest patients, where case fatality both in 2003 and in 2010 was very low, and 15–20 among those aged 55–64 years. Accordingly, there is good evidence to suggest that application of modern, evidence-based treatment saves more lives, at least in the short term, among the elderly than among the youngest patients.

It is, however, important to be aware that quality registers probably comprise a selected and healthier subset of AMI patients. By mid-2002 all acute hospitals in England and Wales were participating in the registry. Participating hospitals are requested to enter all ACS patients and, in practice, MINAP probably records the great majority of STEMs, but significantly fewer NSTEMIs.5 Underreporting of NSTEMI varies between hospitals and may reflect variation in resources allocated to data capture, in particular the systematic identification of patients with possible ACS not admitted to cardiac wards, and thus probably a substantial proportion of elderly patients.

In one study from the corresponding Swedish quality register, the Register of Information and Knowledge about Swedish Heart Intensive care Admissions (RIKS-HIA), information was merged with data from several other Swedish registries. The 70% of the AMI patients from the hospital discharge registry who were included in the RIKS-HIA were generally younger, more often men, generally more healthy, and more often had AMI as the principal diagnosis, compared with AMI patients who were not included.6 Patients registered in the RIKS-HIA had a markedly lower 30-day mortality than patients not registered [adjusted odds ratios 0.19 (men) and 0.30 (women)]. A second study showed that patients in the RIKS-HIA were more likely to be discharged with statins and ACE inhibitors.7 It is more than probable that patients entered into the MINAP database differ from patients with AMI who were not recorded, and it is possible that this may apply even more to the very old, indicating that adherence to evidence-based therapies and improvement in prognosis are almost certainly overestimated.

With patients 85 and older now comprising a substantial proportion of AMI patients, it is time to seriously consider their management. Given the heterogeneity of this patient group, guidelines cannot, obviously, be applied rigidly. However, age alone should not act as a deterrent from applying evidence-based treatment among the elderly. One crucial step towards improvement in cardiac care among the elderly is to ensure that registries (and trials) include representative patients also among the older segments of the population.

**Conflict of interest:** None declared.

**References**