

## Editorial

## Improving Quality of Care of Acute Myocardial Infarction: More Focus Needed on Long-Term Optimal Medical Treatment and Secondary Prevention

Mejora de la calidad de la asistencia en el infarto agudo de miocardio: es necesario prestar mayor atención al tratamiento médico óptimo a largo plazo y a la prevención secundaria

Christiaan J.M. Vrints\*

Department of Cardiology, Antwerp University Hospital, Edegem, Belgium

## Article history:

Available online 15 March 2012

Timely reperfusion with thrombus aspiration and coronary stenting accompanied by potent adjunctive antiplatelet and antithrombotic therapy has dramatically changed the clinical outcome of ST elevation myocardial infarction (STEMI). Since the concept of limiting myocardial infarct size by prompt myocardial reperfusion was described in the early seventies<sup>1</sup> in-hospital mortality of STEMI has been reduced from 30% to single-digit levels in the latest clinical reperfusion trials.<sup>2</sup>

Although the mortality of cardiovascular diseases has been halved in the last 50 years<sup>3</sup> it still remains the leading cause of death in developed countries.<sup>4,5</sup> Moreover, during the next decades health authorities will face a tremendous challenge as the prevalence and costs of cardiovascular disease will show a progressive and substantial increase related to the aging of the population.<sup>6</sup>

Using a hospital discharge administrative database, Andrés et al. in the article published in *Revista Española de Cardiología* analyzed the long-term outcome of patients with acute myocardial infarction in Aragon between 2000 and 2007.<sup>7</sup> Their analysis shows that readmission for recurrent acute myocardial infarction is very common: readmission due to a new acute myocardial infarction was recorded in 44.2% of patients aged 45 to 65 years during the first year and in 73.9% at 3 years after hospital discharge. This high recurrence rate is in keeping with the observations in other registries<sup>8–10</sup>: modern management of acute coronary syndromes has resulted in a markedly improved in-hospital outcome but morbidity and mortality burden during early- and long-term follow-up is almost three to four times higher than during the initial hospitalization. Moreover, the risk for recurrent cardiovascular events and mortality during long-term follow-up is higher among patients with non-ST elevation acute coronary syndromes than in patients with a STEMI, which until recently was not recognized. Therefore, if we want to improve further quality of care of acute coronary syndromes, we should concentrate more on

the prevention of recurrent cardiovascular events and mortality during early- and long-term follow-up.

How can we do this? First of all by performing a more complete coronary revascularization in STEMI patients with multivessel coronary artery disease. Compared to culprit-vessel-only angioplasty, multivessel revascularization in STEMI patients was associated with a marked reduction of major cardiac adverse events during long-term follow-up.<sup>11</sup> Nonculprit lesions, if proven significant by fractional flow reserve measurement, should probably best be treated by percutaneous coronary intervention or coronary artery bypass grafting as a staged procedure during or shortly after the initial hospitalization rather than by acute multivessel percutaneous coronary intervention on admission.<sup>12–15</sup>

Furthermore, in patients with preexisting cardiovascular disease, in diabetics and in those with a high number of cardiovascular risk factors, we should invest more energy in the implementation of optimal medical treatment and secondary prevention measures. The finding by Andrés et al.<sup>7</sup> that the number of cardiovascular risk factors present is a major determinant of readmission and mortality during long-term follow-up emphasizes again the importance of including cardiac rehabilitation and other secondary prevention measures, besides reperfusion procedures, in composite performance actions used for evaluating quality of STEMI care.<sup>16</sup>

The important role of cardiovascular risk factors as major determinants of recurrent cardiac events after myocardial infarction is also in line with the observation that more than half of the reduction of cardiovascular mortality observed in developed countries during the last 50 years was related to improved cardiovascular prevention and better implementation of efficacious medical therapies, rather than to new technological therapeutic interventions.<sup>17</sup> The aging of the population will in the near future lead to a major surge in the need for hospitalizations of patients with acute cardiovascular syndromes. Any reduction in the need for rehospitalization after a first acute myocardial infarction by a more effective secondary prevention of coronary artery disease will therefore be more than welcome.

Finally, the observation that a great number of rehospitalizations occur well beyond the typical 12-month duration of a randomized clinical trial emphasizes again the important complementary role of observational studies and long-term registries in

## SEE RELATED ARTICLE:

DOI: 10.1016/j.rec.2011.09.012, Rev Esp Cardiol. 2012;65:414–20.

\* Corresponding author: Department of Cardiology, Antwerp University Hospital, Wilrijkstraat 10, B-2650 Edegem, Belgium.

E-mail address: christiaan.vrints@ua.ac.be

the assessment of the efficacy of new treatment modalities or drugs for secondary prevention after an acute coronary syndrome.<sup>18</sup>

## CONFLICTS OF INTEREST

None declared.

## REFERENCES

1. Maroko PR, Kjekshus JK, Sobel BE, Watanabe T, Covell JW, Ross Jr J, et al. Factors influencing infarct size following experimental coronary artery occlusions. *Circulation*. 1971;43:67–82.
2. Primary versus tenecteplase-facilitated percutaneous coronary intervention in patients with ST-segment elevation acute myocardial infarction (ASSENT-4 PCI): randomised trial. *Lancet*. 2006;367:569–78.
3. Kesteloot H, Sans S, Kromhout D. Dynamics of cardiovascular and all-cause mortality in Western and Eastern Europe between 1970 and 2000. *Eur Heart J*. 2006;27:107–13.
4. Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, et al. Heart disease and stroke statistics –2011 update: a report from the American Heart Association. *Circulation*. 2011;123:e18–209.
5. Allender S, Scarborough P, Peto V, Rayner M, Leal J, Luengo-Fernandez R, et al. European cardiovascular disease statistics. London: British Heart Foundation; 2008.
6. Heidenreich PA, Trogon JG, Khavjou OA, Butler J, Dracup K, Ezekowitz MD, et al. Forecasting the future of cardiovascular disease in the United States. *Circulation*. 2011;123:933–44.
7. Andrés E, Cordero A, Magán P, Alegría E, León M, Luengo E, et al. Mortalidad a largo plazo y reingreso hospitalario tras infarto agudo de miocardio: un estudio de seguimiento de ocho años. *Rev Esp Cardiol*. 2012;65:414–20.
8. Fox KA, Carruthers KF, Dunbar DR, Graham C, Manning JR, De Raedt H, et al. Underestimated and under-recognized: the late consequences of acute coronary syndrome (GRACE UK-Belgian Study). *Eur Heart J*. 2010;31:2755–64.
9. Garcia-Garcia C, Subirana I, Sala J, Bruguera J, Sanz G, Valle V, et al. Long-term prognosis of first myocardial infarction according to the electrocardiographic pattern (ST elevation myocardial infarction, non-ST elevation myocardial infarction and non-classified myocardial infarction) and revascularization procedures. *Am J Cardiol*. 2011;108:1061–7.
10. Polonski L, Gasior M, Gierlotka M, Osadnik T, Kalarus Z, Trusz-Gluza M, et al. A comparison of ST elevation versus non-ST elevation myocardial infarction outcomes in a large registry database: are non-ST myocardial infarctions associated with worse long-term prognoses? *Int J Cardiol*. 2011;152:70–7.
11. Politi L, Sgura F, Rossi R, Monopoli D, Guerri E, Leuzzi C, et al. A randomised trial of target-vessel versus multi-vessel revascularisation in ST-elevation myocardial infarction: major adverse cardiac events during long-term follow-up. *Heart*. 2010;96:662–7.
12. Widimsky P, Holmes DR. How to treat patients with ST-elevation acute myocardial infarction and multi-vessel disease? *Eur Heart J*. 2011;32:396–403.
13. Vlaar PJ, Mahmoud KD, Holmes Jr DR, Van Valkenhoef G, Hillege HL, Van der Horst ICC, et al. Culprit vessel only versus multivessel and staged percutaneous coronary intervention for multivessel disease in patients presenting with ST-segment elevation myocardial infarction: a pairwise and network meta-analysis. *J Am Coll Cardiol*. 2011;58:692–703.
14. Kornowski R, Mehran R, Dangas G, Nikolsky E, Assali A, Claessen BE, et al. Prognostic impact of staged versus “one-time” multivessel percutaneous intervention in acute myocardial infarction: analysis from the HORIZONS-AMI (Harmonizing Outcomes With Revascularization and Stents in Acute Myocardial Infarction) trial. *J Am Coll Cardiol*. 2011;58:704–11.
15. Bittl JA. Interventional strategies for ST-segment elevation myocardial infarction and multivessel coronary artery disease. *J Am Coll Cardiol*. 2011;58:712–4.
16. Krumholz HM, Anderson JL, Bachelder BL, Fesmire FM, Fihn SD, Foody JM, et al. ACC/AHA 2008 performance measures for adults with ST-elevation and non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Performance Measures for ST-Elevation and Non-ST-Elevation Myocardial Infarction) developed in collaboration with the American Academy of Family Physicians and American College of Emergency Physicians Endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation, Society for Cardiovascular Angiography and Interventions, and Society of Hospital Medicine. *J Am Coll Cardiol*. 2008;52:2046–99.
17. Björck L, Rosengren A, Bennett K, Lappas G, Capewell S. Modelling the decreasing coronary heart disease mortality in Sweden between 1986 and 2002. *Eur Heart J*. 2009;30:1046–56.
18. Bueno Hc, Armstrong PW, Buxton MJ, Danchin N, Lubsen J, Roland E, et al. The future of clinical trials in secondary prevention after acute coronary syndromes. *Eur Heart J*. 2011;32:1583–9.