Editorial

Lights and (Some) Shadows in the Management of Acute Coronary Syndrome in Spain: the DIOCLES Study

Luces y (algunas) sombras en el manejo del síndrome coronario agudo en España: el estudio DIOCLES

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In the past few decades, The Spanish Society of Cardiology, and in particular, its Ischemic Heart Disease and Acute Cardiovascular Care Section, has made a notable contribution by creating registries to record the reality of heart disease and its treatment and prognosis in Spain. The Society has participated in or published registries in all areas of cardiology, and its studies on ischemic heart disease have been subsequently by the European Society of Cardiology to calculate the European prevalence of stable angina.[1] In the area of stable ischemic heart disease, the TRECE[2] and AVANCE[3] trials were conducted in the past decade, and in the area of acute ischemic heart disease with or without ST-segment elevation, the PRIAMHO I[4] and PRIAMHO II,[5] DESCARTES[6] and MASCARA[7] trials were also conducted in the past decade. The latter trials showed a progressive improvement in the treatment and prognosis of acute coronary heart disease in Spain. These trials were carried out following a strict methodology and with quality controls, allowing well-documented conclusions to be drawn. The DIOCLES trial (from the Spanish: Description of ischemic heart disease in Spain) was recently published by Barrabés et al in *Revista Española de Cardiología* and represents another step forward in this area.[8] This trial is an update of the data collected in the MASCARA trial,[7] which included patients between 2004 and 2005. Since 2005, substantial differences have been introduced in the treatment of ST-segment elevation myocardial infarction (STEMI), ranging from an increase in the number of "infarction code" networks in STEMI, with the consequent rise in the number of in primary percutaneous coronary interventions (PCI), to a radical approach and use of new drugs.

The DIOCLES trial was promoted by the Ischemic Heart Disease and Acute Cardiovascular Care Section and by the Spanish Society of Intensive Care, Critical Care and Coronary Units. The main objective was to determine in-hospital and 6-month mortality in patients admitted to hospital with suspected acute coronary syndrome (ACS) in Spain between 10 January 2012 and 15 June 2012 and to record their management. Centers were selected with the usual methodology used for the latest registries conducted in the unit, randomly preselecting 70 public or state-assisted private general hospitals with more than 50 beds recorded in the database of the Ministry of Health. Their randomization was stratified by health care level. Therefore, 35% of the total was represented by hospitals with cardiology or general critical care units with cardiac catheterization laboratories; 45% by hospitals with a critical care unit but no cardiac catheterization laboratory, and 20% by hospitals without a critical care unit. Finally, 2 centers were specifically invited. The data included were submitted to quality control by randomly selecting hospitals and checking the accuracy and completeness of the data collected. A total of 2557 patients were included with the following diagnoses: 788 (30.8%) ST-elevation ACS; 1602 (62.7%) non-ST-elevation ACS, and 167 (6.5%, a percentage that remained stable compared with the MASCARA trial) with unclassified ACS. In general, patients with non-ST-elevation ACS and unclassified ACS were older and there was a higher prevalence of women and cardiovascular risk factors, as well as more frequent use of cardiovascular drugs than in patients with ST-segment elevation ACS.

Compared with the MASCARA trial, DIOCLES reported 2 important therapeutic improvements that are probably the reason for the reduced mortality. First, according to clinical practice guidelines,[9,10] there is a clear increase in the prescription of secondary prevention drugs at discharge. Considering the total number of patients, statin prescription increased by 23.1%, angiotensin axis inhibitors (angiotensin receptor antagonists and angiotensin-converting enzyme inhibitors) by 18.1%, beta-blockers by 13.2%, aspirin by 12.0%, and clopidogrel by 22.8%. Second, in patients with STEMI, the revascularisation rate was 82%. This figure is a clear increase compared with the 68% reported in the MASCARA trial, especially due to the spread of primary PCI, which increased from 24.7% to 56.8%, as well as the increase in the number of emergency PCIs, which rose from 10.7% to 34.1%. The median time between pain onset and primary PCI was 120 minutes (door-to-balloon time in the MASCARA trial was 97 minutes) and the median time between pain onset and fibrinolysis administration was 40 minutes, whereas the door-to-needle time in the MASCARA study was 45 minutes (fibrinolysis was administered outside the hospital to one-third of patients, and in the emergency department in almost another third).

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All this has improved the in-hospital and 6-month prognosis for ACS. The DIOCLES trial recorded an in-hospital mortality rate of 4.1% (5.7% in the MASCARA trial) and a 6-month mortality rate (in patients who had been discharged) of 3.8% (vs 7.47% in the MASCARA trial). Therefore, the spread of community-based programs for the rapid treatment of ACS and the widespread application of clinical practice guidelines are already reflected in treatment times and improved patient prognosis.

However, it is worth noting that the median time between pain onset and fibrinolysis administration was 40 minutes, whereas that between pain onset and primary PCI was 120 minutes. This latter figure is still 40 minutes higher than the time recommended in European clinical practice guidelines on STEMI (especially since the figure is a median, meaning that half of the patients had more prolonged times),[9] whereas 120 minutes is the time limit indicated by the guidelines.[9] Nonetheless, this time is 80 minutes higher than that of fibrinolysis and is higher than the 60 minutes suggested by the guidelines for the decision to administer fibrinolysis instead of referring the patient for primary PCI. Importantly, a median time of 120 minutes means that half the patients were above the recommended time and therefore, fibrinolysis administration should have been considered.

Thus, both times and treatment have clearly improved, translating into a national reduction in the mortality rate, both in the acute phase (5.2% in STEMI) and after 6 months (8.0% in STEMI). This figure, as well as that for non-ST-elevation acute myocardial infarction, is in line with results in Europe. In a recent article on the treatment of reperfusion in 37 European countries, the Spanish nonreperfusion rate (pharmacological or interventional) was 42 out of 1 000 000 inhabitants, only behind Belgium and ahead of France, Great Britain, Sweden, and Denmark, among other countries.[11] In addition, according to the DIOCLES trial, STEMI mortality in Spain is somewhat lower than in Sweden, both in the acute phase and after 6 months[12]. Nevertheless, mortality is still considerable in the first 6 months following an ACS. These figures will most probably be improved by more widespread use of rehabilitation units.

Therefore, in accordance with the authors, times to reperfusion in ST elevation ACS are still far from optimal. The various initiatives and awareness campaigns on chest pain may improve the impact on the general population. The progressive spread of health care networks for acute myocardial infarction is also essential, but there probably needs to be greater awareness that the protocols should always take into consideration the time elapsed from pain onset to primary PCI. If more than 1 hour passes, fibrinolysis should be administered automatically if there are no contraindications, as mentioned in the European guidelines on STEMI, in order to then prepare the patient for emergency PCI if no reperfusion is observed, or for coronary angiography in patients with successful reperfusion. In fact, because the DIOCLES trial observed an increase in emergency PCI compared with previous studies, it seems progress has begun to be made in this area.

As usual, a good study raises more questions than it provides answers, such as the suitability of using a scale like the GRACE model in patients to stratify prognosis,[13,14] specific analysis of the outcome of patients who receive fibrinolysis within the recommended times and who then undergo an intervention vs those outside the therapeutic window who then also undergo an intervention, the number of patients who were referred to rehabilitation units, etc. Over the coming years, the DIOCLES trial

will continue to be a useful resource for handling acute ischemic heart disease in Spain.

To conclude, the treatment of acute ischemic heart disease in Spain has many more lights than shadows and is progressing satisfactorily, in line with similar Western countries. However, there are still some shadowy areas and therefore room for improvement. One of the most evident shadows is the absence of a universal infarction code to be used throughout Spanish territory.

CONFLICTS OF INTEREST

None declared.

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