

Editorial

Beyond Reperfusion Networks in ST-segment Elevation Myocardial Infarction: Assessment of Quality of Care



Más allá de las redes asistenciales de reperfusión coronaria en el infarto con elevación del ST: evaluación de la calidad de la asistencia

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Reperfusion therapy has long since been firmly established as the treatment of choice in ST-segment elevation myocardial infarction (STEMI), since it dramatically improves outcome when delivered in a timely manner. Several randomized controlled trials (RCTs) have addressed and validated the various means of reperfusion, eg, thrombolysis, prehospital thrombolysis, rescue percutaneous coronary intervention (PCI), and primary PCI (pPCI) compared with standard therapy. RCTs have also shown that pPCI leads to a better outcome than thrombolysis. In addition, data from registries and surveys have also shown that prehospital thrombolysis, if delivered early, particularly in young patients, performs equally as well as pPCI.^{1,2}

Based on these tenets, the guidelines strongly recommend reperfusion therapy for any patient with STEMI presenting within 12 hours following symptom onset, unless contraindicated. The strategy recommended in the guidelines looks pretty straightforward. Any patient referred primarily to a PCI-capable hospital should be referred immediately to the catheterization laboratory for reperfusion. The same is true if the patient is transported from any other location, as long as the time from first medical contact to balloon is less than 2 hours, and even less than 90 minutes in the case of presumably massive STEMI.³ If these time constraints cannot be met, patients should undergo thrombolysis, preferably prehospital thrombolysis, unless contraindicated, and should be transferred immediately to the nearest PCI-capable hospital. This “drip and ship”, or pharmacoinvasive strategy, is firmly validated in RCTs.² If reperfusion has occurred on arrival at the PCI-capable hospital, then secondary PCI is recommended within 3 to 24 hours; if reperfusion has not occurred, the patient should undergo rescue PCI, also firmly validated in RCTs vs a noninvasive strategy.⁴

Despite these recommendations, registries have shown that a lack of reperfusion is still a major issue, with rates varying from a low of 25% to a high of 50%, depending on the country.⁵ Rates even vary widely within the same country. This implies that many hurdles still exist along the pathway to reperfusion. Some

obstacles are linked to the lack of adequate structures. For example, data from the European Society of Cardiology reporting the reperfusion rate in the member countries show that low-income countries clearly cannot offer reperfusion therapy—particularly pPCI—to all those who are candidates for reperfusion. It is also clear that within the same country, irrespective of its income, the reperfusion rate may vary considerably from one center to another. Several factors may explain these situations, such as lack of information, difficult logistics in mountainous areas, long distances and transfer times to the nearest hospital, and perilous weather conditions. Human factors may also play a role, as some physicians may not be willing to adhere to regional or national programs for reperfusion, or they may be reluctant to transfer their patients with STEMI because they feel devaluated by the “loss” of the most “interesting” cases. These are some of the obstacles that need to be overcome when considering reperfusion as a national cause. Indeed, many initiatives have been undertaken to improve implementation rates for reperfusion therapy within countries. In Europe, some smaller countries in terms of population and size have succeeded in implementing pPCI in almost all patients with STEMI thanks to nationwide initiatives, raising reperfusion rates to very high levels. Short distances to the nearest PCI-capable hospital, motivation and the implementation of reperfusion networks are key elements to success. This implies that all contributors to the network, namely physicians, paramedics, ambulance services, and emergency mobile services, who may be confronted with STEMI patients, must understand what is at stake; they must agree on a predefined protocol and act accordingly to speed up the process and shorten delays in order to improve the reperfusion rate.

In this regard, the current report published in *Revista Española de Cardiología* on reperfusion in Spain is remarkable.⁶ Based on hospital records of the Spanish National Health System involving almost all regions of Spain, the report analyzes in-hospital outcome of STEMI patients over a period of several years after the implementation of reperfusion networks, with a focus on mechanical reperfusion. Cequier et al. report an increase in the overall reperfusion rate, driven by the increase in PCI rate with, in parallel, a reduction in in-hospital mortality. This increase in PCI rates over the 9 years of the survey implies that centers have developed reperfusion pathways, probably due to improved

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awareness, better training of physicians and centers over time, and improved adherence to guideline-recommended therapies within the networks.⁷ The mortality rate was lowest in patients undergoing PCI, intermediate in patients undergoing thrombolysis, and highest in patients denied reperfusion. The latter were older and had more comorbidities than those undergoing reperfusion. This is yet another manifestation of the treatment paradox, whereby the sickest patients do not receive the most aggressive therapy, and it has clear repercussions on outcomes. This is not specific to Spain and has been observed in many other registries published to date.⁸

In their discussion, the authors clearly acknowledge the hurdles to implementing reperfusion networks, and the fact that the reperfusion rate varies considerably within their country for undetermined reasons, possibly a lack of adequate means. They are also conscious that the most severe patients have less access to reperfusion. Last, they are aware of the limitations inherent to datasets extracted from databases of the health care system, in particular, lack of access to important information or endpoints such as, for example, bleeding. Information about the type of PCI performed is also missing. Is this chiefly pPCI? What is the rate of secondary or rescue PCI? Similarly, what is the rate of prehospital thrombolysis? This kind of information is important to understand how to improve the efficacy of a reperfusion network. Therefore, the next step could well be the organization of a national STEMI registry. Surveys at regular intervals are easier to implement than a registry, but can nonetheless provide good quality data.

Assessing quality of care could also be an important endeavor in Spain, as in many other countries.^{9,10} While reducing mortality is the ultimate goal of treatment, it is established that the cause of in-hospital death in STEMI patients is multifactorial, driven mainly by the patient's condition and comorbidities, and only partially by the quality of care. In addition, issues of statistical power explain why measuring the health care process is more reliable than measuring outcomes as a means to assess the quality of care.¹¹ Thus, assessing quality of care has become a widely used tool in this field. The current report shows how difficult it is for physicians to assess the quality of care, because of the aforementioned limitations inherent to the exploitation of large health care databases. Is it enough to consider that regional/national reperfusion networks are now adequately developed, and that the reperfusion rate has risen and mortality decreased? This report provides no insight into adherence to guidelines in terms of times to reperfusion, antithrombotic treatment, risk assessment, discharge treatment, and patient information, all factors that may have a strong influence on in-hospital and long-term outcome. The Acute Cardiac Care Association (ACCA) of the European Society of Cardiology recently defined quality indicators (QIs) for the management of acute myocardial infarction, covering 7 domains of care,¹² and these will likely help physicians (but also authorities, insurance companies and the press) to better assess quality of care. The ACCA QIs were defined with a view to improving quality, but can also serve for center benchmarking. "Center organization" is one of the 7 domains of care covered by the ACCA QIs, and the relevant QI stipulates that "the center should be part of a network organization with written protocols for rapid and efficient management".¹²

Given the growing interest in assessment of quality of care, we may find that in the future, the standards defined by the ACCA become used in clinical practice, in addition to registries, allowing regional, national and international comparisons of the care delivered to patients. This would also allow the identification of potential weak points and consequently, areas where there remains room for improvement.

CONFLICTS OF INTEREST

F. Schiele reports fees for lectures and/or speaker's bureau from Sanofi-Aventis, Amgen, Pfizer, Astra-Zeneca, MSD, BMS, and Daiichi-Sankyo, outside the submitted work. J. P. Bassand reports fees for lectures and/or speaker's bureau from Aspen, outside the submitted work.

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