Universal reperfusion therapy: When good is never good enough

La reperfusion myocardique universelle : quand très bien faire n’est toujours pas assez

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More than 20 years have passed since the benefit of early reperfusion therapy in the setting of ST-segment elevation acute myocardial infarction (STEMI) was first demonstrated [1]. During the past two decades the relationship between the duration of acute coronary occlusion and both functional recovery and survival has also been widely accepted [2], leading to an everyday battle to reduce the duration of coronary occlusion. Multiple strategies have been developed:

- to reduce door-to-needle time for thrombolysis (i.e., prehospital thrombolysis in France) and door-to-balloon time for primary percutaneous coronary interventions (PCIs) (i.e., prehospital triage towards the catheterization laboratory in France), to speed up the initiation of thrombolysis or PCI;
- to develop urban primary PCI networks as well as rescue PCI networks in remote areas;
- to avoid coronary reocclusion by the use of coronary stents and intense antiplatelet regimens;
- to prevent distal embolization by the use of filters or thrombus-extracting devices;
- to implement optimal secondary prevention.

These strategies, which have been implemented in many other countries, had one major objective: to allow effective and universal reperfusion in almost all patients within the golden 1 to 6 hours after onset of symptoms.
While the benefit of primary PCI over thrombolysis was first reported in 1995 [3], it took more than 10 years for this improvement to emerge in European and American guidelines, when experts were sure that they could recommend a technique of reperfusion that was widely available; primary PCI became the first-line reperfusion strategy within 12 hours after symptom onset in all cases, with the exception of patients presenting to a non-PCI hospital within 3 hours after symptom onset and who would have a door-to-needle time less than 30 minutes and a door-to-balloon time greater than 90 minutes [4].

In this issue of Archives of Cardiovascular Diseases, Dr. Juliard and colleagues report their observations over a 20-year period of the management and outcomes of patients with STEMI presenting within 6 hours of symptom onset to a tertiary Parisian University Hospital. This smart group of interventional cardiologists and emergency physicians has always been at the cutting edge of knowledge and experience in acute myocardial reperfusion, and has sometimes even driven progress in this field. Similar to other studies [5—7], the authors report a survival benefit over time in the low-to-intermediate risk population, with a temporal trend towards higher rates of reperfusion therapy, while rates of cardiogenic shock remain unchanged. Of note, there was an increase in the use of primary PCI and glycoprotein IIb/IIIa inhibitors and a parallel decrease in the use of thrombolysis. Nevertheless, several unique aspects distinguish the present work from other studies.

First, during the latest period of the study, and compared with data from Global Registry of Acute Coronary Events (GRACE) [7], patients were younger (median age 58 vs 65 years) and rates of reperfusion therapy and primary PCI were higher (95.8% vs 71% and 69.9% vs 52%, respectively) as was the use of glycoprotein IIb/IIIa inhibitors (87% vs 39%). Door-to-balloon (40 minutes) and pain-to-thrombolysis (144 minutes) times were much lower than has been reported. In-hospital mortality rates are nevertheless comparable between the two registries (5.4% vs 4.6%). There is an obvious leverage effect on mortality by the 5% in-hospital mortality rates are not only higher in patients with cardiogenic shock but also among those with prehospital cardiac arrest (24% mortality rate) and surprisingly among those transferred from another hospital ward (19% mortality rate). Although extracardiac comorbidities and delayed diagnosis are proposed as potential explanations for this finding, the role of discontinuation of antiplatelet therapy in patients with coronary artery disease, hospitalized for non-cardiac interventions may be considered [9].

In the present study, Dr. Juliard and colleagues report one of the highest rates of reperfusion therapy and successful reperfusion therapy (TIMI 3 flow rates) as well as one of the lowest in-hospital mortality rates in STEMI patients without cardiogenic shock presenting within the first 6 hours. These superb results illustrate the excellence of both the PCI programme and the network with key prehospital initiators of patient management — mobile intensive care units — leading to continuous improvement in quality of care.

References