Editorial

Strategic Steps to Improve Reperfusion in Acute Myocardial Infarction in Greece

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According to current guidelines the main therapeutic action in acute myocardial infarction with ST-segment elevation (STEMI) is the implementation of timely reperfusion, either with primary angioplasty (PCI) or with fibrinolysis, aiming at a fast and sustained opening of the culprit coronary artery.[1,2] Despite the superiority of primary PCI over fibrinolytic therapy in terms of mortality, reinfarction and stroke, all scientific societies recognise that it is not widely available.[3] Considering also the fact that fibrinolytic therapy, if administered within the first 2 or 3 hours from pain onset, may be more effective than a delayed primary PCI, the guidelines propose reperfusion algorithms that take into consideration the availability or not of a catheterisation laboratory, the time from pain onset to presentation, and the eventual transportation delays from a non-invasive hospital to an invasive one.[1] Accordingly, patients with STEMI presenting within 12 hours from pain onset at a hospital with invasive facilities should be offered primary PCI by an experienced team within 90 min from arrival. Patients with STEMI presenting at a hospital without a catheterisation laboratory within 3 hours from pain onset should be treated with fibrinolysis, unless there is certainty that fast transportation can guarantee a primary PCI within 60-100 min (time hard to achieve). Recent data suggest that this time may be significantly shorter (e.g. only 40 min for a patient younger than 65, with an anterior infarction, within 2 hours from pain onset).[4] This could mean that, even in invasive centres, fibrinolysis may occasionally be preferable to a relatively delayed primary PCI. Patients presenting in non-invasive hospitals 3-12 hours from pain onset are candidates either for transfer for primary PCI (provided no long delay is expected) or for immediate on-site fibrinolysis. Finally, in countries where pre-hospital fibrinolysis has been implemented the results were better than for in-hospital administration[5] and eventually equal to those of primary PCI.[6]

In order to implement a panhellenic programme for optimal management of STEMI patients that will not only be consistent with the guidelines but will also take into consideration the current situation, it is necessary to study in detail all available data from registries.[7] Recently, the results of HELIOS, a registry which is by design representative of the actual situation in Greece, were published.[8] From the HELIOS data it is evident that, unfortunately, around 40% of STEMI patients do not receive any form of reperfusion therapy and that pre-hospital fibrinolysis is practically non-existent.

The goal of having primary PCI performed in every single STEMI patient on a countrywide basis, within a minimal time delay from presentation, by an experienced team, is understandably distant and perhaps not necessary. However the situation can

be improved as of today, with feasible, consecutive steps. We believe that such steps should be the following:

1. In hospitals with a catheterisation laboratory all STEMI patients should be treated with primary PCI, provided that a minimal delay is guaranteed. The administration of fibrinolysis in the case of an expected delay in the catheterisation laboratory may often be the indicated action. Moreover, since the experience of the invasive cardiologist is of paramount importance, it lies within each laboratory's responsibility to ensure the quality of its results.

2. Hospitals without a catheterisation laboratory (as well as those that, despite having a laboratory, cannot cover all their needs for primary PCI) should be constantly alert to the optimal use of fibrinolysis. The minimisation of time delays and the administration of fibrinolysis in the Emergency Department is the responsibility of each institution. A structured checklist for easy identification of the indications and possible contraindications would be useful, not only for avoiding errors, but also for achieving a "door to needle" time less than 30 min. Vigilance for signs of failed fibrinolysis and transfer for rescue PCI is equally important. The goal of reducing the percentage of patients who receive neither fibrinolysis nor primary PCI is a top priority.

3. Once every hospital has optimised its procedural actions for reperfusion, a central system to guide patients with STEMI to primary PCI centres could then be attempted. This could be achieved either directly, with the national ambulance system (EKAB) transferring patients to a receiving invasive centre, or indirectly, by guaranteed fast transportation via the initial non-invasive hospital. It should be noted that the development of new invasive facilities in certain geographical areas will inevitably create low-volume centres of dubious utility. Current guidelines insist on a minimum caseload per hospital and per operator in order to maintain competence.[1]

4. In those areas of the country where patients present initially at a Health Centre it is important to have the ability to administer pre-hospital fibrinolysis. The transportation of a patient with STEMI from a Health Centre to a peripheral hospital for fibrinolysis constitutes an unnecessary delay. A countrywide prehospital fibrinolysis system is rather complicated but deserves thorough study.

5. In parallel with the above steps, a continuing public awareness campaign could increase at a panhellenic level the number of patients with STEMI who seek medical assistance within 3 hours from pain onset.

All steps should be carried out methodically and tested constantly for their effectiveness. The detailed study of all available data from existing registries is absolutely necessary before decisions are taken. It is vital to create a continuous electronic registry of all patients with acute myocardial infarction who are admitted to every single hospital of the country. Sweden's RIKS-HIA registry could serve as an example.[9] The continuous recording of all time delays, the comparison of the observed versus the expected outcomes, and the monitoring of temporal trends in mortality and adverse events are important for taking immediate corrective measures. The unrestricted transfer, without a carefully planned system, of all patients to invasive centres that are poorly prepared to receive a high volume of cases, would unavoidably lead to delayed treatment and perhaps inferior outcome. The ultimate goal is not just to have high percentages of primary PCI in the country, but to improve the outcome of patients with acute myocardial infarction. Towards this direction, and in line with the above proposed steps, a panhellenic strategy to improve reperfusion in acute myocardial infarction is now necessary.

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