Editor’s Commentary: One Size Does Not Fit All

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In this present series of “Mini-Review: Expert Opinions,” leading clinical investigators present their cases for treatment of acute ST-segment elevation myocardial infarction with thrombolytic therapy or percutaneous coronary intervention (PCI). The investigators review relevant studies and their own experience that support their positions.

A review of information provided by Drs Armstrong, Collen, and Antman1 and Grines, Serruys, and O’Neill,2 as well as other relevant literature related to the treatment of acute ST-elevation myocardial infarcts, would lead the unbiased reviewer to conclude that the optimal therapy presently available is an acute intervention, ie, PCI (or surgical revascularization), if that procedure can be done by experts within at least 90 minutes of the event. One obtains the most rapid opening of the infarct-related artery and the best perfusion of the infarct-injured zone associated with no or little risk of intracerebral hemorrhage with PCI. However, this is not always possible to do. Many infarcts occur in the early morning hours in patients at considerable distances from a hospital where such therapy is available. In other cases, the necessary facility may not be available in a timely manner or an experienced and capable operator may not be present. Although patients have been transported over some distance to reach a hospital where such therapy can be given, it still appears that if this process requires several hours to accomplish, the real advantage of PCI is markedly diminished.

There are patient subsets where PCI is also preferable, and these include, among others, the very elderly, patients with recent major surgery, patients with bleeding diatheses, those with sustained severe systemic arterial hypertension, those with extensive resuscitation efforts, and patients with severe hemodynamic compromise as a consequence of a large myocardial infarction.

However, thrombolytic therapy also has its place, most especially when the delay required to implement PCI may be several hours, particularly if the thrombolytic therapy may be given very soon after onset of the ST-segment elevation infarction. Advances have been made in the ease of administration of thrombolytic agents and in the rapidity of their action. Considerable experience has been gained now in the concomitant administration of antithrombin and potent platelet inhibitory therapies along with a thrombolytic intervention, potentially allowing a lower dose of the thrombolytic intervention to be used with additive improvement in myocardial perfusion. The further development of increasingly fibrin-specific thrombolytic agents with rapid action and minimal risk of systemic bleeding would also importantly influence the choice of intervention in patients with ST-elevation infarcts.

Clearly, one size does not fit all, as is the case in most similar situations, and the therapeutic intervention selected needs to be tailored to the needs of the individual patient so that the best therapy is given according to the available alternatives. This should be done with the realization that both PCI and thrombolytic therapy are likely to continue to improve with the availability of selectively coated stents that markedly reduce the risk of restenosis, as well as with further development of thrombolytic interventions so they become very rapidly effective and increasingly safe.

I am hopeful that we will ultimately have a medical care system that makes the best therapy available relatively promptly to individuals who experience acute ST-segment elevation infarcts. We need to develop specialized centers for the treatment of acute coronary syndromes, being certain that the necessary physician and support team talent is available and that at least one of these forms of therapy (PCI or...
thrombolytic therapy), and preferably both, are available for use. In the major centers, both forms of therapy should be available, with physicians trained to use both well. In small rural community hospitals that are long distances from major medical centers, it will be necessary to designate a center as a specialized location for the treatment of acute coronary syndromes. In some instances, it may be that only thrombolytic therapy will be available, but clearly when patients are selected carefully and treated correctly, this has major potential advantages. In other instances, it may be possible to develop rapid transport systems that could reach a major medical center hospital that has been designated as a specialized center for the treatment of these individuals within 30 minutes to 1 hour. I hope that we will develop a medical care system that will allow one to rapidly identify patients at very high-risk for future ST-segment elevation myocardial infarction (and other acute coronary syndromes), and when such an event occurs, to give thrombolytic therapy within minutes of the event to appropriate patients, thereby limiting myocardial damage. I believe that we should remain interested in early thrombolytic therapy when rapid PCI is not available, followed by careful evaluation of the patient as he/she reaches a specialized center. PCI should then be used in the patient with incomplete coronary revascularization after thrombolytic therapy, i.e., “facilitated PCI.” We should develop the ability to identify patients with ST-segment elevation myocardial infarcts in their homes or at the scene by appropriate ECG monitoring and have the capability to treat those that are appropriate with effective thrombolytic therapy followed by their transport to the closest specialized center where all treatment options are available.

We must remember that the need for prevention remains paramount. It is also my hope that current efforts to identify “vulnerable” atherosclerotic plaques by invasive and noninvasive means will come to fruition in the near future, allowing local and systemic treatments that reduce, and hopefully prevent, the development of acute coronary syndromes altogether.

References
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