

Acknowledgement

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Perspectives in GIM

Reperfusion Therapy for ST Elevation Myocardial Infarction: What Is Relevant to the General Internist?

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About the Author

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The management of acute ST elevation myocardial infarction (STEMI) has been extensively studied. The *American College of Cardiology/American Heart Association Guidelines for the Management of Patients with ST-Elevation Myocardial Infarction*, developed in collaboration with the Canadian Cardiovascular Society, were published in 2004¹ and subsequently updated in 2007.² One of the key components addressed by these guidelines was the area of reperfusion therapy.

Fibrinolytic therapy has been shown to reduce mortality in STEMI patients and has been accepted as a standard of care. Subsequent studies comparing fibrinolytic therapy to primary percutaneous coronary intervention (PCI) defined the role of primary PCI as highly effective, with lower rates of recurrence of myocardial infarction, a decreased incidence of stroke, and better short-term survival.³

Trials of reperfusion therapy using either fibrinolysis or PCI intervention have used the inclusion criteria of “chest pain” of at least 20 minutes’ duration within 6 hours of presentation, and the presence

of the standard ST elevation criteria on an electrocardiogram (EKG). However, it should be recognized that some patients with STEMI, especially the elderly, may present with atypical symptoms.^{4,5} Nevertheless, the presence of the EKG diagnostic criteria for STEMI in this population still implies a total coronary artery occlusion. The association of ST elevation with total coronary artery occlusion is clearly documented.^{6,7} Delays in instituting timely reperfusion therapy in patients with either typical or atypical symptoms result in ongoing myocardial necrosis with unfavourable ventricular remodelling in the subacute phase, and possibly left ventricular dysfunction over long term.

Should “pain free” patients with persistent ST segment elevation be thrombolized? Generally speaking, the answer is, Yes! In patients who present with atypical symptoms, the onset of their acute infarct may be difficult to identify. Consideration should be given to reperfusion if the predominant finding on EKG is ST elevation. In contrast, if the EKG shows significant Q waves, the process of myocardial necrosis may be

advanced and the reperfusion therapy may not be able to salvage a significant amount of myocardium.

What Are the ACC/AHA STEMI Recommendations for Reperfusion?

The ACC/AHA STEMI guidelines state: “The committee continues to endorse the concept that faster times to reperfusion and better systems of care are associated with important reductions in morbidity and mortality rates in patients with STEMI. An underutilized but effective strategy for improving systems of care for STEMI patients is to expand the use of pre-hospital 12 lead electrocardiogram programs by emergency medical systems (EMS) that provide advanced life support.” The overarching goal is to keep ischemic time within 120 minutes. When primary PCI is available, the best outcomes are achieved by offering this strategy 24 hours per day, 7 days a week. The goal should be to achieve a “door to balloon” time within 90 minutes. With use of primary PCI, the recommendation is to have an ongoing program of outcome analysis and periodic review of the process of care. A national initiative has been put in place in the United States to improve quality of care and outcomes in STEMI patients.⁸ Hospitals without PCI facilities should achieve a door-to-needle time of 30 minutes for STEMI patients. Patients with STEMI who present at a non-PCI hospital in cardiogenic shock or with contraindications to fibrinolysis should be transferred urgently to a PCI facility. Following use of fibrinolytic therapy, rescue PCI is suggested in the following situations: ongoing hemodynamic or electrical instability; persistent ischemic symptoms; or <50% resolution of ST elevation 90 minutes after therapy – in moderate to large-sized infarcts.

What Is Necessary to Implement These STEMI Guidelines in Canada?

Provinces need to enhance their “systems of care” for STEMI management. Every province in Canada is unique in regard to facilities for timely PCI for STEMI patients and their availability of pre-hospital 12-lead EKGs and prehospital fibrinolysis.

In the province of Nova Scotia, all ambulances have been equipped with 12-lead electrocardiogram services, and some of them have the capability of transmitting EKGs to the nearest emergency department. The use of prehospital fibrinolysis has been established in one region, with plans to gradually extend it to other regions of the province. The primary PCI area is being expanded to include cases where a door-to-balloon time would be achievable within 90 minutes. Within this area, the cardiac catheterization laboratory can be activated with a diagnostic prehospital EKG. Nova Scotia guidelines for ACS management prepared under the auspices of Cardiovascular Health Nova Scotia,⁹ a provincial

Department of Health program, have been disseminated to all regional hospitals in the province. These guidelines define the inclusion criteria for referral for primary and rescue PCI within the province.

Such efforts to enhance STEMI systems are likely ongoing across Canada. All emergency department physicians, internists, and cardiologists should be aware of systems in place within their region in order to improve the quality of care and outcomes of reperfusion therapy in STEMI patients.

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