Coronary reperfusion and reduction in myocardial oxygen demand are two fundamental aspects of the initial therapy for acute myocardial infarction. The association of acute myocardial infarction with the thrombotic occlusion of the coronary artery has been known since the 18th century. Subsequently, this knowledge led to the development of antiplatelet and thrombolytic therapy. Thrombolytic drugs were first discovered in the 1950s, and in the 1980s, after a long phase of experimentation, these agents became part of the clinical care of patients with acute myocardial infarction, initially by the intracoronary route and later by the IV route. The success rate of thrombolytic agents in restoring coronary blood flow sufficient enough to perfuse the myocardium is about two thirds of all cases, which implies that in the other one third of cases either these agents are not effective or the cause of coronary occlusion is not acute thrombosis. It has been well-recognized that a number of acute coronary events are due to atherosclerotic coronary dissection without thrombosis, intramural hematoma in the coronary arterial wall, and rapid atherosclerotic progress. This may explain, at least partially, the lack of coronary vessel patency in one third of the patients who receive thrombolytic drugs for acute ST-segment elevation myocardial infarction. Rescue coronary angioplasty plays a key role in such cases, but a significant period of time might have passed by the time that rescue angioplasty is performed. This has led to the concept of angioplasty as the primary reperfusion therapy, because lack of response to thrombolytic therapy cannot be identified in advance, and a lack of response to thrombolytic therapy, even if rescue angioplasty is performed, may result in substantial myocardial damage. Primary angioplasty performed in experienced centers and by experienced operators, compared to thrombolytic therapy, offers higher 90-min patency rates of the infarct-related artery with lower reinfarction and stroke rates, and lower 30-day and 6-month mortality rates. Although trials clearly have shown the short-term benefits of primary angioplasty therapy over thrombolytic therapy, a recent metaanalysis has questioned the long-term superiority of this approach. Nonetheless, certain groups of patients such as the elderly, diabetic individuals, individuals with saphenous vein graft occlusion, and individuals in cardiogenic shock may particularly benefit from undergoing primary angioplasty.

The long-term prognosis of acute myocardial infarction depends not only on coronary artery patency, but more so on the myocardial damage sustained during acute myocardial infarction. Therefore, the time from the onset of acute coronary occlusion to the opening of the culprit coronary artery is a crucial facet in the management of acute myocardial infarction, irrespective of the reperfusion method used. Angioplasty achieves this goal rapidly, as the reperfusion time with the use of thrombolytic drugs is about 90 to 120 min, and it could be even longer with the use of streptokinase. Nevertheless, primary angioplasty can be performed only in hospitals that have a cardiac catheterization laboratory and personnel who are available at the time when patient presents with acute ST-segment elevation myocardial infarction. Only 10 to 20% of hospitals in Western countries have facilities to perform angioplasty, and few can perform emergency angioplasty or have facilities that are available 24 h per day to carry out angioplasty. In addition, very few patients are fortunate enough to experience acute myocardial infarction in the vicinity of such hospitals, therefore, therapy with thrombolytic agents remains the major form of reperfusion therapy.

Lately, investigators have tested the hypothesis of transferring patients with acute ST-segment elevation myocardial infarction to specialized hospitals to undergo primary angioplasty with a reasonably acceptable time delay. The primary angioplasty in patients transferred from general community hospitals to specialized angioplasty units with or without emergency thrombolysis (PRAGUE) trial compared local thrombolytic treatment, thrombolytic treatment during transfer for angioplasty, and transfer for angioplasty without thrombolysis within 6 h of myocardial infarction in 300 patients presenting at hospitals without angioplasty facilities. Streptokinase was used as a thrombolytic agent. The local thrombolytic treatment group reached a combined end point of death, reinfarction, and stroke at 30 days in 23% of patients, the thrombolysis-during-transfer group reached it in 15% of patients, and the transfer-for-angioplasty-without-thrombolysis group reached it in 8% of patients. Reinfarction was significantly reduced in the transfer-for-angioplasty-without-thrombolysis group compared to the local thrombolytic group and the thrombolysis-during-transfer group.
group. The results of the Danish multicenter randomized trial on thrombolytic treatment vs acute coronary angioplasty in acute myocardial infarction (DANAMI-2) were more or less similar. In the DANAMI-2 trial, 1,129 patients with acute ST-segment elevation myocardial infarction were enrolled from referral hospitals and were randomly assigned to local hospital thrombolytic treatment with tissue-type plasminogen activator or to transfer (time of transfer, \( \leq 3 \) h) to a specialist center to undergo primary angioplasty. A combined end point of death, reinfarction, and disabling stroke at 30 days was reached in 8.5% of patients in the primary-angioplasty-after-transfer group and in 14.2% of patients in the thrombolysis group. The better outcome after angioplasty was driven primarily by a reduction in the rate of reinfarction.

The comparison of primary angioplasty and prehospital thrombolysis in the acute phase of myocardial infarction (CAPTIM) trial, on the other hand, did not clearly demonstrate the superiority of primary angioplasty over early thrombolysis. In this trial, 940 patients, within 6 h of the onset of acute ST-segment elevation myocardial infarction, were randomly assigned to prehospital early thrombolysis with tissue-type plasminogen activator or to primary angioplasty. There was a nonsignificant trend toward a reduction in the combined end point of death, reinfarction, and disabling stroke for angioplasty (6.2%) compared with prehospital thrombolysis (8.2%). This trend was driven chiefly by a reduction in reinfarction in the angioplasty group. However, a nonsignificant trend toward an increased mortality was seen in the angioplasty group (4.8% vs 3.8%, respectively). This trial emphasized the role of early thrombolytic therapy and reiterated the perception that it is the rapidity of reperfusion that determines the prognosis, irrespective of the method used.

Randomized controlled trials remain the best source of evidence, although they do not truly represent clinical practice because certain patients are excluded from trials, and such exclusions are not possible in routine clinical practice. Moreover, the randomized trials are designed to show the highest possible benefit with the least risk, and thus patient selection by and large aspires to attain such a goal by excluding patients who are expected to gain the least benefit and those who are at high risk. Therefore, the study cohort in the trials is generally different than the broad patient population. Besides, the situations in real life may not be suitable to implement the results of the well-proven clinical trials.

Khouzam and associates have reported such a situation in this issue of CHEST (see page 457). The Kino Community Hospital, the site of the study, is located in remote southern Arizona, near the border with Mexico, primarily serving an indigent population and lacking many technical capabilities, including a catheterization laboratory. In brief, the only reperfusion therapy available to all the patients who present to this hospital with acute ST-segment elevation myocardial infarction is medical, as economic and technical factors prohibit the possibility of undergoing primary angioplasty. The authors adopted a medical reperfusion protocol that was used in the Thrombolysis in Myocardial Infarction (TIMI)-14 trial to treat all patients who presented at the emergency department of the Kino Community Hospital with an acute ST-segment elevation myocardial infarction. The regimen consisted of the administration of low-dose tissue-type plasminogen activator along with abciximab and low-dose heparin. Over a period of 3 years, 42 patients were treated with this regimen, of whom 25 (60%) responded completely, 5 responded partially, and 12 did not respond at all. In the TIMI-14 trial, the response to treatment was assessed by the degree of flow in the culprit epicardial coronary artery, but the authors assessed the response by the resolution of ST-segment elevation, which indicates reperfusion at the myocardial tissue level and is considered to be a better reperfusion marker than the degree of flow in epicardial coronary arteries. Although it is difficult to compare responses when assessment is performed with two different methods, the response rate using the regimen in the TIMI-14 trial was 76%, but at the Kino Community Hospital it was lower (60%), likely because patients treated at the Kino Community Hospital were not selected, as it was done in the TIMI-14 trial. This report takes readers into a real-world situation that is far away from the well-controlled environment of the randomized controlled trial, and portrays the current status of treatment in a number of hospitals in the United States and around the world.

While trials have indicated that primary angioplasty (and probably transfer for primary angioplasty) is the best option for revascularization in patients with acute ST-segment elevation myocardial infarction, in most countries this option is not always possible. Even in health-care systems with the best resources, only a minority of patients with acute myocardial infarction present initially to experienced interventional hospitals or could be transferred to such centers within a reasonably acceptable time. Primary angioplasty might become a standard method for revascularization in all patient with acute myocardial infarction once health-care systems are developed in which all patients can be treated in well-equipped, experienced interventional centers or can be transferred to such centers within a reasonably acceptable time. Until then, the best initial
therapy for patients with acute myocardial infarction is to provide the best care, given the available resources, to such patients in a timely manner at any location. The choice of revascularization method should be decided swiftly, because if angioplasty is delayed excessively its efficacy may well be inferior to that of early thrombolysis, as the reduction in mortality is exceedingly influenced by the rapidity of myocardial reperfusion.

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SARS, Cough, and Fever—or Is It SARS, Fever, and Cough?

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n November of 2002, a new atypical pneumonia emerged in mainland China.1 This infection spread rapidly throughout Southeast Asia and to Canada, and came to be known as the severe acute respiratory syndrome (SARS). A non-specific case definition was established2 and a novel coronavirus (SARS-CoV) was identified as the causative agent.3,4 By the time this pandemic was declared contained in July 2003, almost 800 people had died from > 8,000 infections.5 Since July 2003, there has been no documented person-to-person spread of SARS. No one knows for sure if there is a human reservoir, but even if there is not, there is concern that animal and/or laboratory reservoirs could lead to another pandemic. Due to the rapidity of the spread, morbidity, and mortality associated with SARS-CoV, careful monitoring for recurrence of transmission and rapid implementation of control measures is in order.

Although SARS-CoV is less transmissible than previously thought, a few infected persons have been responsible for a disproportionate number of transmissions. These have been referred as super-spreading events.6,7 The incubation period for this infection is 2 to 10 days. Although some asymptomatic and mild infections have been documented, they seem to be uncommon and do not appear to contribute to the spread of disease. Transmission generally has been in close contacts and in health-care and hospital settings. The primary mode of transmission appears to be through direct or indirect contact of mucous membranes with infectious respiratory droplets or fomites.

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