Treatment of Acute Myocardial Infarction by Primary Coronary Angioplasty or Intravenous Thrombolysis

To the Editor:

The importance of time to reperfusion among patients with acute myocardial infarction treated with thrombolytic therapy has been firmly established. Recent data suggest that time to reperfusion is a critical determinant of outcome with direct angioplasty as well. The primary reason balloon angioplasty has been associated with a better outcome than thrombolytic therapy in nearly all comparative randomized trials is likely that it can achieve reperfusion more rapidly in a greater number of patients. It was with considerable surprise, therefore, that I read the registry report by Danchin et al in which they reported that, contrary to the results of randomized trials, the outcomes of patients receiving thrombolysis and primary angioplasty in the “real world” were similar.

Danchin et al’s study has 2 important shortcomings. First, the authors did not, in fact, perform “primary coronary angioplasty” because they included patients admitted up to 6 hours after the onset of symptoms and then performed angioplasty up to 24 hours after hospital admission. Direct coronary angioplasty refers specifically to angioplasty performed early during an infarction in patients with persistent pain and ECG changes and not to angioplasty performed in the 24 hours after infarction. The investigators acknowledged performing percutaneous transluminal coronary angioplasty (PTCA) later than 6 hours after the onset of symptoms in “many patients, at a time when a little benefit might be expected from the procedure” in terms of a reduction in early mortality. One can only wonder how much better the PTCA patients would have done had they been taken directly from the emergency room to the catheterization laboratory, as most patients with acute myocardial infarction are when treated at hospitals that offer direct angioplasty.

In addition, the investigators failed to provide data regarding the time from hospital admission to the administration of thrombolytic therapy or to the initiation of the angioplasty procedure (preferably the time to first balloon inflation). Had this information been included, their study might be of some benefit in understanding the relative merits of these 2 forms of reperfusion therapy. If, as I suspect, there was much a longer time to the initiation of angioplasty than to the administration of thrombolytic therapy, this study provides little insight into the most appropriate treatment for patients with acute myocardial infarction. The finding that patients alive at 5 days were 2.85 times as likely to be alive at 1 year if they had received PTCA is all the more remarkable given the study design.

Several of the largest randomized trials evaluating these procedures (eg, Primary Angioplasty in Myocardial Infarction trial [PAMI] and Global Use of Strategies to Open Occluded Coronary Arteries in Acute Coronary Syndromes [GUSTO IIb]) included many small community hospitals to better characterize the scope of patients treated with primary PTCA and accelerated tissue-type plasminogen activator. The purpose of our study, however, was to determine whether the practice of PTCA performed at the acute stage of myocardial infarction, on the scale of a whole country, proved beneficial compared with intravenous thrombolysis; both modes of reperfusion therapy were taken into account as they were used “in the real world” and not according to ideal recommendations (ie, thrombolysis included any type of thrombolytic treatment, and PTCA included all patients with symptom onset within 6 hours of hospital admission who had PTCA performed within 24 hours of admission).

In everyday life, it is not uncommon that a patient may be referred for primary PTCA (and therefore denied the use of intravenous thrombolysis) and that the time from admission to reopening of the artery is longer than initially expected because of various impediments. In France, most patients with myocardial infarction are taken from their home to an Intensive Care Unit by emergency ambulances with medical staff onboard. The scope of patients treated with primary PTCA ranges from patients who are taken directly from the ambulance to the catheterization laboratory, bypassing the emergency room and the Intensive Care Unit, to patients initially referred to “secondary” hospitals and then referred to a tertiary center with primary PTCA facilities; therefore, the actual time from symptom onset to PTCA is highly variable. We recognize that the lack of information regarding the exact time from hospital admission to first balloon inflation in our database is a limitation of the study, but that does not alter the study’s main message: overall, in France, patients treated with angioplasty at the acute stage of myocardial infarction did not fare better than those treated with thrombolysis.

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Response

We thank Dr Berger for his comments, which draw attention to the very object of our report. We certainly recognize that primary angioplasty performed by well-trained interventionists in appropriate acute care surroundings and in the first hours after the onset of myocardial infarction is superior to intravenous thrombolysis. However, in most randomized trials, the thrombolysis regimen could not be considered optimal, and in the Global Use of Strategies to Open Occluded Coronary Arteries in Acute Coronary Syndromes (GUSTO IIb) trial, the results of mortality and reinfarction at 6 months are not statistically different between treatment with primary percutaneous transluminal coronary angioplasty (PTCA) and accelerated tissue-type plasminogen activator. The purpose of our study, however, was to determine whether the practice of PTCA performed at the acute stage of myocardial infarction, on the scale of a whole country, proved beneficial compared with intravenous thrombolysis; both modes of reperfusion therapy were taken into account as they were used “in the real world” and not according to ideal recommendations (ie, thrombolysis included any type of thrombolytic treatment, and PTCA included all patients with symptom onset within 6 hours of hospital admission who had PTCA performed within 24 hours of admission). In everyday life, it is not uncommon that a patient may be referred for primary PTCA (and therefore denied the use of intravenous thrombolysis) and that the time from admission to reopening of the artery is longer than initially expected because of various impediments. In France, most patients with myocardial infarction are taken from their home to an Intensive Care Unit by emergency ambulances with medical staff onboard. The scope of patients treated with primary PTCA ranges from patients who are taken directly from the ambulance to the catheterization laboratory, bypassing the emergency room and the Intensive Care Unit, to patients initially referred to “secondary” hospitals and then referred to a tertiary center with primary PTCA facilities; therefore, the actual time from symptom onset to PTCA is highly variable. We recognize that the lack of information regarding the exact time from hospital admission to first balloon inflation in our database is a limitation of the study, but that does not alter the study’s main message: overall, in France, patients treated with angioplasty at the acute stage of myocardial infarction did not fare better than those treated with thrombolysis.
Finally, Dr Berger misinterpreted the data in Table 5 of our article. In patients alive at 5 days, the risk of being dead at 1 year is actually higher in those initially treated with PTCA than in those initially treated with thrombolysis.

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