Influence of Time to Treatment Interval on Myocardial Salvage in Patients With Acute Myocardial Infarction Treated With Coronary Artery Stenting or Thrombolysis

To the Editor:

Schömig et al 1 report an elegant study on the effect of thrombolysis or primary angioplasty on myocardial salvage in acute ST-elevation myocardial infarction. Their conclusion is that stenting is preferred over thrombolysis regarding salvage of myocardium. However, their methods raise several questions.

First, why are time intervals chosen according to the tertiles of the time-to-treatment intervals, 165 minutes (2 hours and 35 minutes) and 280 minutes (4 hours and 40 minutes)? Why not choose time intervals of 1:00, 2:00 and 3:00 hours, as in the Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries (GUSTO)-1 study? Choosing 165 minutes can be interpreted as there being too few patients treated within 2 hours after onset of pain to perform a statistical analysis.

Secondly, in patients treated with stenting, the time-to-treatment interval was calculated from the onset of symptoms to the onset of balloon inflation, which is the time to reperfusion. In patients treated with thrombolysis, the time from onset of symptoms to initiation of lytic therapy was used. However, reperfusion of the blocked artery usually occurs ∼60 minutes after initiation of lytic therapy. So, 2 different times are being compared, which is confusing, and not favorable to the thrombolysis group. In fact, the way the study is reported suggests a comparison of primary stenting and late thrombolytic therapy. In Nijmegen, The Netherlands, two thirds of patients are treated within 2 hours after onset of symptoms to initiation of lytic therapy. However, their methods raise several questions.

With regard to the definition of the time-to-treatment interval, an accurate assessment of the reperfusion time with thrombolytic therapy is difficult in the absence of serial angiographic examinations, because time interval from initiation of thrombolysis to opening of the infarct-related arteries is variable and unpredictable and can hardly be estimated noninvasively. However, to address the authors’ concern, we compared myocardial salvage in patients treated with stenting within <165 minutes (original cutoff point for the first tertile) with that of patients treated with thrombolysis within <105 minutes (original interval shortened by 60 minutes to adjust for the potential bias mentioned by Dr Elsman and colleagues). We found a salvage index of 0.56 (0.49; 0.75) in patients treated with stenting within 165 minutes and 0.41 (0.09; 0.68) in patients with thrombolysis initiated within 105 minutes from symptom onset (P=0.05).

In conclusion, the results of our study, 1 and of the additional analyses presented here, support the position of Dr Elsman and colleagues that the efficacy of thrombolysis in patients with acute myocardial infarction is largely confined to a short time interval after symptom onset. In addition, our results indicate that coronary stenting is superior to thrombolysis even in this short interval.

Peter Elsman, MD
Freek W.A. Verheugt, MD
Department of Cardiology
University Medical Center Nijmegen, The Netherlands
Evert J.P. Lamfers, MD
Department of Cardiology
Canisius-Wilhelmina Hospital Nijmegen, The Netherlands


Response

We appreciate the comments of Drs Elsman, Lamfers, and Verheugt on our study.1 The objective of our study was the assessment of the time dependence of efficacy of thrombolysis or coronary stenting in patients with acute myocardial infarction. Larger and specifically designed studies are required to define cutoff time intervals that may guide selection of optimal reperfusion strategy. Following the suggestion of the Dutch colleagues, we analyzed 43 patients of the study cohort1 treated within the first 2 hours from symptom onset and found that myocardial salvage was greater in the group with stenting than in the group with thrombolysis; salvage index, median (25th percentile; 75th percentile), 0.58 (0.49; 0.81) versus 0.41 (0.12; 0.64), respectively; P=0.05.

Albert Schömig, MD
Gjin Ndrepepa, MD
Julinda Mehilli, MD
Markus Schwaiger, MD
Helmut Schühlen, MD
Stephan Nekolla, PhD
Jürgen Pache, MD
Stefan Martinoff, MD
Hildegard Bollwein, MD
Adnan Kastrati, MD
Deutsches Herzzentrum and 1. Medizinische Klinik rechts der Isar der Technischen Universität Munich
Munich, Germany

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Peter Elsman, Freek W.A. Verheugt and Evert J.P. Lamfers

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