Prehospital Thrombolytic Therapy for ST-Segment Elevation Myocardial Infarction

The results of the ER-TIMI (Thrombolysis in Myocardial Infarction) 19 trial (1) provide yet another building block in the case for prehospital administration of thrombolytic agents to patients presenting with acute ST-segment elevation myocardial infarction (MI). These results reflect as accurately as possible the contemporary impact on time to administration (32-min decrease), and they come at a point when there is increasing focus on the use of percutaneous coronary intervention (PCI) as an alternative to thrombolysis (2). Despite the modest impact on timing, I strongly agree with the statement by Morrow et al. (1) that, with the necessary supportive infrastructure in the prehospital situation, there is little reason to delay thrombolytic treatment.

Now that the practical difficulties related to initiating medically supervised thrombolytic therapy during the prehospital phase have receded, the question focuses on which patients to treat before transport. The 12-h time window adopted for this study seems unsuitable for day-to-day practice. Eligible patients seen within the first hour or so with conspicuous electrocardiographic (ECG) evidence of myocardial injury clearly have most to gain from immediate thrombolytic treatment. For them a saving of under 30 min may be crucial, and even if short transport and door-to-drug times are anticipated, administration of a thrombolytic agent in the field would seem imperative. In contrast, those with a symptom duration in excess of 4 h and less dramatic ECG findings have less to gain and, in places where medical triage of calls from paramedics could be a limiting factor, resources might be conserved by waiting until after a short transit time to the hospital.

Because reperfusion during the early hours after onset is critical for the salvage of meaningful quantities of myocardium and because it is inconceivable that timely PCI can be implemented universally, I believe that facilities for prehospital administration of thrombolytic therapy should now be made widely available, at least for patients who seek help quickly. In countries where the ambulances are staffed by physicians this practice was generally adopted early in the thrombolytic era. Today it is highly inappropriate that patients seen early in areas served by paramedic systems should be deprived of a time-critical treatment, even for half an hour, because of a difference in medical organization. If availability of thrombolytic agents in paramedic vehicles becomes the rule rather than the exception there will be the opportunity to provide treatment at a time when much more of the myocardial “horse” is still in the “stable,” resulting in substantial benefit to patients.

The initial concept of prehospital coronary care envisaged patients coming under the umbrella of intensive care when the ambulance arrived: following appropriate stabilization, transport to the hospital without potentially harmful “haste or fuss” could take place (3). Widespread adoption of thrombolysis initiated by supervised paramedics would bring the implementation of this valid concept fully up to date.

REFERENCES


REPLY

We appreciate Dr. Geddes’ interest and comments on our report of the results of the ER-TIMI (Thrombolysis in Myocardial Infarction) 19 trial (1). We concur that it will be important for emergency medical systems implementing prehospital thrombolytic programs to develop carefully considered eligibility criteria, including evaluation of the time from symptom onset. However, the appropriate “time window” for consideration of prehospital thrombolysis may vary depending on characteristics of each emergency medical system, such as the typical transport times and other treatment options available. In systems where treatment with a fibrinolytic is the only option for timely reperfusion therapy and where field management times are long, we would be reluctant to deprive a patient presenting within 12 h of symptom onset without contraindications from receiving fibrinolytic as early as possible. The benefit of fibrinolysis within this time period has been established (2), and there is little reason to delay therapy once eligibility has been determined.

Certainly, the potential gains from prehospital fibrinolysis are less in patients presenting later in the course of acute myocardial infarction (AMI) (3). Thus, we agree that for patients activating the emergency medical response 6 to 12 h after symptom onset, other factors may be included in the decision whether to administer fibrinolytic prehospital. For example, in systems where the field management times are short (e.g., <20 min), patients with relative contraindications to fibrinolysis who are also presenting late may be served best by additional evaluation in the emergency department. Also, based on recent findings from the DANish multicenter randomized study on thrombolytic therapy versus acute coronary angioplasty in Acute Myocardial Infarction (DANAMI)-2 Trial (4), systems in which transfer for primary percutaneous coronary intervention is possible may wish to consider prehospital thrombolysis only for patients presenting very early after symptom onset. Such a strategy of deferring thrombolysis will hinge upon the expected door-to-balloon times for transferred patients.

Given the wide variation in each of these factors between emergency medical systems, it seems reasonable to tailor the details of a prehospital thrombolytic program to the system in which it will operate. In all cases, the decision whether to administer...
prehospital fibrinolytic should be made by the supervising physician on the basis of an integrated assessment of the clinical presentation, electrocardiogram, and treatment options available.

David A. Morrow, MD, MPH
Elliott M. Antman, MD
Eugene Braunwald, MD
TIMI Study Group
Cardiovascular Division
Brigham and Women’s Hospital
75 Francis Street
Boston, MA 02115
E-mail: dmorrow@rics.bwh.harvard.edu

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