SCIENCE-IN-BRIEF
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TURNING SCIENCE INTO ACTION

Pre-hospital Transport Times and Outcomes After Different Reperfusion Strategies for ST-Segment-Elevation Myocardial Infarction

The following is a synopsis of "Pre-hospital Transport Times and Outcomes After Different Reperfusion Strategies for ST-Segment-Elevation Myocardial Infarction," published in the February 1, 2019, issue of the *American Journal of Cardiology*.

What is already known on this topic?

Timely reperfusion strategy is recommended for the management of ST-segment-elevation myocardial infarction (STEMI) patients, and primary percutaneous coronary intervention (PCI) is the preferred reperfusion therapy when first-medical-contact-to-balloon time is within 90 minutes for patients admitted directly to a PCI-capable hospital and 2 hours for patients transferred to a PCI-capable hospital. For patients outside the recommended time frame for PCI, reperfusion strategy includes pharmacoinvasive therapy with fibrinolysis, followed by either rescue PCI or routine early PCI. Since PCI can be administered only at PCI-capable hospitals, geographic factors may affect the choice of reperfusion therapy for STEMI patients.

What is added by this article?

Using data from the Blue Cross Blue Shield of Michigan Cardiovascular Consortium registry, the authors evaluated prehospital transportation times and clinical outcomes in STEMI patients treated with different reperfusion strategies. The study included 27,205 STEMI patients at 47 nonfederal PCI-capable hospitals who were treated with primary, rescue, or routine early PCI between January 2010 and December 2016. Prehospital transport times for patients who were admitted directly were estimated by plotting the patient's home ZIP code in relation to the nearest PCI-capable hospital, while prehospital transport time for transfer patients was estimated as less than an hour. Clinical outcomes were analyzed by looking at postprocedural bleeding and complications.

The researchers found that 96% of the patients lived within an hour of a PCI-capable hospital and that 97% of those patients were treated with primary PCI. By contrast, only 48% of patients with longer prehospital transport times were treated with primary PCI. Overall, 95% of patients were treated with primary PCI, and the remaining 5% were treated with a pharmacoinvasive strategy. Of the patients treated with a pharmacoinvasive strategy, 59% received rescue PCI and 41% received routine early PCI. The estimated prehospital transport time for patients treated with primary PCI was 12 minutes; for those treated with a pharmacoinvasive strategy, it was 59 minutes.

Patients treated with either primary PCI or a pharmacoinvasive strategy had similar rates of postprocedural bleeding; PCI access site bleeding was the most common bleeding complication reported. Patients treated with either primary or rescue PCI had similar rates of postprocedural bleeding and other complications, as well as similar rates of in-hospital mortality.

What are the implications of these findings?

Prehospital transport time predicts the choice of reperfusion strategy for STEMI patients. As illustrated in this study, the probability of STEMI patients receiving primary PCI falls as the transport time to a PCI-capable hospital increases. Additional studies can aid development and implementation of STEMI systems of care, particularly in relation to emergency medical services transport protocols and interfacility transfer protocols, with the goal of reducing prehospital delays.

Resources

1. Centers for Disease Control and Prevention: Vital Signs: Preventing 1 Million Heart Attacks and Strokes
2. Million Hearts®: Cardiac Rehabilitation Change Package
3. American Heart Association: Improving Care of STEMI in the United States 2008 to 2012

Citation

Andersson HB, Seth M, Gurm HS, Bates ER. Pre-hospital transport times and outcomes after different reperfusion strategies for ST-elevation myocardial infarction. Am J Cardiol. 2019;123(3): 375–381. doi:10.1016/j.amjcard.2018.10.015.

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