

Transfer to PCI Hospital Slows STEMI Treatment

BY PATRICE WENDLING

FROM JAMA

Only 11% of patients with ST-elevation myocardial infarction who presented at a hospital without acute percutaneous coronary intervention capability got in and out of the referral hospital within the recommended benchmark of 30 minutes or less, in a retrospective analysis of 14,821 patients.

Moreover, STEMI patients who had a door-in to door-out (DIDO) time of more than 30 minutes had significantly higher in-hospital mortality of 5.9% compared with 2.7% for patients with a DIDO time of 30 minutes or less (see chart).

This mortality risk remained significant even after adjustment for differences in baseline patient characteristics and presenting features (adjusted odds ratio 1.56),

Patients with a DIDO time of more than 30 minutes were significantly more likely than were those with shorter DIDO times to be older; to be female; to have comorbidities such as hypertension, diabetes, and prior heart failure or stroke; and to present during off hours.

A left bundle branch block or signs of posterior myocardial infarction on the presenting ECG were also more common in those with prolonged DIDO times.

Notably, only a small minority of patients with a prolonged DIDO time (less than 1%) had contraindications to fibrinolytic therapy, which is the preferred reperfusion strategy for STEMI when access to timely primary PCI is not a viable option, Dr. Wang pointed out.

The percentage of patients achieving the guideline-recommended overall door-to-balloon time of 90 minutes or less was significantly higher for patients with a DIDO time of 30 minutes or less, compared with patients with a DIDO time greater than 30 minutes (60% vs. 13%), she reported. Accordingly, the median DTB times were significantly shorter, at 85 minutes vs. 127 minutes, respectively.

The observed in-hospital mortality rate was 5.5% during the study period. The median length of hospitalization was 3 days among all patients.

Using patients with a DIDO time of 30 minutes or less as the reference, risk-adjusted mortality increased as DIDO times lengthened from a range of 31-60 minutes (OR 1.34) to 61-90 minutes (OR 1.41) and beyond 90 minutes (OR 1.86).

“Our results underscore the importance of optimizing regional and statewide networks for STEMI systems of care,” Dr. Wang wrote.

Most American hospitals lack round-the-clock PCI capacity, although a substantial proportion of contemporary STEMI patients require interhospital transfer for primary PCI. An analysis reported earlier this year by the same group revealed that between 2005 and 2007, fewer than 10% of transferred patients with STEMI met the metric of overall door-to-balloon time of less than 90 minutes (*Am. Heart J.* 2011;161:76-83, e1).

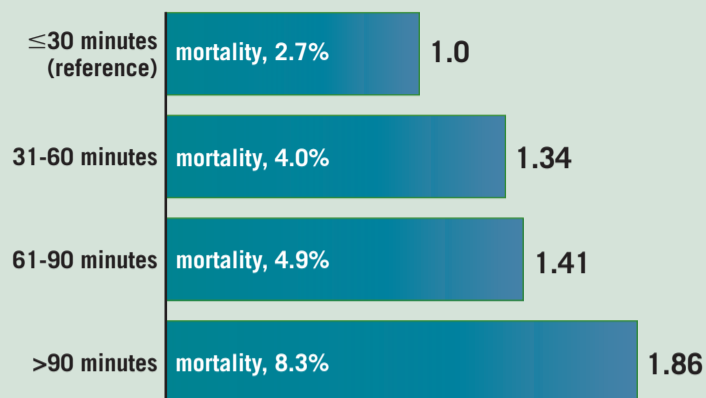
Finally, the current analysis is not without a sliver of good news.

The researchers observed that overall DTB time has further improved for transferred patients with STEMI, with about one in five patients treated within a DTB

time of less than 90 minutes. The proportion of patients with a DIDO time of 30 minutes or less also showed improvement over time, with median DIDO times falling from 90 minutes in January 2007 to 58 minutes in March 2010.

The authors noted that the proportion of STEMI patients that required interhospital transfer for primary PCI was very likely underestimated, because reperfusion is known to be underutilized in routine practice. ■

DIDO Time Associated With In-Hospital Mortality (adjusted odds ratio)



Note: Based on a retrospective analysis of 14,821 patients with STEMI. Source: JAMA 2011;305:2540-7

VITALS

Major Finding: The recommended door-in to door-out time of 30 minutes or less was observed in only 11% of transferred STEMI patients requiring revascularization.

Data Source: Retrospective analysis of 14,821 patients with STEMI transferred to 298 STEMI receiving hospitals for primary PCI.

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Dr. Tracy Y. Wang and her associates reported (*JAMA* 2011;305:2540-7).

“DIDO time is a useful performance measure attributable to STEMI referral hospitals that can be used to assess and iteratively improve effectiveness of regional STEMI networks and may further emerge as a quality benchmark to ascertain performance and accountability,” the authors wrote.

They go on to suggest that “further attention and improvement of this performance measure will translate into substantial improvement in the timeliness of primary PCI and clinical outcomes for transferred STEMI patients.”

Hospitals typically focus on shortening overall door-to-balloon (DTB) times as a way to improve the outcomes of STEMI patients, but little has been known about the impact of DIDO times as a component of the interhospital transfer process.

DIDO times are increasingly being advocated as a new quality of care metric for transferred STEMI patients, with a national benchmark of 30 minutes or less recommended by the 2008 American College of Cardiology/American Heart Association performance measures for acute myocardial infarction (*J. Am. Coll. Cardiol.* 2008;52:2046-99).

Dr. Wang and her associates identified 14,821 STEMI patients transferred to 298 STEMI receiving hospitals for primary PCI in the ACTION (Acute Coronary Treatment and Intervention Outcomes Network) Registry-Get With the Guidelines during January 2007-March 2010. The median DIDO time was 68 minutes (interquartile range 43-120 minutes).

Only 11% (1,627) of patients had a DIDO time of 30 minutes or less, while 56% had a DIDO time greater than 60 minutes, and more than one-third (35%) had a DIDO time greater than 90 minutes, reported Dr. Wang of Duke Clinical Research Institute, Durham, N.C.

EMS Efficiencies Key in Rural Areas

The most important modifiable predictor of outcome in ST-elevation myocardial infarction is time to treatment with reperfusion therapy. Primary percutaneous coronary intervention is preferred over fibrinolytic therapy as a reperfusion strategy when the delay in time to the patient presents to a high-volume, well-equipped center with expert interventional cardiologists. However, most hospitals do not have PCI capability. Their options are to transfer patients quickly for primary PCI or give the patient fibrinolytic therapy and keep the patient or transfer for urgent or delayed PCI.

Patients transferred from STEMI referral hospitals to STEMI receiving hospitals for primary PCI have substantial delays that prolong total myocardial ischemia time and increase complication and mortality rates. DIDO time of less than 30 minutes is a new performance measure meant to reduce system delays in interhospital transfer for primary PCI by referral hospitals, similar to the use of door-to-balloon times to reduce in-hospital system delays in receiving hospitals.

In this report from the ACTION Registry-GWTG, the authors emphasize that the median DIDO time was 68 minutes and only 11% of pa-

tients were within 30 minutes. However, the good news is that median DIDO times decreased from 90 minutes in January 2007 to 58 minutes in March 2010. Moreover, although only 19% achieved first door-to-balloon time within the 90 minutes, the U.S. target, 50% were within the 2-hour European target.

Unfortunately, the rural referral hospital does not have control of limited emergency transport services or geographic challenges that prolong transfer times. Therefore, this quality metric will probably have more utility in urban and suburban referral hospitals for walk-in patients where shorter interhospital transfer times are possible.

A better primary PCI strategy for these communities, however, is early triage by emergency medical services, rapid diagnosis with prehospital electrocardiography, destination protocols that bypass hospitals without PCI capability, and prehospital activation of the cardiac catheterization laboratory.

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