Health care system delay may increase risk of death for heart patients receiving reperfusion therapy

August 17 2010

For patients with a certain type of heart attack, delay in the time between first contact with emergency medical service to initiation of therapy such as balloon angioplasty is associated with an increased risk of death, according to a study in the August 18 issue of *JAMA*.

Timely reperfusion therapy with either fibrinolysis (the dissolution of fibrin) or primary percutaneous coronary intervention (PCI; procedures such as balloon angioplasty or stent placement used to open narrowed coronary arteries) is recommended for patients with ST-segment elevation myocardial infarction (STEMI; a certain pattern on an electrocardiogram following a heart attack). Door-to-balloon delay has been proposed as a performance measure in triaging patients for primary PCI. "However, focusing on the time from first contact with the health care system to the initiation of reperfusion therapy (system delay) may be more relevant, because it constitutes the total time to reperfusion modifiable by the health care system. No previous studies have focused on the association between system delay and outcome in patients with STEMI treated with primary PCI," the authors write.

Christian Juhl Terkelsen, M.D., Ph.D., of Aarhus University Hospital, Aarhus, Denmark, and colleagues assessed the associations between treatment, patient, system, and door-to-balloon delays and mortality in a large group of patients with STEMI treated with primary PCI. The study included data from Danish medical registries of patients with STEMI

transported by emergency medical service and treated with primary PCI from January 2002 to December 2008 at 3 high-volume PCI centers in Western Denmark. Patients (n = 6,209) underwent primary PCI within 12 hours of symptom onset. The median (midpoint) follow-up time was 3.4 years.

The researchers found that when stratified according to intervals of system delay, long-term cumulative mortality was 15.4 percent (n = 43) in patients with system delays of 0 through 60 minutes (n = 347), 23.3 percent (n = 380) in those with delays of 61 through 120 minutes (n = 2,643), 28.1 percent (n = 378) in those with delays of 121 through 180 minutes (n = 2,092), and 30.8 percent (n = 275) in those with delays of 181 through 360 minutes (n = 1,127). "In multivariate analysis adjusted for other predictors of mortality, system delay was independently associated with mortality, as was its components, prehospital system delay and door-to-balloon delay," the authors write.

"We conclude that health care system delay is valuable as a performance measure when patients with STEMI are treated with primary PCI, because it is associated with mortality, it constitutes the part of treatment delay modifiable by the health care system in the acute phase, and it applies to patients field-triaged directly to the PCI center as well as to patients transferred from local hospitals. Increased focus on the total health care system delay may optimize triage of patients with STEMI and may be the key to further improving survival of these patients."

Provided by JAMA and Archives Journals