Treating heart attack past recommended time may significantly increase risk of death

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An examination of the treatment received by patients with myocardial infarction (heart attack) at 80 hospitals in Quebec indicates that those who received either primary percutaneous coronary intervention (PPCI; such as angioplasty) or fibrinolysis (administration of medication to dissolve blood clots) beyond the times recommended in international guidelines had a significantly increased risk of death within 30 days, along with an increased risk of the combined outcome of death or readmission for heart attack or heart failure at one year, according to a study in the June 2 issue of *JAMA*.

"Both primary percutaneous coronary intervention and fibrinolysis are well-recognized treatments for STEMI in international guidelines, and benefits are maximized when treatment occurs early," according to background information in the article. STEMI (ST-segment elevation myocardial infarction) is a certain pattern on an electrocardiogram following a heart attack. "However, randomized trials and selective registries are limited in their ability to assess the effect of timeliness of reperfusion on outcomes in real-world STEMI patients."

Laurie Lambert, Ph.D., of the Quebec Healthcare Assessment Agency, Montreal, Canada, and colleagues conducted a province-wide evaluation of STEMI care in Quebec (population, 7.8 million) to determine the use of reperfusion treatments (such as PPCI or fibrinolysis) and their delays and whether STEMI reperfusion treatment outside of the guideline-recommended delays was associated with poorer outcomes than treatment within recommended delays. The researchers analyzed data of

STEMI care for 6 months during 2006-2007 in 80 hospitals in Quebec. Maximum delays recommended in international guidelines for PPCI are 90 minutes; 30 minutes for fibrinolysis.

Of the patients treated with acute reperfusion (n = 1,832), 78.6 percent (1,440) underwent PPCI and 21.4 percent (392) received fibrinolytic therapy. Among patients who underwent PPCI, the median (midpoint) door-to-balloon time was 110 minutes. PPCI was untimely (greater than 90 minutes) in 68 percent of patients. For patients who received fibrinolysis, the median delay was 33 minutes, and untimely (greater than 30 minutes) in 54 percent of patients. Incidence of the combined outcome (death or readmission for heart failure or heart attack) at 1 year was 13.5 percent for fibrinolysis patients and 13.6 percent for PPCI patients.

"When the 2 treatment groups were combined, patients treated outside of recommended delays had an adjusted higher risk of death at 30 days (6.6 percent vs. 3.3 percent) and a statistically nonsignificant increase in risk of death at 1 year (9.3 percent vs. 5.2 percent) compared with patients who received timely treatment. Patients treated outside of recommended delays also had an adjusted higher risk for the combined outcome of death or hospital readmission for congestive heart failure or acute myocardial infarction [heart attack] at 1 year (15.0 percent vs. 9.2 percent). At the regional level, after adjustment, each 10 percent increase in patients treated within the recommended time was associated with a decrease in the region-level odds of overall 30-day mortality," the authors write.

"Our study, while consistent with registry and clinical data associating longer treatment delays with poorer outcomes, is novel and robust in several ways. Above all, it represents not a sampling but more than 95 percent of all STEMI patients within a large and complex system of care and provides very recent information that transcends the relative

selectivity of randomized clinical trials and most registries."

" … we believe this evaluation represents a needed contribution to the evidence base for deriving clinical practice guidelines and an important advance in knowledge of the outcomes associated with contemporary processes of STEMI care. This 'real-world' information is relevant both clinically and from a perspective of evidence-based health care policy and planning, pointing to the lifesaving potential for approaches that focus on offering the most timely reperfusion treatment to patients with STEMI," the researchers write.

They add that time, rather than mode of reperfusion, emerges as a critical determinant of outcome in this systematic evaluation of STEMI care. "Regardless of reperfusion strategy, patients treated beyond maximum recommended delays had increased mortality."

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