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Restoring blood flow quickly after heart attack symptoms appear may help reduce heart damage

Published on December 29, 2015 at 12:59 AM

While hospitals have made strides in reducing the time it takes to treat heart attack patients once they arrive at the hospital, patient delays recognizing symptoms and seeking treatment are associated with increased damage to the heart, according to a study published online today in *JACC: Cardiovascular Interventions*.

Door-to-balloon time is the time from when a heart attack patient arrives in the emergency room until percutaneous coronary intervention is performed to restore blood flow. American College of Cardiology/American Heart Association guidelines state that hospitals treating STEMI patients with emergency percutaneous coronary intervention should do so within 90 minutes or less of reaching the hospital, and the ACC launched the Door-to-Balloon (D2B) Alliance in 2006 to reduce the time to which STEMI patients receive percutaneous coronary intervention in U.S. hospitals.

According to the study, in about 90 percent of percutaneous coronary intervention cases, blood flow is restored in the surface of the heart, but in about one-third of patients, blood flow is not restored to the heart muscle. Researchers in this study compared the impact of the time from heart attack symptom onset-to-balloon and door-to-balloon on heart muscle function.

Researchers reviewed the records of 2,056 patients in the multi-center Harmonizing Outcomes with Revascularization and Stents in Acute Myocardial Infarction (HORIZONS-AMI) trial comparing patients with symptom onset-to-balloon time in three categories 1) two hours and less, 2) more than two hours to four hours, and 3) more than four hours.

Patients in the study who took a total of two to four hours or longer from the onset of symptoms to get treated with a balloon angioplasty to restore blood flow to the heart were less likely to have blood flow fully restored to the heart and were more likely to die within three years than patients treated more quickly.

"The decrease in median door-to-balloon time in recent years has not resulted in a reduction in mortality in STEMI patients," said Roxana Mehran, M.D., a study author and director of interventional cardiovascular research and clinical trials at the Zena and Michael A. Weiner Cardiovascular Institute at Mount Sinai School of Medicine. "This study highlights the need to reconsider the role of door-to-balloon as a performance metric and examine the utility of a broader metric of systems delay such as first medical contact to balloon time as well as total ischemic time."

In an accompanying editorial, Michael A. Kutcher, M.D., of Wake Forest Baptist Medical Center, said the door-to-balloon metric and systems in place are extremely valuable and should continue; however, physicians need to pay attention to associated metrics such as the symptoms and signs of the onset of ischemia, which is loss of blood flow. He attributed the lack of significant improvement in mortality and morbidity with reduced door-to-balloon time to the fact that microvascular damage can still occur with shorter door to balloon times and can lead to increased risk of death.

"Patients with prolonged symptom onset-to-balloon time are a high risk group and should be treated accordingly with assertive strategies," Kutcher said. "We as an interventional cardiology community should continue to educate the public and health care providers regarding the importance to quantify symptom onset-to-balloon time and follow through with prompt action."

Source:

American College of Cardiology
