Medical Xpress

Reperfusion therapy type for heart attacks seems less important than assuring all patients receive timely treatment

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Patients suffering the classic type of heart attack, ST-elevation myocardial infarction (STEMI), are recommended to undergo reperfusion therapy immediately to restore blood flow to the heart. However, not all STEMI patients receive this potentially life-saving treatment. In a study published in the *Canadian Journal of Cardiology*, researchers found that patients who did not receive reperfusion treatment had a 30-day mortality rate three to four times higher than patients who did. Moreover, the type of hospital where the patient initially presented also made a significant difference.

STEMI is typically treated with either coronary angioplasty (primary percutaneous coronary intervention [PPCI]) to dislodge the clot and widen the narrowed coronary artery or fibrinolysis with chemicals to break down the clot. These reperfusion therapies restore normal blood flow and can increase chances of survival. For these therapies to work, they should be administered quickly - the standard of care is within 90 minutes for PPCI and 30 minutes for fibrinolysis.

Given the superiority of PPCI in randomized controlled trials, a reasonable question is whether more PPCI centers are required. The authors address this question by characterizing the participating hospital centers as 1) dedicated PPCI centers that always treat STEMI patients with PPCI; 2) fibrinolysis centers that treat with only fibrinolysis because they are located remote from PPCI centers; 3) transfer centers

near PPCI centers that exclusively transfer their patients for PPCI; and 4) "mixed centers," also generally more remote from PPCI facilities, that treat some of their STEMI patients with fibrinolysis and transfer others for PPCI.

Investigators examined the records of over 3,700 STEMI patients admitted to all 82 Quebec acute care hospitals, and found that more than 2,900 patients received reperfusion treatment (81% PPCI, 19% fibrinolysis), while more than 800 patients (21.8%) did not. Mortality did not differ among reperfused patients regardless of which of the four types of centers initially received the patient and despite treatment delays which were particularly long for patients transferred for PPCI from mixed centers. However, when mortality of ALL patients, both reperfused and non-reperfused, was examined, the mortality in mixed treatment centers was statistically greater than in the other centers.

"Prognosis is better if these interventions can be performed with minimal delay. Studies have extensively investigated and compared these treatments, focusing on time to treatment and how to improve it. But a substantial number of patients with STEMI do not receive reperfusion treatment at all for various reasons and their likelihood of death is significantly higher," noted lead investigator Laurie J. Lambert, PhD, of the Cardiovascular Evaluation Unit, Institut National d'Excellence en Santé et en Services Sociaux (INESSS), Montreal, Quebec, Canada.

Dr. Lambert explained the significance of their observations as follows: "Some studies have obtained puzzling findings suggesting that treatment delays may not matter so much in patients treated with PPCI. Our observations suggest that patients transferred long distances for PPCI tend to be at lower risk and have relatively good outcomes by virtue of their low baseline risk, even if overly long treatment delays occur. However, the fate of higher risk patients who have not received reperfusion treatment may go undocumented and unappreciated.

Attention needs to be brought to these higher risk patients, and better ways found to improve their outcome."

Examining the profiles and outcomes of all patients, and not only those receiving reperfusion treatment, may substantially improve patient outcomes by identifying important gaps in treatment and reducing to a minimum the proportion of STEMI patients not receiving reperfusion treatment. This study suggests that in the real world receiving timely reperfusion therapy is more important than which particular modality is utilized.

In an accompanying editorial, Rabih Azar, MD, MPH, of the Hotel Dieu de France Hospital and the St. Joseph University Faculty of Medicine (Beirut, Lebanon), and David Waters, MD, of the San Francisco General Hospital and the University of California San Francisco, commented that, "This study has important clinical and public health implications. As the authors have mentioned, rather than increasing the number of facilities with on-site PPCI, the functioning of the health care system should be improved. Two major targets for intervention are the number of patients who get reperfusion therapy and the delay of such therapy. Transfer networks should be revised and improved in order to facilitate and accelerate transfers. Mixed centers where PPCI was almost always delayed while fibrinolysis was given promptly could be transformed into fibrinolysis centers."

More information: "Outcomes of Patients with ST-Elevation Myocardial Infarction Receiving and Not Receiving Reperfusion Therapy: The Importance of Examining All Patients," *Canadian Journal of Cardiology*, 2016.

"Editorial: Performance Deficiencies in the Treatment of ST-Elevation Myocardial Infarction in Quebec- 'Tis but a part we see, and not a whole,'" *Canadian Journal of Cardiology*, 2016.

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