Pre-activating cath labs prior to STEMI arrival speeds treatment, reduces risk

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ST-elevation myocardial infarction (STEMI) patients have a higher chance of survival if emergency medical service (EMS) teams notify the cardiac catherization lab at the hospital where the patient will be transported in advance of the patient's arrival, according to a study published today in *JACC: Cardiovascular Interventions*. However, hospital cardiac catherization labs in the U.S. are only being notified (pre-activated) at least 10 minutes in advance 41 percent of the time.

STEMI is a type of heart attack caused by a blocked blood supply to the heart. If not treated quickly, it has a high risk of disability and death.

According to this study, with pre-activation, an EMS-transported STEMI patient may be able to bypass the typical protocol of going to the emergency department first and instead go directly to the cardiac catherization lab, saving critical minutes. This study also found that the amount of time a cath lab has to pre-activate makes a significant difference in patient outcomes.

"Cath lab pre-activation is currently defined and measured simply by whether or not it occurred, regardless of its timing in relation to hospital arrival," said lead study author Jay S. Shavadia, MD, a cardiologist and researcher from Duke University Medical Center and the Duke Clinical Research Institute. "But our results suggest that the amount of notification provided is very important—if the pre-activation occurs less than 10 minutes before the patient is transported, it does not offer as much benefit to the patient."

The study examined data from the ACTION Registry—now known as the Chest Pain—MI Registry—which includes patients admitted to participating hospitals with STEMI or non-STEMI (NSTEMI). Researchers analyzed 27,840 pre-hospital identified STEMI patients transported to 744 primary percutaneous coronary intervention (PCI)-capable hospitals (hospitals with cath labs) who were treated with PCI from January 2015 to March 2017.

The analysis found that cath lab pre-activation was associated with a:

- Median 12-minute shorter door-to-device time, the amount of time it takes from when a patient arrives at the hospital to the time a balloon and stent is implanted to open a cardiac blockage
- Higher proportion of patients achieving first medical contact-to-device times (the amount of time between first contact with EMS personnel and balloon and stent implantation) of less than 90 minutes compared with no cath lab pre-activation
- Significantly lower likelihood of reperfusion delay for patients presenting during both work hours and off-hours
- Lower risk-adjusted, in-hospital mortality compared with hospitals with lower cath lab pre-activation rates

"The study has provided data we can now use to move forward to help save more lives," Shavadia said. "The next step is to begin establishing treatment protocols between PCI-capable hospitals and pre-hospital EMS providers to facilitate and successfully implement cath lab pre-activation strategies."

These findings reflect better coordination of STEMI care between EMS and high pre-activation PCI hospitals.

"We know that shorter door-to-device times improve patient outcomes," said David J. Moliterno, MD, FACC, editor-in-chief of *JACC:*

Cardiovascular Interventions. "These findings show that even a 10-minute delay in cath lab notification may lead to increased door-to-device times. Improving coordination between EMS and PCI hospitals is necessary to reduce the time it takes to treat STEMI patients."

The impact on cath lab pre-activation in patients who were initially thought to have STEMI but turned out to have an alternate diagnosis when they arrived to the cath lab (false cath lab activation) was not evaluated in this study, and further research focused on how false cath lab pre-activation impacts patient outcomes and resource utilization needs to be considered.

More information: *JACC: Cardiovascular Interventions*, DOI: 10.1016/j.jcin.2018.07.020

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