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Clinical

Paramedic diagnosis of STEMI can reduce "door-to-balloon" time

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By Rob Goodier

NEW YORK (Reuters Health) - When paramedics diagnose acute myocardial infarction before the patient arrives at the hospital, they can greatly reduce the time to treatment, a new study found.

Door-to-balloon times -- i.e., how long it takes from when the patient enters the door of the hospital until the balloon-tipped catheter is deployed -- dropped by nearly an hour, from an average of 87 minutes to 37 minutes, according to research presented January 13 at the annual meeting of the National Association of EMS Physicians in Tucson, Arizona.

This project, and similar studies around the country, show "that it is feasible and practical to have EMS personnel diagnosing heart attacks from the scene and launching the processes needed to minimize the time to coronary intervention," Dr. David Cone told Reuters Health by email. Dr. Cone led the study at Yale University and Yale-New Haven Medical Center in Connecticut.

Warned while the patient is still en route, a hospital can activate the catheterization laboratory. After hours, catheterization teams are often off site and called in as needed.

In Dr. Cone's study, after a new protocol was initiated in May 2010, paramedics activated the catheterization laboratory in 38 cases of acute ST-segment myocardial infarction (STEMI), achieving a mean "door-to-balloon" time of 37 minutes.

In comparison, in 47 STEMI cases in which paramedics failed to notify the hospital before arrival, the door-to-balloon time averaged 87 minutes. Another 28 STEMI patients came to the hospital on their own; their mean door-to-balloon time was 80 minutes.

National guidelines by the American College of Cardiology and the American Heart Association recommend a door-to-balloon time of 90 minutes or less.

In the midst of a nationwide "D2B" campaign, the average door-to-balloon time has fallen. The median was 96 minutes at the end of 2005, dropping to 64 minutes by September 2010, according to report by Krumholz et al in *Circulation* last August.

Dr. Cone's team first assessed the accuracy with which paramedics can diagnose STEMI. A test group of 103 paramedics interpreted three STEMI and two non-STEMI 12-lead electrocardiogram readouts. They had 8.1% false positives, with a sensitivity of 92.6% and a specificity of 85.4%.

"We've been talking about this for years," said Dr. Joseph DeLucia from St. Louis University Hospital in Missouri, who was not involved in the research. "I first heard about it in 1983. Now, electronics and

communication have gotten so cheap, and paramedics are so educated, they're starting to do it and put it in effect."

Even with the false positive rate, this new system has obvious benefits, Dr. DeLucia told Reuters Health. "I wish everyone was using it," he said.

Dr. Cone noted that the data presented at the meeting didn't include outcomes. "I cannot say with any certainty that any difference was made in saving lives, limiting the amount of heart muscle damaged, etc.," he said. "However, we know that shorter times to intervention generally correlate with better outcomes, and in this project we met our goal of decreasing intervention times, to give our patients the best chance for a good outcome."

"There are a number of logistical considerations to implementing this," he added, "so each EMS system needs to carefully consider its resources and how it will go about doing this - but it can be done."

"As we (and others) gather more outcomes data, we will be able to say more definitively how much benefit there is to our patients," Dr. Cone concluded. "It may turn out that the benefit is actually fairly small, in which case EMS systems may decide that there are higher priorities for their limited resources."

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