

Heart attack victims who have ECGs in the field experience shorter time-to-treatment

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A recent study found that individuals experiencing chest pain who had electrocardiogram (ECG or EKG) assessments prior to arriving at the hospital experienced a significantly reduced time-to-treatment or door-to-balloon (D2B) time. When EMS personnel responding to cardiac emergencies obtained ECGs of the subjects in the field, the mean D2B time was 60.2 minutes compared with 90.5 minutes for in-hospital ECGs. This advanced assessment significantly reduced D2B by allowing patients to bypass the ER and be transported directly to the cardiac catheterization laboratory (CCL) for reperfusion treatment. Details of the study appear in the January 2010 issue of *Catheterization and Cardiovascular Interventions*, published by Wiley-Blackwell on behalf of The Society for Cardiovascular Angiography and Interventions.

ST-segment elevation [myocardial infarction](#) (STEMI), when a blood clot totally obstructs a coronary artery, is treated with reperfusion therapy to reestablish blood flow as quickly as possible. Prior studies showed that rapid time-to-treatment with primary [percutaneous coronary intervention](#) (PPCI), previously known as angioplasty, was associated with lower mortality rates, and for each 30 minutes of delay the relative risk of 1 year mortality increased by 7.5%. In an effort to improve patient survival rates, the American College of Cardiology (ACC) and the American Heart Association (AHA) developed national guidelines that state hospitals treating STEMI patients with PPCI should strive to achieve a median door-to-balloon time of less than 90 minutes.

The research team, led by Shukri David, M.D., FSCAI from Providence

Hospital and Medical Center, conducted a prospective, observational study of D2B time in three hospitals in Southeast Michigan from October 1, 2003 through April 30, 2008. At each center, a protocol was initiated, where EMS personnel obtained a 12-lead ECG during initial assessment in the field from patients with symptoms suggestive of STEMI. With prehospital ECGs, data is transmitted via cellular link to an emergency room (ER) computer receiving station where ER physicians interpret the information and upon diagnosis of STEMI, activate the CCL team prior to the patient's arrival. Similar data were collected for all patients who came to the ER without prehospital ECGs (the control group).

Results showed that 241 patients with STEMI received in-hospital ECGs and 108 patients received prehospital ECGs. The mean age of patients in both groups was 59 years and roughly 72% were male. Baseline characteristics including cardiac risk factors were similar between the groups. Researchers did note a significantly lower proportion of prehospital ECGs were obtained in African-American patients (15.7%) versus Caucasian (75.9%). "The predominant cause of this disparity was that prehospital ECG capability only became available to the ambulances in the city of Detroit at the conclusion of this study," noted Dr. David. According to the 2000 census approximately 82% of Detroit's population is African-American.

Researchers found that in-hospital mortality was 2% for the control group (7 out of 241) compared with no deaths in those patients with prehospital ECG. Patients in the in-hospital ECG group who presented during working hours waited 75 minutes prior to reperfusion treatment while those presenting during off-hours (weekends and holidays) experienced a 98-minute wait time. In the prehospital ECG there was a significant reduction in D2B time independent of presentation time, with 98% of patients in this group who were admitted during off-hours having treatment within 90 minutes. "Our results re-emphasize the

importance of early activation of the CCL in order to improve time-to-reperfusion in patients with STEMI," concluded Dr. David.

More information: "Impact of the Prehospital ECG on Door-to-Balloon Time in ST Elevation Myocardial Infarction." Anjani Rao, Youssef Kardouh, Saba Darda, Devang Desai, Lingareddy Devireddy, Thomas Lalonde, Howard Rosman and Shukri David. *Catheterization and Cardiovascular Interventions*; Published Online: January 21, 2010 ([DOI: 10.1002/ccd.22257](https://doi.org/10.1002/ccd.22257))

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