

Reference: Min MK, Ryu JH, Kim YI, Park MR, Park YM, Park SW, Yeom SR, Han SK, Kim YW. Does cardiac catheterization laboratory activation by electrocardiography machine auto-interpretation reduce door-to-balloon time? *Am J Emerg Med.* 2014 Nov;32(11):1305-10. doi: 10.1016/j.ajem.2014.07.026. Epub 2014 Aug 2. PubMed PMID: 25249338.

Clinical question: Does EKG auto-interpretation reduce door-to-balloon time without increasing unnecessary cath lab activation?

Introduction: Acute Myocardial Infarction is a common disease in the ED with a high mortality rate. The American College of Cardiology and American Heart Association have set guidelines calling for thrombolytics within 30 minutes of arrival in the ED and percutaneous coronary intervention within 90 minutes of arrival. EKGs continue to be the mainstay for rapid diagnosis of AMI.

Methods: A retrospective study performed at a tertiary care university hospital in Yangsan City, Korea comparing cath lab activation by the emergency physician for 6 months and activation by the auto-interpretation by the EKG machine. In the initial 6 month period (Code heart I) the cath lab activation was done after the ED physician evaluated the patient and interpreted the EKG. In the second 6 month period, cath lab was activated only after the EKG auto-interpretation was completed showing STEMI in patients that had symptoms of ACS (code heart II). Patients included were over the age of 18 who were diagnosed with STEMI at the time of discharge and who received emergency PCI. The study also compared all patients who experienced the code heart system. Exclusion criteria included prior use of fibrinolytic agents, DTB time more than 90 minutes for patient-related reasons, age under 18 years, transfer for CABG or self-discharge.

Participants: 126 patients were diagnosed with STEMI. 68 were prior to implementation of the code heart system. 58 patients were diagnosed with STEMI after implementation (24 code heart I, 34 code heart II).

Limitations: This was a single-center study done in a retrospective manner. This study is limited by inaccurate or incomplete records. The sample size was also relatively small.

Results and discussion: The mean DTB time prior to implementation of the code heart system was 96.51 +/- 65.60 minutes compared to 65.40 +/- 26.40 minutes after implementation – which was a statistically significant improvement. The number of patients who had a greater than 90 minute DTB time also decreased from 16 to 2 respectively. Door to activation time comparing code heart I vs code heart II was 10.45 +/- 8.71 and 8.37 +/- 7.75 minutes, and was not found to be statistically significant (p=0.369). DTB time was 65.13 +/- 36.30 and 67.09 +/- 16.54 respectively. The percentage of DTB time greater than 90 minutes was 4.1% and 2.9%. Both of which were not found to be statistically significant. STEMI was diagnosed in 75% of the code heart I group and 25.3% of the code heart II group. The use of auto-interpretation of STEMI by EKG did not improve DTB time, and had a significantly high false-positive rate than ED physician interpretation and activation. Based on this study, ED physician activation by single page activation system is the most effective strategy in reducing DTB time while limited unnecessary activation of the code heart system.

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