Emergency Medicine Activation of the Cardiac Catheterization Laboratory: Insights from the D2B Alliance and the NCDR CathPCI Registry™

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Background: Primary Percutaneous Coronary Intervention (PCI) has become the preferred treatment in acute myocardial infarction with ST-segment elevation (STEMI), but the benefits of Primary PCI depend upon how quickly the procedure is performed. Current American College of Cardiology/American Heart Association (ACC/AHA) guidelines recommend that STEMI patients be treated within 90 minutes of contact with a medical facility (i.e., door-to-balloon time ≤ 90 minutes). Although delays in D2B time are associated with increased 30-day mortality, a significant proportion of patients do not receive primary PCI within this 90 minute goal. One strategy that has been shown to reduce door-to-balloon time is having Emergency Medicine (EM) physicians activate the catheterization lab without consulting cardiology. In spite of evidence of the effectiveness of this strategy, many hospitals have not adopted independent EM activation.

Specific Aim: We sought to determine if hospitals that had a strategy of independent EM activation have a higher numbers of false activations, as assessed by angiographic findings at the time of catheterization, compared with hospitals that do not routinely allow EM activation.

Hypothesis: EM activation remains underutilized in part due to concerns that it would increase the number of false activations.

Methods: We analyzed data from the NCDR CathPCI Registry™ to identify patients who underwent catheterization for suspected STEMI in hospitals enrolled in the D2B Alliance in 2006-7. The hospitals’ strategy for catheterization laboratory activation was classified as: cardiology alone makes the decision (Cardiology Only), EM physicians make the decision in consultation with cardiology (EM with Cardiology), and EM physicians make the decision without consulting cardiology (EM Only). Outcomes included angiographic findings demonstrating a significant stenosis or total occlusion, performance of a revascularization procedure, and the proportion of patients with D2B time ≤90 minutes.

Results: A total of 44,783 patients with suspected STEMI underwent catheterization at 513 hospitals. Angiographic findings did not vary significantly across patients treated at hospitals with different strategies for activating the catheterization laboratory. The proportion of patients without a hemodynamically significant stenosis was low at all hospitals irrespective of their activation strategy, ranging from 3.6% at ED with Cardiology hospitals to 4.8% at Cardiology Only hospitals. Similarly, the proportions of patients with either a total occlusion or who underwent revascularization did not vary significantly by hospital activation strategy. In contrast, a substantially higher proportion of patients treated at hospitals adopting a strategy of EM Only had a door-to-balloon time ≤90 minutes compared with patients treated at Cardiology Only or EM with Cardiology hospitals. Findings were similar in multivariable analysis.

Conclusion: A strategy of independent EM catheterization lab activation is associated with a low rate of false activations as assessed by the severity of coronary artery disease and the need for revascularization. In addition, allowing EM physicians to activate the catheterization laboratory without consulting cardiology was associated with a higher proportion of patients with STEMI receiving Primary PCI within 90 minutes of hospital arrival. These findings support widespread adoption of a strategy of independent EM activation of the catheterization laboratory as part of hospitals’ ongoing efforts to improve door-to-balloon times.