**FALSE CATHETERIZATION ALERTS: ECG CLUES AND ECONOMIC IMPACT**

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**Background and Objective**: Rapid diagnosis of ST-segment elevation myocardial infarction (STEMI) is crucial for appropriate management. Catheterization for a false STEMI activation has risks including exposure to contrast agent and radiation, increased health care costs and delay in treatment of the primary medical condition. In this study, we reviewed all STEMI alerts between January 2012 to December 2015 to understand the electrocardiographic (ECG) differences between patients with true and false STEMI.

**Methods**: This was a single center retrospective study including all “cath alerts” between January 2012 and December 2015. “Cath alert” is a term used to activate the interventional cardiology team when the ED physicians based on review of the initial ECG suspect STEMI.
**Results:** Our study population (N= 361) included 221 (61%) men and 140 (39%) women, with average age 60 ± 4.2 years. Among the 361 STEMI alerts, 82 (22.7%) did not have acute coronary syndrome (ACS). Common electrocardiographic causes of misdiagnosis included left ventricular hypertrophy (LVH, found in 40/82, 49%), early repolarization changes (20/82, 24%), right bundle branch block (13/82, 16%), and Brugada pattern (3/82, 4%). Twenty-eight of these 82 cath alerts were cancelled by the interventionalist after reviewing the ECG. An independent review of the false alert ECGs (N=82) by two expert cardiologists showed that they would have called a STEMI alert in 18 and 29 patients respectively. Multivariate regression analysis showed that LVH and RBBB were independent predictors of non-ACS false STEMI (OR 0.54; 95% CI 0.32- 0.93; p = 0.03 for LVH, and OR 0.26, 95% CI 0.1- 0.62, p = 0.004 for RBBB). The total cost of hospital admission for all patients with false STEMI was approximately $11.5 million ($141,023 per admission).

**Conclusion**: The incidence of false STEMI alerts was almost a quarter at a large city hospital. This number might be reduced with additional training of ED physicians in ECG interpretation, and recognition of common causes of misdiagnosis such as LVH, early repolarization changes, RBBB, and Brugada pattern.