

Relation Between Thrombolysis in Myocardial Infarction Risk Score and One-Year Outcomes for Patients Presenting at the Emergency Department With Potential Acute Coronary Syndrome

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The Thrombolysis in Myocardial Infarction (TIMI) score, derived from unstable angina/non-ST-segment elevation acute myocardial infarction patient population, predicts 14-day cardiovascular events. It has been validated in emergency department (ED) patients with potential acute coronary syndrome with respect to 30-day outcomes. Our objective was to determine whether the initial TIMI score could risk stratify ED patients with potential acute coronary syndrome with respect to the 1-year outcomes. This was a prospective cohort study of patients presenting to the ED with chest pain who underwent electrocardiography. Patients with ST-segment elevation myocardial infarction (acute myocardial infarction) were excluded. Follow-up was conducted by telephone and record review >1 year after the index visit. The main outcome was the 1-year mortality, nonfatal acute myocardial infarction, or revascularization stratified by the TIMI score. Of 2,819 patients, 253 (9%) met the composite outcome. The overall incidence of the composite 1-year outcome of death (n = 119), acute myocardial infarction (n = 96), and revascularization (n = 90) according to TIMI score was TIMI 0 (n = 1,162), 4%; TIMI 1 (n = 901), 8%; TIMI 2 (n = 495), 13%; TIMI 3 (n = 193), 23%; TIMI 4 (n = 60), 28%; and TIMI 5 to 7 (n = 8), 88% (p <0.001). In conclusion, in addition to risk stratifying ED patients with chest pain at the initial ED evaluation, the TIMI score can also predict the 1-year cardiovascular events in this patient population. © 2010 Elsevier Inc. All rights reserved. (*Am J Cardiol* 2010;105:441-444)

The Thrombolysis in Myocardial Infarction (TIMI) score is a simple 7-item risk score. It was originally developed by Antman et al¹ with data derived from the TIMI 11B and Efficacy and Safety of Subcutaneous Enoxaparin in Non-Q-wave Coronary Events (ESSENCE) trials, where it was found to predict the 14-day adverse cardiovascular outcomes in patients with unstable angina or non-ST-segment myocardial infarction.¹ The TIMI risk score was further applied and validated in subsequent clinical trials,^{2,3} which found similar results in the short^{2,4-8} and long term.⁸⁻¹¹ Since it was developed and studied using a patient population with acute coronary syndrome (ACS), it required additional study in the emergency department (ED) to determine its value in a largely undifferentiated patient population with symptoms of potential ACS. Studies have determined that it can simplify risk stratification in ED patients presenting with chest pain and is associated with the 30-day outcome.¹²⁻¹⁶ No study has examined the association of the TIMI risk score in the ED with the 1-year outcome. The goal of our investigation was to determine, in a prospective cohort study of ED patients, whether the TIMI risk

score can accurately risk stratify patients with potential ACS with respect to the 1-year cardiovascular events. In particular, we focused on the outcomes in patients without previous cardiac events.

Methods

This was a prospective cohort study of ED patients with potential ACS, conducted at the Hospital of the University of Pennsylvania in Philadelphia. Subject recruitment occurred from July 13, 2003 to March 31, 2008. The Local Institutional Committee on Research Involving Human Subjects approved the study protocol. Our hospital is an urban tertiary care center receiving approximately 57,000 patient visits each year.

The inclusion criteria included all patients presenting to the ED with a primary complaint of nontraumatic chest pain or possible ischemic equivalents who underwent electrocardiography for evaluation of possible ACS. Patients with previous cardiac events (acute myocardial infarction [AMI] or revascularization), ST-segment elevation myocardial infarction, or cocaine use in the past week were excluded. All patients with symptoms suggestive of potential ACS were screened.

For all patients, the core criteria recommended in the standardized reporting guidelines¹⁷ were collected. These reporting guidelines were developed by the Emergency Medicine Cardiac Research and Education Group-International (EMGREG-I), with representation from the major cardiology and emergency medicine societies, including the

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