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Kevin D. Swenson

University of North Dakota

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Acute Myocardial Infarction: Are we overlooking NSTEMI?

Kevin D. Swenson

Physician Assistant Program, University of North Dakota School of Medicine & Health Sciences

Grand Forks, ND 58012-9037 www.med.und.edu/nakad

Introduction

- AMI is differentiated into ST-segment elevation myocardial infarction (STEMI) or non-ST-elevation (NSTEMI) based on 12-lead ECG findings.
- NSTEMI and STEMI management differs, the latter being more aggressive.

Statement of the Problem

- With a more vigorous effort to rule out STEMI, management of NSTEMI may now be considered a lower priority in an acute care setting.
- Studies are needed to determine if this prioritization is an appropriate approach to AMI management and if NSTEMI patients have less favorable outcomes as a result.

Research Questions

1. In patients with acute myocardial infarction, is there a notable difference in approach to treatments and timeliness of care between STEMI and NSTEMI?
2. In patients with acute myocardial infarction, is there a notable difference in treatment outcomes of STEMI versus NSTEMI?

Literature Review

MANAGEMENT OF ACS/AMI

- Aggressive management of AMI may include CAG, percutaneous coronary intervention, coronary artery bypass grafting and/or pharmacologic treatment such as anticoagulants, antiplatelets, fibrinolytics and glycoprotein IIb/IIIa antagonists.1
- Conservative management of AMI includes medical management of anticoagulation, antiplatelet therapy, symptomatic treatment and ongoing cardiac enzyme testing.30
- 12-lead ECG is used to determine location of blockage and to differentiate between STEMI and NSTEMI.7
- 12-lead ECG may not clearly differentiate STEMI versus NSTEMI.14
- New left bundle branch block and posterior MI considered STEMI equivalents, but do not reveal 12-lead ST elevation.17

DEFINITIVE MANAGEMENT OF STEMI

- Early CAG with percutaneous coronary intervention (PCI) remains the standard for acute management of STEMI, provided CAG can be performed within 90-120 minutes of initial ED presentation.5,11
- CAG indicated even within first 24 hours.

DEFINITIVE MANAGEMENT OF NSTEMI

- NSTEMI patients may be monitored by repeating cardiac enzymes, 12-lead ECG’s and assessment of symptoms at intervals of four to six hours.4
- The Advanced Cardiovascular Life Support® (ACLS) ACS algorithm differentiates patients without ST-segment elevation into high risk and low/intermediate risk.28
- Invasive strategy (CAG) shown to be effective in reducing the incidence of myocardial infarction within six to twelve months (RR 0.73, 95% CI 0.62 to 0.86) and three to five years (RR 0.78, 95% CI 0.67 to 0.92). This study included 7,818 chest pain patients from 5 prospective randomized controlled trials.
- Current NSTEMI guidelines provide discretion for risk stratification and determination of invasive or conservative strategies.13,16

OUTCOME COMPARISONS OF STEMI AND NSTEMI

- A 2007 French MI registry study analyzed one-year treatment outcome comparisons of STEMI and NSTEMI patients, where treatment decisions were based on provider discretion. STEMI patients were more likely to receive fibrinolysis (28.9 vs. 0.7%, P<0.0001) and/or PCI (71.0 vs. 56.1%, P<0.0001).15
- Demographic statistics from a 2010 Polish observational multicentered registry of 13,441 AMI patients: More comorbid causes of death in the United States.12
- More aggressive treatment of STEMI patients than NSTEMI patients based on current practices. However, current practices provide more aggressive treatment of STEMI patients than NSTEMI patients.20

- Differences in symptom presentation.
- The details involved in comparative PCI outcome studies reveal that NSTEMI patients have similar outcomes to STEMI patients in early invasive therapy strategies.

Applicability to Clinical Practice

- NSTEMI patients may benefit from the more aggressive STEMI strategy.
- Current NSTEMI practices may require ongoing testing which delay definitive treatment from hours to days. This “watchful waiting” approach may be contributing to higher mortality and MACE rates in NSTEMI.
- A more standardized tool may be beneficial to assist in the risk stratification component of treatment determination in NSTEMI.
- Current studies are illustrating statistically that NSTEMI patients are receiving favorable results from invasive treatments such as PCI. Some studies show even more favorable outcomes than in STEMI patients.

References

4. Cox, D. A., Stone, G. W., Grines, C. L., Stuckey, T., Zimetbaum, P. J., Tcheng, J. E., ... Griffin, J. J. (2006, August 1). Long-term outcomes of successful PCI in both STEMI and NSTEMI patients were examined from the PROSPECT (Providing Regional Observations to Study Predictors of Events in the Coronary Tree) study. The international multi-centered registry study followed 697 post-PCI MI patients for 3-4 years to a primary end point of MACE including death, MI or rehospitalization. MACE occurred less frequently in NSTEMI patients than in STEMI patients (19.6 vs. 22.3%).