Outcome of applying the European Society of Cardiology (ESC) 0/1-hour algorithm in patients with suspected myocardial infarction

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Abstract link: http://www.onlinejacc.org/content/74/4/483.abstract
Article type: Diagnosis
Ratings: Methods – 3/5 Usefulness – 4/5

INTRODUCTION

Background
The European Society of Cardiology (ESC) recommends the 0/1-hour troponin dosage algorithm for rapid triage of patients with chest pain and suspected non-ST segment elevation myocardial infarction (MI).

Objectives
To determine safety, performance, and applicability of the 0/1-hour troponin triage algorithm when routinely applied in the emergency room

METHODS

Design
Prospective cohort study

Setting
Two university centres in Switzerland and Argentina

Subjects
Adult patients presenting with chest pain suggestive of MI; exclusion if STEMI diagnosis

Intervention
Standard assessment with history and physical examination plus determination of hs-cTnT at presentation and 1 hour after initial medical encounter. Management of patients was left to the discretion of the attending clinicians who were blinded to the study’s outcomes.

Outcomes
Primary outcomes were triage performance when using the algorithm and 30-day rate of major adverse clinical events (MACE): cardiovascular death and MI. Secondary outcomes were feasibility and adherence to the triage algorithm and impact on emergency department (ED) resources use and length of stay.

MAIN RESULTS

The ESC 0/1-hour algorithm triaged 62% of patients towards “rule-out” category with a 0 h troponin T < 5 ng/L or a 0 h < 12 ng/L and 1 h change < 3 ng/L. In the “rule-out” group, 88% of patients underwent...
outpatient management with a 0.1% occurrence of 30-day MACE. The remaining patients (12%) were treated as inpatients without justification provided, and 28% of these patients underwent revascularization therapy with 0.2% of 30-day MACE. The overall 30-day MACE in the “rule-out” category was 0.2% and does not include revascularization therapy. The algorithm was strictly adhered in 94% of patients’ encounters with an average time between the blood draws of 65 minutes. The median time to discharge from the ED or transfer to a hospital ward was 2 hrs, 30 min.

**CONTEXT**

This study builds on the emerging literature showing the capacity of high-sensitivity troponin assays and short interval blood draws to reduce MI diagnosis delays and therefore allows for a more rapid initiation of adequate therapy. The ESC 0/1 hour algorithm appears to be safe and to effectively decrease time to ED discharge with a 30-day MACE rate of 0.1% in the outpatient cohort of 1,619 patients. Furthermore, a recent study showed the 0/1 hour TnT protocol to be non-inferior to the standardized 0/3 hours hs-cTnT protocol.¹

**BOTTOM LINE**

The ESC 0/1 h hs-cTnT algorithm allows for safe early discrimination of patients presenting to the ED with chest pain and suspected NSTEMI in the presented cohort.² Nevertheless, 4.4% of patients in the “rule-out” low-risk group underwent revascularization procedure, which was not considered an MACE in this study. Moreover, this algorithm is not applicable to early presenters (< 3 hrs), patient with ongoing pain, or known renal insufficiency. Further studies acknowledging the safety with the different types of troponin assay are required for general applicability.³

**Keywords:** Cardiac disease, emergency medicine, evidence-based medicine

**Competing interests:** None declared.

**REFERENCES**

