Trauma Trumps Coronary Symptoms in the Emergency Department

Fishman PE, Shofer FS, Robey JL, et al. The impact of trauma activations on the care of emergency department patients with potential acute coronary syndromes. Ann Emerg Med 2006;48;347–53.

Study Overview

Objective. To determine the impact of concurrent trauma activation on the processes and outcomes of care for patients with potential acute coronary syndrome (ACS).

Design. Observational cohort study.

Setting and participants. Patients who presented to the emergency department (ED) of an urban, tertiary care, level 1 trauma center with a potential ACS from 1 July 2003 to 30 June 2004 were stratified according to whether or not they presented concurrently with a trauma activation. Patients were included if they were aged ≥ 24 years, presented with chest pain, and received an electrocardiogram (ECG). Patients were followed daily during hospitalization for specific cardiovascular complications (ie, death, myocardial infarction, heart failure, dysrhythmias) and were contacted 30 days after presentation for follow-up.

Main outcome measures. The primary outcome was a composite of in-hospital cardiovascular complications and 30-day death or myocardial infarction. Secondary outcomes were time from triage to first ECG, transfer to an evaluation room, return of first cardiac marker results, disposition decision, and actual disposition.

Main results. 357 patients who presented concurrently with a trauma activation and 1235 who presented without a trauma activation were enrolled. Both groups were similar with regard to demographic characteristics, cardiac risk factors, and TIMI risk score. Potential ACS patients who presented concurrently with a trauma activation had a 6.2% unadjusted incidence of 30-day adverse cardiovascular events compared with 3.6% for patients who did not present with a concurrent trauma activation (unadjusted odds ratio [OR], 1.74 [95% confidence interval {CI}, 1.03–2.93]). After adjusting for measures of patient acuity (ED triage classification, TIMI risk score) and ED volume (total patient care hours, ED activity), concurrent trauma activation was independently associated with an increased rate of 30-day cardiovascular complications (OR, 1.72 [95% CI, 1.01–2.92]).

Conclusion. In patients with potential ACS, presentation to the ED during a concurrent trauma activation may result in an increased risk for 30-day adverse cardiovascular events.

Commentary

The ED is the U.S. health care safety net, where patients with acute and nonacute conditions present for treatment and management of their symptoms. Patients are "triaged" based on urgency for care, with more critical patients receiving higher priority. What happens when 2 critical patients compete for limited resources within the ED setting?

Looking specifically at concurrent ED presentation by trauma patients and patients with potential ACS, Fishman et al found that both the timeliness and outcomes of care for patients with potential ACS were negatively impacted by a shift in ED resource utilization to trauma patients. This study also raises the troubling question of the impact that increasing ED patient volume and crowding have on quality of patient care. Although this study was completed at a single institution and the findings may not be generalizable, the results highlight how ED and hospital staff are challenged to appropriately allocate resources and apply good clinical judgment under high workload conditions. This study demonstrated that during periods of high workload and high patient acuity, timeliness of reperfusion therapy for patients with potential ACS was compromised (adjusted 5-minute median increase in time to ECG, $P = 0.04$; adjusted 12-minute median increase to first cardiac marker results, $P = 0.04$). Furthermore, patients with potential ACS who presented to the ED concurrently with a trauma activation had worse 30-day cardiovascular outcomes. Previous studies have found similar findings. In a study by Lambe et al [1], patient wait times were an average of 26 minutes greater at trauma centers compared with nontrauma centers. In a study of a Toronto hospital network, ambulance diversion was associated with delays in time to reperfusion therapy for patients with acute myocardial infarction [2]. As patient volumes continue to increase in the setting of ED and hospital closures nationwide [3], competition for finite resources, delays in care, and the resulting risk for negative outcomes are likely also increase.

Applications for Clinical Practice

Patients with ACS symptoms will continue to present to the ED. Therefore, efforts must be made to improve the timing and quality of care for these patients so as to reduce the risk for potentially avoidable adverse outcomes. By promoting recognition and awareness of these adverse outcomes and the conditions under which they occur, interventions and administrative plans can be developed for improved resource allocation during periods of high acuity for all critical patients.

—Review by Ula Hwang, MD, MPH

References

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