Are There Differences in Acute Myocardial Infarction Treatment Patterns Between Canada and the United States?

Ko DT, Krumholz HM, Wang Y, et al. Regional differences in process of care and outcomes for older myocardial infarction patients in the United States and Ontario, Canada. Circulation 2007;115:196–203.

Study Overview

Objective. To assess differences in medication use, invasive cardiac procedure use, and risk-standardized mortality rates for patients with acute myocardial infarction (AMI) in the United States and Ontario, Canada.

Design. Retrospective cohort study.

Setting and participants. The study included 38,886 U.S. Medicare patients (identified from the National Heart Care Project) who were hospitalized between March 1998 and April 2001 and 5634 Canadian patients (identified from the Enhanced Feedback for Effective Cardiac Treatment project) who were hospitalized between April 1999 and March 2001. All patients had a primary discharge diagnosis of AMI (ICD-9 code 410) and were aged between 65 and 105 years. The U.S. cohort was divided into 4 regions (northeastern, southern, midwestern, and western).

Main outcome measures. Primary outcome measures were the percentage of ideal patients (ie, those who survived to hospital discharge without contraindication to therapy) who received aspirin, β blockers, and angiotensin-converting enzyme (ACE) inhibitors at discharge and 30-day risk-standardized mortality. Secondary outcomes were risk-standardized mortality at 1 and 3 years.

Main results. From 1998–2001, baseline characteristics and severity of illness across the U.S. regions and Ontario were similar. Use of cardiac catheterization in AMI patients was significantly higher in the United States as compared with Ontario (38.7% versus 16.8%; $P < 0.001$). The northeastern United States had a lower cardiac catheterization rate compared with southern, midwestern, and western regions, respectively (25.6% versus 40.8%, 41.1%, and 42.6%; $P < 0.001$). Among ideal patients, rates of aspirin and lipid-lowering medication use were similar across all U.S. regions and Ontario. The rate of β-blocker use was higher in Ontario as compared with the United States (66.3% versus 62.7%; $P < 0.001$, respectively); however, across all U.S. regions, β-blocker use was highest in the northeast (71.1%). The rate of ACE inhibitor use was also higher in Ontario as compared with the United States (67.6% versus 52.6%; $P < 0.001$). Risk-standardized mortality at 30 days was similar between the United States and Ontario (17.3% versus 16.5%; $P = 0.1$). Among U.S. regions, 30-day risk-standardized mortality was not substantially different (northeastern, 15.3%; southern, 19%; midwestern, 17.1%; western, 16.4%). At 1 and 3 years, mortality rates were significantly lower in Ontario compared with the United States (27.7% versus 31.9% and 40.3% versus 45.9%; $P < 0.001$ for both comparisons).

Conclusion. Regional practices may have a greater influence on care for patients with AMI than the differences in health care delivery systems.

Commentary

Previous studies have shown differences in cardiac procedure utilization for AMI patients between the United States and Canada, and these differences have been attributed to variations in health care systems, particularly with respect to compensation [1,2]. This study by Ko et al compared patterns of care for AMI patients between the United States and Canada and also between regions in the United States. Use of cardiac procedures, such as cardiac catheterization, percutaneous coronary intervention, coronary artery bypass, echocardiography, and stress testing, were much higher in the United States compared with Ontario. Conversely, rates of β-blocker and ACE inhibitor use were lower in the United States. Despite higher utilization of cardiac procedures, risk-standardized mortality differences were not substantial between the United States and Ontario. Investigators found that the northeastern United States and Ontario performed fewer cardiac procedures and had similar mortality outcomes compared with other U.S. regions. In addition, rates of β-blocker and ACE inhibitor use were highest in the northeastern United States and Ontario. These data suggest that performing more cardiac procedures did not lead to better mortality outcomes.

Limitations to this study should be noted. Privacy laws prevented patient level data from being combined; instead, aggregate group data were compared. In addition, only

patients from Ontario were sampled because similar clinical data sets were not available for other provinces in Canada. Patients from the United States were equally sampled from each state; however, Ontario patients were randomly sampled from the entire province. Data on other clinically important outcomes, such as left ventricular ejection fraction, quality of life, or heart failure hospitalizations were unavailable.

Applications for Clinical Practice

This study highlights an interesting pattern in Ontario and the northeastern United States, specifically that greater use of cardiac procedures did not lead to lower risk-standardized mortality in either the short or long term. This implies that other regions may be able to deliver the same quality of care for AMI patients at lower cost by performing fewer cardiac procedures and increasing medication rates for β blockers and ACE inhibitors. In addition, regional practice patterns might have a larger influence than previously thought, and perhaps quality of care initiatives and policies should be targeted toward this level of practice.

—Review by Robert L. Huang, MD

References

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