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Literature Update 2012: 3 Articles You've Gotta Know!

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Introduction

Here we are at the end of yet another year, and I'm reflecting on my favorite original research articles of 2012. In submitting this year's picks, I'll provide my usual disclaimer that these are not necessarily the most important articles or the best articles of the year, but rather they are simply my 3 favorite. These articles are practical and quickly useful in almost any emergency department around the world, and they focus on high-risk conditions.

I must admit my bias in the final selection process -- I'm not generally a big believer in the concept of "groundbreaking" new articles. Too many times, we've seen publications touted as groundbreaking, advocating approaches and therapies that are shot down years later; this is especially true for publications on new drugs, so I always hesitate to include drug studies on the list. Nevertheless, these 3 research articles are among the very few that I've encountered in recent years that I really believe will change our practice and produce immediate life-saving or risk-management benefits.

First Study: Myocardial Infarction

Association of Age and Sex With Myocardial Infarction Symptom Presentation and In-Hospital Mortality

Canto JG, Rogers WJ, Goldberg RJ, et al; NRMI Investigators

JAMA. 2012;307:813-822

This was my favorite article of the year because it deals with 3 of my favorite themes in emergency medicine: cardiology, myth-busting, and high-risk conditions.

The authors evaluated a national registry of patients with myocardial infarction (MI) that included more than 2 million patients. They focused their attention on 4 variables among the patients: age, sex, clinical presentation, and mortality. After evaluating this large group of patients, they were able to dispel 3 common myths that many of us learned in training: (1) Premenopausal women are "low risk" when it comes to coronary disease, in terms of incidence and mortality; (2) only older women present with atypical symptoms, whereas young women have typical MI symptoms; and (3) painless MIs are associated with a better prognosis than painful MIs.

Some specific details are worth noting from this article. Women fared worse than men when they had an MI: They had a staggering 14.6% in-hospital mortality rate vs 10.3% for men. This disparity in mortality was most prominent in younger patients.

A disparity existed between men and women in terms of the incidence of painless presentations as well, and once again the difference was most prominent in younger groups: 18.5% of women < 45 years of age had no chest pain, compared with only 13% of men in the same age group. As expected, painless presentations were especially

common in older patients, with 50% of men and women > 75 years of age presenting without chest pain.

Patients presenting without pain had higher in-hospital mortality at all ages, but once again, an increased disparity was noted between young women and young men. Women < 45 years of age who experienced painless MIs had a 15% in-hospital mortality rate, compared with 10% among young men with painless MIs. The mortality statistics evened out with advancing age, as did the frequency of atypical presentations.

Why It's Important in Emergency Medicine

This study reminds us of some simple points that will save lives. Young women do have MIs, and when they do, they tend to present atypically more often than men. Women fare worse than men when they have an MI. Finally, painless MIs are common and are associated with higher mortality than painful MIs.

Abstract

Study 2: Troponins and Chest Pain

2-Hour Accelerated Diagnostic Protocol to Assess Patients With Chest Pain Symptoms Using Contemporary Troponins as the Only Biomarker: The ADAPT Trial

Than M, Cullen L, Aldous S, et al

J Am Coll Cardiol. 2012;59:2091-2098

Current recommendations for the evaluation of low-risk chest pain include mandatory provocative testing within 72 hours for patients after MI is ruled out. [1] In theory, the provocative test provides further risk stratification for patients in whom there is some concern about acute coronary syndrome (ACS). However, provocative testing cannot reliably be performed in many patients because of cost and access issues. Even in my own academic medical center, a large tertiary care hospital with a multitude of resources, only a minority of patients receives a provocative test after they rule out for MI.

The published guidelines of our national organizations are often not met, and this is associated with legal risk. Researchers have therefore been searching for alternatives to provocative testing that will allow stratification of patients to very low risk for adverse outcome after MI is ruled out.

Recently, the use of accelerated diagnostic protocols (ADPs) incorporating serial highly sensitive troponin levels at the time of arrival and 2 hours after arrival have been gaining favor. The current study supports another by the same primary authors in 2011 [2] indicating that patients presenting with chest pain who (1) are at low cardiac risk (Thrombolysis in Myocardial Infarction [TIMI] score of 0), (2) have no ischemic findings on electrocardiography, and (3) have negative troponin levels at arrival and at 2 hours after arrival have a very low risk for adverse cardiac outcome after 30 days. In this study, only 1 of 392 patients who met the ADP criteria described above had an adverse outcome; this patient was ruled in for MI after 12 hours and had a successful stent placement.

Why It's Important for Emergency Medicine

The sensitivity of the ADP was 99.7%. Pending validation by other research groups, this 2-hour ADP using highly sensitive troponin levels may be an excellent alternative for risk

stratification of low-risk patients who present to the emergency department with chest pain when provocative testing is not feasible.

Abstract

Study 3: Minor Head Injury in Patients on Warfarin or Clopidogrel

Immediate and Delayed Traumatic Intracranial Hemorrhage in Patients With Head Trauma and Preinjury Warfarin or Clopidogrel Use

Nishijima DK, Offerman SR, Ballard DW, et al; Clinical Research in Emergency Services and Treatment (CREST) Network

Ann Emerg Med. 2012;59:460-468.

I hate oral blood thinners. Whether we're talking about anticoagulants or anti-platelet agents, I hate them all.

Well...maybe it's actually fear rather than hate. One of the reasons for this negative sentiment is that the management of patients who are using these medications in the setting of trauma is not straightforward. Further complicating matters is that most of the patients who use these medications are older patients that are prone to syncope and falls. These patients typically present to the emergency department with what appears to be a minor head injury, and it's unclear whether all they need is CT of the head. Furthermore, even after a negative CT, it remains unclear whether these patients need admission for observation, mandatory repeat CT, or some other management strategy to detect delayed intracranial bleeding.

Fortunately, this large study from Nishijima and colleagues helps to clarify management. The authors evaluated 1064 patients who had experienced minor head injury. Warfarin was being used by 768 patients, and 296 patients were taking clopidogrel. Patients were evaluated for immediate traumatic intracranial hemorrhage (TICH) and followed up again in 2 weeks. The demographic characteristics of both groups were similar.

The prevalence of immediate TICH was 5.1% in patients receiving warfarin and 12% in those receiving clopidogrel. Delayed TICH was identified in 0.6% of patients receiving warfarin and in no patient receiving clopidogrel.

Why It's Important for Emergency Medicine

These findings provide some simple but key take-home points. First, patients receiving either clopidogrel or warfarin who experience minor head trauma are indeed at risk for TICH and deserve strong consideration for imaging. In addition, delayed TICH after a negative initial head CT occurs rarely. On the basis of these findings, it seems reasonable to discharge patients with minor head injury home after a negative head CT, but with good discharge instructions and close follow-up. Mandatory admission, reversal of therapeutic levels of anticoagulation, or repeat head CT for all patients is not warranted.

Abstract

References

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Cardiology, Council on Cardiovascular Nursing, and Interdisciplinary Council on Quality of Care and Outcomes Research. Testing of low-risk patients presenting to the emergency department with chest pain: a scientific statement from the American Heart Association. Circulation. 2010;122:1756-1776. Abstract

2. Than M, Cullen L, Reid C, et al. A 2-h diagnostic protocol to assess patients with chest pain symptoms in the Asia-Pacific region (ASPECT): a prospective observational validation study. Lancet. 2011;377:1077-1084. Abstract

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