Pitfalls in Emergency Medicine Practice

Or… How to Be a Better Bookie in EM

2. Exclusion of cardiac ischemia based on chest wall tenderness for the diagnosis of Acute Myocardial Infarction (AMI).

This is another case where the patients don't seem to be able to read the popular literature and textbooks! Chest wall tenderness or reproducible chest pain is a clinical feature that may persuade the unaware or superficially prepared emergency physician to make a diagnosis of chest wall pain due to musculoskeletal causes…. unfortunately, this would be a sucker bet for the competent emergency medicine bookie.

Remember that the house odds are currently about 1% for sending home an AMI in all patients who present with chest pain…. and the malpractice lawyers collect good money on these house odds.

Clearly with the lowest rate of AMI's with reproducible chest pain...at 7%... the competent EM Physician would be a sucker to send home a patient simply because they have reproducible chest pain.

7% (or MORE) of patients with AMI or with unstable angina will have their pain partially or fully reproducible on chest wall palpation

Several studies have shown that chest wall tenderness is not a reliable indicator of non-cardiac chest pain. In two separate studies, as many as 15% of patients who were diagnosed with AMI had some degree of chest wall tenderness noted on their physical examination...[12] (At least one of these studies also noted that patients with AMI may not have classic chest pain…. as was discussed in our last installment of Pitfalls.)

To be absolutely objective in this subject, several other studies have demonstrated that chest wall tenderness will "suggest" that the cause is from a non-cardiac etiology. In two separate meta-analyses of this subject, Panju et al, (total number of

patients not stated) and Chun and Magee (442 patients) concluded that chest wall tenderness decreased the likelihood of AMI with likelihood ratios of 0.2-0.4 and 0.3 respectively.[3] [4] Interestingly, however, in both of these meta-analyses the pre-test probability was felt to be 12.5-17.4%… which means that for

Panju - 12.5% Pretest * LR(0.4) = Posttest 4.3%
Chun 174% Pretest * LR(0.3) = Posttest 6.3%

Goodacre et al in a study of 893 patients in the United Kingdom confirmed these likelihood ratios with their study of clinically stable patients who had no initially positive diagnostic EKG's showing only a 0.3 negative likelihood ratio.[5]

I'm not sure that potentially sending home 4-6% of our AMI patients based on a physical examination will appeal to our malpractice underwriters…. They might consider that to be poor odds… since they aren't happy with the current 1%! Although the characteristic of chest wall tenderness may actually decrease the likelihood of an acute myocardial infarction, it simply isn't a powerful enough test to support sending home the patient without additional testing.

Using Chest Wall Tenderness as an independent "rule-out" strategy is simply not acceptable practice in Emergency Medicine for patients at risk for MI.

References

[1] Uretsky BE, Farquahr DS, Berezin AF, et al. Symptomatic myocardial infarction without chest pain: Prevalence and clinical course. Am. J. Cardiol 1977;40:498-503.
[2] Tierney WM, Roth BJ, Psaty B, wt al. Predictors of myocardial infarction in emergency room patients. Crit Care Medicine 1985;13:526-531.
[3] Panju AA, Hemmelgarn BR, Gordon G, et al. Is this paitent having a myocardial infarction? JAMA 1998;280:1256-1263
[4] Chun AA, McGee SR. Bedside diagnosis of coronary artery disease: A systematic review. Am J Med 2004;117:334-343.
[5] Goodacre MB, Locker T, Morris F, Campbell S. How useful are clinical features in the diagnosis of acute undifferentiated chest pain? Acad Emerg Med 2003;9:203-208.