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Question:

P: In low-risk ED patients with a **recent negative cardiac stress echo**

I: Does repeat exercise stress echo

C: Compared to negative ECG and cardiac markers alone

O: Offer any diagnostic advantage

Clinical Scenario:

40-year-old male with minimal risk factors for ACS presents to the ED for the second time in the past year with substernal chest pain. On his first visit six months ago he had two negative sets of cardiac enzymes, a negative cardiac stress test, and was diagnosed with muscular-skeletal chest pain. Today he presents with similar chest pain and has two sets of negative cardiac enzymes and a normal EKG. Can the patient be discharged home or should he get another cardiac stress test.

Search Strategy:

Pub Med

Search outcome: papers found

Relevant Papers: 5

Title	Author Date and Country	Patient Group	Study Type	Outcomes	Key results	Study weaknesses
Adverse cardiac events in emergency department patients with chest pain six months after a negative inpatient evaluation for acute coronary syndrome	Manini et al Sept 2002 UCSF San Francisco USA	157 patients admitted to the hospital with chest pain and had a negative evaluation for acute coronary syndrome (ACS)	retrospective	Patients receiving inpatient ACS eval had lower mortality than patients getting outpatient ACS eval	Six month after the negative ACS work up, the rate of adverse cardiac events was 14% with 2% mortality.	Few patients enrolled and retrospective
Randomized comparison of a strategy of pre-discharge coronary angiography versus exercise testing in low-risk patients in a chest pain unit: in-hospital and long-term outcomes	DeFilippi et al June 2001 U. Texas Galveston, TX USA	248 patients with no ischemic EKG changes triaged to chest pain unit randomized to coronary angiography or exercise treadmill testing. Followed for one year	Randomized clinical trial	Coronary angiography showed > 50% stenosis in 19% whereas exercise treadmill testing diagnosed disease in 7%	Exercise treadmill testing was less sensitive than coronary angiography in detecting CAD	Long term adverse cardiac events and mortality not recorded
Usefulness of exercise test in selected patients coming to emergency department for acute chest pain	Macor et al Feb 2003 Pordenone Italy	150 ED patients with low risk for ACS with negative cardiac enzymes were sent for exercise	Prospective study	Positive stress in 16%, inconclusive in 18%, and negative in 66%.	Median follow up 237 days, 4 were dx with ACS and 7 had revascularization procedures. Patients with negative stress were significantly less likely to have adverse cardiac event	Few patients

		stress testing				
Immediate exercise testing to evaluate low-risk patients presenting to the emergency department with chest pain	Amsterdam et al July 2002	1,000 low-risk chest pain patients who present to the ER got immediate exercise stress testing	Prospective study	Positive in 13%, negative in 64%, and inconclusive in 23%. No mortality at 30-days in any group but one non-Q-wave MI in the negative group versus 4 non-Q-wave MI and 12 myocardial revascularizations in the positive group	Approx 0.16% risk of non-Q-wave MI with a negative stress at 30-days in low risk patients. A negative stress suggests very low probability of MI in 30 days.	Short duration of follow-up.
Utility and safety of immediate exercise testing of low-risk patients admitted to the hospital with acute chest pain	Sarullo et al Sep 2000 Palermo Italy	190 low risk chest pain patients who present to the ER got immediate exercise stress testing	Prospective study	30% positive, 58% negative test. 17 month median follow-up of 111 patients with negative test, 1 had an MI and 7 had angina	In low risk patients with a negative stress there is <1% risk of MI in the first 17 months.	Limited to low risk patients, low number of patients.

Comments:

Low risk patients who have an initial negative ED work up for ACS including a non-diagnostic EKG, negative serial cardiac enzymes, and a negative exercise cardiac stress, have a very low risk for developing ACS within the next year. This information should be able to help ER physicians risk stratify chest pain patients who present to the ER who have a history of a negative cardiac work up. Given the information presented here, chest pain patients with a recent negative exercise stress test should be able to be sent home with low, but not zero, risk for ACS.

1. Manini AF, et al. Adverse cardiac events in emergency department patients with chest pain six months after a negative inpatient evaluation for acute coronary syndrome. *Acad Emerg Med.*, 2002 Sep;9(9):896-902
2. deFilippi, CR, et al. Randomized comparison of a strategy of predischarge coronary angiography versus exercise testing in low-risk patients in a chest pain unit: in-hospital and long-term outcomes. *J. American College of Cardiology*, 2001 June 15;37(8):2042-2049
3. Cassin, MF, et al. Usefulness of exercise test in selected patients coming to the emergency department for acute chest pain. *Ital Heart J.*, 2003 Feb;4(2):92-8
4. Amsterdam, EA, et al. Immediate exercise testing to evaluate low-risk patients presenting to the emergency department with chest pain. *J. American College Cardiology*, 2002 July 17;40(2):251-256
5. Sarullo FM, et al. Utility and safety of immediate exercise testing of low-risk patients admitted to the hospital with acute chest pain. *Int. J. Cardiology*, 2000 Sep 15; 75(2-3):329-43