



Senior Medicine Rotation: Evidence-Based Medicine Project

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Block:

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Patient #1: 45 yo obese woman with PMH asthma, still menstruating, with no other CAD risk factors who p/w 2/10 CP, non radiating, "pinching", lasting hours, non-positional, at rest, lasting hours both before and during hospitalization. Troponin neg x3, no ECG changes. Exercise ECG testing was normal but a thalium scan showed an apical reversible perfusion defect.

Patient #2: 45 yo woman, still smoking, with HTN, unknown lipid profile, no FH CAD or diabetes, who had a TAH/BSO five years PTA and presents with SSCP, 5/10, at rest during her morning cigarette, with no associated symptoms. Troponins neg X3, no ECG changes. Both exercise ECG and thalium scans were negative.

Clinical Question: Does non-invasive testing improve the diagnosis of CAD in symptomatic middle aged women? Which testing modality is superior?

Search Strategy

Database: Ovid Medline

Using a "keyword" mapping method yielded unsatisfactory results. I found more appropriate papers using a "title" search. Of the eight titles found, only one was acceptable; others were reviews and one was an interesting longitudinal study of asymptomatic subjects who had stress tests.

OVID Ovid MEDLINE(R) <1966 to March Week 5 2005> Help

Author Title Journal More Fields Search Tools Combine Searches More Limits Change Database LOGOFF

Table with 4 columns: #, Search History, Results, Display. Row 5 is highlighted in yellow.

Save Search/Alert Delete Searches

7. Kwok Y. Kim C. Grady D. Segal M. Redberg R. Meta-analysis of exercise testing to detect coronary artery disease in women.[see comment]. [Journal Article. Meta-Analysis] American Journal of Cardiology. 83(5):660-6, 1999 Mar 1.

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Senior Medicine Rotation: Based Medicine Project (Cont)

Group	Criteria or definition	n
Population	Women presenting with CAD symptoms	Exercise + ECG 3,721 Exercise + thalium 842 Exercise + echo 296
Inclusion criteria	Search terms “coronary artery disease diagnosis” “exercise test” combined with “ecg”, “echocardiography”, “thalium”, or “technicium	570 titles for exercise ECG 493 titles for radionuclide 303 titles for exercise echo
Exclusion criteria	Study with <50 women No angiography (gold standard) Pharmacologic stress Post-infarction or post angioplasty Pts who did not have an angiogram were excluded	19 studies of exercise ECG 5 studies of exercise thalium 3 studies of exercise echo
Quality weighting (exercise ECG only)	Basis for weighting: Test review bias Verification bias Adequate description of the study group	
Sample Size weighting (All studies)		

Primary Guides

- Blinding?
Regarding the meta-analysis: eligible articles were abstracted by two independent reviewers. Regarding the studies themselves: studies with blinded analysis of catheterization results had higher *weight*, though this weighting was not used in the data analysis.
- Appropriate patient sample? The populations included in the meta-analysis are not described.

Secondary Guides

- Test influenced decision to perform reference standard? Yes, likely in many cases. Patients who did not have angioplasty were not included in the meta-analysis, but they were not followed up for evidence of CAD.
- Methods for test described in detail? Yes.

Test 1	Gold Standard	Sensitivity	Specificity	Positive Likelihood Ratio	Negative Likelihood Ratio
Exercise ECG	yes				
Women		61%	70%	2.03**	0.56
Men		68%	77%	2.96	0.42
Exercise Thallium	yes				
Women		78%	64%	2.17	0.34
Men		85%	85%	5.67	0.18
Exercise Echo	yes				
Women		86%	79%	4.1	0.18
Men		? "similar"	? "similar"		

What are the results?

- data provided to calculate likelihood ratio? Yes.

Overall, I was surprised at how low the sensitivity and specificity of exercise ECG alone for both men and women—I suppose this is the reason for the “treadmill score” used for prognosis. Other studies have shown that exercise tolerance is more prognostic in women than exercise-induced ECG changes. According to the authors, lower prevalence of CAD in women does not alone account for gender differences in sensitivity and specificity. Other proposed mechanisms are estrogen effects (‘digoxin like’), inappropriate catecholamine response, mitral valve prolapse, or different chest wall anatomy.

More importantly, this meta-analysis shows the superiority of exercise thallium and echo over ECG testing alone. In women, thallium testing is more impressive for its negative predictive value. Echo testing is overall superior in women, but my response to this is tempered by the fact that quality weighting was not performed, the blinding procedures in the studies are not known, and my knowledge that echo is particularly dependent on skilled readers, and the result may not be easily reproducible.

Will the results help me in caring for my patients?

- reproducibility and interpretation satisfactory in my setting?
The interpretation of the results is definitely influenced by being at CUMC, where stress echo is not usually performed. In women, I will place more value in negative stress thallium results in low and intermediate risk women, and less value in positive results.
- results applicable to my patients?
Yes, they are applicable as long as I am able to estimate a pre-test probability for them. Scores like the TIMI risk score and the Framingham score are useful in this respect, but I don’t know how many women were in the populations in which those were derived.
- results change my management?
This paper convinces me that patient number one, with a low pre-test probability and a positive thallium scan, did not need a catheterization. I am also more confident in the negative result in the intermediate risk patient #2.
- patient better off as a result of the test?

No (patient #1) and yes (patient #2).