Is cardiac stress testing appropriate in asymptomatic adults at low risk?

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A 48-year-old insurance executive is offered the option of several health insurance packages at the time of a promotion. He is healthy and a nonsmoker; both his parents are alive and well; and he takes only vitamins and fish oil supplements on a regular basis. His levels of total cholesterol, low-density lipoprotein cholesterol, and high-density lipoprotein cholesterol are all in the normal range, as is his blood pressure. He plans to purchase the lowest price policy, but wants to know if he should also get a stress test to best guide his care.

GUIDELINES RECOMMEND AGAINST TESTING

Patients who are at low risk of disease and without symptoms should not undergo cardiac stress testing. The test is unlikely to be helpful in these patients and may expose them to harm unnecessarily. Cardiac stress testing such as exercise electrocardiography is most useful in patients who have chest pain and shortness of breath on exertion, to look for underlying cardiovascular disease. Despite this, the test is often used inappropriately as part of a routine health evaluation in low-risk, asymptomatic people, such as this patient.

Recent high-quality guidelines address exercise electrocardiography as a screening test for cardiovascular disease in asymptomatic, low-risk adults.

The US Preventive Services Task Force 2012 guideline[1] recommends against screening with exercise electrocardiography for predicting coronary heart disease events in adults with no symptoms and at low risk of these events. A systematic review found no data from randomized controlled trials or prospective cohort studies of this test to screen asymptomatic adults compared with no screening.[2]

The American Academy of Family Physicians (AAFP) 2012 guideline[3] recommends against routine screening with exercise electrocardiography either for the presence of severe coronary artery stenosis or for predicting coronary events in adults at low risk. The AAFP guideline notes that there is moderate or high certainty of no net benefit or that the harms outweigh the benefits of exercise electrocardiography in adults at low risk and without symptoms.

The 2010 joint guideline of the American College of Cardiology and the American Heart Association[4] does not comment on the role of screening exercise electrocardiography in low-risk asymptomatic adults, but states that a physician may consider ordering exercise electrocardiography in asymptomatic adults at intermediate risk of coronary heart disease. The guideline recommends that the individual physician decide whether screening exercise electrocardiography is warranted in a patient at intermediate risk.

Cardiac stress testing is often used inappropriately in people at low risk

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The Choosing Wisely initiative

As part of the Choosing Wisely initiative of the American Board of Internal Medicine Foundation, a number of medical specialty societies have published lists of recommendations and issues that physicians and patients should question and discuss. Cardiac stress testing in low-risk asymptomatic patients is on the list of a number of organizations, including the American College of Physicians, the American College of Cardiology, the AAFP, and the American Society of Nuclear Cardiology. These lists can be found at www.choosingwisely.org.

POSSIBLE HARM ASSOCIATED WITH CARDIAC STRESS TESTING

The overall risk of sudden cardiac death or an event that requires hospitalization during exercise electrocardiography is very small, estimated to be 1 per 10,000 tests, and the risk is probably even less in patients at low risk.[5] But the risk of potential downstream harm from additional testing or interventions may be greater than direct harm. Still, no study has yet assessed harm associated with follow-up testing or interventions after screening with exercise electrocardiography.

On the basis of large, population-based registries that include symptomatic persons, the risk of any serious adverse event as a result of angiography is about 1.7%; this includes a 0.1% risk of death, a 0.05% risk of myocardial infarction, a 0.07% risk of stroke, and a 0.4% risk of arrhythmia.[6] In addition, coronary angiography is associated with an average effective radiation dose of 7 mSv and myocardial perfusion imaging with a dose of 15.6 mSv.[7] These are approximately two times and five times the amount of radiation an average person in the United States receives per year from exposure to ambient radiation (3 mSv).

Several studies that included symptomatic and asymptomatic patients who had undergone angiography reported that between 39% and 85% of patients had no coronary artery disease. This means that many patients were subjected to the risks of invasive testing and treatment without the possibility of benefit. Patients who receive lipid-lowering therapy or aspirin because of an abnormal exercise electrocardiogram are also exposed to the risks related to those interventions.

THE CLINICAL BOTTOM LINE

On the basis of current data, the insurance executive should not get a stress test because the results of the test are unlikely to have an impact on his medical management, are unlikely to improve his clinical outcome, and carry a small risk of harm. Low-risk, asymptomatic people with a positive stress test have the same mortality rate as those who have a negative stress test, and its usefulness beyond traditional risk-factor assessment in motivating patients and guiding therapy has not been established.[8] In addition, the rate of false-positive results with exercise stress testing is as high as 71%.[9] Although the risk of an adverse event from the initial stress test is low, ie, 1 serious event in 10,000 tests, the risk of subsequent cardiac catheterization after a positive test is significantly higher, ie, 170 serious events in 10,000 tests. For these reasons, the potential harm of exercise electrocardiography outweighs the benefits in this patient.

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