ONE MINUTE CONSULT

BRIEF ANSWERS TO SPECIFIC CLINICAL QUESTIONS

Q: Which medications should be held before a pharmacologic or exercise stress test?

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A: THIS DEPENDS on the reason for the test, whether the patient can safely do without the medication temporarily, and the type of test.

REASONS FOR STRESS TESTING

Stress electrocardiography and various types of provocative imaging tests are done for a variety of reasons, including:

- To diagnose coronary disease
- To characterize the impact of known coronary disease on cardiac perfusion or function
- To assess ischemic burden semiquantitatively
- To characterize ventricular reserve and responsiveness in assessing patients for valvular surgery
- To test the effectiveness of a therapeutic program in relieving ischemic distress
- To estimate the risk of coronary events and cardiac mortality.

Tests done for most of these reasons need to be done with the patient expending maximal (or at least near-maximal) effort, as assessed by an adequate pulse response. The exception: when testing the effectiveness of a given therapeutic program, the goal is to suppress an abnormal response at the patient's physical limit. In this case, at the end of the test you want to see a patient who is free of symptoms, exhausted, and without ischemic markers, rather than a given pulse response.

SHOULD THE MEDICATION BE HELD?

Modifying drug therapy before a test to optimize results requires a degree of clinical judgment.

Most patients undergoing tests to diagnose coronary disease are not taking antianginal drugs, but they may be taking beta-blockers to control blood pressure or heart rhythm. Since a vigorous heart-rate response to exercise is key, beta-blockers (which limit the heart rate) may pose a problem, and these drugs usually can be safely held to try to elicit a more adequate pulse response.

Beta-blockers that are taken once daily should be held the day before and the day of the test. Beta-blockers taken twice or three times daily can be held the night before and the day of the test.

For patients undergoing tests to characterize known coronary disease, a maximal test is still important. These patients very well may be on nitrates and beta-blockers. Beta-blockers can usually be held safely in the way mentioned above, and the nitrates can be held on the day of the test. This will optimize detection of ischemic changes, both on the electrocardiogram and on the various imaging tests.

If the patient has a pain syndrome that seems to represent a change in angina, stopping a beta-blocker might not be a good idea, but an exercise test probably is not the best idea either. Coronary catheterization might be a more appropriate first step.

Modifying drug therapy before a test requires clinical judgment

PHARMACOLOGIC STRESS TESTING

Twenty to thirty percent of patients cannot exercise adequately (for a variety of reasons), or need special imaging studies to answer specific questions, such as positron emission tomography or dobutamine echocardiography to determine if areas of the myocardium are hibernating.

In these patients, pharmacologic "stress" with adenosine, dipyridamole, or dobutamine can be used before obtaining nuclear perfusion images, gated or first-pass radionuclide ven-

triculographic images, or a series of echocardiographic images.

Dobutamine directly stimulates heart rate and contractility. It can have an inadequate effect if the patient is using a beta-blocker, and beta-blockers can be held safely before the procedure if the patient does not have unstable or changing angina.

Adenosine and dipyridamole produce near-maximal coronary dilation and, as a result, different degrees of increase in flow in healthy vs diseased arteries in patients with coronary artery disease. Adenosine does this directly by stimulating adenosine receptors on the arterial wall; dipyridamole works indirectly by blocking reuptake of adenosine at the cellular level.

Because this arterial dilation produces perfusion images due to differential flow as opposed to true ischemia, beta-blockade has no impact on the quality of the images, and these studies can be done independent of the pulse response.

The effect of dipyridamole on adenosine reuptake is blocked by aminophylline and caffeine, and for this reason these substances need to be stopped 24 hours before the test. Most patients know to avoid coffee and likely tea, but it is important to remind them about chocolate, colas, and decaffeinated products, as these still contain a significant amount of caffeine.

Beta-blockers do not need to be held before adenosine or dipyridamole tests

There is no best stress test, but every patient has a test that is best for him or her and the question being asked. It is possible, usually safe, and very important to optimize results through judicious adjustment in medications. If there is any uncertainty about the stability of the coronary symptoms, however, coronary arteriography is a safe and reliable alternative.

SUGGESTED READING

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