LETTERS TO THE EDITOR

Is Acute Rest Scintigraphic Myocardial Perfusion Imaging in Patients with Acute Chest Pain and Nondiagnostic Electrocardiograms Clinically Useful, or Is It Misleading?

The study by Heller et al. is consistent with other studies that have focused on chest pain patients with low coronary event rates, demonstrating excellent negative predictive accuracy (99%), but poor positive predictive accuracy (12%) (1,2). In fact, the positive predictive value of the test is so poor as to be misleading and may explain why the authors had a 6% event rate but a 25% cardiac catheterization rate, presumably prompted by the abnormal resting nuclear scintigrams. This extremely poor positive predictive value needs to be stressed, so that physicians contemplating using nuclear studies in the management of chest pain patients use another technique, such as exercise testing, for risk stratifying patients who rule out for myocardial infarction but who have an abnormal resting nuclear scan. Our institution uses immediate exercise treadmill testing to evaluate chest pain patients in the emergency department. Our negative predictive value is 100% and our positive predictive value is 50% (3–5). The authors concluded that nuclear scintigraphy is cost effective, but a different conclusion might be reached if the cost of the cardiac catheterizations for patients with false positive scans was included in the cost analysis. I would appreciate their input on this question.

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REFERENCES


REPLY

An important aspect of the design of our study (1) needs to be emphasized: the physicians who managed the patients after hospital admission were blinded toward the results of resting myocardial perfusion imaging. Thus, subsequent cardiac catheterization was definitely not “prompted” by abnormal resting images. It would therefore be inappropriate to incorporate the cost of cardiac catheterization in the cost analysis. Cardiac catheterization was neither part of the design of study, nor would it be appropriate to automatically propose cardiac catheterization in all patients with abnormal resting images.

The relatively low positive predictive value of 12% in our study refers to the proportion of patients with abnormal images who had transient CK and CK-MB enzyme elevations. It is known from previous studies that abnormal resting myocardial perfusion images occur not only in patients with acute myocardial infarction (1), but also in patients with unstable angina (2–8). It is therefore incorrect to assume that 78% of positive images were necessarily falsely positive. In fact, these images likely visualized accurately resting myocardial hypoperfusion in patients with chest pain. This notion is supported by the subsequent clinical course of these patients. The attending physicians decided independently to refer more patients to cardiac catheterization who had (unbeknownst to them) abnormal resting images than patients who had normal images. Admittedly, in some patients, true inferior myocardial perfusion defects could not always be distinguished definitely from inferior attenuation. The 50% positive predictive value mentioned by Dr. Lewis presumably refers to the proportion of patients with positive exercise tests in relation to angiographic coronary artery disease. Thus, the positive predictive values in our study and the one mentioned by Dr. Lewis, refer to two different benchmarks: cardiac enzymes and angiographic coronary artery disease.

In evaluating patients with acute chest pain and nondiagnostic electrocardiograms goal should be not only to identify patients with acute myocardial infarction (which is achieved by serial enzymes levels), but also to identify patients with unstable ischemic syndromes. Myocardial perfusion imaging serves very well for this purpose, as we demonstrated in our study. The next goal then, is to identify patients with significant chronic coronary artery disease. We, and others, routinely perform early stress testing in the emergency department once an acute ischemic syndrome has been ruled out. However, in our experience a substantial