Editorial Comment

Dobutamine Stress Echocardiography: Is it a Reliable Tool in the Evaluation of Ischaemic Heart Disease?

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Key words:
Stress echocardiography, dobutamine, coronary artery disease.

Manuscript received:
November 28, 2003;
Accepted:
January 8, 2004.

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The diagnostic approach to coronary artery disease (CAD) using non-invasive methods still presents a challenge even today[1]. The classically used methods, such as treadmill stress testing, have a rather low specificity and sensitivity, especially in patients with one-vessel disease, as well as methodological limitations, such as in patients with mobility problems or left bundle branch block. In those patients, drug myocardial scintigraphy with adenosine and dobutamine stress echocardiography provide a good alternative. Particularly in recent years, stress echocardiography has become a widely used examination, whose clinical utility, over the whole spectrum of CAD manifestations, has been well established by a large number of clinical studies. The application of new technologies, such as b-harmonics and echo contrast media, has widened its scope and its diagnostic accuracy[2].

Hence, dobutamine stress echocardiography is used for the detection of CAD, for evaluation and prognosis in CAD patients, and for the detection of viable myocardium after myocardial necrosis. More specifically, for the detection of CAD, data from many clinical studies show a sensitivity of 80% and a specificity of 86%, based on angiographic findings[3,4]. As would be expected, the sensitivity and specificity are lower in patients with one-vessel disease, especially in the case of the circumflex and right coronary arteries[5]. However, the specificity of the method is considerably higher than that of perfusion scintigraphy, especially in patients with left ventricular hypertrophy and in women (smaller left ventricle, technical errors from the presence of the breasts in the scintigraphic examination). As regards the prognosis of patients with suspected or known CAD, dobutamine stress echocardiography provides exceptionally valuable information. In those patients, a negative stress echo examination is associated with a one-year mortality rate of 0.4-1.05%[6]. Finally, in the assessment of myocardial viability, after either myocardial infarction or reperfusion interventions, low-dose dobutamine stress echo has a high sensitivity (53-87%) and specificity (85-95%)[7]. This specificity is again considerably higher than that of scintigraphy with either thallium or technetium, given that scintigraphy detects small viable regions that do not, however, contribute to myocardial contractility, while it is doubtful to what extent their viability plays a part in survival[8-10]. Positron emission tomography, an examination that is not widely available but has been used in recent years for the diagnosis of CAD, does not seem to provide more information than dobutamine stress echo for the detection of CAD or viable myocardium,

since its slightly superior sensitivity is offset by a lower specificity. Besides, one should not forget the high cost of the above examinations in comparison with dobutamine stress echo, which is a cheap examination and may be carried out quickly.

The article in this issue by Karabinos et al[11] confirms the safety and reliability of the method in a large series of patients. The authors used a well-established protocol for drug administration in five three-minute stages. The incidence of serious complications was comparable with that reported elsewhere in the international literature. Their findings confirm the high specificity and quite high sensitivity of dobutamine stress echo in both the detection of CAD and the evaluation of myocardial viability. The examination proved to have high significance in relation to the prediction of future coronary events, and it is worth noting that the authors' results were unaffected by sex and left ventricular hypertrophy, two factors that can cause false positive findings, especially in radioisotope techniques. Finally, in this study, as in others, the method falls short in the detection of ischaemia in patients with one-vessel disease, particularly in the case of the circumflex or right coronary artery. The authors also describe one case with acute automatic dissection of the right coronary artery immediately following the dobutamine stress echo examination, an occurrence that has never before been reported in the literature. However, from the data provided it is not possible to establish a clear causal relationship between the examination and the dissection.

The above study comes from a centre with considerable experience in performing dobutamine stress echo examinations, while the number of patients is large by Greek standards. Its findings serve to confirm what has already started to become apparent in recent years, namely, that dobutamine stress echocardiography, especially using echo contrast media, is a method of first choice, having at least equal if not superior diagnostic value to that of radioisotope methods and positron emission tomography in the diagnosis of CAD and the detection of myocardial viability.

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