

## ECHO VERSUS ECG FOR SUSPECTED CAD

Exercise-induced wall motion abnormalities, detected by echocardiography, increase the risk of major adverse cardiac events (MACE) and mortality in patients with suspected coronary artery disease (CAD), but who have normal electrocardiographic measurements. These patients, incorrectly considered to be at low risk on the basis of electrocardiography, might benefit from treatment.

Current practice guidelines recommend exercise electrocardiography as the preferred initial diagnostic and prognostic test for patients with suspected CAD and with interpretable electrocardiographic readings. Patients who do not develop chest pain or ST-segment changes during treadmill exercise—the end points of exercise electrocardiography—are considered to be at low risk of MACE. Electrocardiography is a simple, noninvasive procedure, but it lacks sensitivity and often fails to detect myocardial ischemia. Wall motion abnormalities are known to develop before signs of ischemia are manifested in the form of angina or abnormalities on the electrocardiogram. Thus, exercise echocardiography might provide a more accurate diagnosis and prognosis by detecting ischemic changes that cannot be identified on an electrocardiogram.

To assess the prognostic value of exercise-induced wall motion abnormalities detected by echocardiography, researchers at the Hospital Universitario A Coruña in Spain conducted a study in 4,004 patients who had normal exercise electrocardiography results. In addition to post-exercise echocardiography images, the researchers used peak imaging to assess myocardial ischemia, a technique shown to have higher sensitivity for detecting CAD. Patients enrolled in the study had interpretable resting electrocardiographic measurements and did not develop chest pain or ST-segment changes during treadmill exercise. However, echocardiography showed that new wall motion abnormalities developed or pre-existing abnormalities were worsened during exercise in a significant number of these patients. During a follow-up period of 4.5 years, 313 patients died and 183 developed MACE before revascularization. The 5-year mortality and rate of MACE were doubled in patients with ischemia compared with those without ischemia. A multivariate analysis showed that exercise-induced wall motion abnormality is an independent predictor of mortality and MACE. Exercise echocardiography also provided additional prognostic information over clinical data, echocardiographic data at rest, and hemodynamic data obtained during exercise for predicting outcome. “Our study illustrates the notion that a negative exercise electrocardiogram may not be enough to confidently exclude myocardial ischemia, and supports a larger role for exercise echocardiography in risk stratification of patients with suspected CAD,” says Alberto Bouzas-Mosquera, one of the investigators.

Further studies will be required to establish the cost-effectiveness of routine exercise echocardiography—a more costly procedure than exercise electrocardiography—and whether the additional expense is justifiable. Bouzas-Mosquera suggests that “the lower initial cost of exercise electrocardiography ... might not translate into a lower overall cost of patient care. Furthermore,” he adds, “failure to detect myocardial ischemia might preclude appropriate management of these patients, particularly those without a prior history of CAD”.

*Sharmini Rajanayagam*

**Original article** Bouzas-Mosquera, A. *et al.* Prediction of mortality and major cardiac events by exercise echocardiography in patients with normal exercise electrocardiographic testing. *J. Am. Coll. Cardiol.* **53**, 1981-1990 (2009)