LETTERS TO THE EDITOR

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Peak treadmill exercise echocardiography: not feasible?

We have read with interest the new European Association of Echocardiography Guidelines on Stress Echocardiography recently published in both European Heart Journal 1 and European Journal of Echocardiography. 2 In the full-text version of these guidelines, 2 it is stated that ‘When a treadmill test is performed, scanning during exercise is not feasible.’ This is a common statement repeated in several guidelines on this topic. However, we have previously demonstrated that peak treadmill exercise echo is feasible, 3–5 with greater sensitivity (92 vs. 77%) and similar specificity to post-exercise treadmill echocardiography for the detection of coronary artery disease when modern technology that should include continuous harmonic imaging acquisition is available. 3 Furthermore, we also reported the value of peak treadmill exercise imaging for the detection of multivessel disease, when compared with post-exercise treadmill imaging. 4 The quality of the images was similar at peak and post-exercise, except for the parasternal views. However, these same segments can be adequately visualized in the apical views; therefore, a successful peak imaging examination may rely on apical images alone. Even though the number of adequately visualized segments was slightly lower at peak (13.2 ± 2.1) when compared with post-exercise (14.3 ± 2.2, P = 0.044), the sensitivity of peak imaging for the prediction of multivessel coronary artery disease was quite superior (79 vs. 55%, P < 0.001). Besides, the agreement between centres on the interpretation of exercise echocardiography has been also explored in a multicentric study, in which peak imaging in treadmill was obtained for most of the patients (125/150 patients included). The agreement was moderate 6 (κ = 0.48; intercentre range 0.45–0.52), which is similar to the inter-institutional agreement for dobutamine stress echo. Other advantages of peak over post-exercise treadmill echocardiography include capability of acquiring images in case of doubts about clinical symptoms or ECG changes at any step of the exercise protocol, a relative lack of hurry in comparison with the post-exercise approach in which images should be ideally acquired in <60 s, and the possibility of using the narrow post-exercise time period to obtain ‘complementary’ data such as mitral regurgitation or diastolic function assessment. Of course, bicycle can be confidently used to acquire peak images, but peak O₂ consumption is lower than that achieved by treadmill, 7 which might lead to lower sensitivity. In addition, in contrast to treadmill, leg discomfort or lack of leg strength is a common reason for stopping prematurely the test. Virtually all patients capable of exercising are able to perform a treadmill exercise testing, but not all of them are able to exercise in bicycle, as it is straight recognized in these guidelines.

References

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Peak treadmill exercise echocardiography: not feasible?: reply

We thank Dr Peteiro for the interest in our work. Exercise remains the cornerstone for the detection and prognostication of coronary artery disease, and its feasibility is very high when associated with stress echocardiography. We agree that regardless of the technique used, exercise echocardiography can be performed using either a treadmill or bicycle protocol. However, when treadmill exercise is performed, scanning during exercise is less feasible, so most protocols rely on post-exercise imaging. 1 Here comes the real limitation of treadmill exercise echocardiography. In fact, it is imperative to complete post-exercise imaging as soon as possible: the patient is moved immediately from the treadmill to an imaging table and placed in left lateral decubitus, so that imaging may be completed within 1–2 min. This technique assumes that regional wall motion abnormalities will persist long enough to be detected in the recovery phase. In most laboratories, the use of treadmill implies and is synonymous of post-exercise imaging which is what is not recommended in the EAE document due to its lower diagnostic accuracy.