Better, (perhaps) cheaper, but is it best?

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This editorial refers to 'Clinical and economic impact of stress echocardiography compared with exercise electrocardiography in patients with suspected acute coronary syndrome but negative troponin: a prospective randomized controlled study'† by P. Jeetley et al., on page 204

Patients presented at the emergency room with chest pain, non-characteristic ECG changes and negative Troponin represent a very frequent clinical dilemma. These patients are often hospitalized unnecessarily and frequently undergo non-invasive and even invasive investigations which turn out to be negative. Occasionally, they may falsely be discharged from the ER and eventually develop a major cardiac event. The most common and apparently the cheapest test employed in the evaluation of these patients is standard exercise ECG. Jeetley et al.† prospectively studied a large group of such patients. The patients performed either exercise ECG or stress (exercise or dobutamine) echocardiography. Patients were then re-classified in terms of risk stratification and either admitted to the hospital/referred for further non-invasive and invasive procedures or discharged based on clinical assessment combined with the results of these tests and then followed for clinical events during 9 months. Cardiac catheterization was performed based on clinical grounds and only in those classified as high risk. The authors were able to show that a significantly larger number of patients could be classified as low risk and discharged from hospital without further investigations after stress echo than similar patients performing stress ECG. Hard events at 9 months were non-significantly more frequent in the stress echo group (5%) as opposed to stress ECG (3%). An economical calculation (based on the British Health Care System) showed an apparently significant reduced cost in the stress echo group. These are very interesting and potentially important observations, and Jeetley et al. should certainly be congratulated for this study.

Stress echocardiography in the last years has become a major non-invasive diagnostic modality for patients with suspected or established coronary artery disease, and even for the assessment of valvular heart disease. Recent publications indicate that stress echocardiography may be a very useful prognostic tool and predict mortality, particularly in women. A negative exercise echocardiography appears to be associated with excellent 3 year prognosis. The work of Jeetley et al. adds another important indication for stress echocardiography: the evaluation of patients with chest pain at an intermediate risk admitted to the ER. The strength of this work is its clinical nature, resembling ‘real-life’ decision-making. The authors apparently had no impact on the decisions undertaken for these patients, except for performing the stress ECG/echo and then collecting the data regarding follow-up. There are, however, several shortcomings. This study certainly could not assess the true predictive value of stress echo for the assessment of coronary artery disease in this population, since most patients undergoing the test did not have an objective documentation of their coronary anatomy. Furthermore, though 5% of event rate during 9 months for a population with chest pain at an initially intermediate risk is perhaps acceptable, still 7/155 patients, classified by stress echo as ‘low risk’ and discharged from the hospital, experienced eventually a major event during this period. Furthermore, these stress echoes had been read by a single highly experienced individual, a scenario which is possibly often not the case in the real world.

The economical calculations provided by the authors are certainly interesting; however, they are hardly applicable anywhere else out of Great Britain, as they take into account only the cost of the specific tests performed to these patients—which also vary significantly around the world, and not considering the costs for hospitalizations/procedures/medications and more. Nevertheless, it is noteworthy that following a stress echo, much less additional non-invasive evaluations are necessary than after an exercise ECG (30 nuclear and 12 extra protocol stress echoes).

In view of all these, it would, indeed, appear that a strategy of performing stress echo in such patients is possibly better and perhaps even eventually cheaper than an initial stress ECG strategy. But is it the best strategy?

In some institutes, nuclear cardiology is readily available for these investigations and can certainly be used in a similar manner. Unfortunately, these test are generally more expensive (in Great Britain £231 vs. £129 pounds, Table 4) and, on the average, are much longer. Although generally they are considered somewhat more sensitive in
the detection of ischaemia than stress echo, this usually comes at the expense of reduced specificity.

An exciting new tool that has recently become clinically available is 64 slice/s cardiac CT. This new modality has the potential to become, in the near future, the method of choice in evaluating patients with chest pain at an intermediate risk, lack of ischaemic ECG changes, and negative Troponin. Already, at this early time, the comparison of the results with what is considered today as the true ‘gold standard’ for the assessment of coronary lumen, intravascular ultrasound, is favourable.10 There is, of course, a long way to go and we need to learn to overcome the pitfalls of this modality, in particular in patients with significant calcification and in those after stent(s) implantation. The issue of cost has also yet to be resolved, according to each country’s local specific economical environment. In the time being, based on the current study as well as previous ones, stress echo appears to be a simple and very useful initial non-invasive modality to assess patients with chest pain at an intermediate risk score. Clearly not ideal, perhaps even not best, but rather good indeed.

Conflict of interest: none declared.

References

Clinical vignette

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Evaluation of constrictive pericarditis by 64-slice multi-detector computed tomography

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A 71-year-old gentleman presented with a history of progressive right-sided heart failure. On 64-slice multi-detector computed tomography (MDCT), the patient was found to have a markedly thickened and calcified pericardium, with a maximal pericardial thickness of 14 mm over the inferior right and left ventricular surfaces (Panels A and B). Cine MDCT reconstructions demonstrated a conical-shaped deformity of both ventricles, enlargement of both atria, and an abnormal diastolic bounce of the interventricular septum consistent with constrictive pericarditis (Movie 1). Surgical pericardectomy was performed, during which bulging of the right ventricle through a resected portion of the pericardium was noted (Panel C). Pathological analysis of the resected pericardium found a thickened, calcified pericardium consistent with idiopathic constrictive pericarditis.

Supplementary movie is available at European Heart Journal online.

Panel A. Four-chamber MDCT image of the heart demonstrates marked thickening and calcification of the pericardium, which is most noticeable over the right ventricle (arrows). Note the abnormal conical deformity of the ventricles.

Panel B. Short-axis MDCT image of the heart. Note the fibrotic, thickened pericardium over the inferior border of both ventricles (arrows), as well as the extensive calcification of the pericardium over the right ventricle (arrow heads) and, to a lesser extent, the left ventricle.

Panel C. During surgical pericardectomy, the heart was found to be encased by a grossly thickened and calcified pericardium. Dissection of a portion of the pericardium over the right ventricle allowed the right ventricular free wall to bulge through the resected area (arrow).

Movie 1. Four-chamber cine CT reconstruction demonstrates the typical conical deformity of the ventricles, enlargement of the atria, a subtle bounce of the interventricular septum during diastole, and restraint of ventricular motion in diastole.