Title	Cost Effectiveness of Functional Cardiac Testing in the Diagnosis and Management of Coronary Artery Disease: A Randomized Controlled Trial. The Cecat Trial
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Aim

To assess: the feasibility and utility of functional cardiac tests as a gateway to angiography in diagnosing coronary artery disease; the ability of diagnostic strategies that include functional tests to identify patients who gain most from revascularization; outcomes for patients who underwent 4 alternative diagnostic strategies; and the most cost-effective diagnostic strategy for patients with suspected coronary artery disease.

Conclusions and results

Initial diagnostic tests were completed successfully with unequivocal results for 98% of angiography patients, 94% of single photon emission computed tomography (SPECT) sestamibi (MIBI) patients (p=0.05), 78% of cardiac magnetic resonance imaging (MRI) patients (p<0.001), and 90% of stress echocardiography patients (p<0.001). Claustrophobia and large size were the most common reasons for failure to complete tests. 22% of MIBI patients, 20% MRI patients, and 25% stress echo patients avoided angiogram. For patients who had positive functional tests, diagnoses were confirmed by angiography (50% stenosis in LAD or 70% stenosis in any other major vessel) in 83% of MIBI patients, 89% of MRI patients, and 84% of stress echo patients. Negative functional tests were followed by positive angiograms in 31% MIBI patients, 52% MRI patients, and 48% stress echo patients. Proportions that had coronary artery bypass grafting (CABG) were similar at 10% (angiography), 11% (cardiac MRI), and 13% (SPECT MIBI and stress echo). Proportions who had percutaneous transluminal coronary angioplasty (PTCA) were 25% (angiography), 18% (SPECT MIBI), and 23% (MRI and stress echo). At 18 months, comparing SPECT MIBI and stress echo with angiography we can rule out clinically significant difference in total exercise time since the upper limit of the confidence interval was less than 1. The cardiac MRI group had significantly shorter mean total exercise time of 35 seconds and the upper limit of the confidence interval was 1.14 minutes less than angiography group. Hence, we cannot rule out a difference of at least 1 minute with 95% confidence.

Recommendations

20%/25% of patients can avoid invasive testing by use of functional cardiac testing as gateway to angiography, without substantial effects on outcomes. Patients allocated to the MIBI group had similar results to the angiography group, and we ruled out clinically significant differences. At 18 months the group had more patients with significant improvement in CCS compared with angiography patients.

Methods

See Executive Summary link at www.hta.ac.uk/project/1217.asp.

Further research/reviews required

Further research, using blinded re-assessment of functional test results and angiograms, is required to formally assess diagnostic accuracy of functional tests. Longer-term, cost-effectiveness analysis is planned to assess whether decisions based on functional tests have significant impact up to 2 years post treatment.

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