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

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The study evaluated the clinical and economic impact of stress echocardiography (Echo) versus exercise electrocardiogram (ECG) for patients with suspected acute coronary syndrome but non-diagnostic ECG. The authors concluded that stress Echo was associated with less diagnostic uncertainty and fewer referrals for further investigation, and hence led to significant cost-savings over exercise ECG. The methodology of the study appears appropriate and, in general, was transparent, although the costing element was limited in its scope. The authors' conclusion should be considered with this in mind.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study evaluated the clinical and economic impact of stress echocardiography (Echo) versus exercise electrocardiogram (ECG) for patients with suspected acute coronary syndrome but non-diagnostic ECG.

Interventions
The interventions under examination were stress Echo versus exercise ECG that provided additional prognostic information for the targeted patients. Patients in the stress Echo group undertook either treadmill or pharmacological testing, while those in exercise ECG group undertook treadmill testing.

Location/setting
UK/hospital.

Methods
Analytical approach:
The economic evaluation was based on a single clinical trial. The time horizon of the economic analysis was to the point of diagnosis. The authors reported that the perspective of the UK National Health Service was adopted.

Effectiveness data:
The study was a single-centre, prospective, randomised controlled trial in which 218 patients were randomised to the exercise ECG group and 215 to the stress Echo group. The patients’ characteristics were comparable at baseline. The median duration of follow-up was 8.7 months. The primary outcomes of the trial included the rates of patients classified as having a low, intermediate or high risk, and the percentage of patients requiring further tests.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The main primary outcome was the rate of patients classified as having a low, intermediate or high risk. This was not combined with the cost. In effect, a cost-consequences analysis was performed.

Cost data:
The cost analysis considered costs of tests that could directly confirm or refute the diagnosis of coronary artery disease (CAD). The resource use data were collected from the clinical trial and unit costs were obtained from the UK Department of Health. The price year was 2004 and the costs were in UK pounds sterling (£).

Analysis of uncertainty:
Not performed.

Results
For stress Echo versus exercise ECG, 77% versus 33% of patients, respectively, were classified as low risk, \( (p=0.0001) \) with no difference in cardiac event rate (5% versus 3%), 3% versus 39% of patients were classified as intermediate risk, \( (p=0.0001) \), and 29% versus 20% of patients were classified as high risk, \( (p=0.04) \).

Three per cent of patients in the stress Echo group required further tests versus 47% in the exercise ECG group, \( (p=0.0001) \).

Mean costs for the detection of CAD were £366.63 in the stress Echo group versus £515.48 in the exercise ECG group, \( (p=0.004) \).

Authors' conclusions
The authors concluded that stress Echo was associated with less diagnostic uncertainty and fewer referrals for further investigation, and that it therefore led to significant cost-savings over exercise ECG.

CRD commentary
Interventions:
The authors explained clearly the choice of the interventions under examination. These are also likely to be relevant in other settings.

Effectiveness/benefits:
The effectiveness data were derived from a prospective, randomised controlled trial. This study design was appropriate for the study question. It was unclear whether power calculations or other statistical analyses were conducted to demonstrate the appropriateness of the sample size. Furthermore, the evidence came from a group of patients in a single hospital, which may, or may not, have been representative of other patient groups. The reporting of the study design and the assessment of clinical outcomes was, on the whole, good.

Costs:
The cost analysis was confined to a few tests related to the diagnosis of CAD. The unit costs and quantities of resources used were well presented. The perspective and the price year were well reported.

Analysis and results:
The clinical outcomes were not combined with the costs because a cost-consequences analysis was conducted. The issue of uncertainty was not addressed and the generalisability of the study results to other settings was not discussed. In addition, the authors recognised that a potential bias against exercise ECG was a limitation of the study.

Concluding remarks:
The methodology of the study appears appropriate and, in general, was reported clearly, although the costing element was limited in its scope. The authors' conclusion should be considered with this in mind.

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Other publications of related interest


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