Cost-effectiveness of mandatory stress testing in chest pain center patients

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.

Health technology
Mandatory stress testing in chest pain centre (CPC) patients.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients presenting at the ED with acute chest pain of unclear origin suggestive of myocardial ischaemia but with low suspicion of acute myocardial infarction (AMI). The average age was 52 years.

Setting
Hospital. The study was carried out in Michigan, USA.

Dates to which data relate
The effectiveness and resource use data for the intervention group were collected in 1994. The resource data for the control group were collected in 1993 (effectiveness data not recorded). The price year was not clearly reported.

Source of effectiveness data
The estimates of mortality rate, incidence of AMI, therapeutic intervention cases (IHD) or AMI detected were derived from a single study.

Link between effectiveness and cost data
The costing associated with the intervention group was undertaken retrospectively on the same patient sample as that used in the effectiveness analysis, whereas the costing associated with the control group was undertaken on a different sample than that used in the corresponding effectiveness analysis (378 patients with no history of coronary artery disease).

Study sample
Whilst no power calculations were reported, a total of 502 patients (average age 53 years, 54% male) was included as the intervention group and a total of 611 patients was included in the control group.

Study design
Case control study from a single centre. The duration of follow-up was 150 days after hospital discharge. The loss to follow-up was 5% at 14 days after discharge and 14% after 150 days.

Analysis of effectiveness
The analysis was based on the whole sample. The primary health outcome was sensitivity and specificity of CAD, mortality rate. Incidence of AMI, or therapeutic intervention at 3, 14, and 150 days after discharge, ischaemic heart disease or AMI cases detected, number of patients undergoing percutaneous transluminal coronary angioplasty (PTCA) or coronary artery bypass grafting (CABG) and number of patients undergoing stress testing were also recorded.

Effectiveness results
The sensitivity and specificity values were 63% (95% CI: 49% - 77%) and 58% (95% CI: 54% - 63%). Three additional cases with ischaemic heart disease would have been inadvertently released home from the emergency department without any further evaluation being performed under the comparator strategy relative to the intervention. At 3 and 14 days follow-up there were no cases of mortality, AMI or therapeutic intervention. At 150 days follow-up there were 2 cases of death and 1 case of AMI. Of the 67 patients admitted from the CPC, 66% had a final diagnosis of IHD or AMI. Twenty-four patients with IHD were identified only on further stress testing. Of these patients, 7 underwent PTCA or CABG. Four-hundred and twenty-four patients underwent stress testing.

Clinical conclusions
Mandatory stress testing has been shown to be a safe diagnostic and prognostic tool in CPC patients after a 4 hours negative myoglobin protocol.

Measure of benefits used in the economic analysis
The outcome measures were the number of patients transferred to the CPC who would have been hospitalized before the inception of the CPC. Chart review and telephone survey were used to follow admitted and discharged patients.

Direct costs
Quantities were not reported separately from costs. Nursing, cardiology, laboratory, pharmacy and radiology costs were included in the estimation. The source of data was the study hospital financial department, with the data for the control group being obtained from a case series of patients admitted to the institution in the year before the intervention. Discounting was not applied due to the short period of follow-up. The price date was not clearly reported.

Currency
US dollars($).

Sensitivity analysis
Not performed.

Estimated benefits used in the economic analysis
Three cases of IHD would be avoided by the intervention relative to the comparator.

Cost results
The total cost of performing 400 stress tests was $75,000. The cost of identifying one patient with IHD was $3,125 and one patient who underwent PTCA or CABG was $10,714. Cost savings of $1,470 (-62%) per patient transfer were achieved with the intervention relative to the hospital inpatient traditional management.
Synthesis of costs and benefits
A synthesis of benefits and costs was not reported as the mandatory stress testing produced more favourable outcomes and cost less, thus making it the dominant strategy. The projected cost per year of life saved for the intervention relative to the do-nothing option (clinical suspicion) was reported to be 'less than $2,000'. An incremental analysis was carried out in terms of cost saving.

Authors’ conclusions
Objective testing should be used in addition to 'do nothing' (clinical suspicion) optionalone to diagnose and then treat emergency patients with acute chest pain and low suspicion of acute myocardial infarction. Stress testing appears to be safe, reliable, and cost-effective in patients evaluated in a chest pain centre.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. Mandatory stress testing is an innovative diagnostic technique to increase the efficiency of coronary observation units. You, as a user of this database, should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The estimate of benefit may be open to question given the fact that the design did not account for potential differences between the intervention and control groups other than with regard to the health technologies to which they were subject. The data have not been used selectively.

Validity of estimate of costs
Resource quantities were not reported separately from the prices. The cost analysis, although reporting some quantities of resource use, did not include adequate details of the methodology employed. The price date was not clearly reported.

Other issues
Appropriate comparisons were made with other studies in terms of inclusion rates criteria and cost per year of life gained, and the results do not appear to have been presented selectively. The conclusions reached by the authors may be open to doubt, however, due to the uncertainties in the data. The results were reported, by the authors, as being non-generalisable.

Implications of the study
Further prospective, well-controlled studies are needed before any valid results can be obtained regarding the cost-effectiveness of mandatory stress testing in chest pain centre patients. Furthermore, as stated by the authors, further research is needed to understand the role of continuous 12-lead ST-segment monitoring in the CPC. Finally, extrapolation to other institutions is required.

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None stated.

Bibliographic details

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Other publications of related interest

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Subject indexing assigned by NLM

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