Projected cost-effectiveness of smoking cessation interventions in patients hospitalized with myocardial infarction

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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
This study examined the cost-effectiveness of counselling for smoking cessation, with supportive follow-up telephone calls after discharge, for patients hospitalised with acute myocardial infarction. The authors concluded that smoking cessation counselling, with supportive contact after discharge, could be cost-effective and reduce the incidence of smoking, with its adverse health events and social costs. The analysis was based on valid cost-effectiveness methods and the authors’ conclusions are robust and appropriate.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of counselling for smoking cessation, including supportive follow-up telephone calls after discharge, for patients hospitalised with acute myocardial infarction (AMI).

Interventions
Routine care consisted of advice to quit smoking, given during hospital stay, and the provision of printed materials on smoking cessation. The counselling intervention consisted of routine care plus a behavioural counselling session and the American Heart Association's workbook and DVD, with follow-up telephone calls from a nurse at two days, one week, three weeks, four weeks, and three months after discharge.

Location/setting
USA/hospital and community.

Methods
Analytical approach:
The analysis was based on a Monte Carlo simulation in a standard decision-tree model, with a hypothetical cohort of 327,600 hospitalised smokers. A 10-year follow-up period was considered. The authors stated that the analysis was conducted from a societal perspective.

Effectiveness data:
The clinical data were from a selection of relevant sources, which included published studies, national databases, and personal communications with study authors. The key input was the likelihood of successfully stopping smoking with either intervention, and these data were from a published meta-analysis of randomised clinical trials. Other inputs, such as mortality due to AMI, came from another meta-analysis of observational studies.

Monetary benefit and utility valuations:
The utility values were collected using the European Quality of life (EQ-5D) instrument, with a nationally representative sample of US patients. The utility decrements due to AMI were assessed using the standard gamble and the time trade-off methods.

Measure of benefit:
Various benefit measures were considered: the smoking quit rate, AMIs avoided, life-years, and quality-adjusted life-years (QALYs). A 3% annual discount rate was applied to life-years and QALYs.
Cost data:
The economic analysis included the costs of counselling (time spent by nurses and social workers, and the materials), smoking cessation medications (nicotine replacement, bupropion, and varenicline), medical care, coronary heart disease care and medications, AMI hospital stays, productivity lost by premature death, and non-medical items. The costs and quantities of resources were from published reports and national databases, such as the Healthcare Cost and Utilization Project's Nationwide Inpatient Sample and the Medicare and Medicaid databases. All costs were in US dollars ($) and were discounted at an annual rate of 3%. The price year was 2008.

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken on selected inputs, using plausible ranges of values, most of which were from the literature.

Results
The total costs for the whole cohort were $69,550 million with usual care and $68,650 million with counselling and follow-up. Both the medical and the non-medical costs were lower in the usual care group, but the productivity losses were lower in the counselling and follow-up group.

There were 230,400 patients who continued smoking, 50,060 non-fatal AMIs, 174,700 life-years lost, and 154,700 QALYs lost with usual care, while there were 180,200 patients who continued smoking, 48,680 non-fatal AMIs, 136,500 life-years lost, and 121,700 QALYs lost with counselling and follow-up. Counselling and follow-up was dominant as it was more effective and less expensive than usual care, when considering total societal costs.

When considering only the intervention costs, the incremental cost per quitter, with counselling follow-up, was $540 and the incremental cost per AMI avoided was $19,800. When considering all health care costs, the incremental cost per life-year gained, with the intervention, was $4,350 and the incremental cost per QALY gained was $5,050.

The incidence of non-fatal AMI was a key driver of the model. Another influential input was the utility associated with recurrent non-fatal AMI. Counselling with follow-up remained cost-effective in all circumstances.

Authors' conclusions
The authors concluded that smoking cessation counselling, with supportive contact after discharge, could be cost-effective and reduce the incidence of smoking, with its adverse health outcomes and social costs.

CRD commentary
Interventions:
The comparator was appropriately selected to reflect the routine care in the authors’ setting. A clear description of the two strategies was provided.

Effectiveness/benefits:
No systematic review was reported to identify the relevant sources of data, but they might have been appropriately selected for the model. For example, the efficacy of the interventions was from a published meta-analysis of clinical trials and these are generally considered to be valid sources of evidence. More details on these sources would have allowed a better judgement of the evidence. The authors stated that conservative assumptions were made to underestimate the benefits of smoking cessation counselling with supportive follow-up. Various benefit measures were considered and each of them was relevant. Life-years and QALYs were appropriate because the disease affects both expected survival and quality of life. The utility values were from an appropriate source, which was representative of the US population.

Costs:
The cost categories were consistent with the perspective stated. The results were presented from a societal perspective and including only health care costs, to show the impact of productivity losses. The authors justified the exclusion of some costs. The unit costs and resource quantities were generally not presented separately. Standard US sources were used for the unit costs, but these were not fully described. Some of the key costs were varied in the sensitivity analysis. Other details, such as the price year and the discount rate, were given.
Analysis and results:
The results were extensively reported. The intervention dominated the comparator, when considering societal costs. Incremental cost-effectiveness and cost-utility ratios were only calculated when required; when considering the perspective of the health care system, which included only the direct medical costs. A justification for the length of follow-up was given and it was based on the available data for health outcomes. A deterministic approach was used to investigate the uncertainty, and the analysis was restricted to variations in some selected inputs. The authors stated that 90% of patients in the clinical trials were men, and the results might not be transferable to women.

Concluding remarks:
The analysis was based on valid cost-effectiveness methods and the authors’ conclusions are robust and appropriate.

Funding
Not stated.

Bibliographic details

PubMedID
21220659

DOI
10.1001/archinternmed.2010.479

Original Paper URL
http://archinte.ama-assn.org/cgi/content/abstract/171/1/39

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Confounding Factors (Epidemiology); Cost-Benefit Analysis; Counseling /economics; Efficiency; Female; Health Care Costs; Hospitalization /economics; Humans; Incidence; Inpatients /statistics & numerical data; Male; Meta-Analysis as Topic; Middle Aged; Monte Carlo Method; Myocardial Infarction /economics /epidemiology /prevention & control; Quality of Life; Quality-Adjusted Life Years; Randomized Controlled Trials as Topic; Research Design; Smoking /epidemiology; Smoking Cessation /economics; United States /epidemiology

AccessionNumber
22011000231

Date bibliographic record published
15/06/2011

Date abstract record published
13/07/2011