Cost-effectiveness of clopidogrel in STEMI patients in the Netherlands: a model based on the CLARITY trial

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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 objective was to assess the cost-effectiveness of combined treatment with clopidogrel and aspirin compared with aspirin alone, for patients with ST-segment elevation myocardial infarction. The authors concluded that clopidogrel, combined with aspirin and given according to the Clopidogrel as Adjunctive Reperfusion Therapy (CLARITY) trial protocol, was cost-effective. The methods were satisfactory, but could have been reported in more detail. The authors’ conclusions appear to be appropriate for the scope of their analysis.

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

Study objective
The objective was to assess the cost-effectiveness of combined treatment with clopidogrel and aspirin compared with aspirin alone for patients with ST-segment elevation myocardial infarction (STEMI).

Interventions
The two interventions were one year of treatment with clopidogrel plus aspirin versus one year of treatment with aspirin.

Location/setting
Netherlands/secondary care.

Methods
Analytical approach:
A published decision-tree model (Berg, et al. 2007, see ‘Other Publications of Related Interest’ below for bibliographic details) was adapted, using Swedish and German data, to assess the lifetime costs and effects of the two interventions in the Netherlands. The time horizon was when the patients reached the age of 100 years and the authors reported that a societal perspective was adopted.

Effectiveness data:
The clinical and effectiveness data were from published studies. Swedish hospital discharge and death registers were used for the risk of events. The main effectiveness estimate was the combined endpoint of an occluded infarct-related artery, a recurrent myocardial infarction (MI) before angiography, or death. Effectiveness data were derived from the Clopidogrel as Adjunctive Reperfusion Therapy (CLARITY) trial (Sabatine, et al. 2005, see ‘Other Publications of Related Interest’ below for bibliographic details). The CLARITY trial was a randomised, double-blind, placebo-controlled trial of 3,491 patients.

Monetary benefit and utility valuations:
The utilities were derived from a Swedish study that evaluated utility in a population with moderate-to-severe health problems, which were comparable to those of STEMI patients.

Measure of benefit:
Life-years gained and quality-adjusted life-years (QALYs) gained were the measures of benefit and they were discounted at an annual rate of 1.5%, according to Dutch guidelines.
Cost data:
The authors reported that both the direct and indirect costs were included. These included the costs of MI, stroke, gastrointestinal bleeding, and subsequent events. The additional costs of clopidogrel were also analysed, but the costs of aspirin were omitted, as they were a part of both regimens. The clopidogrel costs were from pharmacists’ prescriptions and all other costs were from fee schedules and published literature. The indirect costs were adjusted, using the friction cost method, to take into account compensation by the remaining labour force. All costs were reported in Euros (EUR) and the price year was 2006. Future costs were discounted at an annual rate of 4%, in accordance with Dutch guidelines.

Analysis of uncertainty:
A series of one-way sensitivity analyses was undertaken to evaluate the impact of varying the efficacy rates, discount factors, and costs. A multivariate probabilistic sensitivity analysis was undertaken by applying probability distributions to all the model parameters and then using a Monte Carlo simulation. The results were presented as incremental cost-effectiveness scatter plots and acceptability curves.

Results
Combined treatment with clopidogrel and aspirin resulted in 0.05 life-years gained and 0.062 QALYs gained, compared with aspirin alone. It also resulted in cost savings of EUR 1,682 per patient, when including direct costs only, and of EUR 1,929 per patient, from a societal perspective.

The combined treatment was dominant over aspirin alone, as it was less costly and more effective.

The results from the sensitivity analysis showed that for combined treatment with clopidogrel and aspirin to be cost-effective, at a cost per QALY threshold of EUR 20,000, the product of the two- to 12-month risk and the risk reduction had to be over 0.487%.

Authors’ conclusions
The authors concluded that clopidogrel therapy, combined with aspirin and applied according to the CLARITY protocol, was cost-effective.

CRD commentary
Interventions:
The interventions were clearly reported. There might be other relevant comparators in other settings.

Effectiveness/benefits:
The authors provided a clear reason for using the CLARITY trial for the main effectiveness estimate, which was that it was a multinational clinical trial that included patients from the Netherlands. They also stated that the CLARITY trial was a large study and its results could be generalised to the Dutch setting. The other main model parameters appear to have been from Swedish data used in a previous model. The authors reported similarities between the health care systems of the Netherlands and Sweden, but they stated that their reliance on Swedish data was one of the main limitations of their study. They reported that Swedish observational effectiveness data were used due to a lack of Dutch trial data.

Costs:
The authors reported that a societal perspective was adopted and that both the direct and indirect costs were included. They did not report the cost categories, which makes it impossible to determine if all the relevant costs were included. The costs of the intervention appear to have been based on the clinical study protocol. The references for the costs were reported, but there were no other details. The price year, time horizon, currency, and discount rate were all appropriately reported.

Analysis and results:
Evidence on the costs and outcomes was synthesised, using a decision-tree model. The details of this model and a diagram were appropriately reported. The impact of uncertainty on the model’s results was adequately explored in a series of one-way and probabilistic sensitivity analyses. The authors mentioned other comparable studies, but did not
report their results. They appropriately reported the limitations of their study.

Concluding remarks:
The methods were satisfactory, but could have been reported in more detail. The authors’ conclusions appear to be appropriate for the scope of their analysis.

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