Oral antiplatelet therapy in secondary prevention of cardiovascular events: an assessment from the payer's perspective

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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 assessed the cost-effectiveness of antiplatelets (aspirin, clopidogrel, and dipyridamole) for the secondary prevention of cardiovascular events. Aspirin was cost-effective for primary or secondary prevention in patients at high risk of cardiovascular events, clopidogrel for symptomatic cardiovascular disease or acute coronary syndrome (for up to two years), and aspirin with dipyridamole for the secondary prevention of stroke (for up to five years). This economic evaluation was based on robust methodology and the authors’ conclusions were valid and appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of antiplatelet drugs for the secondary prevention of cardiovascular events in patients who had already experienced an ischemic event or who had acute coronary syndromes.

Interventions
The three oral antiplatelets were aspirin, clopidogrel, and dipyridamole and they were compared either alone or in combination. The five comparisons were: aspirin versus placebo; clopidogrel versus aspirin; clopidogrel for one year versus clopidogrel for 28 days; dipyridamole plus aspirin versus aspirin alone; and dipyridamole plus aspirin versus clopidogrel alone.

Location/setting
UK/primary and secondary care.

Methods
Analytical approach:
This economic evaluation was based on a Markov model involving a hypothetical cohort of 60-year-old cardiovascular patients. A lifetime horizon was considered and the authors stated that the perspective was that of the National Health Service (NHS).

Effectiveness data:
A comprehensive literature review identified the relevant clinical inputs. The PubMed and the Cochrane Library databases were searched and the search criteria were reported. Detailed results were provided. The data on treatment efficacy were derived from nine randomised controlled trial (RCT)s. The main characteristics and the findings of these were reported. The epidemiological parameters were derived from other published UK sources. Each RCT was used to perform an individual cost-effectiveness analysis among the drugs directly compared in the trial. The only indirect comparison was made between dipyridamole plus aspirin versus aspirin alone. The key clinical outcome was the risk reduction in cardiovascular events and death.

Monetary benefit and utility valuations:
None.

Measure of benefit:
Life-years (LYs) were used as the summary benefit measure. They were calculated using the decision model and were...
discounted at an annual rate of 3.5%.

Cost data:
The economic analysis included drugs and all health care services related to atherosclerotic disease and related death. The costs were presented as macro categories. These costs and quantities were derived from a variety of published sources such as previous cost-effectiveness studies and the NHS Reference costs. Drug costs were estimated using prices published in the British National Formulary. All costs were in UK pounds sterling (£) and the price year was 2006. Future costs were discounted at an annual rate of 3.5%.

Analysis of uncertainty:
A multivariate probabilistic sensitivity analysis was performed by attributing stochastic distributions to model inputs. The types of distributions were reported. All costs, age-related risk increases in event rates, and relative risks of experiencing subsequent events were varied between 0.75 and 1.25 of the initial value. The cost-effectiveness acceptability curves were generated for a variety of willingness to pay (WTP) thresholds.

Results
Aspirin was dominant (less costly and more effective) when compared with placebo regardless of the RCT used to derive the clinical data.

In comparison with aspirin, clopidogrel was cost-saving or generated a maximum additional cost of $772 and the gain in LYs with clopidogrel ranged from 0.0054 to 0.1153. When clinical data were derived from secondary prevention trials, clopidogrel was dominant, while the incremental cost-effectiveness ratio rose to $143,071 when the trial included both primary and secondary prevention patients.

When clopidogrel for one year was compared with clopidogrel for 28 days, the former strategy was less expensive (savings of $192) and more effective (0.1068 LYs gained), and was thus dominant.

When dipyridamole plus aspirin was compared with aspirin, the former strategy was dominant, as it was when compared with clopidogrel alone.

Authors’ conclusions
The authors concluded that aspirin was cost-effective for the secondary prevention of cardiovascular events. Although, in situations associated with greater risk, more intensive treatment with clopidogrel (alone or together with aspirin) for one or two years was cost-effective for the secondary prevention of ischaemic events. Also, for the secondary prevention of stroke, dipyridamole plus aspirin was the preferred strategy.

CRD commentary
Interventions:
The three treatments represented the most widely used oral therapies in the secondary prevention of thrombotic cerebrovascular or cardiovascular disease. Thus, their selection was appropriate.

Effectiveness/benefits:
The clinical data were identified through a systematic review of the literature, the main criteria of which were reported. Only RCTs were included, which enhances the validity of the study, given their robust design. All these studies were pivotal trials, which have a high internal validity. The data from the trials were not combined, instead each study was used to generate a set of clinical inputs for different economic evaluations. The results of each trial were reported and the methodology used to derive the transition probabilities was described. In general, it seems that valid methodology was used. The derivation of the benefit measure was clearly described. LYs represent a commonly used measure, the benefits of which can be compared across different health care interventions.

Costs:
The categories of costs were consistent with the perspective. The costs were presented as macro categories and a detailed breakdown of cost items was not given. The use of macro categories is common, but this reduces the transparency of the economic analysis. The price year, discount rate, and currency conversions were presented. The
sources of costs were only partially described.

Analysis and results:
The synthesis of costs and benefits was accurately performed and presented. The issue of uncertainty was extensively addressed by means of a probabilistic sensitivity analysis, the findings of which were clearly presented. The authors discussed some issues related to the validity of the specific clinical trials used for this economic evaluation and the impact of their findings on NHS guidelines.

Concluding remarks:
This economic evaluation was based on robust methodology, the sources and findings of which were clearly presented. The authors’ conclusions were valid and appropriate.

Funding
No funding was received.

Bibliographic details

PubMedID
18047390

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Cardiovascular Diseases /economics /prevention & control; Cost-Benefit Analysis; Hemorrhage /chemically induced; Humans; Models, Economic; Platelet Aggregation Inhibitors /adverse effects /economics /therapeutic use

AccessionNumber
22007002791

Date bibliographic record published
03/02/2009

Date abstract record published
07/04/2009