Cost-effectiveness analysis of abciximab: a Canadian hospital perspective

Zed P J, Frighetto L, Sunderji R, Marra C A

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
The use of abciximab, a platelet glycoprotein IIb/IIIa (GPIIb/IIIa), 0.25mg/kg IV pre percutaneous transluminal coronary angioplasty (PTCA) followed by 10 micro. g/min continuous infusion post PTCA for a period of 12 hours, to prevent complications such as reocclusion and restenosis in patients undergoing percutaneous transluminal coronary angioplasty (PTCA).

Type of intervention
Treatment and secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
High risk patients undergoing PTCA. High risk groups included patients identified with acute myocardial infarction within 12 hours of symptoms, early post infarction or unstable angina and refractory unstable angina.

Setting
Hospital. The economic analysis was conducted in Vancouver, British Columbia, Canada.

Dates to which data relate
Data on effectiveness were taken from two randomised controlled trials published in 1994 and 1997. Data on resource use were taken from the study hospital in 1997, with additional information taken from a 1997 publication. 1997 price years were used.

Source of effectiveness data
Effectiveness data were derived from a synthesis of previously completed studies.

Modelling
A 6 month decision analysis model was used to extrapolate information on costs and outcomes for the intervention and its comparator, based on the effectiveness information taken from published studies and cost estimates from the study institution.

Outcomes assessed in the review
Composite clinical outcomes associated with high risk patients undergoing PTCA who additionally received abciximab or placebo therapy. These outcomes included incidence of death, acute myocardial infarction and adverse bleeding complications experienced (haematoma; gastrointestinal, retroperitoneal, genitourinary and pulmonary).
**Study designs and other criteria for inclusion in the review**  
Randomised controlled trials comparing abciximab with placebo in the treatment of patients undergoing PTCA. Studies involving low risk populations were excluded from the analysis.

**Sources searched to identify primary studies**  
No sources used to identify primary studies were specified.

**Criteria used to ensure the validity of primary studies**  
Not stated.

**Methods used to judge relevance and validity, and for extracting data**  
Methods used to judge relevance and validity were not stated.

**Number of primary studies included**  
2 randomised controlled trials were included in the review.

**Methods of combining primary studies**  
The weighted average from the two trials of the probability for composite clinical outcomes including death, acute myocardial infarction and revascularisation and PTCA was estimated. Adverse events associated with bleeding were taken from one of the trials only, as the other trial was not representative of the situation in the study institution.

**Investigation of differences between primary studies**  
Not stated.

**Results of the review**  
The probabilities of having a composite clinical event (either death, myocardial infarction or additional PTCA) after 6 months in the abciximab and non-abciximab groups were 29% and 33% respectively. The probabilities of major rebleeding in the two groups were 4% and 1.6%.

**Measure of benefits used in the economic analysis**  
The benefit measure was event-free patients at 6 months following treatment.

**Direct costs**  
Direct costs associated with treatment and the costs of adverse events in the two groups were estimated. These included acquisition and procedure costs for drugs (abciximab plus alteplase and streptokinase), coronary artery bypass grafts, myocardial infarctions, percutaneous transluminal angioplasty procedures and treatment for major rebleeding. All cost estimates were derived from the study hospital costing department (or, for drugs, from the pharmacy department), with the exception of rebleeding costs which were derived from a 1997 study published in the literature. 1997 price years were used and costs were not discounted. Costs were determined from the perspective of the study institution.

**Indirect Costs**  
Not included.
Currency
Canadian dollars (Can$).

Sensitivity analysis
One way sensitivity analysis was conducted varying probabilities for clinical outcomes and rates of rebleeding. A multivariate threshold analysis was also conducted.

Estimated benefits used in the economic analysis
4% more patients in the abciximab group experienced an event-free six month period following PTCA compared with the placebo group. Adverse events due to rebleeding were included in the economic analysis.

Cost results
The mean cost per patient during the six month period treated in the abciximab group was Can$3,261 compared with Can$2,073 in the comparator group. These costs included costs for dealing with adverse rebleeding. Therefore, the incremental additional cost per patient in the abciximab group was Can$1,188.

Synthesis of costs and benefits
The incremental cost per event-free six month period gained using abciximab therapy was $29,700 compared with standard therapy for high risk patients undergoing PTCA. These results were robust in sensitivity analysis with the exception of the cost of abciximab. The cost of abciximab per patient would have to decrease from $1,610 to $423 for the abciximab strategy to become dominant.

Authors’ conclusions
The authors concluded that the use of abciximab increased the number of patients event-free after six months compared with the comparator placebo group, but at additional cost. Policy makers must determine whether these additional costs warrant the use of the drug. It would be anticipated that the cost-effectiveness ratio would be higher for low risk patients who were not included in the analysis. There is some evidence in the literature that the duration of clinical effectiveness may last up to 36 months and further economic analysis will be required when more data is available.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used: this was the standard treatment and management protocol for patients undergoing PTCA.

Validity of estimate of measure of benefit
Probabilities were derived from two randomised controlled trials identified by the authors. However, the method used to identify these trials in the literature was not stated and it is not clear whether these studies were identified in a systematic fashion. Calculations to determine statistically significant differences do not appear to have been provided.

Validity of estimate of costs
Information was provided on the source of costs and resources used. Only direct costs were considered in the analysis and future studies may wish to consider the costs to others in society such as patients and caregivers, although the authors noted that these would be likely to improve the favourability of abciximab.

Other issues
The results of the analysis may not be generalisable to settings outside the study institution within the British NHS Economic Evaluation Database (NHS EED)
Columbian healthcare system. The authors also noted that the estimate of effectiveness only covered a six month period and further analysis will be required when longer term trial results become available.

**Implications of the study**
Further economic analyses are required comparing abciximab with appropriate interventions over longer time periods than 6 months, as and when clinical trial data becomes available.

**Source of funding**
None stated.

**Bibliographic details**

**PubMedID**
9606473

**Original Paper URL**
http://www.theannals.com/abstracts/volume32/May/536.html

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Angioplasty, Balloon, Coronary; Antibodies, Monoclonal /adverse effects /economics /therapeutic use; Canada; Coronary Disease /drug therapy /economics /prevention & control; Cost-Benefit Analysis; Hemorrhage /chemically induced; Humans; Immunoglobulin Fab Fragments /adverse effects /economics /therapeutic use; Platelet Aggregation Inhibitors /adverse effects /economics /therapeutic use

**AccessionNumber**
21998000792

**Date bibliographic record published**
30/04/2000

**Date abstract record published**
30/04/2000