Pharmacoeconomic aspects of non-steroidal anti-inflammatory drug gastropathy

Walan A, Wahlqvist P

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
Non-steroidal anti-inflammatory drug (NSAID) treatment in patients with arthritis.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population consisted of hypothetical arthritis patients.

Setting
The setting was primary and secondary care. The economic analysis was carried out in Sweden.

Dates to which data relate
Effectiveness data were obtained from studies published between 1995 and 1998. Resource use data were obtained from studies published between 1992 and 1998. The price year was 1996.

Source of effectiveness data
The evidence/estimate for final outcomes were based on a synthesis of completed studies.

Link between effectiveness and cost data
The costing was undertaken on the same hypothetical patient sample as that used in the effectiveness study.

Modelling
A decision tree model was used to estimate benefits and costs.

Outcomes assessed in the review
The outcomes assessed in the review were the gastrointestinal (GI) side effects due to NSAIDs. These included the probability of developing gastric ulcers, duodenal ulcers, dyspeptic symptoms and serious complications.

Study designs and other criteria for inclusion in the review
No criteria for inclusion were specified.
Sources searched to identify primary studies
The sources searched were not specified.

Criteria used to ensure the validity of primary studies
No criteria used to ensure the validity of primary studies were specified.

Methods used to judge relevance and validity, and for extracting data
No methods used to judge validity of the primary studies and data extraction were specified.

Number of primary studies included
At least five primary studies were included in the analysis.

Methods of combining primary studies
The results from the primary studies were complementary and no combination was performed.

Investigation of differences between primary studies
No investigation of differences between the primary studies was reported.

Results of the review
50% of NSAID users had a gastrointestinal event during a period of one year. Of these, 1.25% of patients had serious complications: 12% gastric ulcers, 8% duodenal ulcers and 28.75% had episodes of dyspeptic symptoms.

Measure of benefits used in the economic analysis
The measure of benefit used in the economic analysis was the QALY. A decision tree model to account for different probabilities of benefiting from treatment and experiencing a GI side effect was developed. The valuation of utilities was obtained from primary studies. Utilities were obtained using the time trade off method, no other information on the valuation of utilities was provided.

Direct costs
Discounting was not applied due to the one-year period of the study. Some quantities (drug dosages) were reported separately from costs. Direct costs included the costs of acute ulcer treatment (including an initial endoscopy with biopsies and histology), the costs of maintenance treatment with omeprazole or ranitidine, treatment of NSAID-associated peptic symptoms without ulcers (including an initial endoscopy with biopsies and histology, and follow-up visits), hospitalisations for serious complications (i.e. peptic ulcer bleeding), travel costs for health care visits. The perspective adopted was that of society. Estimations of quantities and costs were based on published studies and assumptions made by the authors. Final estimates were obtained using the decision tree model. The sources of quantity and cost data were published studies. The price year was 1996. The cost of hospitalisation due to serious complications, which dated from 1989, was inflated to 1996.

Statistical analysis of costs
No statistical analysis of costs was performed.

Indirect Costs
Discounting was not applied due to the one-year period of the study. Some quantities were reported separately from...
costs. Indirect costs included the cost of lost production due to absence from work. The cost boundary was that of the patient. Estimation of quantities and costs were based on published studies. The price year was 1996.

**Currency**

**Sensitivity analysis**
Sensitivity analyses based on increases and decreases of values of input parameters by 25% were performed. A sensitivity analysis by assuming that NSAID treatment was stopped when a gastrointestinal event occurred was also performed. In addition, analysis based on the probability to benefit from NSAID of 0.2 was performed.

**Estimated benefits used in the economic analysis**
When the probability of benefit from NSAID was set at 0.2, the effectiveness would be increased by 0.012 QALYs annually. Prescribing NSAID resulted in 0.827 QALYs per year, while not prescribing them led to a total of 0.815 QALYs. Threshold values for the probability of benefit were within 10% for all sensitivity analyses.

**Cost results**
When the probability of benefiting from NSAID was set at 0.2, the total cost of prescribing NSAIDs was Sek52,420 and the total cost of not prescribing NSAID was Sek60,000. Prescribing NSAIDs reduced costs annually by Sek7,580.

**Synthesis of costs and benefits**
No synthesis of costs and benefits was reported. The results of threshold analyses showed that, for a probability of benefiting from NSAIDs of between 5.9% and 7.4%, the treatment with NSAIDs would be more beneficial but also more costly. For probability of benefit above 7.4%, the NSAID treatment was more effective and cost saving at the same time. In the sensitivity analyses this threshold reached 9.8% if the costs of arthritis decreased by 25%, or 9.3% if a gastrointestinal event led to stopping of NSAID.

**Authors' conclusions**
A simple modelling approach indicated that treatment with NSAIDs might be highly cost-effective as both the clinical and economic benefits for patients responding to such treatment outweighed possible drawbacks.

**CRD COMMENTARY - Selection of comparators**
No explicit justification was provided for the adoption of the no treatment option as a comparator; it would appear to represent current practice in the authors' setting. You, as a user of the database should decide if this is the case in your own setting.

**Validity of estimate of measure of benefit**
The authors did not state that a systematic review of the literature had been undertaken. No justification for the primary studies incorporated in the model was provided. The risks of experiencing side effects were based on a single clinical trial and no validity of this trial, or justification for its selection were analysed in the article. Insufficient information was provided on the derivation of the utilities used in the model.

**Validity of estimate of costs**
A positive aspect of the cost analysis was that the most important categories of costs relevant to the adopted societal perspective were included in the analysis. However, the estimations of quantities and costs were based on a number of assumptions made by the authors and on data sources that may not be comparable in terms of patient population. The
users should consider the relevance of treatment strategy in their setting.

Other issues
The limitations of the study reported by the authors were that the model did not include long term effects of treatments in terms of life expectancy of patients, the risk of dying from GI complications was not included, other potential beneficial effects of NSAIDs were not modelled, and the proportion of patients stopping the treatment due to side effects was not modelled.

Implications of the study
The authors outlined areas of future research and concluded that a more thorough and long-term model and evaluations for different populations, needs to be estimated.

Source of funding
None stated.

Bibliographic details

PubMedID
10379474

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Anti-Inflammatory Agents, Non-Steroidal /adverse effects /economics /therapeutic use; Arthritis, Rheumatoid /drug therapy /economics; Cost-Benefit Analysis; Drug Costs /standards /trends; Duodenal Ulcer /chemically induced /economics; Dyspepsia /chemically induced /economics; Economics, Pharmaceutical; Health Care Costs; Humans; Models, Economic; Probability; Quality-Adjusted Life Years; Stomach Ulcer /chemically induced /economics /epidemiology; Sweden