The cost-effectiveness of extended-duration antithrombotic prophylaxis after total hip arthroplasty

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 extended-duration antithrombotic prophylaxis following total hip arthroplasty. The authors concluded that there was insufficient economic evidence to support extended treatment with low molecular weight heparin, but there was some evidence to suggest that warfarin might be cost-effective. Despite some limitations in the reporting, the methodology seems to have been appropriate, and the authors' conclusions appear to be correct.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of extended-duration antithrombotic prophylaxis following total hip arthroplasty.

Interventions
Extended-duration antithrombotic treatment with low molecular weight heparin or warfarin was compared with no extended treatment.

Location/settings
Canada/hospital and home.

Methods
Analytical approach:
A decision tree model was developed to facilitate the combination of the clinical and economic data and a lifetime horizon was adopted. The authors stated that the perspective was that of a direct payer.

Effectiveness data:
The effectiveness data were identified through a systematic literature review. MEDLINE, EMBASE and the Cochrane Database of Systematic Reviews were searched and studies were included if they evaluated drugs for extended preventive treatment against deep-vein thrombosis following total hip arthroplasty, and were a randomised controlled trial (RCT). Where necessary meta-analysis was used to combine the trial results. The main outcome measures were symptomatic venous thromboembolic events, major bleeding events, and death.

Monetary benefit and utility valuations:
Quality-of-life weights were derived from a published study.

Measure of benefit:
The measure of benefit was the quality-adjusted life-year (QALY) and these were discounted at an annual rate of 3%.

Cost data:
The categories included in the cost analysis were the costs of drug acquisition and administration, and the diagnosis and management of deep-vein thrombosis, pulmonary embolism, and major bleeding complications. The drug acquisition costs were obtained from a pooled sample of prices from nine retail pharmacies across Canada. The costs of treatment
at home were obtained through personal communication and the costs of diagnosis and management of complications were estimated by pooling published physician and laboratory fees for various aspects of treatment. The resource use data were largely obtained from published studies. The price year was 2006 and all costs were reported in Canadian dollars (CAD).

Analysis of uncertainty:
A probabilistic sensitivity analysis was conducted to determine the sensitivity of the cost-effectiveness results to uncertainty in the parameter estimates. Important cost parameters were also tested in a one-way threshold analysis to identify the values that would result in a cost-effectiveness of $50,000 per QALY gained.

Results
In a hypothetical cohort of 1,000 patients, low molecular weight heparin was associated with an incremental gain of 7.51 QALYs compared with no extended treatment. Warfarin had an incremental gain of 5.51 QALYs compared with no extended treatment. The incremental costs per 1,000 patients were CAD 799,104 with heparin and CAD 72,236 with warfarin.

The incremental cost-effectiveness relative to no extended treatment was CAD 106,454 per QALY gained for heparin and CAD 13,115 per QALY gained for warfarin.

The cost-effectiveness for heparin was sensitive to the proportion of the cohort requiring home-nursing services and the cost-effectiveness for warfarin was sensitive to the rate of major bleeding events.

Authors' conclusions
The authors concluded that there was insufficient economic evidence to support extended treatment with low molecular weight heparin, following total hip arthroplasty. They also stated that warfarin was potentially cost-effective, but the findings were based on limited clinical evidence and further research was required.

CRD commentary
Interventions:
The details of the interventions were reported and their choice was appropriate as they represented the relevant strategies in the authors' setting.

Effectiveness/benefits:
The effectiveness data were derived from a systematic review of the literature, which should have ensured that the most recent and relevant evidence was included. The use of data from RCTs was appropriate as RCTs are the gold standard design and should ensure a high degree of internal validity. The effectiveness estimates were reported, but their sources were not. The source from which the utility weights were derived was reported and appears to have been appropriate.

Costs:
The costs appeared to reflect the perspective stated. The details of the sources and, where appropriate, the method used to derive the unit costs and resource quantities were reported, but the actual cost estimates were not given. Adjustments to the cost data, including, the price year and inflation, were reported. As all the costs were incurred within a ninety day period, discounting was not necessary and was not performed.

Analysis and results:
The authors' conducted an appropriate incremental analysis and the full results were presented. The issue of uncertainty was addressed in the sensitivity analysis, the results of which were reported and discussed. The authors' acknowledged a number of limitations to their analysis, in particular the uncertainty surrounding many of the estimates included in the model.

Concluding remarks:
Despite some limitations in the reporting, the methodology seems to have been appropriate, and the authors' conclusions appear to be correct.
Funding
Supported by the Nova Scotia Health Research Foundation.

Bibliographic details

PubMedID
17403806

DOI
10.2106/JBJS.F.00092

Original Paper URL
http://www.ejbjs.org/cgi/content/abstract/89/4/819

Indexing Status
Subject indexing assigned by NLM

MeSH
Anticoagulants /administration & dosage /economics; Arthroplasty, Replacement, Hip /adverse effects; Cost-Benefit Analysis; Heparin, Low-Molecular-Weight /administration & dosage; Humans; Thromboembolism /etiology /prevention & control; Time Factors; Warfarin /administration & dosage

AccessionNumber
22007001055

Date bibliographic record published
04/06/2007

Date abstract record published
09/12/2009