Comparison of the two-year outcomes and costs of prophylaxis in medical patients at risk of venous thromboembolism

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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 venous thromboembolism prophylaxis with enoxaparin or unfractionated heparin, or no prophylaxis in at-risk medical patients. The authors concluded that enoxaparin was a potentially favourable venous thromboembolism prophylaxis regimen compared with unfractionated heparin and no prophylaxis for at-risk patients. Overall the methodology was adequate and the methods and results were well reported. Given the scope of the analysis, the authors' conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of venous thromboembolism prophylaxis with enoxaparin, unfractionated heparin, or no prophylaxis, in at-risk medical patients.

Interventions
The study compared three interventions: low molecular weight heparin (enoxaparin 40mg subcutaneously once a day for five days); unfractionated heparin (5,000 international units subcutaneously twice-a day for five days); and no prophylaxis.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A Markov decision model was used to assess the costs and outcomes of the three interventions. The time horizon was two years and the authors reported that the perspective was that of a payer and relevant to both the commercial sector and Medicare.

Effectiveness data:
The effectiveness and clinical data were derived from a number of sources including trials, large-scale US health care claims databases, and a variety of published sources. The key clinical inputs were the rates of: venous thromboembolism; adverse events (such as bleeds and heparin-induced thrombocytopenia); complications; and death. Information on these variables was derived from the Prophylaxis in Medical Patients with Enoxaparin (MEDENOX) trial (Samama, et al. 1999, see 'Other Publications of Related Interest' below for bibliographic details).

Monetary benefit and utility valuations:
None.

Measure of benefit:
Venous thromboembolism event rates were the measure of benefit.

Cost data:
The direct costs included in the model were those of: prophylactic drugs; venous thromboembolism event treatment;
diagnosis; adverse event treatment; and complication treatment. The authors reported that these costs were derived from a variety of published sources. All costs were inflated to 2006 prices using the Consumer Price Index for medical services, and were reported in US dollars ($). As they were incurred over a two-year period, discounting was not undertaken.

Analysis of uncertainty:
One-way and multi-way sensitivity analyses were undertaken by varying the model parameters over a range of ± 20%. A Monte Carlo analysis was also performed.

Results
The incidence of venous thromboembolism events was 6.8% with enoxaparin; 7.9% with unfractionated heparin; and 17.9% with no prophylaxis.

The average cost per patient was $1,264 with enoxaparin; $1,585 with unfractionated heparin; and $2,245 with no prophylaxis.

The authors reported that the sensitivity analysis showed that these results were generally robust to all plausible scenarios.

Authors' conclusions
The authors concluded enoxaparin was a potentially favourable venous thromboembolism prophylaxis regimen compared with unfractionated heparin and no prophylaxis for at-risk patients.

CRD commentary
Interventions:
The interventions were reported clearly and in detail.

Effectiveness/benefits:
The authors did not report if a systematic review of the literature was undertaken and so it is not clear if all the relevant information was included in the model. The key clinical input parameters for the model were derived from a trial published in the New England Journal of Medicine, which means that the internal validity of the effectiveness estimates was likely to be good.

Costs:
The perspective was explicitly reported and it appears that all the major cost categories and costs relevant to this payer perspective were included. The sources from which the costs were derived were adequately reported. Details were given of the time horizon, price year, and currency used. Overall, the cost reporting was good.

Analysis and results:
All the relevant details of the Markov model were reported, but there was no diagram. The uncertainty was assessed using one-way and multi-way sensitivity analyses, together with a Monte Carlo simulation. Although these methods go some way towards assessing the impact of uncertainty on the results, a probabilistic sensitivity analysis could have captured the overall model uncertainty better. The authors adequately reported the limitations of their study, which were: the data were modelled on a hypothetical patient cohort; the model was limited to a maximum of one venous thromboembolism recurrence during the study period; and, due to a lack of data, venous thromboembolism recurrence following prophylaxis was assumed to be equal for all groups.

Concluding remarks:
Overall the methodology was adequate and both the methods and results were generally well reported. Given the scope of the analysis, the authors' conclusions appear to be valid.

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Other publications of related interest


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MeSH
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