Cost comparison of strategies for the management of venous thromboembolic event risk following laparotomy for ovarian cancer

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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 strategies to manage the risk of postoperative venous thromboembolism, in postmenopausal women who were undergoing laparotomy as a primary treatment for ovarian cancer. The authors concluded that one month of prophylaxis with unfractionated heparin was the least costly and most effective strategy. The methods were adequate and the results were sufficiently reported. The authors’ conclusions appear to be appropriate for their objective.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of strategies to manage the risk of postoperative venous thromboembolism (VTE), in postmenopausal women who were undergoing laparotomy as a primary treatment for ovarian cancer.

Interventions
Six options were analysed: no prophylaxis against VTE; in-patient treatment with a sequential compression device (SCD); in-patient unfractionated heparin 5,000 units three times a day; in-patient low molecular weight heparin (LMWH) 40mg daily; unfractionated heparin 5,000 units three times a day for one month; and LMWH 40mg daily for one month.

Location/setting
USA/in-patient and out-patient secondary care.

Methods
Analytical approach:
A decision tree was used to assess the outcomes and costs of the six options, by combining data from published studies. The authors reported that the perspective was that of the health care system.

Effectiveness data:
The effectiveness data were from studies published between 2000 and 2010, and identified by a search of the PubMed database. The key search terms were reported. The main estimate of effectiveness was the rate of VTE with each of the six options.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measure of benefit was the reduction in risk of VTE.

Cost data:
The direct costs included out-patient and in-patient VTE prophylaxis, the treatment of VTE, and the treatment of complications from therapy. The costs of drugs were their average wholesale prices. In-patient costs were based on
institutional in-patient charges. VTE treatment costs were from the US Nationwide Inpatient Sample database for 2008. Direct charges to patients were converted to costs, using a standard cost-to-charge ratio of 0.6. All costs were reported in US $.

Analysis of uncertainty:
One-way sensitivity analyses were undertaken to assess the uncertainty in the cost and clinical parameters.

Results
The average cost per patient was $1,611 for unfractionated heparin, $1,803 for the SCD, $2,186 for in-patient unfractionated heparin, $2,197 for LMWH, $2,502 for in-patient LMWH, and $3,165 for no prophylaxis.

The VTE risk was 1.9% for unfractionated heparin, 6.4% for the SCD, 5.4% for in-patient unfractionated heparin, 1.9% for LMWH, 5.9% for in-patient LMWH, and 13% for no prophylaxis.

Unfractionated heparin was dominant over all the other interventions, as it was less costly and more effective.

The variables that had the most impact on the results were the baseline probability of VTE, the cost of VTE treatment, and the cost of bleeding.

Authors’ conclusions
The authors concluded that one month of prophylaxis with unfractionated heparin was the least costly and most effective strategy to prevent postoperative VTE.

CRD commentary
Interventions:
The interventions were described and appear to have been appropriate comparators.

Effectiveness/benefits:
The effectiveness data were from published studies. The review of PubMed was not systematic, but the key search terms were provided and it is likely that all the major relevant articles were found. The benefit measure may make it difficult to compare this study's results with those of studies for other diseases. It also did not assess morbidity, which might vary between interventions. The authors acknowledged that this lack of assessment of quality of life was a limitation of their study.

Costs:
The perspective was explicitly reported. It appears that all the major costs relevant to this health care system perspective were included. The authors reported the sources for these costs and the cost-to-charge ratio was varied over a wide range in the sensitivity analysis. The time horizon was not explicitly stated, but appears to have been less than one year, meaning that discounting was not required. The price year was not reported and it was unclear if the costs were appropriately adjusted for inflation.

Analysis and results:
The cost and outcome information was synthesised in a decision tree. The structure and simplifying assumptions were reported and a diagram was presented. The results were clearly reported. A thorough one-way sensitivity analysis was undertaken and the results were presented in full. The overall model uncertainty could have been evaluated better in a probabilistic sensitivity analysis. As the main limitation to the study, the authors reported that the cost information was from multiple sources.

Concluding remarks:
The methods were adequate and the results were sufficiently reported. The authors’ conclusions appear to be appropriate for the objective of the analysis.

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