Cost-effectiveness of venous thromboembolism prophylaxis in surgery

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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.

Health technology
Prevention of postoperative venous thromboembolism comparing treatment where clinically indicated, general prophylaxis, and selective treatment following screening.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing three types of surgery were analysed: cholecystectomy (low risk of thromboembolism), general elective abdominal surgery (medium risk), and elective total hip replacement (high risk).

Setting
Practice setting was hospital. The economic data was collected at Malmo University Hospital, Sweden.

Dates to which data relate
Costs are expressed in 1990 prices. Effectiveness dates were not given.

Source of effectiveness data
Review of previously completed studies.

Outcomes assessed in the review
The frequency of thromboembolism.

Study designs and other criteria for inclusion in the review
Not stated.

Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.
Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
More than 100 studies.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not carried out.

Results of the review
Frequencies were calculated per 1000 patients. For abdominal surgery, the rate of thromboembolism was 0.115 in the no prophylaxis alternative, 0.035 in the general prophylaxis alternative, and 0.290 or 0.196 in the selective treatment alternative, depending on whether a fibrinogen test or a fibrinogen test and phlebography was carried out. For cholecystectomy, the rates were 0.05, 0.025, 0.1, and 0.068, respectively, and for hip surgery were 0.232, 0.07, 0.59 and 0.4, respectively.

Measure of benefits used in the economic analysis
Benefits were measured in terms of the reduced frequency of thromboembolism.

Direct costs
Quantities and costs were not measured separately. Only direct hospital costs were considered, including treatment costs, prophylaxis costs and test costs. Treatment costs included medication, diagnosis, sampling, and the treatment and prolonged hospitalisation due to complications. The estimation of costs was based on hospital records. Prices related to 1990.

Currency
Swedish crowns (SEK)

Sensitivity analysis
Sensitivity analysis was performed with regard to the frequency of thromboembolism, prophylactic effect and treatment costs. The methods used are not specified.

Estimated benefits used in the economic analysis
For abdominal surgery and hip surgery, prophylaxis was expected to reduce thromboembolism by 70% and for cholecystectomy, by 50%.

Cost results
For abdominal surgery, costs per patient were SEK 2,259 for no prophylaxis, SEK 1,793 for general prophylaxis, SEK 6,790 for selective treatment following the test and SEK 5,987 for the test and phlebography. For cholecystectomy, costs per patient were SEK 989 for no prophylaxis, SEK 1,604 for general prophylaxis, SEK 3,173 for selective treatment following the test and SEK 2,887 for the test and phlebography. For hip surgery, costs per patient were SEK
4,402 for no prophylaxis, SEK 2,392 for general prophylaxis, SEK 12,531 for selective treatment following the test and SEK 10,847 for the test and phlebography.

**Synthesis of costs and benefits**
General prophylaxis is effective in the three surgical interventions investigated. It is the best cost saving alternative in general surgery and elective hip surgery. In cholecystectomy, the best cost reducing alternative is no prophylaxis.

Sensitivity analysis revealed that the results were not sensitive to different assumptions regarding the frequency of thromboembolism. With regard to prophylactic effect, costs in abdominal surgery were minimised with the no treatment alternative until the effect of prophylaxis was to reduce the frequency of thromboembolism by 49%.

Since prophylaxis also increases the number of haemorrhagic complications, costs were minimised in groups of patients who have a frequency of post-operative DVT above 8%.

**Authors’ conclusions**
Prophylaxis reduce the risks of thromboembolism. The author argued that doubling the use of prophylaxis (from one-third to two-thirds of patients) would save SEK 50 million.

**CRD Commentary**
1) Details concerning the methods used and the assumptions made in the collection of data are lacking. For example, there is no mention of how the studies on thromboprophylaxis were chosen, nor any reference to study designs or sample sizes.

2) Since the sensitivity analysis revealed that the results for abdominal surgery are sensitive to the extent that prophylaxis reduces the frequency of thromboembolism, the lack of detail regarding how the data relating to this are collected and analysed is a major weakness.

3) The study shows that the use of prophylaxis is likely to be more cost-effective than selective treatment for general surgery and hip replacement but does not prove conclusively that it is more cost-effective than the no treatment alternative.

4) The study does not use an incremental cost-effectiveness analysis and thus making a judgement about the cost-effectiveness of prophylaxis for surgical interventions where general prophylaxis use is both more effective and more expensive (as is the case for cholecystectomy) is difficult.

5) The results should ideally have been presented in terms of the cost per life-year saved.

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