Extracapsular hip fracture management: cost-consequences analysis of two alternative operative methods

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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 study objective was to compare the clinical and economic impact of two alternative procedures for the treatment of elderly patients with unstable trochanteric hip fracture. The authors concluded that osteosynthesis and hemiarthroplasty were equally effective in terms of mortality and complication rate, but hospital costs were lower for the osteosynthesis group. The quality of the study methodology was generally good and the study was presented clearly and discussed. However, the authors’ conclusions should be considered with a degree of caution given some limitations of the analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective of the study was to compare the clinical and economic impact of two alternative procedures (osteosynthesis and hemiarthroplasty) for the treatment of elderly patients with unstable trochanteric hip fracture.

Interventions
The study examined osteosynthesis (internal fixation, also called iliosis) and noncemented bipolar hemiarthroplasty (NCBH).

Location/setting
Greece/hospital.

Methods
Analytical approach:
This economic evaluation used data from a primary study to assess the economic and clinical consequences of the two treatments. The time horizon was 1 year. The authors stated that the perspective of the hospital was adopted in the study.

Effectiveness data:
The clinical data were derived from patients admitted to two hospitals over the period March 2001 to February 2002. A sample of 173 patients was prospectively enrolled, of which 91 were admitted to one hospital for NCBH, while 82 were admitted to the second hospital for internal fixation. The two groups were matched for age, gender, severity of co-morbidities and other clinical factors. The patients were followed for 1 year post-treatment (follow-up evaluations at 3, 6 and 12 months after surgery). Key clinical data were the rate of complications and mortality.

Monetary benefit and utility valuations:
None.

Measure of benefit:
No summary benefit measure was used in the economic evaluation. The authors acknowledged that, in effect, a cost-consequences analysis was undertaken. The key clinical end points were mortality and the rate of complications. The secondary end points included recovery of mobility and functional ability.

Cost data:
The health services included in the analysis were hospital stay in the orthopaedic ward, surgical procedures, diagnostic tests, drugs, supplies, personnel and maintenance costs. Depreciation of equipment and plant was also considered. The economic analysis was based on a micro-costing approach. Resource use referred to hospital service consumption for the sample of patients enrolled in the clinical study. The unit costs were derived directly from the hospital. Staff salaries came from mean gross incomes. The price year was 2001. The costs were in euros (EUR).

Analysis of uncertainty:
The issue of uncertainty was not addressed.

Results
The clinical study showed that in-hospital mortality was 3.3% in the osteosynthesis group and 4.9% in the hemiarthroplasty group, (p=0.709). The incidence of in-hospital complications was 11% and 13.4%, respectively, (p=0.694).

Mortality over 1 year' follow-up was 22% in the osteosynthesis group versus 14.3% in the hemiarthroplasty group, (p=0.231), but it was significantly higher in the osteosynthesis group during the first trimester after surgery (9.3% versus 1.4%, p=0.038).

Secondary clinical end points were basically comparable between the groups, although some of them (e.g. regain of pre-treatment ability to perform daily activities) performed better at intermediate intervals in the hemiarthroplasty group. The total costs per patient were EUR 1,930.62 in the osteosynthesis group and EUR 3,719.38 in the hemiarthroplasty group. This difference was almost totally attributable to differences in surgery costs.

Authors' conclusions
The authors concluded that the two operative treatments for elderly patients with unstable trochanteric hip fracture were equally effective in terms of mortality and complication rate. Thus, the cost of the procedure represented the key factor in the decision about the preferred treatment, and the analysis showed that osteosynthesis was the cheapest option. The authors stated that prospective randomised clinical trials should be undertaken to further assess the cost-effectiveness of these procedures.

CRD commentary
Interventions:
A formal justification for the selection of the two procedures was not given, but they are likely to represent the available options for the patient population under examination.

Effectiveness/benefits:
The use of a prospective study to derive the clinical estimates was appropriate, although a randomised trial would have been more appropriate. The authors stated that study groups were well matched with respect to demographic and clinical characteristics. Several clinical end points were considered over different time points. These aspects of the analysis tend to enhance the internal validity of the comparison. Nevertheless, it is important to note that the most relevant limitation of the analysis was the failure to perform power calculations to demonstrate the appropriateness of the sample size, in order to show the statistical significance of the comparison. Thus, it is unclear whether the equal effectiveness of the two treatments was due to chance arising from an inadequate sample size, or whether it represented a true similarity. Moreover, the authors noted that the retrospective assessment of before-treatment health might not have been appropriate. It was also noted that a longer follow-up period would have been interesting. Finally, since the assessment of the treatment outcomes was not blinded, assessment bias cannot be totally ruled out.

Costs:
The cost analysis was presented clearly and the types of cost items included in the study were reported. The approach used to derive these costs (micro-costing) was appropriate and represents a strength of the analysis. The authors carried out statistical analyses of the costs, which enhance the robustness of the cost comparison. It was also pointed out that true costs rather than charges were used. The price year was reported. The unit costs were not presented separately from the quantities of resources used, but the costs were given as macro-categories. The authors noted that the inclusion of
the costs of productivity losses would have been interesting.

Analysis and results:
A synthesis of the costs and benefits was not relevant to the scope of the analysis and was not performed. The results of the clinical and economic analyses were presented clearly. The issue of uncertainty was not addressed. The authors compared their results with those of other studies and highlighted differences in the settings and methods.

Concluding remarks:
The quality of the study methodology was generally good and the study was presented clearly and discussed. However, the authors’ conclusions should be considered with a degree of caution given the limitations described.

Funding
None stated.

Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Activities of Daily Living; Aged; Costs and Cost Analysis; Female; Fracture Fixation, Internal /economics; Hip Fractures /mortality /surgery; Hospital Costs; Hospital Mortality; Humans; Male; Orthopedic Procedures /economics /methods; Postoperative Complications /economics; Prospective Studies

AccessionNumber
22008100533

Date bibliographic record published
01/09/2008

Date abstract record published
01/12/2008