The mortality, morbidity and cost benefits of elective total knee arthroplasty in the nonagenarian population
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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 assessed the cost-effective of total knee arthroplasty (TKA) in comparison with nursing home placement in nonagenarian patients with severe knee osteoarthritis requiring surgery. The authors concluded that the use of TKA in nonagenarians was safe, it improved functional scores, and it resulted in cost-savings in comparison with nursing home placement in the UK. The authors’ conclusions should be considered with a degree of caution given some methodological limitations and the poor reporting of some aspects of the analysis.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim of the study was to assess the cost-effectiveness of total knee arthroplasty (TKA) in comparison with nursing home placement in nonagenarian patients with severe knee osteoarthritis requiring surgery. Specifically, the study balanced the benefits and the risks (complications) associated with surgery in this specific patient population.

Interventions
The surgical procedure (i.e. TKA) was compared with nursing home placement without TKA.

Location/setting
UK/hospital.

Methods
Analytical approach:
This economic evaluation was based on a single study. The time horizon of the analysis corresponded to the study follow-up, which was 7.5 years on average. The authors did not explicitly state which perspective was adopted.

Effectiveness data:
The clinical data came from a review of the patients’ charts of all 42 cases (mean age at surgery 90.4 years, age range: 90 to 90.6) treated at the authors’ institution between 1990 and 2006. Preoperative outcomes were compared with clinical end points assessed 6 weeks after the surgical procedure. Further follow-up at the end of the study was carried out by a telephone conversation. Several clinical end points were used, including disease-specific questionnaires, complications and survival.

Monetary benefit and utility valuations:
None.

Measure of benefit:
No summary benefit measure was used and the clinical end points (disease-specific questionnaires, complications and survival) were not combined with the costs. In effect, a cost-consequences analysis appears to have been carried out.

Cost data:
The costs were presented as two main categories. Specifically, hospital stay (including surgery, acute and rehabilitation stay, medical staff costs, and infrastructure) and nursing home services. Hospital stay was derived from the authors’
hospital financial department, while nursing home services came from the Department of Social Services of the Aberdeen Council. Resource use was based on data derived from the patients’ charts (for patients receiving TKA). The price year was not reported. The costs were in UK pounds sterling (£).

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

Results
The minor (11) and major (1) complications associated with TKA did not result in death. None of the patients experienced pain after TKA. The mean Knee Society Score improved from 25 points preoperatively to 81 points postoperatively, (p<0.001). The Western Ontario and McMaster Universities Score improved from 62 points preoperatively to 41 points at the last follow-up point, (p<0.002).

The mean survival in the whole group of 42 patients receiving TKA was 3.9 years (range: 0.7 to 10). At the time of the study, 23 patients were still alive while 19 patients had died. A total of 19 living patients were independent and managing their own shopping, while 3 had been admitted to a nursing home. Of the 19 patients who died, 12 had been independent and 7 had been admitted to a nursing home before their death.

Over a 5-year period, assuming that without TKA patients would have been admitted to nursing home care within 1 year of their outpatient clinical appointment, the total cost of surgery for 42 patients was £711,161, while the nursing home costs for 42 patients would have been £3,458,000. Thus, TKA was associated with a saving of £2,746,839, equivalent to £9,680 saved per patient per year.

Authors’ conclusions
The authors stated that the use of TKA in nonagenarians was safe, it improved functional scores, and it resulted in cost-savings in comparison with nursing home placement in the UK.

CRD commentary
Interventions:
The rationale for the selection of the interventions was clear since the only two possible treatments for the patient population under examination were considered. However, the direct comparison between nursing home placement and TKA was carried out only in the cost analysis, and no direct comparison was made with respect to clinical outcomes.

Effectiveness/benefits:
The clinical data came from a retrospective review of the patients’ charts. This approach is usually considered weak, not only for the retrospective design (as the authors acknowledged) but also, in this specific case, for the lack of an explicit comparison group. In effect, peri- and postoperative outcomes were compared in the same patient sample, with each case acting as its own control. The study was carried out at a single institution (i.e. a teaching hospital), which might not be representative of other patient populations admitted in other medical centres. These issues tend to limit the internal validity of the clinical study.

Costs:
The authors did not state the viewpoint of the economic analysis and only two main categories of costs were included. A breakdown of the cost items was not given and the unit costs were not presented separately from the quantities of resources used. There was little information on other aspects of the analysis, such as the price year, the use of discounting (which could have been useful) and the use of statistical tests. Only the cost calculations were described transparently.

Analysis and results:
The study took the framework of a cost-consequences analysis in which no summary benefit measure was derived then synthesised with the costs. The issue of uncertainty was not addressed. The authors reported the findings from other published studies, which were comparable with those from the current series.

Concluding remarks:
On the whole, there were a few limitations to the study, the key aspects of which were also poorly reported. Thus, the authors' conclusions should be considered with a degree of caution.

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**Bibliographic details**


**Other publications of related interest**


**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

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