A model to analyse costs and benefit of intensified diabetic foot care in Austria


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 long-term clinical and economic outcomes of intensified versus standard treatment for diabetic foot in Austria, considering not only healing time and treatment applied but also the stage of severity of the ulcers. The study demonstrated the cost-effective of the intensified approach, which resulted in fewer amputations and lower costs. The study has some limitations in the derivation of clinical data. The methods and results were well presented, but caution will be required when interpreting the results of the analysis given the drawbacks of the study.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective of the study was to assess the long-term clinical and economic outcomes of intensified versus standard treatment for diabetic foot in Austria. Diabetic patients were stratified by the stage of severity of the ulcers.

Interventions
The interventions under examination were an intensified treatment versus the standard care for diabetic foot ulcers. The two strategies were not described clearly.

Location/setting
Austria/outpatient.

Methods
Analytical approach:
The study was based on a review of patient charts to determine the 1-year outcomes for patients with foot ulcers. These data were then extrapolated to a long-term horizon using a Markov model supplemented by additional published sources. The time horizon was 15 years. The authors stated that a societal perspective was adopted.

Effectiveness data:
The clinical records of 119 consecutive ulcerations in 86 patients, admitted to a tertiary outpatient department between the beginning of 1999 and the end of June 2000, were reviewed retrospectively. The patients were followed until healed, until death or until the end of the study period. Other data were derived from published sources, but the search criteria and other details were not reported. Life expectancy was taken from Austrian life tables. The key clinical end point was the healing rate for different severity stages: A (less severe) to D (more severe).

Monetary benefit and utility valuations:
None.

Measure of benefit:
No summary benefit measure was used because of the cost-consequences design of the analysis. However, several model outputs were reported. These were the amputation rate, cumulative mortality and average life expectancy.

Cost data:
The categories of costs included in the analysis were inpatient stay, outpatient visits, examinations, surgical interventions, wound dressings, orthopaedic shoes, transport and antibiotics. Resource use data were based on the retrospective review of patients' records, as reported in the clinical study. The costs for inpatient services were taken
from the Austrian diagnosis-related discharge system, while the costs of drugs, orthopaedic shoes and dressings came from the official price list for pharmaceuticals. Costs for diabetic foot ulcer treatment in primary care were estimated from the general practitioner (GP) sector; other costs were based on published studies. The costs were presented in euros (EUR). The price year was 2001 and previous costs were inflated at an annual rate of 5%. Discounting was required in the long-term simulation, and an annual rate of 5% was applied.

Analysis of uncertainty:
A deterministic univariate sensitivity analysis was performed by varying key clinical and economic inputs of the model. The authors appear to have defined the alternative ranges of values. An additional scenario, in which the proportion of patients in each severity stage (A, B, C or D) was identical (homogeneous scenario), was also presented.

Results
At 15 years (10 years; 5 years), the expected amputation rate was 31.2% (26.9%; 19.6%) with intensified treatment and 50.7% (49.3%; 42.2%) with standard treatment.

The cumulative mortality was 75.7% (51.6%; 24.8%) with intensified treatment and 87.1% (73.4%; 49.1%) with standard treatment.

The average life expectancy was 9.28 years (7.48; 4.39) with intensified treatment and 6.31 years (5.36; 3.47) with standard treatment.

The average cost per patient per year was EUR 1.704 (EUR 1,731; EUR 1,859) with intensified treatment and EUR 3,213 (EUR 3,322; EUR 3,583) with standard treatment.

Similar results were obtained for the homogeneous scenario. Outcomes were also reported according to the stage of the disease.

The results of the sensitivity analysis did not substantially alter the base-case findings, except for wide variations from the values considered in the primary analysis.

Authors' conclusions
The authors concluded that higher costs for the intensified conservative treatment were compensated for by lower rates of surgical interventions and therefore lower surgical costs.

CRD commentary
Interventions:
The comparison of intensified treatment with standard care was appropriate. However, the authors did not provide a description of the two strategies under examination. This means that an objective assessment of the relevance of these two options in other settings is not possible.

Effectiveness/benefits:
The clinical data came from a combination of primary and secondary data. The former were derived from a retrospective review of patients' records, while the latter came from published evidence. The sample size and patient demographics were reported, but the use of a retrospective analysis of data is usually considered to be methodologically weak because of the limitations of such a design. Furthermore, as the authors pointed out, the small sample size and the single-centre design represent two important limitations to the validity of the analysis. No information on the secondary sources (i.e. types of study, number of patients involved, etc.) was provided, which limits the possibility of assessing the validity of these estimates. In addition, the approach used to identify these sources was not described.

Costs:
The costs included in the analysis were reported as macro-categories, owing to the typical accounting system in the authors' setting. However, the authors reported detailed results for each cost category, showing the impact of each item on the total costs. This represents a strength of the analysis. Other details, such as the sources of the resource use data, price year, currency, and discounting, were also reported. Indirect costs were not included, although the authors stated
that a societal perspective was used, probably due to the old age of the patient population under analysis.

Afternote: communication with the authors has confirmed that indirect costs were not calculated due to the age of the patients, all patients having already retired at the time of wound treatment.

Analysis and results:
The costs and benefits were not combined as a cost-consequences analysis was carried out. In effect, the intensified strategy was both more effective and less expensive (i.e. dominant), precluding the need to calculate a cost-effectiveness ratio. Extensive details of the methods and results were presented. The issue of uncertainty and variability was addressed in sensitivity and scenario analyses. In terms of the potential transferability of the study results to other settings, the authors stated that their findings may be generalisable to contexts with similar interventions. The use of a Markov model to extrapolate short-term outcomes over a longer time horizon was appropriate and this procedure was clearly described.

Concluding remarks:
Both the methods and results were well reported. However, there were a few limitations to the study, especially with respect to the identification of clinical estimates. The authors' conclusions appear appropriate within the limitations of the analysis.

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No specific funding was received for this study.

Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Ambulatory Care /economics; Amputation /economics; Austria; Bacterial Infections /economics; Cohort Studies; Cost Control; Cost-Benefit Analysis; Diabetic Foot /classification /economics /therapy; Female; Health Care Costs; Humans; Ischemia /economics; Longitudinal Studies; Male; Markov Chains; Models, Economic; Retrospective Studies; Survival Rate; Time Factors; Treatment Outcome; Wound Healing /physiology

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