The cost-effectiveness of etanercept in patients with severe ankylosing spondylitis in the UK
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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 long-term etanercept (ETN) treatment in patients with severe ankylosing spondylitis (AS). The authors concluded that ETN was a cost-effective treatment for AS in the UK, but more research into AS costs and utilities was needed. The methodology was generally satisfactory; however there were some limitations in the reporting, especially on the cost side. Nonetheless, the conclusions reached by the authors appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of long-term etanercept (ETN) treatment in patients with severe ankylosing spondylitis (AS).

Interventions
The interventions compared were ETN with non-steroidal anti-inflammatory drugs (NSAIDs), and NSAIDs alone.

Location/setting
UK/primary and secondary care.

Methods
Analytical approach:
A mathematical model was used to estimate the costs and benefits of the interventions. The time-horizon was 25 years and the authors stated the study perspective to be that of the National Health Service.

Effectiveness data:
The estimates of the initial response to treatment were obtained from a European randomised controlled trial (RCT), which compared ETN with placebo and 88% of patients in the placebo arm received NSAIDs. Data on the long-term disease progression was taken from published studies. The main clinical parameters were changes in the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and the Bath Ankylosing Spondylitis Functional Index (BASFI).

Monetary benefit and utility valuations:
The utility values were obtained by transforming, using a mathematical relationship, the BASDAI, BASFI, and European Quality of life (EQ-5D) data, collected during the European RCT.

Measure of benefit:
The primary measure of benefit was the quality-adjusted life-year (QALY) and these were discounted at an annual rate of 3.5%.

Cost data:
The costs associated with medications, hospitalisations and physiotherapy were included in the analysis. The resource use data were obtained from a cost study including 147 AS patients attending a rheumatology centre in England. The cost estimates were taken from various datasets. All costs were reported in UK pounds sterling (£) and were discounted at an annual rate of 3.5%.
Analysis of uncertainty:
Both one-way and probabilistic sensitivity analyses were conducted to examine the uncertainty in each variable separately, and all variables simultaneously. The results of the one-way sensitivity analysis were presented in a Tornado diagram, while the results of the probabilistic sensitivity analysis were presented on a cost-effectiveness plane.

Results
Over 25 years, ETN with NSAIDs was associated with 7,285 QALYs at a cost of £62,516,684 and NSAIDs alone were associated with 5,700 QALYs at a cost of £26,538,439. The incremental cost per QALY gained was therefore £22,704.

Three variables were found to have an impact on the cost-effectiveness results. These were the quality of life estimates, annual ETN withdrawal rate, and disease costs. The probabilistic sensitivity analysis showed that, in 93% of simulations, the cost per QALY gained was less than £25,000.

Authors' conclusions
The authors concluded that ETN was a cost-effective treatment for AS in the UK, but further research into AS costs and utilities was needed.

CRD commentary
Interventions:
Details of the two interventions, including their dosage, were adequately reported. NSAIDs represented the current practice in the treatment of AS in the UK, while ETN was a potential treatment option for those failing on NSAIDs.

Effectiveness/benefits:
The estimates of the initial response to treatment were obtained from a RCT which should have a high degree of internal validity. However, it should be noted that 12% of the patients in the placebo arm of the trial received something other than NSAIDs - the stated comparator - which may have introduced bias into the results. The authors noted that the data on long-term disease progression were scarce, and therefore they relied on a cross-sectional study, which has known limitations. However, this was mitigated to some extent by the sensitivity analysis conducted on the effectiveness estimates. The primary outcome measure was the QALY which was appropriate as it reflects the impact of the treatment on the length and quality of life of AS patients.

Costs:
The costs appeared to reflect the stated perspective. The details of the sources of the cost and resource use estimates were reported in full. However, only the total treatment costs associated with ETN were reported in the paper, which will limit the possibility of replicating these results for other settings. In addition, no details of the unit or total costs for the comparator were reported. Further, the price year was not reported making it difficult to re-value the results in future years.

Analysis and results:
The authors conducted an appropriate incremental analysis and the full results were reported. The issue of uncertainty was adequately addressed through a sensitivity analysis, the results of which were discussed. The authors discussed the limitations of their model in detail.

Concluding remarks:
The methodology was generally satisfactory; however there were some limitations in the reporting, especially on the cost side. Nonetheless, the conclusions reached by the authors appear to be appropriate.

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