Cost-utility of different treatment strategies after the failure of tumour necrosis factor inhibitor in rheumatoid arthritis in the Finnish setting

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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 evaluate the cost-effectiveness of various treatment strategies for patients with rheumatoid arthritis, after the failure of a tumour necrosis factor inhibitor. The authors concluded that treatment with rituximab or rituximab then infliximab, followed by best supportive care, was cost-effective in Finland. There were some limitations in the reporting of the methods, but the authors’ conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of various treatment strategies for patients with rheumatoid arthritis, after the failure of a tumour necrosis factor inhibitor.

Interventions
Initially patients received either best supportive care (BSC) or one of the following treatments, each combined with methotrexate, before BSC: adalimumab, abatacept, etanercept, infliximab, or rituximab. Based on the most cost-effective strategy, combinations of these treatments were considered.

Location/setting
Finland/primary and secondary care.

Methods
Analytical approach:
A Markov model with a six-month cycle length was developed to synthesise the costs and outcomes data from published studies. A lifetime horizon was used and the authors reported that a societal perspective was adopted.

Effectiveness data:
Drug efficacy estimates were obtained from published clinical trials. The other effectiveness estimates, including mortality, were from published studies. The key clinical outcome was the disease severity measured by the Health Assessment Questionnaire (HAQ) score.

Monetary benefit and utility valuations:
The utility values were based on a published formula applied to the HAQ score.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs), which were discounted at an annual rate of 3%.

Cost data:
The study included primary and secondary care (including out-patient and in-patient visits, and laboratory costs), treatment costs, and patient travel costs. The resource use and units costs were reported separately. Some of the resource use data were from the literature, while the drug costs were from the Finnish Medicine Tariff. The price year was 2008 and all costs were in Euros (EUR) and were discounted at an annual rate of 3%.

Analysis of uncertainty:
One-way sensitivity analyses were performed on uncertain variables, including the treatment length, the utility values, and the cost estimates. A probabilistic sensitivity analysis was undertaken and the results were presented using a cost-effectiveness acceptability frontier.

**Results**

BSC alone resulted in an average treatment cost of EUR 85,714 and produced 2.69 QALYs.

Treatment with rituximab plus methotrexate followed by BSC dominated treatment with adalimumab, etanercept, or abatacept plus methotrexate followed by BSC, as it was less costly and more effective. Rituximab resulted in an incremental cost-effectiveness ratio (ICER) of EUR 30,248 per QALY gained compared with BSC alone.

Adding a third line of treatment increased the costs and QALYs gained. Compared with treatment with rituximab plus methotrexate followed by BSC, the ICER of adding another treatment ranged from EUR 37,013 (for rituximab then infliximab, both with methotrexate, then BSC) to EUR 68,100 (for rituximab, abatacept, both with methotrexate, then BSC) per QALY gained.

At a willingness to pay EUR 50,000 for an additional QALY, treatment with rituximab plus methotrexate, then infliximab plus methotrexate, followed by BSC should be considered. In general, the base case findings were robust to the variations in the sensitivity analysis.

**Authors’ conclusions**
The authors concluded that rituximab followed by BSC, and rituximab, followed by infliximab, then BSC were cost-effective treatment strategies, in Finland.

**CRD commentary**

**Interventions:**
The chosen interventions were the usual treatment options in the authors' setting, except infliximab, which was included to facilitate international comparisons. Details of the treatment strategies, included dosages, were reported.

**Effectiveness/benefits:**
The drug efficacy data were from randomised controlled trials, which should ensure a high degree of internal validity. The method used to identify these trials was not reported, making it difficult to determine if the best available evidence was used. The key epidemiological data were from Finnish sources and appear to have been appropriate. The derivation of the utility values was described, and QALYs were a valid measure of benefit, as they capture the impact of rheumatoid arthritis on both quality and length of life.

**Costs:**
A societal perspective was adopted, with productivity losses excluded on the basis that patients with the characteristics of the analysed population were usually retired. The authors stated that the average age of their cohort was 48 years, which contradicts the assumption that they were retired. The unit costs and quantities were reported separately, but the sources for the resource data were unclear. The price year, discounting, and currency were clearly reported.

**Analysis and results:**
An incremental analysis was performed and the results were well presented and discussed. The uncertainty was satisfactorily investigated. The authors discussed some limitations to their analysis, including the uncertainty surrounding some resource use and cost estimates. Given the use of Finnish cost estimates, the results might not be generalisable to other settings.

**Concluding remarks:**
There were some limitations in the reporting of the methods, but the authors’ conclusions appear to be appropriate.

**Funding**
Funded by Roche Oy, Finland.
Bibliographic details

PubMedID
20100793

DOI
10.1093/rheumatology/kep425

Original Paper URL
http://rheumatology.oxfordjournals.org/content/49/4/767.abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Adalimumab; Adult; Antibodies, Monoclonal /economics /therapeutic use; Antibodies, Monoclonal, Humanized; Antibodies, Monoclonal, Murine-Derived /economics /therapeutic use; Anti-rheumatic Agents /economics /therapeutic use; Arthritis, Rheumatoid /drug therapy /economics; Cohort Studies; Cost-Benefit Analysis; Female; Finland; Health Care Costs; Humans; Infliximab; Male; Middle Aged; Models, Biological; Quality-Adjusted Life Years; Rituximab; Severity of Illness Index; Time Factors; Treatment Outcome; Tumor Necrosis Factors /antagonists & inhibitors /economics /therapeutic use

AccessionNumber
22011000642

Date bibliographic record published
25/05/2011

Date abstract record published
20/07/2011