Health-economic analysis: cost-effectiveness of scheduled maintenance treatment with infliximab for Crohn's disease - modelling outcomes in active luminal and fistulizing disease in adults

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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 authors assessed the cost-effectiveness of infliximab for the treatment of moderate-to-severe luminal and fistulising Crohn's disease. From the perspective of the NHS, Infliximab treatment was found to be cost-effective in both patient populations, although this was influenced by some key inputs such as patient weight. The study appears to have been well conducted and based on a sound methodology. Thus, the authors' conclusions are likely to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of infliximab for the treatment of moderate-to-severe luminal and fistulising Crohn’s disease (CD). The average age, of the patients studied, was 45 years and their average weight was 60 kg.

Interventions
Eight weeks of scheduled maintenance treatment with infliximab (5 mg/kg) was compared with standard care, which comprised corticosteroids with or without immunomodulators.

Location/setting
UK/hospital outpatient.

Methods
Analytical approach:
Two separate Markov models were created to simulate the management of CD with the two interventions, in two cohorts of patients: those with luminal CD and those with fistulising CD. The time horizon of the analysis was 5 years. The authors stated that the perspective of the UK National Health Service (NHS) was adopted.

Effectiveness data:
The clinical data appear to have been derived from a selection of known, relevant studies. The patient characteristics and the treatment effect for infliximab versus standard care were taken from the ACCENT I and II randomised clinical trials (RCTs). Initial response for infliximab was obtained from other published RCTs. Studies reflecting standard treatment protocols, in the authors’ setting, were used to obtain the probability of surgery for those who did not respond to treatment. Some information on the sources of the data was provided. The key clinical estimate was the probability of infliximab maintaining the state of remission.

Monetary benefit and utility valuations:
Utility valuations associated with CD were derived from a study of 200 Spanish patients whose preferences were elicited using the EQ-5D questionnaire and then converted using UK tariffs. Utility valuations relating to surgery and post-surgery health states, were derived from a panel of UK gastroenterologists.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure. QALYs were discounted at an annual
rate of 3.5%.

Cost data:
The health services were infliximab (acquisition and administration), concomitant medications, and hospital services (inpatient stay for surgery, diagnostic procedures, examination under anaesthetic, and outpatient visits). The costs of adverse events were not considered. Most of the costs were derived from reference prices published by the NHS. Drug resource use was based on data from the RCTs. Resource consumption of hospital services was derived from published sources. The costs were in UK pounds sterling (£) and referred to the year 2005 to 2006. A 3.5% annual discount rate was applied to future costs.

Analysis of uncertainty:
Deterministic univariate and probabilistic sensitivity analyses were performed to assess how robust the model was in response to variations in key clinical and economic inputs.

Results
In patients with severe active luminal CD, the mean cost per patient was £31,499 with infliximab and £36,627 with standard care (difference: £4,873). The QALYs gained due to infliximab was 0.186 and the incremental cost per QALY was £26,128.

In patients with fistulising CD, the mean cost per patient was £37,488 with infliximab and £31,490 with standard care (difference: £5,998). The QALYs gained due to infliximab was 0.202 and the incremental cost per QALY was £29,752.

The univariate sensitivity analysis showed that the incremental cost per QALY remained in the range of £23,752 to £38,848 for active luminal CD and £27,047 to £44,206 for fistulising CD. Utility valuations and patient weight were the most influential model inputs. The probabilistic analysis confirmed the base-case findings.

Authors’ conclusions
The authors concluded that an 8-week scheduled maintenance treatment with infliximab was a cost-effective treatment for adult patients with active luminal or fistulising CD from the perspective of the UK NHS.

CRD commentary
Interventions:
The choice of the comparators was appropriate in that it reflected the current pattern of care in experts’ centres across the UK. Infliximab was the recommended treatment for patients with severe CD in the UK.

Effectiveness/benefits:
The clinical data were derived from selectively identified studies. The key characteristics of some of these were described. For example, the use of RCTs ensures the validity of these estimates, given the robust design. The issue of heterogeneity of sources was not specifically addressed, but the sensitivity analysis investigated the robustness of the clinical data. The derivation of utility weights was described in terms of source used and types of methodology used to derive these estimates. QALYs are a validated benefit measure. They are particularly appropriate for patients with CD, given the impact of this condition on patients’ quality of life.

Costs:
The categories of costs included were consistent with the perspective adopted. Most costs were presented as macro-categories, which were derived from reference prices. Some data on resource consumption were presented as single items. However, in general, unit costs and quantities of resources used were not reported. The price year and the use of discounting were reported. The potential variability in costs was investigated in the sensitivity analysis.

Analysis and results:
The synthesis of costs and benefits was appropriately performed and the issue of uncertainty was addressed in the sensitivity analyses. The study findings were clearly presented, both for the base-case and the sensitivity analyses. The model structure and key transition patterns were also clearly described.
Concluding remarks:
The study appears to have been well conducted and based on a sound methodology. The authors’ conclusions are, therefore, likely to be valid.

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