
Infliximab dose escalation vs initiation of adalimumab for loss of response in Crohn's disease: a cost-effectiveness analysis

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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 objective was to determine if dose escalation of infliximab was cost-effective in comparison with adalimumab initiation after loss of response to infliximab in patients with Crohn's disease. The authors concluded that dose escalation would yield more quality-adjusted life-years than switching to adalimumab, but at a considerable cost. Overall, the quality of the methodology and reporting of results were satisfactory. However, given their findings, the authors should have clearly reported in their conclusions that infliximab dose escalation was not cost-effective.

Type of economic evaluation

Cost-utility analysis

Study objective

The objective of the study was to determine if dose escalation of infliximab was a cost-effective strategy compared with adalimumab initiation after loss of response to 5mg/kg of infliximab in patients with Crohn's disease.

Interventions

An increase in infliximab dose to 10 mg/kg after the failure of 5 mg/kg was compared with infliximab discontinuation and the start of adalimumab. Patients who did not respond to the increase in infliximab were started on adalimumab.

Location/setting

USA/secondary care.

Methods

Analytical approach:

No randomised controlled trials comparing the interventions existed, so the authors used a decision-tree model to combine the cost and effectiveness data from different sources. The time horizon of the study was 1 year. The study perspective was not reported.

Effectiveness data:

The evidence came from a number of published studies, including three clinical trials for the main parameters. The authors did not report any search methods or inclusion criteria. The main clinical parameter was the initial response to adalimumab and infliximab dose escalation.

Monetary benefit and utility valuations:

Utility estimates were derived from a published study (Gregor et al. 1997, see 'Other Publications of Related Interest' below for bibliographic details), which used the standard gamble technique to derive estimates of utility.

Measure of benefit:

The measure of benefit used was the quality-adjusted life-years (QALYs) gained.

Cost data:

: The direct costs included drugs, intravenous administration, non-anti-tumour necrosis factor-alpha (TNF α), standard drug therapy, surgery and post-operative remission. Drug unit costs were derived from the 2006 Drug Topics Red Book, whilst infusion costs were estimated from the American Medical Association Current Procedural Terminology

Code. The remaining costs were derived from a published Markov model of the natural history of Crohn's Disease (Silverstein et al. 1999, see 'Other Publications of Related Interest' below for bibliographic details). The currency was US dollars (\$), and the costs were adjusted to 2006 prices using the Consumer Price Index (CPI).

Analysis of uncertainty:

A series of one-way sensitivity analyses were performed on the initial response and tolerability; remission at 1 year; mortality associated with the two drugs; and cost of the two drugs. Two-way sensitivity analyses were also performed on the cost of adalimumab and infliximab.

Results

Dose escalation of infliximab was associated with a mean cost per patient of \$28,367 and 0.79 QALYs per patient.

Adalimumab therapy was associated with a mean cost per patient of \$18,074 and 0.76 QALYs per patient.

The incremental cost-utility ratio of dose escalation of infliximab compared with adalimumab therapy was \$332,032 per QALY gained.

The authors reported that the factors that most influenced cost-effectiveness in the sensitivity analysis were the drug costs for infliximab and adalimumab. For example, when the price of adalimumab was increased by three times, dose escalation of infliximab was both more effective and less costly.

Authors' conclusions

The authors concluded that after a Crohn's patient had lost response to 5 mg/kg of infliximab, dose escalation would yield more QALYs compared with switching to adalimumab but at a considerable cost.

CRD commentary

Interventions:

Both interventions were well described. The authors reported that, at present, infliximab dose escalation is used in patients who have lost response to the standard dose.

Effectiveness/benefits:

The effectiveness data were derived from several published studies. The authors did not provide any information or details of these studies. However, they did provide the relevant references. The methods used in the literature review were not reported. Therefore it is not possible to ascertain if the best available evidence was used in the model. Appropriate details of the sources and methods used to derive utility estimates were given. The reader should consider if a time horizon of 1 year is adequate to capture the differences in health outcome.

Costs:

The authors did not report the study perspective. However, all costs relevant to the perspective of a health care system appear to have been included. The resource use data were derived from those studies used to derive the effectiveness data. The authors reported the unit costs used and their sources. The price year was reported, as were the methods used to adjust costs to a base year. However, adjusting costs using the health care component of the CPI would have been more appropriate than using the overall CPI, as health care price inflation is generally higher than that for the overall economy.

Analysis and results:

Overall, the analytical approach was satisfactorily reported, with the model structure being reported in full and a graphical depiction presented. The results were also reported clearly and in full. Appropriate one- and two-way sensitivity analyses were performed and reported. Although these types of sensitivity analyses go some way towards addressing parameter uncertainty, the use of a probabilistic sensitivity analysis would have been a more thorough way to fully capture parameter uncertainty. Overall, the level of reporting was good with the base-case estimates of the effectiveness, utility and cost data being reported. In addition, the authors acknowledged and highlighted the limitations of their study.

Concluding remarks:

Overall, the quality of the methodology and reporting of results were satisfactory. However, given their findings, the authors should have clearly reported in their conclusions that infliximab dose escalation was not cost-effective.

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Bibliographic details

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10.1111/j.1365-2036.2007.03548.x

Other publications of related interest

Silverstein MD, Loftus EV, Sandborn WJ, et al. Clinical course and costs of care for Crohn's disease: Markov model analysis of a population-based cohort. *Gastroenterology* 1999;117:49-57.

Gregor J, McDonald W, Klar N, et al. An evaluation of utility measures in Crohn's disease: *Inflamm Bowel Dis* 1997;3:265-76.

Indexing Status

Subject indexing assigned by NLM

MeSH

Adalimumab; Adult; Antibodies, Monoclonal /administration & dosage /economics /therapeutic use; Antibodies, Monoclonal, Humanized; Cost-Benefit Analysis; Crohn Disease /drug therapy; Decision Support Techniques; Health Care Costs; Humans; Infliximab; Quality-Adjusted Life Years

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