A cost-effectiveness analysis of MMX mesalazine compared with mesalazine in the treatment of mild-to-moderate ulcerative colitis from a UK perspective

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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 a new formulation of mesalazine, versus the usual oral mesalazine, for patients with mild-to-moderate ulcerative colitis. The authors concluded that multi matrix system (MMX) mesalazine was likely to be cost-effective. The study methods were satisfactory, and the reporting of the methods and results was adequate. Given the scope of the study, the authors' conclusions appear to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of a new formulation of mesalazine, versus the usual oral mesalazine, for patients with mild-to-moderate ulcerative colitis.

Interventions
The multi matrix system (MMX) mesalazine, 2.4g once daily, (Mezavant XL) was compared with normal mesalazine 0.8g three times daily (Asacol).

Location/setting
UK/out-patient secondary care.

Methods
Analytical approach:
The analysis was based on a Markov model, with eight-week cycles, up to five years, and up to a lifetime (60 years). The authors stated that the UK NHS perspective was adopted.

Effectiveness data:
The clinical and effectiveness data were from published studies, including randomised controlled trials and meta-analyses. The main effectiveness measure was the rate of remission, measured by the modified ulcerative colitis Disease Activity Index. These data were from a published phase III randomised controlled trial, with 343 patients treated with MMX mesalazine, mesalazine or placebo, for eight weeks. The data up to 16 weeks were from an open-label extension of this trial, and the data up to five years were based on another prospective two-year study.

Monetary benefit and utility valuations:
The utility estimates, for patients with ulcerative colitis, were from two studies that were published in abstract form. These utility scores were obtained using the time trade-off technique and the EQ-5D questionnaire. The estimates, for patients with colorectal cancer, were from a published study.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs). Future benefits were discounted at an annual rate of 3.5%.

Cost data:
The direct costs included those for medication; treatment of severe relapse (including in-patient and surgical costs); out-
patient visits; and treatment for colorectal cancer. The medication costs were from the British National Formulary. The treatment costs for severe relapse were from a published cost-of-illness study. The out-patient visit costs were from the UK NHS. The costs of treating colorectal cancer were from a UK Department of Health report. Future costs were discounted at an annual rate of 3.5%. All costs were reported in UK £.

Analysis of uncertainty:
One-way sensitivity analyses were performed, by varying each of the model parameters, to determine the key drivers of the model. A probabilistic sensitivity analysis was undertaken, by assigning probability distributions to the model parameters. This analysis was run with 10,000 Monte Carlo simulations. The results were presented in a tornado diagram, a cost-effectiveness acceptability curve, and as a cost-effectiveness plane.

Results
Over five years, the average QALYs gained were 3.445 with MMX mesalazine and 3.434 with mesalazine. Over a lifetime, the average QALYs gained were 14.861 with MMX mesalazine and 14.822 with mesalazine.

Over five years, the average cost per patient was £5,582 with MMX mesalazine and £5,574 with mesalazine. Over a lifetime, the average cost per patient was £21,668 with MMX mesalazine and £21,375 with mesalazine.

Compared with mesalazine, MMX mesalazine had an incremental cost-utility ratio of £749 per QALY gained, over five years, and £7,600 per QALY gained, over the lifetime of the patient.

The probabilistic sensitivity analysis showed that MMX mesalazine had a 62% chance of producing cost savings, and a 74% chance of being cost-effective, assuming a £20,000 per QALY willingness-to-pay threshold.

Authors’ conclusions
The authors concluded that MMX mesalazine was likely to be cost-effective, compared with normal mesalazine.

CRD commentary
Interventions:
The interventions were described. The selection of the comparators was appropriate as the new treatment was compared against the normal treatment in the authors’ setting.

Effectiveness/benefits:
The clinical and effectiveness data were from published studies. The main estimates were from a phase III randomised controlled trial, making them very likely to have been internally valid. The authors did not report whether a systematic review of the literature was undertaken to identify all the relevant evidence, and there might have been other relevant data. QALYs were an appropriate benefit measure, given the impact of ulcerative colitis on quality of life. The key utility values were from two studies, which were published in abstract form only, which reduces the transparency of the analysis, but they appear to have been collected using valid instruments.

Costs:
The perspective was explicitly reported to be that of the UK NHS. For this perspective, all the major relevant costs appear to have been included. The sources for the resource use and unit costs were reported. The time horizon and discount rate were given, but the price year was not, which will hamper future inflationary exercises.

Analysis and results:
A Markov decision model was used to synthesise the cost and outcome information. Appropriate details of the model structure, including a diagram and the key assumptions, were reported. An incremental approach was used to combine the costs and benefits of the two interventions and the results were sufficiently reported. The impact of uncertainty on the model’s results was exhaustively tested in one-way and probabilistic sensitivity analyses. As the main limitation to their study, the authors reported that there was much uncertainty in the extrapolation of the 16-week trial follow-up results to the five-year time horizon.

Concluding remarks:
The study methods were satisfactory, and the reporting of the methods and results was adequate. Given the scope of the
study, the authors’ conclusions appear to be valid.

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