Cost-effectiveness analysis of early versus non-early intervention in acute migraine based on evidence from the 'Act when Mild' study

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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 early versus later treatment with almotriptan, for acute migraine. The author concluded that early treatment of acute migraine was cost saving from a French societal perspective, and likely to be cost-effective from a public health system perspective. The study methods were adequate and the results were sufficiently reported. Given the scope of the analysis, the author's conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of early versus later treatment with almotriptan, for acute migraine.

Interventions
Almotriptan taken within one hour of migraine onset, before pain levels escalated, was compared with almotriptan taken after pain had become moderate or severe.

Location/setting
France/primary care.

Methods
Analytical approach:
The analysis was based on a decision tree. The time horizon was 24 hours from pain onset. The author stated that the perspectives of the French public health system and society were adopted.

Effectiveness data:
The clinical and effectiveness data were mainly from one randomised controlled trial – the Act when Mild (AwM) trial (see Other Publications of Related Interest). This was a placebo-controlled trial comparing the responses to early or later treatment with almotriptan for acute migraine. It was conducted in 41 centres across Belgium, France, Germany, Italy and Portugal. The main outcome measure was the duration of the migraine.

Monetary benefit and utility valuations:
The utility penalties, for severe, moderate and mild pain states, were from the HUI3 scores of otherwise healthy people in each pain state.

Measure of benefit:
The summary measures of benefit were the Migraine hours avoided, productivity hours gained, and quality-adjusted life-years (QALYs) gained.

Cost data:
For the public health care system perspective, the costs of medications (almotriptan and rescue medication) were included. These costs were adjusted for patient co-payments, made in the French health care system, and any additional patient co-payments were not included. For the societal perspective, these co-payments and the monetary value of productivity lost were included. Medication used and productivity lost were assessed in the AwM trial. The prices for
the medications were from a French database, and productivity lost was valued using the average cost of a labour hour in France. The price year was 2010. All costs were reported in Euros (EUR).

Analysis of uncertainty:
One-way sensitivity analyses were performed by varying the cost of almotriptan, the cost of rescue medication, the proportion of the costs paid by patients, the value of a labour hour, utilities, and the proportion of patients who quickly became spontaneously pain free. A Monte Carlo simulation was performed by bootstrapping the results from the trial, using 1,000 replications, and the results were presented in a cost-effectiveness acceptability curve.

Results
From the societal perspective, the mean cost per patient was EUR 54.77 for early treatment and EUR 66.90 for later treatment. The mean difference was EUR -16.53 (95% CI -15.79 to -17.27).

The mean migraine duration was 2.8 hours with early treatment, and 4.6 hours with later treatment. The mean difference was -1.8 hours (95% CI -1.9 to -1.8). The mean productivity lost was 1.4 hours with early treatment, and 1.9 hours with later treatment. The mean difference was -0.5 hours (95% CI -0.6 to -0.5). The mean utility lost, within 24 hours from migraine onset, was 0.087 with early treatment, and 0.105 with later treatment. The mean difference was -0.018 (95% CI -0.019 to -0.016).

Compared with later treatment, early treatment was dominant, as it was more effective and less costly.

The sensitivity analysis showed that early treatment remained dominant, from the societal perspective. In the worst-case scenario, from a public health system perspective, early treatment had an incremental cost of EUR 43,487 per QALY gained.

Authors' conclusions
The author concluded that early treatment of acute migraine was cost saving from a French societal perspective, and likely to be cost-effective from a public health system perspective.

CRD commentary
Interventions:
The interventions were described. Their selection was appropriate, as they were the two options investigated in the AwM trial.

Effectiveness/benefits:
The clinical and effectiveness data were predominantly from one randomised controlled trial. This trial was described, and references were given for further details of its methods and results. The trial was multicentre, randomised and placebo controlled, making it likely that its results were internally valid.

Costs:
The perspectives were stated. Only the costs of the medication and productivity lost were included, but it seems that these were the major relevant costs for migraine patients, and no major cost was omitted. The author reported how the resource use was obtained, and the sources used to value the resources. The price year and time horizon were reported. The time horizon was very short (24 hours), but migraine attacks last for a few hours, so this was adequate.

Analysis and results:
The cost and outcome information was synthesised using a decision-tree model. Details of the model structure were provided, including a diagram. Uncertainty in the model's results was tested in one-way and Monte Carlo sensitivity analyses. These types of analysis go some way towards evaluating the impact of uncertainty, but probabilistic sensitivity analyses could have captured the overall model uncertainty. The authors discussed some limitations to their study, such as the use of French costs, but resource use and outcome data were from other European countries, and that the utility values were not directly obtained from the patients in the trial.

Concluding remarks:
The study methods were adequate and the results were sufficiently reported. Given the scope of the analysis, the
author's conclusions appear to be valid.

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