Cost utility of allogeneic stem cell transplantation with matched unrelated donor versus treatment with imatinib for adult patients with newly diagnosed chronic myeloid leukaemia

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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 utility of allogeneic stem cell transplantation from a matched unrelated donor compared with treatment with imatinib. The author concluded that the incremental cost-utility ratio of imatinib was higher than commonly accepted thresholds. The methodology was satisfactory and, given the scope of the study, the author’s conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost utility of allogeneic stem cell transplantation (SCT) from a matched unrelated donor (MUD) compared with treatment with imatinib in newly diagnosed patients with chronic-phase chronic myeloid leukaemia.

Interventions
This study compared MUD-SCT with imatinib treatment.

Location/setting
Germany/in-patient secondary care.

Methods
Analytical approach:
A Markov model was developed with a hypothetical cohort of 1,000 patients and a time horizon of five years. The author reported that the perspective was that of the German statutory health insurance.

Effectiveness data:
The clinical and effectiveness data were derived from the published literature. The clinical effectiveness of imatinib came from a randomised controlled trial. The main parameters were the transition probabilities for moving from one health state to another. The health states were those of chronic myeloid leukaemia and death. All rates were converted into probabilities.

Monetary benefit and utility valuations:
The utilities were derived from published studies, which used the European Quality of life (EQ-5D) questionnaire, the standard gamble technique, and expert opinion. Those utility values derived from the standard gamble technique and expert opinion were re-scaled to the EQ-5D baseline.

Measure of benefit:
Quality-adjusted life-years (QALYs) gained were the summary benefit measure. As benefits could be generated over a period of five years, future benefits were discounted at an annual rate of 3%.

Cost data:
The direct costs were those relating to: imatinib; allogeneic SCT from a MUD; graft-versus-host disease; hospitalisation; treatment of infectious complications; out-patient visits; molecular and cytogenetic analysis; complete
blood count; and aspiration, cytology and histology. The resource use data were derived from the protocol of a German study. The unit costs were derived from the relevant diagnosis-related group data or the Common Tariff Scale. Medication costs were derived from the German formulary. The price year was 2005. As costs could be incurred over a period of five years, future costs were discounted at an annual rate of 3%. All costs were reported in Euros (EUR).

Analysis of uncertainty:
To check the sensitivity of the model, a series of univariate deterministic sensitivity analyses were performed.

Results
Over five years, the average QALYs gained with MUD-SCT were 3.12 and those with imatinib were 3.87. The average cost per patient was EUR 129,843 with MUD-SCT and EUR 182,289 with imatinib.

The costs and benefits were combined in an incremental cost-utility ratio and, compared with MUD-SCT, imatinib was associated with an additional cost per QALY gained of EUR 69,754.

The sensitivity analysis showed that these results were particularly sensitive to the price of imatinib.

Authors' conclusions
The author concluded that the incremental cost-utility ratio of imatinib was higher than commonly accepted thresholds.

CRD commentary
Interventions:
The interventions were adequately reported and current practice was included.

Effectiveness/benefits:
The methods used to identify the published studies, from which the data were derived, were not reported. It is not possible to determine if a systematic review of the literature was undertaken and whether all the relevant information was included. The author did report all the clinical and effectiveness data, the values used in the model, and all the sources.

Costs:
The perspective was explicitly reported and all those cost categories and costs, relevant to the German Health Insurance system, appear to have been included. The sources from which the unit costs and resource use data were derived were satisfactorily reported. The time horizon, price year, and discount rate were all explicitly reported.

Analysis and results:
All the selected evidence was synthesised using a decision analytic Markov model and appropriate details of the model structure, including a diagram, were provided. The uncertainty in the model was evaluated using a series of one-way sensitivity analyses. This type of analysis goes some way towards evaluating the uncertainty, but probabilistic sensitivity analysis would have been a more thorough way of evaluating the overall model uncertainty. The author reported the limitations of the study, the main one being that the outcomes in patients treated in general or clinical practice could be different from those enrolled in clinical trials.

Concluding remarks:
Overall the methodology was satisfactory and the results were reported in full, but more details on how the clinical data were obtained would have been useful. Given the scope of the study, the author's conclusions appear to be appropriate.

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Other publications of related interest


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