Cost-effectiveness study comparing imatinib with interferon-alpha for patients with newly diagnosed chronic-phase (CP) chronic myeloid leukemia (CML) from the Chinese public health-care system perspective (CPHSP)

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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
This study compared the cost-effectiveness of imatinib with that of interferon for patients with newly diagnosed, chronic-phase, chronic myeloid leukaemia. The authors concluded that imatinib was cost-effective, in China, at the threshold recommended by the World Health Organization. The methods were appropriate, but more details of those used to obtain the outcome estimates would have been useful. The results were adequately reported and the conclusions appear to be appropriate for the scope of the analysis.

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

Study objective
The objective was to compare the cost-effectiveness of imatinib versus interferon for patients with newly diagnosed, chronic-phase, chronic myeloid leukaemia.

Interventions
Imatinib, 400mg per day, an oral molecular-targeted therapy, was compared with interferon-alpha, at three million international units per day.

Location/setting
China/secondary care.

Methods
Analytical approach:
A model combined data from published studies to assess the lifetime cost-utility of the two interventions. The authors stated that the perspective was that of the Chinese public health care system.

Effectiveness data:
The effectiveness parameters were mainly from three studies. Long-term survival was from an update of a study assessing the cost-effectiveness of imatinib versus interferon (Reed, et al. 2008, see 'Other Publications of Related Interest' below for bibliographic details). The complete cytogenetic response rates were from two randomised trials that were not conducted in China. These response rates, for long-term survival in chronic myeloid leukaemia, were the main clinical effectiveness estimates.

Monetary benefit and utility valuations:
The utility weights were from the study assessing the cost-effectiveness of the two interventions (Reed, et al. 2004, see 'Other Publications of Related Interest' below for bibliographic details) and they were derived, using the European Quality of life (EQ-5D) questionnaire.

Measure of benefit:
The measures of benefit were life-years gained and quality-adjusted life-years (QALYs) gained. The benefits were discounted at a rate of 3.5% per annum.
Cost data:
The direct costs included those of consultations; blood and other tests; treatment of disease; and medication costs. The prices for drugs were the Chinese listed retail prices. The resource use and unit costs for office visits and blood tests were from the charges of top-tier hospitals in China. The hospitalisation costs were not included as few patients required hospitalisation during the chronic phase and the treatment costs for adverse events were not included as there were no data available. Future costs were discounted at an annual rate of 3.5% and all costs were reported in Chinese yuan (CNY).

Analysis of uncertainty:
One- and two-way sensitivity analyses were undertaken to assess the impact of variations in the model parameters on the results.

Results
After discounting, the average lifetime costs were CNY 473,096 higher for patients receiving imatinib than for those on interferon and the incremental gain in survival was 6.3 life-years or 6.4 QALYs.

Compared with interferon, the incremental cost-effectiveness ratio for imatinib was CNY 74,908 per life-year gained, and the incremental cost-utility ratio was CNY 73,674 per QALY gained.

The sensitivity analyses showed that these results were most sensitive to variations in the discount rate and the price of imatinib.

Authors' conclusions
The authors concluded that imatinib was cost-effective in China, compared with interferon-alpha, at the threshold recommended by the World Health Organization.

CRD commentary
Interventions:
The interventions were adequately reported and an explanation was given for using interferon as the comparator; imatinib was the recommended treatment, but was reimbursable in only a few Chinese cities, while interferon was given to many patients as it was reimbursable in most locations. These interventions might be appropriate comparators in other settings.

Effectiveness/benefits:
Very brief details were given of the methods used to identify the clinical and effectiveness estimates. The effectiveness data were mainly from randomised trials and studies that were not conducted in China. This means it was unclear if all the relevant information was included. The outcome data from other countries, such as the USA, and Europe might not be generalisable to the Chinese setting. The measures of benefit appear to have been appropriate.

Costs:
The perspective was explicitly reported and it appears that all the relevant cost categories were included for this health care perspective, but some relevant costs were omitted, such as hospitalisations and the treatment of adverse events. The authors stated that these omissions biased the analysis against imatinib, but their inclusion would have made the study more accurate. The details of how the resource use and unit costs were obtained were provided. The time horizon, discount rate, and currency details were reported, but the price year was not and this will hamper future reflation exercises.

Analysis and results:
Few details and no diagram of the decision model were provided. The impact of uncertainty on the results was tested in one- and two-way sensitivity analyses. These assess uncertainty to some extent, but a probabilistic sensitivity analysis would have more thoroughly assessed the overall model uncertainty. The authors reported a number of limitations to their study.

Concluding remarks:
The methods were appropriate, but more details on those used to obtain the outcome estimates would have been useful. The results were adequately reported. The conclusions appear to be appropriate for the scope of the analysis.

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