



Title	Effectiveness and Cost-effectiveness of Imatinib for First-line Treatment of Chronic Myeloid Leukaemia in Chronic Phase: A Systematic Review and Economic Analysis
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Aim

To evaluate the effectiveness of imatinib as first-line treatment for chronic myeloid leukemia (CML) compared with interferon-alpha (IFN-alpha), hydroxyurea, and bone marrow transplantation (BMT), and the cost effectiveness of imatinib compared with IFN-alpha and hydroxyurea.

Conclusions and results

Intention-to-treat analysis showed that imatinib was associated with complete cytogenetic response (CR) at 12 months followup of 68%, compared with 20% for the IFN-alpha plus Ara-C group. An estimated 98.5% of people taking imatinib, and 93.1% taking IFN-alpha plus Ara-C had not progressed to accelerated or blast phases at 12 months. Overall survival was not statistically significantly different. Withdrawal due to side effects was 2% for imatinib and 5.6% for IFN-alpha plus Ara-C. The study presents data on cross-over due to intolerance, quality of life (QoL), median complete CR, median withdrawal due to side effects, and median and long-term survival. Direct comparison between imatinib and hydroxyurea or BMT was not possible. Simple indirect comparison with hydroxyurea suggests that imatinib is more effective. Comparison of imatinib and BMT is not currently possible. The incremental cost-effectiveness ratio (ICER) of imatinib compared with IFN-alpha was estimated as £26,180 per quality-adjusted-life-year (QALY) gained. Imatinib appears less cost effective when compared to hydroxyurea with an estimated ICER of £86,934 per QALY.

Recommendations

Imatinib appears to be more effective than current standard drug treatments in terms of CR and progression-free survival, with fewer side effects. There is uncertainty about longer term outcomes, the development of resistance to imatinib, the duration of response, and the place of imatinib relative to BMT. New issues arise continually, eg, optimal management pathways and combination therapies.

Methods

Selected studies and full-text articles were screened and selected. Survival was the key outcome measure. Surrogate outcome measures included HR (hematological response) and CR. As no published cost-effectiveness studies compared imatinib and IFN-alpha, a Markov model was constructed to assess cost effectiveness. This was compared with models submitted to the National Institute for Clinical Excellence by the manufacturer of imatinib.

Further research/reviews required

Long-term followup data from the first- and second-line imatinib trials. Investigation of specific subgroups, eg, high-risk patients, the elderly, children, or those eligible for BMT. Long-term comparisons of imatinib and BMT in early stages of CML. Use of imatinib combined with other therapies, and further detailed economic studies. Impact of CML and imatinib on QoL.