Cost-effectiveness analysis of sunitinib in patients with metastatic and/or unresectable gastrointestinal stromal tumours (GIST) after progression or intolerance with imatinib

Paz-Ares L, Garcia del Muro X, Grande E, Gonzalez P, Brosa M, Diaz S

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 assessed the cost-effectiveness of sunitinib, as a second-line treatment, for patients with metastatic and/or unresectable gastrointestinal stromal tumours that were resistant to, or in patients who were intolerant to, imatinib, from the perspective of the Spanish National Health System. The authors concluded that sunitinib was cost-effective, compared with best supportive care. The methods and results were generally well reported and the authors' conclusions appear to be appropriate.

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

Study objective
The objective was to assess the cost-effectiveness of sunitinib, as a second-line treatment, for patients with metastatic and/or unresectable gastrointestinal stromal tumours that were resistant to, or in patients who were intolerant to, imatinib.

Interventions
Patients received sunitinib, 50mg per day orally for four weeks, followed by two weeks rest, with no sunitinib. This cycle continued until there was a diagnosis of tumour progression. All patients received best supportive care, and this was compared with best supportive care alone, which consisted of diagnostic tests and palliative care.

Location/setting
Spain/secondary care.

Methods
Analytical approach:
A US, developed, Markov model was adapted to the Spanish setting to combine the data from a published trial and expert opinion. The health states included progression-free survival, progression, and death. The time horizon was six years. The authors stated that the perspective was that of the Spanish National Health System.

Effectiveness data:
The effectiveness data were from one, randomised, multicentre, double-blind, placebo-controlled trial of 312 patients (Demetri, et al. 2006, see 'Other Publications of Related Interest' below for bibliographic details). The main clinical effectiveness estimates were the time to disease progression and the overall survival. The transition probabilities were from an analysis of the progression-free survival and overall survival of patients in the trial (202 who received sunitinib and 102 who received best supportive care); overall survival was extrapolated to the six-year time horizon. The incidence of adverse events was from the trial.

Monetary benefit and utility valuations:
The utility values were collected using the European Quality of life (EQ-5D) questionnaire during the trial. The baseline utility value was assumed to be the same for patients in both groups. Changes from baseline were recorded throughout the trial. The values for sunitinib were weighted scores for the treatment and rest periods estimated separately. The utility decrement with disease progression was assumed to be the same for each treatment.
Measure of benefit:
The primary measure of benefit was quality-adjusted life-years (QALYs). Secondary measures of benefit included progression-free survival and life-years. An annual discount rate of 3.5% was applied.

Cost data:
The cost categories included drugs, medical visits, laboratory and radiology tests, palliative care, and adverse events. It was assumed that there were no costs for adverse events with best supportive care. The resource use was estimated by a panel of six local experts (three pathology experts and three expert health economists), using data from the trial. The unit costs were from standard sources and published literature. They were reported in Euros (EUR) and indexed to 2007 values. An annual discount rate of 3.5% was applied.

Analysis of uncertainty:
One-way sensitivity analyses, varying the parameter values by ±25%, were conducted. A scenario was analysed with 85% of patients receiving imatinib 400mg per day, as a palliative treatment, after progression. A probabilistic sensitivity analysis was conducted, using 1,000 replications, and the results were displayed on a cost-effectiveness plane.

Results
Progression-free survival was 0.50 years with sunitinib and 0.24 with supportive care. The life-years were 1.59 with sunitinib and 0.88 with supportive care. The QALYs were 1.00 with sunitinib and 0.55 with supportive care.

The mean costs per patient were EUR 23,259 with sunitinib and EUR 1,622 with supportive care.

The incremental cost-effectiveness ratio for sunitinib compared with supportive care was EUR 4,090 per month of progression-free survival, EUR 30,242 per life-year gained, or EUR 49,090 per QALY gained.

The model was most sensitive to the overall survival hazard ratio, the sunitinib acquisition cost, and the utility values during active treatment and after progression. If 85% of patients received palliative therapy with imatinib, the incremental cost-effectiveness ratio increased to EUR 61,291 per QALY gained. In the probabilistic sensitivity analysis, 99% of replications produced higher effectiveness and higher costs for sunitinib.

Authors' conclusions
The authors concluded that sunitinib was cost-effective, compared with best supportive care, as a second-line treatment for gastrointestinal stromal tumours.

CRD commentary
Interventions:
The interventions were well described and appear to have been appropriate comparators.

Effectiveness/benefits:
The effectiveness data were from a randomised, multicentre, double-blind, placebo-controlled trial, which should ensure that they were of good quality. To fully assess the validity of these data, the trial publication should be consulted. The measures of benefit appear to have been appropriate, as they included disease-specific and more generalisable measures. No utility decrements were applied for adverse events, but the measures of benefit were appropriately discounted.

Costs:
The perspective was clearly stated and the costs appear to have been relevant to this perspective. The unit costs and resource quantities were well reported in tables. The panel of experts, who estimated the resource use, was small, which might increase the uncertainty in these estimates. The sources for the unit costs appear to have been appropriate and the costs were appropriately discounted and adjusted for inflation.

Analysis and results:
The analytic approach appears to have been appropriate. A diagram of the model was provided and the methods were
adequately reported. The results were well reported and an incremental analysis was presented, which was appropriate and makes the results generalisable to other settings. The results and the uncertainty analysis were well reported. The authors appropriately compared their results with those of similar published studies. They discussed some of the limitations of their study, such as the lack of utility data for Spanish patients and the use of survival analysis to extrapolate the trial results up to six years.

**Concluding remarks:**
The methods and results were generally well reported and the authors' conclusions appear to be appropriate.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
19068454

**Original Paper URL**
http://www.springerlink.com/content/h58x7323ln0nk311/

**Other publications of related interest**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Algorithms; Antineoplastic Agents /economics /therapeutic use; Benzamides; Chemotherapy, Adjuvant /economics; Cost-Benefit Analysis; Disease Progression; Double-Blind Method; Drug Resistance, Neoplasm /drug effects; Gastrointestinal Stromal Tumors /drug therapy /economics /mortality /pathology; Health Resources /utilization; Humans; Imatinib Mesylate; Indoles /economics /therapeutic use; Markov Chains; Models, Econometric; Neoplasm Metastasis; Piperazines /therapeutic use; Placebos; Pyrimidines /therapeutic use; Pyrroles /economics /therapeutic use; Survival Analysis; Treatment Failure

**AccessionNumber**
22009100983

**Date bibliographic record published**
07/04/2009

**Date abstract record published**
26/01/2012