Cost-effectiveness of optimized background therapy plus maraviroc for previously treated patients with R5 HIV-1 infection from the perspective of the Spanish health care system

Moreno S, Gonzalez J, Lekander I, Martí B, Oyaguez I, Sanchez-de la Rosa R, Casado MA

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 examined the cost-effectiveness of maraviroc as an addition to optimised background therapy for patients with R5 HIV-1 infection, who had been treated with three classes of antiretroviral drugs. The authors concluded that the addition of maraviroc was a cost-effective strategy, from the perspective of the Spanish health care system. The cost-effectiveness approach was valid and the authors’ conclusions seem robust.

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

Study objective
This study examined the cost-effectiveness of maraviroc plus optimised background therapy for patients with R5 HIV-1 infection, who had been treated with three classes of antiretroviral drugs or who had virus strains that were resistant to three drug classes.

Interventions
Maraviroc 300mg twice per day was added to the optimised therapy and was compared against the optimised therapy alone, for patients with R5 HIV-1 infection who had been treated previously. Maraviroc treatment lasted for one year.

Location/setting
Spain/secondary care.

Methods
Analytical approach:
The analysis was based on a Markov model with a lifetime horizon (26 years). The authors stated that the perspective of the Spanish health care system was adopted.

Effectiveness data:
The clinical evidence for the model was from a selection of relevant studies. The treatment efficacy (HIV-ribonucleic acid response rate) and other key model inputs were from a pooled analysis of the Maraviroc Versus Optimized Therapy in Viremic Antiretroviral Treatment-Experienced Patients (MOTIVATE) studies one and two, which included 426 patients in the maraviroc arm and 209 patients in the placebo arm (Gulick, et al. 2008, see ‘Other Publications of Related Interest’ below for bibliographic details). The follow-up was 24 weeks in study one and 48 weeks in study two. Additional data were from the EuroSIDA study, the Multicenter AIDS Cohort Study (MACS), and other published reports. Some assumptions were made. The treatment efficacy was the key model parameter.

Monetary benefit and utility valuations:
The utility values were from published literature.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years were the summary benefit measures. A 3% annual discount rate was applied.

Cost data:
The economic analysis included the costs of optimised therapy, enfuvirtide, maraviroc, HIV-related medical resources depending on cluster of differentiation (CD) 4 values, AIDS-related adverse events, CD4 cell count, HIV viral load test, and death. The resource use was from published literature (including the MOTIVATE studies). The drug costs were from Spain's General Council of Official Pharmaceuticals Colleges. The costs of different CD4 cell states were from a published Spanish economic evaluation. Other costs were based on published reports. All costs were in Euros (EUR) and were discounted at an annual rate of 3%. The price year was 2009.

Analysis of uncertainty:
One-way sensitivity analyses were carried out on the treatment duration, the model time horizon, the rate of success, the lag time, the transition probabilities, the utilities, the AIDS-related events and mortality, the discount rates, and the costs of maraviroc, optimised therapy, enfuvirtide, HIV-related care, and adverse events. The ranges of values were based on published estimates and authors' assumptions. A probabilistic sensitivity analysis was undertaken considering probability distributions for the model inputs and cost-effectiveness acceptability curves were generated.

Results
The projected costs were EUR 275,970 with maraviroc and EUR 254,655 with optimised therapy. The expected life-years were 7.813 with maraviroc and 6.861 with optimised therapy and the QALYs were 6.631 with maraviroc and 5.723 with optimised therapy. The incremental cost per life-year gained with maraviroc over optimised therapy was EUR 22,398, while the incremental cost per QALY gained was EUR 23,457.

The deterministic analysis showed that the incremental cost per QALY gained with maraviroc ranged from cost-saving, with a time horizon of five years, to EUR 33,112, with a maraviroc treatment duration of 26 years. The most influential inputs were the maraviroc treatment duration and the optimised therapy cost.

The probability of maraviroc being cost-effective at a threshold of EUR 30,000 per QALY was 99%.

Authors' conclusions
The authors concluded that maraviroc plus optimised background therapy was cost-effective from the perspective of the Spanish health care system.

CRD commentary
Interventions:
The selection of the comparators appears to have been appropriate as the conventional approach was compared against a more intensive strategy. A clear description of the optimised therapy was not given. A comparison with other antiretroviral agents appears to have been beyond the scope of this analysis.

Effectiveness/benefits:
The selection of most of the clinical data from a specific clinical trial, without a systematic search for evidence, was appropriate. The methods of this trial were reported in detail in the primary publication and they should have ensured the validity of the clinical data. Limited information on the other sources of data was given and homogeneity between them was not investigated. There were no long-term data for maraviroc, so the treatment duration was assumed to be one year to match the clinical trial data. Most of the clinical data were varied in the sensitivity analysis. Both QALYs and life-years were appropriate benefit measures because the disease affects both survival and quality of life. They both allow comparisons with the benefits of other health care interventions. No details on the derivation of utility weights were provided.

Costs:
The categories of costs reflected the perspective of the third-party payer, which was the viewpoint stated by the authors. The resource quantities and unit costs were generally presented together and as category totals. The costs of each CD4 health state were from a published economic evaluation that was not described, but should have reflected the Spanish situation. The drug use data came from the maraviroc clinical trials, and they might differ from real clinical practice. Other sources of resource use were not reported. In general, typical Spanish sources for the unit costs were used. Other details, such as the price year and discount rate, were appropriately reported.
Analysis and results:
The results were clearly presented and the costs and benefits were appropriately synthesised, using an incremental approach. Sensitivity analyses were carried out to examine how robust the base case findings were to variations in the model inputs. A clear description of the decision model was provided. Conventional discounting was applied to the costs and benefits. The authors acknowledged some limitations of their analysis and these mainly related to the lack of long-term data for maraviroc and the need for assumptions.

Concluding remarks:
The cost-effectiveness approach was valid and the authors’ conclusions seem robust.

Funding
Funding received from Pfizer Inc.

Bibliographic details
Moreno S, Gonzalez J, Lekander I, Marti B, Oyaguez I, Sanchez-de la Rosa R, Casado MA. Cost-effectiveness of optimized background therapy plus maraviroc for previously treated patients with R5 HIV-1 infection from the perspective of the Spanish health care system. Clinical Therapeutics 2010; 32(13): 2232-2245

PubMedID
21316539

DOI
10.1016/S0149-2918(10)80026-8

Original Paper URL
http://www.clinicaltherapeutics.com/article/S0149-2918(10)80026-8/abstract

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Anti-HIV Agents /administration & dosage /economics /therapeutic use; CCR5 Receptor Antagonists; Cost-Benefit Analysis; Cyclohexanes /administration & dosage /economics /therapeutic use; Drug Therapy, Combination; Female; HIV Fusion Inhibitors /administration & dosage /economics /therapeutic use; HIV Infections /drug therapy /economics /immunology /virology; HIV-1 /drug effects; Humans; Male; Markov Chains; Middle Aged; Models, Economic; National Health Programs; Quality-Adjusted Life Years; Spain; Triazoles /administration & dosage /economics /therapeutic use; Young Adult

AccessionNumber
22011000438

Date abstract record published
18/05/2011