Cost-effectiveness of maraviroc for antiretroviral treatment-experienced HIV-infected individuals in Mexico

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 study assessed the cost-effectiveness of maraviroc to the management of treatment-experienced adults with HIV/AIDS in Mexico. The authors concluded that maraviroc might be cost-effective, especially in individuals with limited options for antiretroviral therapy. The analysis used valid and transparent methods that incorporated the impact of alternative assumptions. The authors’ conclusions appear generally robust.

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

Study objective
The study assessed the cost-effectiveness of maraviroc to the management of treatment-experienced adults with HIV/AIDS in Mexico.

Interventions
Optimised background therapy plus the antiretroviral drug maraviroc (300mg twice daily) was compared with optimised background therapy alone for HIV/AIDs in treatment-resistant adults. Treatment resistance was defined as HIV-1 RNA levels above 5,000 copies/mL, after at least six months of therapy with at least one of three antiretroviral agents or documented resistance/intolerance to one member of each antiretroviral therapy class.

Location/setting
Mexico/secondary care.

Methods
Analytical approach:
The analysis was based on the AntiRetroviral Analysis by Monte Carlo Individual Simulation (ARAMIS) model, which was adapted to the Mexican setting. A lifetime horizon was adopted. The authors stated that the perspective of the health care system was taken.

Effectiveness data:
Most clinical inputs had been already incorporated in the published simulation model and were taken from published studies. Baseline characteristics of patients and treatment effect (the key clinical input) were taken from the MOTIVATE 1 and 2 trials, which directly compared the two options. Data were pooled in some circumstances. A 48-week follow-up was used in the clinical trials, so long-term extrapolations were based on observational studies and assumptions. Adverse events were obtained from these two trials. Mortality and other epidemiological data were taken from Mexican sources.

Monetary benefit and utility valuations:
Utility valuations were based on published sources, except for the quality of life associated with adverse events, which was based on expert option.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years were used as the summary benefit measures. A 5% annual discount rate was applied.
Cost data:
The direct medical costs for HIV care included active antiretroviral therapy, tropism testing, adverse events associated with antiretroviral therapy, acute and prophylactic treatment of opportunistic infections, CD4+ cell count tests, HIV RNA tests, treatment for adverse events, and HIV-related or opportunistic infection-related palliative care preceding death. Patterns of resource consumption and most unit costs were based on a review of patient records from nine hospitals in Mexico City. Costs were in presented in Mexican pesos and US $. The price year was 2008. Costs were discounted at an annual rate of 5%.

Analysis of uncertainty:
A secondary analysis considered only the subgroup of CCR5-tropic HIV-1 detectable after tropism testing. Various one-way and multi-way sensitivity analyses were carried out on inputs including treatment efficacy, accuracy of the tropism test, cost of treatment, utility values, and discount rate (no discounting). Data from the MOTIVATE trial were used to calculate genotypic, phenotypic, and overall susceptibility scores for the optimised background therapy activity in each patient.

Results
For optimised background therapy alone, the expected costs were $93,709 with optimised background therapy alone, the projected life years were 5.4033 and the QALYS were 4.4209.

For maraviroc plus optimised background therapy, the expected costs were $115,038, the projected life years were 5.9977 and the QALYS were 4.9236.

The incremental cost per life year gained with maraviroc plus optimised background therapy over optimised background therapy alone was $35,880; the incremental cost per QALY gained was $42,429.

In the secondary analysis, the incremental cost per life year gained fell to $17,777, while the incremental cost per QALY gained was slightly reduced to $41,823.

The sensitivity analysis showed that base case results were generally stable. The most influential inputs were the assumption of no discounting and the assumption of no increase in CD4+ cell count in suppressed patients after week 48.

Authors’ conclusions
The authors concluded that in treatment-experienced adults with HIV/AIDS maraviroc might be cost-effective, especially in individuals with limited options for antiretroviral therapy.

CRD commentary
Interventions:
The selection of the comparators appeared to have been appropriate to the specific setting of Mexican health care. These comparisons were also relevant for other jurisdictions.

Effectiveness/benefits:
Data on treatment effect and toxicity were taken from large, head-to-head clinical trials that were partially described and should ensure high internal validity. When possible, data were pooled to increase the sample size. The use of patient-level data represented a strength of the analysis. Conservative assumptions were made for model extrapolation of clinical results. Some model parameters were adapted to the Mexican context. Clinical parameters were varied extensively in the sensitivity analysis. A number of clinical outcomes were reported to estimate the impact of the interventions on patients' health. The two benefit measures were appropriate as they allowed cross-disease comparisons to be made. Sources of utility valuations were not described.

Costs:
The economic analysis was satisfactorily carried out. The cost categories included were clearly reported with most data on unit costs. All economic inputs were appropriately taken from country-specific official sources. The price year was clearly stated, which would allow reflation exercises in other time periods. The impact of variations in key economic inputs was investigated in the sensitivity analyses.
Analysis and results:
Costs and benefits were synthesised using an incremental approach. Uncertainty was investigated using a deterministic approach, which focused on several key inputs of the model. The authors justified their decision not to perform a probabilistic analysis on the grounds that it was not considered appropriate given the use of a micro-simulation model. The results were clearly reported. Transferability of the results was not addressed, but it was likely that these findings would be relevant to other settings given the use of a validated model with international data. The authors stated that maraviroc was cost-effective using a standard $50,000 threshold, but not with a threshold of three times the gross domestic product of Mexico.

Concluding remarks:
The analysis used valid and transparent methods that incorporated the impact of alternative assumptions. The authors’ conclusions appear generally robust.

Funding
The study and the development of the model were sponsored by Pfizer Inc. (manufacturers of maraviroc). Three of the authors were employees of Pfizer at the time of writing

Bibliographic details

PubMedID
21091827

DOI
10.1111/j.1524-4733.2010.00798.x

Original Paper URL
http://www.valueinhealthjournal.com/article/S1098-3015(11)71822-8/abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Computer Simulation; Cost-Benefit Analysis; Cyclohexanes /economics /therapeutic use; Female; HIV Fusion Inhibitors /economics /therapeutic use; HIV Infections /drug therapy /economics; Humans; Male; Mexico; Middle Aged; Models, Biological; Quality-Adjusted Life Years; Triazoles /economics /therapeutic use

AccessionNumber
22011000075

Date bibliographic record published
16/02/2011

Date abstract record published
16/08/2012