Potential risks and benefits of HIV treatment simplification: a simulation model of a proposed clinical trial


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 objective was to assess the long-term outcomes and costs of standard care versus simple atazanavir-ritonavir alone for human immunodeficiency virus patients, who had suppressed ribonucleic acid levels on treatment. The simple strategy could lead to longer survival at a lower cost than standard care. However, the risk of protease inhibitor resistance in the simple regimen determined its viability. The methodology was valid, despite limited reporting for some parameters. In general, the authors’ conclusions appear to be valid.

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

Study objective
The objective was to assess the long-term outcomes and costs of a continued standard care strategy versus a simple strategy of atazanavir-ritonavir alone, in human immunodeficiency virus (HIV) patients who had achieved suppression of the HIV ribonucleic acid level while receiving treatment.

Interventions
In the standard care strategy, patients received five sequential regimens of combination antiretroviral therapy. Initially they received a non-nucleoside reverse transcriptase inhibitor regimen, followed by two ritonavir-boosted, protease inhibitor (PI) regimens, then a regimen containing ritonavir-boosted darunavir, with or without enfuvirtide, and finally a minimally effective salvage regimen, which did not include enfuvirtide.

In the simple strategy, all patients were switched from their current suppressive therapy, at the start of the study, to a simple maintenance regimen consisting of atazanavir-ritonavir.

Location/setting
USA/the setting was not reported.

Methods
Analytical approach:
A state-transition model (the Cost-Effectiveness of Preventing AIDS Complications model) was used to project the health outcomes and costs of the two interventions. A lifetime horizon was used and the authors stated that a population perspective was adopted.

Effectiveness data:
The effectiveness data came from published studies. The authors did not report any search methods or inclusion criteria. The main clinical parameters were the efficacy and adverse events of a sequence of HIV drug regimens.

Monetary benefit and utility valuations:
Not reported.

Measure of benefit:
The two measures of benefit were life expectancy and quality-adjusted life expectancy (QALE). The future benefits
were discounted at an annual rate of 3%.

Cost data:
The cost category was drug costs. The cost data were taken from published studies. All costs were reported in US dollars ($), and the price year was 2005. Discounting was performed at an annual rate of 3% and the details were provided.

Analysis of uncertainty:
A sensitivity analysis was performed on some of the estimates for the model. In addition, a break-even analysis was performed in which the baseline assumptions were varied in order to identify the point at which the simple strategy would provide an outcome equivalent to the standard care strategy.

Results
Under the standard care strategy patients had a life expectancy of 17.3 years and a QALE of 14.7 years.

In the simple strategy, patients who did not develop PI resistance, had a life expectancy of 17.5 years and a QALE of 14.9 years. However, those who did develop PI resistance, had a life expectancy of 17.0 years and a QALE of 14.5 years.

The average lifetime costs for standard care patients was $456,700, compared with $430,200 for simple strategy patients, who did not develop PI resistance, and $384,300 for simple strategy patients, who did develop PI resistance.

The results of the analysis were sensitive to the proportion of patients developing PI resistance in the simple strategy.

Authors' conclusions
The authors concluded that the simple strategy could lead to longer overall survival at a lower cost compared with the standard care strategy. However, the risk of PI resistance during the simple regimen determined the viability of the strategy.

CRD commentary
Interventions:
The interventions were clearly reported. The standard care strategy (comparator) represented the current practice in the authors' setting.

Effectiveness/benefits:
The effectiveness data were derived from a selection of relevant studies. However, the methods used to select these studies were not reported. Therefore it is difficult to ascertain if the best available evidence was used. The details of the base-case estimates and their sources were fully reported. The measures of benefit, life expectancy and QALE, were appropriate as they capture the long term consequences of the strategies. However, their derivation methods were not reported.

Costs:
The authors stated that a population perspective was adopted for the assessment of benefits, but they did not report a cost perspective, so it is impossible to determine whether all the relevant cost categories were included. The costs were reported per month for each treatment regimen, with no details of the unit costs or resource quantities, which makes it difficult to generalise these results to other settings. The total costs were obtained from the same sources that provided the effectiveness estimates. Details of adjustments, including the price year and discounting, were reported. Limited sensitivity analyses were performed on some of these cost estimates.

Analysis and results:
No synthesis of the cost and outcome results was performed. The impact of uncertainty was investigated. In particular, the authors varied their baseline assumptions to determine the point at which the simple strategy would provide an outcome similar to that of standard care. The level of reporting was generally good and the authors acknowledged and reported the limitations of their analysis.
Concluding remarks:
The methodology seems to have been valid, despite some limitations in the reporting of some of the model parameters. In general, the authors' conclusions appear to be appropriate.

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