Journal of the International AIDS Society

Poster presentation

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NRTI backbone pairs for treatment-naïve adults with HIV infection: a UK economic evaluation

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from Ninth International Congress on Drug Therapy in HIV Infection
Glasgow, UK. 9–13 November 2008

Published: 10 November 2008

Journal of the International AIDS Society 2008, **11**(Suppl 1):P306 doi:10.1186/1758-2652-11-S1-P306

This abstract is available from: http://www.jiasociety.org/content/11/S1/P306

Purpose of the study

Three nucleoside reverse transcriptase inhibitor (NRTI) pairs are commonly used in the UK in people with HIV infection naïve to antiretroviral treatment. This analysis evaluated lifetime health outcomes, costs, and cost-effectiveness associated with once-daily tenofovir DF/emtricitabine (TDF/FTC), twice-daily zidovudine/lamivudine (ZDV/3TC), and once-daily abacavir/lamivudine (ABC/3TC).

Methods

Results of head-to-head clinical trials of TDF/FTC vs. ZDV/3TC (144-week results of Study 934) and ABC/3TC vs. ZDV/3TC (normalized 48-week results of Study CNA30024) were used to populate a Markov model that estimated lifetime costs and health outcomes for treatment-naïve individuals. Virologic response (< 400 copies/mL) over time was estimated by fitting exponential curves to trial data; individuals with viral load levels above 400 copies/mL switched to second-line treatment. Immune response data were used to calculate transition probabilities between six health states based on CD4 cell-count ranges. Subsequent therapy lines were modeled using likely baskets of second-line, third-line, and non-suppressive therapy regimens. Utility values, mortality rates, drug costs and other direct medical costs were obtained from published sources. Adverse events observed in Studies 934 and CNA30024 were accounted for in modeled costs and outcomes. Base-case results were tested in one-way and probabilistic sensitivity analyses.

Summary of results

Individuals using TDF/FTC were predicted to remain on first-line therapy for an average of 5.9 years compared with 4.9 years and 4.8 years, respectively, for those using ABC/3TC and ZDV/3TC. Individuals using TDF/FTC were predicted to accrue total lifetime costs of £267,603 and experience 14.50 quality-adjusted life-years (QALYs), on average, compared with £269,487 and 14.38 QALYs and £266,785 and 14.20 QALYs for ABC/3TC and ZDV/3TC, respectively. The resulting cost-utility ratios were -£15,525 and £2,727 per QALY gained for TDF/FTC compared with ABC/3TC and ZDV/3TC, respectively.

Conclusion

TDF/FTC was predicted to be both more effective and cost saving compared with ABC/3TC and to be cost-effective, using a threshold of £20,000 per QALY gained, compared with ZDV/3TC in treatment-naïve adults with HIV infection in the UK. In addition, TDF/FTC offers convenient, once-daily dosing. Results were driven by better efficacy and tolerability of TDF/FTC compared with the other NRTI pairs.